



# LTRA – Land Transport Regulatory Authority

## Integration Design Document

## Unified Smart Card solutions for Transportation

# SUMMARY



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## CHANGE LOG

| Ver. | Made       | Verification | Approves | Issue Date | Description of the changes                                                                                                                                                                                                                                            |
|------|------------|--------------|----------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1.0  | Consortium | Masarat Misr | LTRA     | 13/11/2024 | Final version                                                                                                                                                                                                                                                         |
| 2.0  | Consortium | Masarat Misr | LTRA     | 28/11/2024 |                                                                                                                                                                                                                                                                       |
| 3.0  | Consortium | Masarat Misr | LTRA     | 16/03/2025 | Chapter '1.7 Customer Smartcard Verification Process' is removed as it is replaced entirely by the chapter ' <b>Customer Migration</b> '.<br>The Use Cases relating to user management involving access to Hitachi services are updated as a result of the migration. |

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Some other minor changes.

# 1 Integration of the New USCT System with the Existing Metro and LRT Systems

Integration of the new USCT System with the existing Metro and LRT Systems is essential to ensure smooth and coherent management of transport operations. This integration is based on the existing specifications provided by Hitachi, as outlined in the documents 'LINE 1 & 2 SSS - System Specification' and 'Unified Interface Definition - Interface Control Document (ICD)'.

## 1.1 Integration Objectives

The main objective of integration is to ensure that the USCT System works in synergy with the Metro and LRT Systems, improving operational efficiency and information flow management.

Integration will ensure:

- The alignment of communication protocols between the systems.
- The synchronisation of operational data for centralised management.
- The adoption of standard procedures for the transfer and processing of information.

## 1.2 Technical Specifications

The technical specifications for integration are based on the following documents provided by Hitachi:

- **LINE 1 & 2 SSS - System Specification:** This document details the system specifications necessary for the integration of the various components, ensuring compatibility and interoperability between the USCT System and the Metro and LRT Systems.
- **Unified Interface Definition - Interface Control Document (ICD):** This document provides the guidelines for defining the communication interfaces between the Systems, ensuring that the transfer of data takes place smoothly and without interruption.

Some specifics included in the following chapters have been sourced from the Hitachi specification document to ensure alignment with the existing system architecture and operational standards. For more information about the Hitachi specifications, please refer to two previous mentioned documents.

## 1.3 Integration Plan

The integration of the new USCT system will require a number of key activities to ensure a smooth transition and efficient operations. Strictly necessary activities are listed below:

### 1. Interface Design

- Development of technical specifications for communication interfaces.

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- Definition of the protocols and data formats to be used.

### 2. Development and Configuration

- Implementation of the communication interfaces between the USCT system and existing systems.
- Configuration of the software modules required for transaction management.
- Configuration of all relevant data, including products, network information, stations, transports, and any other pertinent details, must be provided and accurately configured within the system.

### 3. Testing and Validation

- Performing unit and integrated tests to verify the functionality of the interfaces.
- Validation of data flows between the different systems.

### 4. Training and Support

- Training of operational staff in the use of the new system.
- Provision of technical support during the transition period.

### 5. Go-Live

- Activation of the integrated system in the production environment.
- Continuous monitoring of performance and resolution of problems encountered.

### 6. Review and Optimisation

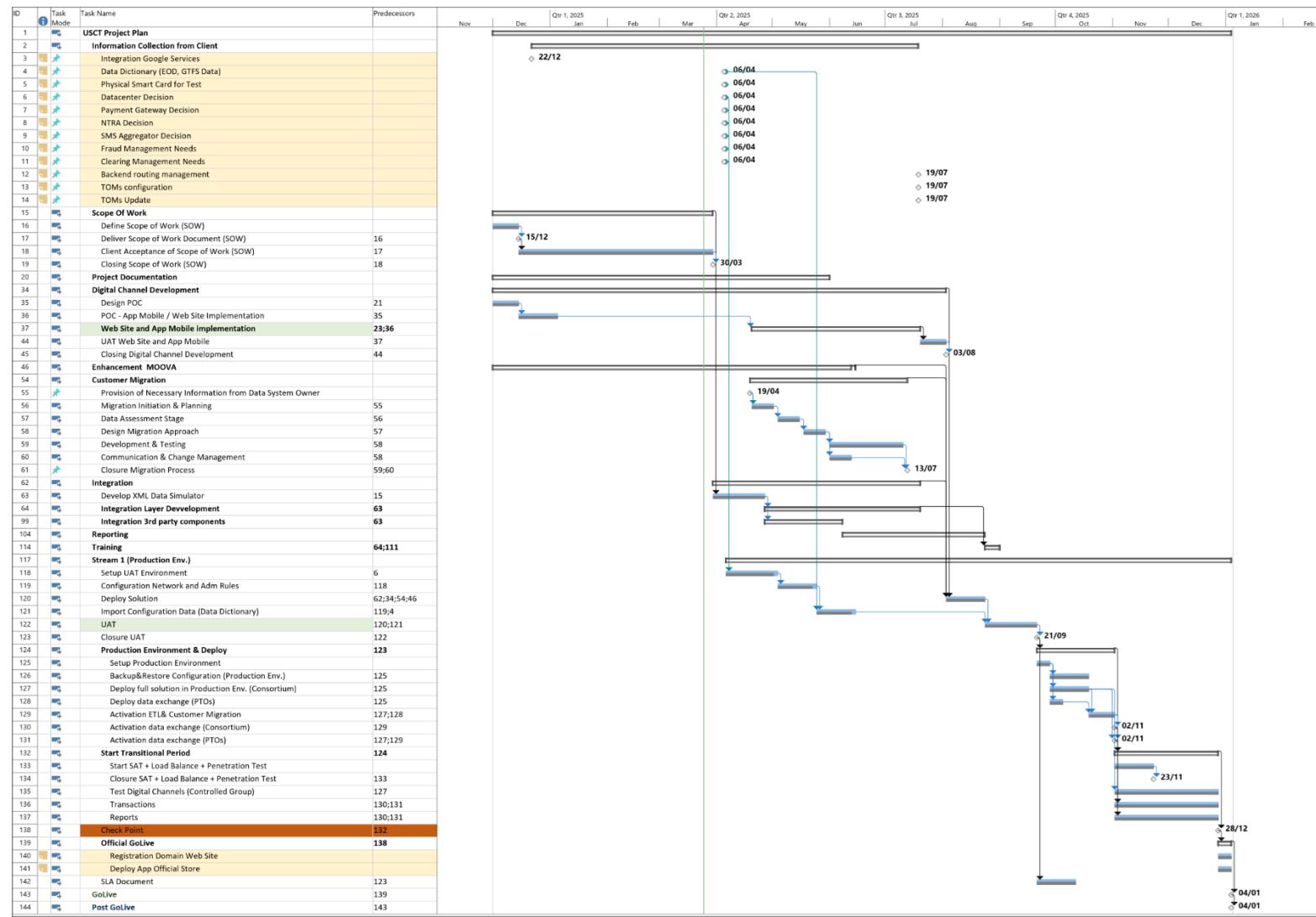
- Evaluation of the integrated system's performance.
- Implementation of any improvements and optimisations.

### 7. Customer Migration

- Identification and segmentation of customer groups for migration.
- Development of a detailed migration plan, including timelines and milestones.
- Communication with customers about the migration process and any changes they need to be aware of.
- Provision of support to customers during the migration to ensure a smooth transition.

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### 1.3.1 Integration Timeline



Page 1

## 1.4 Points of Integration

Below is a list of the main areas of integration, which will be detailed below:

- **Customer Management:** Customer management to ensure a uniform user experience regarding the flow via TOMs or via digital channels of the USCT platform (website / mobile app).
- **Reload / Sell / Renew Fare Products:** Sale of products at the TOMs, which will be associated with the CSC-P and exchanged with the USCT platform for subsequent financial/economic activities.
- **Magnetic Ticket (MT) Purchase / Exchange / Validation:** Transaction acquisition flows related to the magnetic ticket.
- **PVU Reload and Penalty:** Reload and management of penalties via PVU.
- **Blacklist:** Management of blacklists to and from PTOs to ensure centralisation of the status of a CSC-P smartcard.
- **Validation:** Validation of products.
- **Materialization in TOM:** Materialization of content purchased via USCT digital channels (website / mobile app) on the CSC-P.

## 1.5 End To End Use Cases

The general purpose of use cases is the decomposition of business problems into discrete items.

The objective of the proposed end-to-end (E2E) use cases is to integrate existing processes, which will remain largely unchanged except for user management, by introducing a new level: the USCT Platform. This platform will enable customers to have a single access point to all different offerings from various Public Transport Operators.

The use cases are written in natural language in order to facilitate the understanding. The technical architecture (e.g. detailed description of the interfaces) is left to the detailed specifications except when such details are required within the context of a specific use case.

The use cases are grouped per functional domains. The following breakdown is used:

- **Products Management** includes the processes for creating and managing product definitions, setting pricing structures, and integrating these products within the broader AFC system.
- **Customer Management:** On-boarding new customers, overseeing Customer information, ensuring user profiles are maintained accurately, and facilitating smooth interaction with the system.
- **Customer service:** sale and after sale services managed by the Commercial Agents at the front office, and products managed by customers themselves using digital channels (website / mobile app).
- **Usage of the transport mode :** usage of the gates and the enforcement processes.

## 1.6 Assumptions

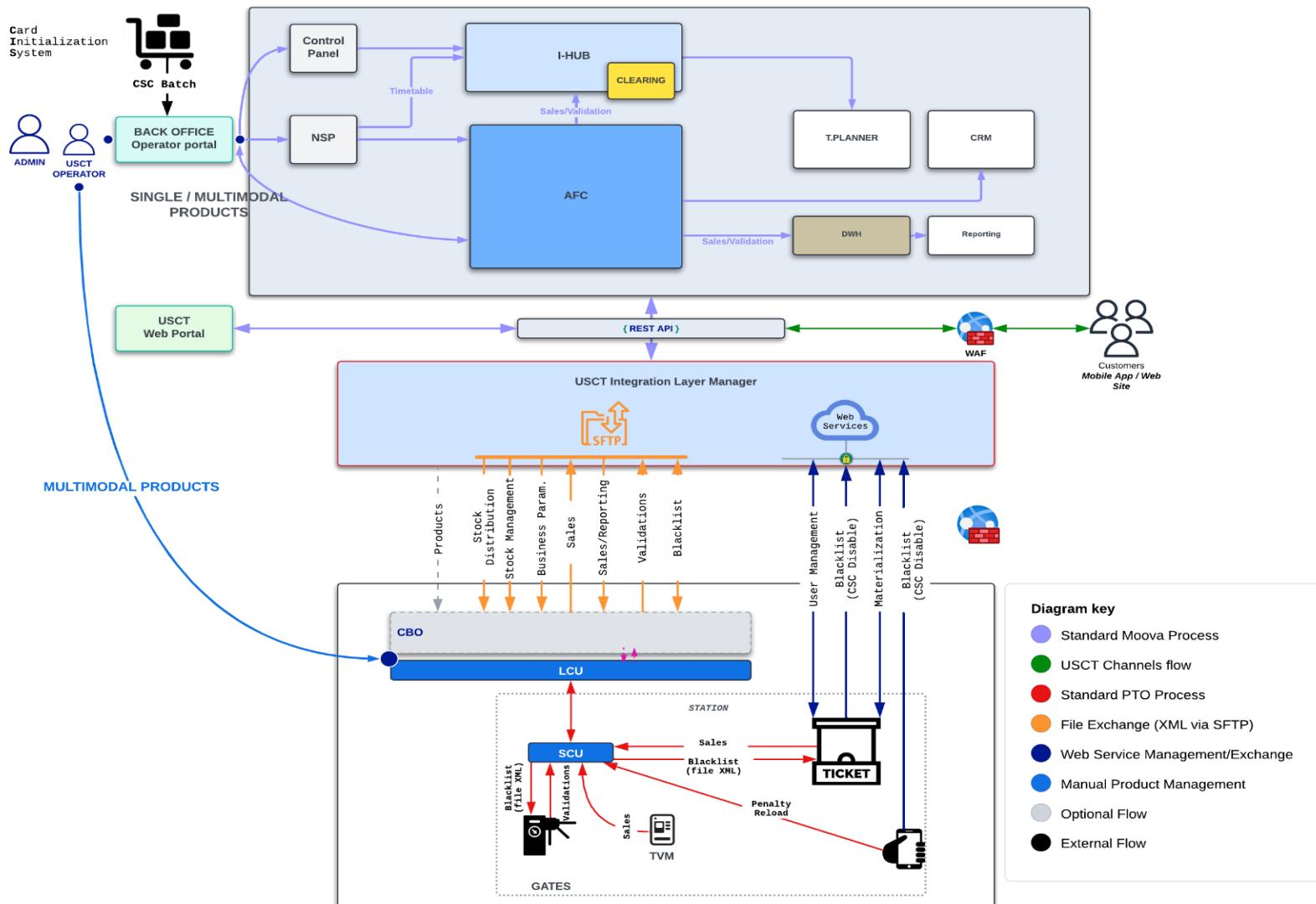
In order to ensure a seamless integration and consistent user experience, the following assumptions have been made:

- The USCT Smartcard will have the same card data model and SAM as the one currently used in the metro (Hitachi).
- USCT (Moova) will host the customer and the card, but it can be shared in any process with the CBO, if required by the CBO (for the event files).

## 1.7 Integration Overview and Process Flows

The following image provides a comprehensive overview of the integration process and the associated flows. It represents the high-level interactions between various subsystems and the new USCT Platform, illustrating how the existing processes are integrated and enhanced. This visual representation aims to facilitate a better understanding of the overall system architecture and the roles of different components in achieving a seamless and efficient operation.

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Important Note: PTO with a Backoffice System must use the CBO Component as entry point, if this is not present, the LCU must be used directly.

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## 1.8 Event Handler

In this chapter, we will explore the activities related to event handling within the AFC system. This includes defining which activities fall within the scope of the project and which do not. The following sections will provide a detailed overview of the events and the division of responsibilities.

## 1.9 Protocol for file transfer

The file transfer is performed via **SFTP** over TCP-IP.

The SFTP server is deployed on the USCT Platform. The Hitachi Central Back Office (CBO), or AFC Level-3 LRT system, connects to this server to provide USCT with various transactions. This process follows the exact existing setup today; however, we are adding a new level that centralizes all transactions in one system.

The files are provided in **XML** format.

## 1.10 Event Data Files

|             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| FileName    | MM_NNNNN_YYMMDDSEQ.xml<br>Refer to description in table below                                                                                                                                                                                                                                                                                                                                                                                                     |
| Directory   | \#Level3Name#\data\yyyymmdd\<br>•     yyyymmdd is a sub directory per day that contains the event data files:<br>o     yyyy: year o     mm: month o     dd: day                                                                                                                                                                                                                                                                                                   |
| XSD         | LCUEventsDataFile.xsd                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Description | The event data files are created by the front-end devices. They contain the operations executed on the fare media or on the device itself. The event data file can contain:<br>Fare media transactions:<br>Sale and services (product sale, T-purse reload, product refund ...)<br>Validation events<br>Device events:<br>o     Filtered device alarms o     Stock status o     Agent shift open / close o     Device startup o     Device shutdown (End of file) |

The event data files are named with following convention:

|                                                          |
|----------------------------------------------------------|
| MM_NNNNN_YYMMDDSEQ.xml                                   |
| MM : Number that identifies the equipment model          |
| NNNNN: Specifies the equipment serial number             |
| YY: Represents the year of the exploitation day (0-99).  |
| MM: Represents the month of the exploitation day (1-12). |
| DD: Represents the day of the exploitation day (1-31).   |

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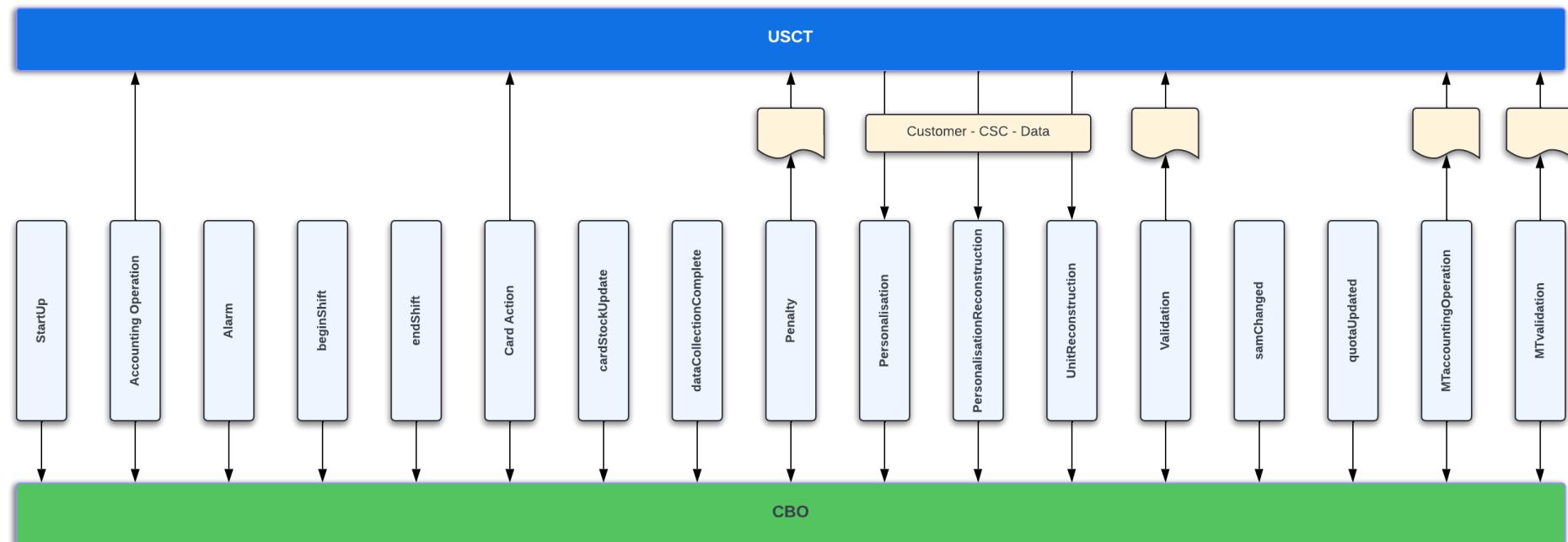
SEQ: Represents the sequence of the day. (one every 15 minutes)

| Field name            | Type / Cardinality<br>(1 by default) | Description                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-----------------------|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| dataRecordsCollection |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| xs:choice             | <u>Cardinality:</u><br>0..n          | The file can contain several events. The event types are chosen from the list (Refer to Hitachi document 63369660-558 § 3.5.2.1):<br>startUp<br>accountingOperation<br>alarm<br>beginShift<br>endShift<br>cardAction<br>cardStockUpdate<br>dataCollectionComplete<br>penalty<br>personalization<br>personalizationReconstruction<br>unitReconstruction<br>validation<br>samChanged<br>QuotaUpdated<br>MTaccountingOperation<br>MTvalidation |
| endOfFile             | <u>Cardinality:</u><br>0..1          | Optional part that can be generated at device shutdown or at the end of the operational day. Refer to Hitachi document 63369660-558 § 3.5.2.1.19                                                                                                                                                                                                                                                                                            |
| Signature             |                                      | See Hitachi document 63369660-558 Appendix E.3                                                                                                                                                                                                                                                                                                                                                                                              |

**Important note:** For more information about the Events and specific meaning of each one, please refer to Hitachi document **63369660-558** chapters **3.5.2.1.1 -> 19.**

## 1.11 Events Owners

The image aims to visualize the different responsibilities related to the processing of the events.

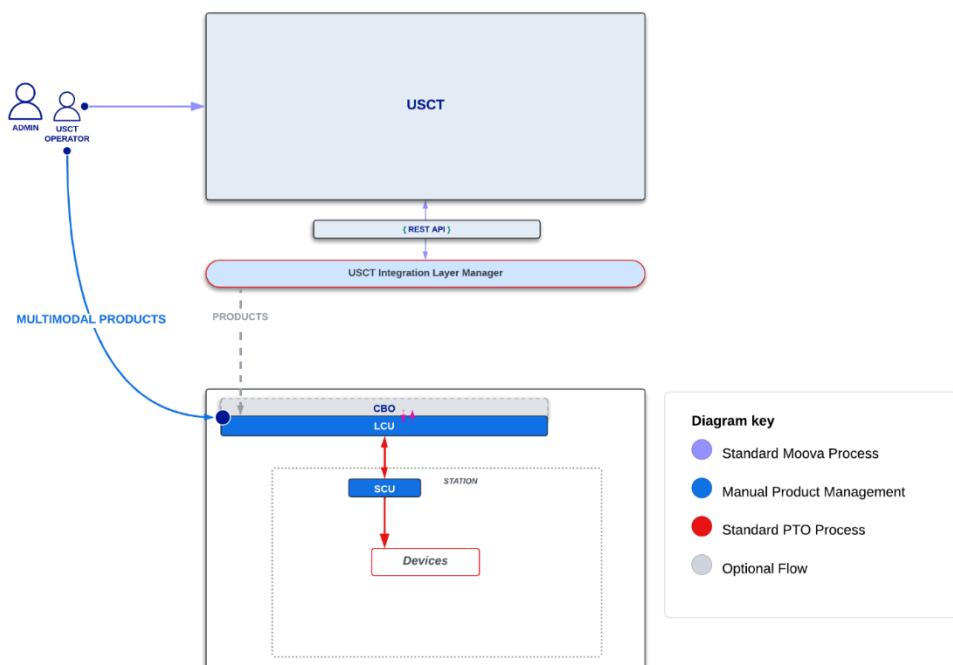


## 2 Product Management

This section outlines the management of the product catalogue within the new USCT platform, including the integration of existing PTO products and any new multimodal products introduced by the platform.

The integrated catalogue on the USCT platform will include both the existing PTO products and the new multimodal products. To ensure seamless integration, the following steps must be followed:

- 1. Manual Configuration of Existing PTO Products:** The products currently sold by the PTOs must be manually configured in the USCT backend. This requires creating the PTO service network within the Network and Service Planning module of the MoovA platform. Once the network is available on the MoovA platform, the product configuration can be done within the AFC module of MoovA. After the configuration, these products can be sold through both the existing channels and new digital channels (Mobile app and website).
- 2. Configuration of New USCT Multimodal Products:** New multimodal products introduced by the USCT platform will be configured in the USCT back office by the LTRA. These products will be shared with the PTOs through XML files (Fare and Time Parameter files) to enable their sale across different channels. These products will also be available via the digital channels. This also ensures proper validation of these products at the gates.



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## 2.1 Management of the new USCT Multimodal Products

The following subchapter will explain how the **USCT Product Catalogue Search API** works. This service is intended to be exposed via the digital channels to enable the users to purchase any fare product available inside the catalogue. **However, if needed, this service can also allow any existing PTO to access the product catalogue of the USCT platform.**

### 2.1.1 PRODUCT SEARCH

| Endpoint    |                                                        |
|-------------|--------------------------------------------------------|
| Http Method | GET                                                    |
| Uri         | <a href="#">es/interactive-ticket-manager/products</a> |

#### 2.1.1.1 INPUT

| Attribute          | Type   | Description                                                        |
|--------------------|--------|--------------------------------------------------------------------|
| <b>pageNumber*</b> | String |                                                                    |
| <b>pageSize*</b>   | String |                                                                    |
| <b>tpTyp</b>       | String | Touchpoint type                                                    |
| <b>medTp</b>       | String | Media type.(Can be specified to filter as per media availability.) |
| <b>cpId</b>        | String | Customer profile code.                                             |
| <b>geoTyp</b>      | String | Type of geographical validity                                      |
| <b>genotypes</b>   | String | Geographic validityType Operator                                   |
| <b>groupType</b>   | String | Combined or Fixed.                                                 |

#### 2.1.1.2 OUTPUT

The output in this case is a list of **Products** and corresponding parameters for each product.

The following table describes different parameters that are used to define a product on USCT.

| Attribute                         | Type           | Description                                                                                                                                                                                                                                                       |
|-----------------------------------|----------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>productId</b>                  | string         | Identifier of the fare product                                                                                                                                                                                                                                    |
| <b>productVersion</b>             | Integer        | Version of the fare product                                                                                                                                                                                                                                       |
| <b>productName</b>                | String         | Name of the fare product                                                                                                                                                                                                                                          |
| <b>productType</b>                | String         | Type                                                                                                                                                                                                                                                              |
| <b>productTypeDesc</b>            | String         | Description of the type of product                                                                                                                                                                                                                                |
| <b>productStartValidity</b>       | String(\$date) | Identifies the start of validity of the product                                                                                                                                                                                                                   |
| <b>productEndValidity</b>         | String(\$date) | Identifies the end of validity of the product                                                                                                                                                                                                                     |
| <b>deadline</b>                   | Integer        | Number of days for the deadline                                                                                                                                                                                                                                   |
| <b>advanceSale</b>                | Integer        | Number of days to sell the product in advance                                                                                                                                                                                                                     |
| <b>codeExternal</b>               | String         | External code identifier of the product                                                                                                                                                                                                                           |
| <b>notSoldSeparately</b>          | Boolean        |                                                                                                                                                                                                                                                                   |
| <b>scopingValidityParameters</b>  | Object         | The parameters reflect mainly spatial limitations. The Scoping Validity Parameter allows one or more validity parameters to be assigned. The many different possible parameters are organized into five groups. (Organisation, Network, Route, Service, Product). |
| <b>temporalValidityParameters</b> | object         | To specify the temporal access right restrictions of a product.                                                                                                                                                                                                   |
| <b>usageParameters</b>            | object         | Parameters which affect the actual use of access rights, such as user profile, frequency of use, transferability, etc.                                                                                                                                            |

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|                                      |         |                                                                                                                                                                                            |
|--------------------------------------|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>scopingGeographicalParameters</b> | object  | The value of a geographical interval or a distance matrix element.                                                                                                                         |
| <b>distributionTouchpoints</b>       | object  | Assigning a distribution channel or a touchpoint through which a product may or may not be distributed.                                                                                    |
| <b>mediaSet</b>                      | object  | Assignment of a media through which a product will be materialised.                                                                                                                        |
| <b>fareTable</b>                     | object  | A faretable cell allows the representation of groups of prices for the combination of fare elements. It defines a multi-dimensional matrix of cells, each of which may state a fare price. |
| <b>fareFrame</b>                     | object  |                                                                                                                                                                                            |
| <b>customerNumber</b>                | Integer | Customer number as per serial number                                                                                                                                                       |
| <b>sellers</b>                       | object  | Identifier of the product seller.                                                                                                                                                          |
| <b>promotions</b>                    | object  | To define the type of promotion to be applied on the product, if any.                                                                                                                      |
| <b>roundTrip</b>                     | Boolean | If the product is valid for a round trip.                                                                                                                                                  |
| <b>bookingIsNeeded</b>               | Boolean |                                                                                                                                                                                            |
| <b>antiPassBacklimit</b>             | Number  | antipassBack duration in seconds.                                                                                                                                                          |
| <b>validationNetworkElements</b>     | object  | Inclusion and exclusion of network elements.                                                                                                                                               |
| <b>noteProdInfo</b>                  | string  |                                                                                                                                                                                            |
| <b>genericParameters</b>             | object  | Can be any generic parameter along with its details.                                                                                                                                       |
| <b>codPriceCalculationModality</b>   | string  | Price calculation modality code.                                                                                                                                                           |
| <b>chargingMoment</b>                | string  | Charging moment code.                                                                                                                                                                      |

## 3 Customer Service

### 3.1 Customer Management

This section encompasses all the use cases involving the management of the customer data inside the USCT. It explains the process and the entry points for the customer on-boarding to the USCT platform through all the available channels. The section further provides an in-depth explanation of each aspect of this process such as registration and any changes/updates of the existing customer data, and the possible systems and actors involved or affected by each aspect of the customer management process.

Moreover, the following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                                                                  | USCT-<br>Integration<br>Design Document | 63248442-305                                                             |
|---------------------------------------------------------------------------|-----------------------------------------|--------------------------------------------------------------------------|
| Creation of a customer record at the TOM and the issuance of the CSC-P    | UC-CM01                                 | UC-CM01 ( <i>Customer creation</i> )<br>UC-SA01 ( <i>Issuing CSC-P</i> ) |
| Creation of a Customer record by digital channels (web site / mobile app) | UC-CM02                                 | N.A.                                                                     |
| Attachment of a CSC-A to a customer at the TOM                            | UC-CM07                                 | UC-CM03                                                                  |
| Check / Update Customer flow via TOM or USCT Channels                     | UC-CM03                                 | UC-CM02<br>(N.A. USCT Digital Channels)                                  |
| Creation/update of a claim at the TOM                                     | UC-CM04                                 | UC-CM04                                                                  |
| Creation/update of a claim by Digital Channels (web site / app mobile)    | UC-CM05                                 | N.A.                                                                     |
| Management of customer claims at the USCT                                 | UC-CM06                                 | UC-CM06                                                                  |

#### 3.1.1 UC-CM01 - Creation of a customer record at the TOM and the issuance of the CSC-P

|        |                                                                                                                                                                                                                                                                                                                                                                                                |
|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID     | UC-CM01                                                                                                                                                                                                                                                                                                                                                                                        |
| Title  | Creation of a Customer record at the TOM                                                                                                                                                                                                                                                                                                                                                       |
| Goal   | <p>The commercial agent registers the information of a new customer.</p> <p>The objective is that the process will not change from the Commercial Agent and EndCustomer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOMs.</p> <p>The main change resides in the fact that the Customer record is held in the CBO.</p> |
| Actors | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                 |

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|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>TOM</li> <li>CBO (Open Shift)</li> <li>USCT (Customer Management)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Precondition(s)</b>  | <ul style="list-style-type: none"> <li>The TOM is configured for accessing the USCT Web Service Interface.</li> <li>The shift is open on the TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Postcondition(s)</b> | <ul style="list-style-type: none"> <li>The Commercial Agent registered the Customer information</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Assumption(s)</b>    | <ul style="list-style-type: none"> <li>TOM (Ticket Office Machines) are connected to the USCT Platform.</li> <li>The USCT Platform exposes web services that are utilized by TOM.</li> <li>These web services are connected to the USCT Platform and invoke API standard channels.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Synoptic</b>         | <p>The synoptic diagram illustrates the process flow across various systems:</p> <ul style="list-style-type: none"> <li><b>Customer Registration:</b> A customer (CUSTOMER) interacts with the TOM system. The process starts with "Customer Data" and "Customer Agent Registration". This leads to a "Message" step, which then triggers an "Enquiry Customer Info." step.</li> <li><b>ILM (Information Layer Manager):</b> Handles the "Registration Process" and "Check 3rd Party (NTRA / CBO WS / ...)" steps. It also receives a "Response" from the "Check 3rd Party" step and performs "Customer Creation".</li> <li><b>MOVA (Mobile Value):</b> Handles the "Enquiry Customer Info." step.</li> <li><b>3rd PARTY:</b> Handles the "Check 3rd Party (NTRA / CBO WS / ...)" step.</li> <li><b>CBO (Customer Management):</b> Handles the "Get Customer Info." step.</li> <li><b>LCU (Local Control Unit):</b> Handles the "Link CustomerCard" step.</li> <li><b>Action:</b> Final steps involving "Personalization" and "Attach Card to Customer Record" lead to the LCU.</li> </ul> |
| <b>Flows</b>            | <p>The flowchart details the integration architecture:</p> <ul style="list-style-type: none"> <li><b>USCT:</b> The central component, connected via REST API to the <b>USCT Integration Layer Manager</b>.</li> <li><b>Integration Layer Manager:</b> Manages communication with external systems.</li> <li><b>Customer Mobile/ Web Site:</b> Connected via WiFi to the Integration Layer Manager.</li> <li><b>User Management:</b> Manages access to the system.</li> <li><b>Web Service Management:</b> Represented by blue dots.</li> <li><b>USCT Channels flow:</b> Represented by green arrows indicating data flow between components.</li> <li><b>Components:</b> CBO, LCU, SCU, STATION, TICKET, and TOM.</li> </ul>                                                                                                                                                                                                                                                                                                                                                               |

Integration Design Document

**Process**

**Flow I:**

1. The Customer presents themselves at the ticket office and provides their data to the operator.
2. The operator enters the information into the system, which connects via web service to the USCT Platform.
3. The process verifies the quality of the information.
4. The Customer is registered on the platform.

**Flow II:**

1. The ticket office operator identifies a CSC from the stock to proceed with personalization.
2. The system retrieves user information from the USCT system.
3. The flow follows the standard process for card personalization.
4. The card is associated with the customer.
5. The TOM operator issues the CSC to the customer.

**Alternative 1:**

- The USCT system provides the event file to the CBO, if required.

Integration Design Document

### 3.1.2 UC-CM02 - Creation of a customer record through digital channels (website/mobile app) and issuance of the CSC-P at the TOM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-CM02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Title            | Creation of a Customer record by the digital channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Goal             | <p>The goal of this use case is to enable users to access the website or mobile app, enter their data, complete the registration process themselves, then proceed to the Ticket Office Machine (TOM) to request a CSC-P.</p> <p>The operator at the TOM will then provide the Customer with the CSC-P.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• CBO (Open Shift)</li> <li>• USCT (Customer Management)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The TOM is configured for accessing the USCT Web Service Interface.</li> <li>• The shift is open on the TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agent provide the Customer with the CSC-P</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• TOM (Ticket Office Machines) are connected to the USCT Platform.</li> <li>• The USCT Platform exposes web services that are utilized by TOM.</li> <li>• These web services are connected to the USCT Platform and invoke API standard channels.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Synoptic         | <p>The diagram illustrates the interaction between the USCT CHANNELS, 3rd PARTY, and TOM components over two steps:</p> <p><b>Step 1:</b> The Customer interacts with the USCT CHANNELS (Access Platform, Registration, Message) and the 3rd PARTY (Check 3rd Party (INTRA+CDI-+), Customer Creation). A Response is sent from the 3rd PARTY to the USCT CHANNELS.</p> <p><b>Step 2:</b> The Customer interacts with the 3rd PARTY (Empty Customer Info., Get Customer Info., Attach CSC-P to Customer, Link Customer/Card) and the TOM (CSC-P Release, Empty Customer Info., Personalization: Attach Card to Customer Record). A Response is sent from the 3rd PARTY to the Customer.</p> <pre> sequenceDiagram     participant Customer     participant USCT_CHANNELS     participant 3rd_PARTY     participant TOM      Note left of USCT_CHANNELS: USCT CHANNELS     Note left of 3rd_PARTY: 3rd PARTY     Note left of TOM: TOM      Customer-&gt;&gt;USCT_CHANNELS: Access Platform     Customer-&gt;&gt;USCT_CHANNELS: Registration     Customer-&gt;&gt;USCT_CHANNELS: Message     USCT_CHANNELS--&gt;&gt;3rd_PARTY: Check 3rd Party (INTRA+CDI-+)     3rd_PARTY--&gt;&gt;Customer: Response     3rd_PARTY--&gt;&gt;Customer: Customer Creation      Note right of Step 1: Response      Customer-&gt;&gt;3rd_PARTY: Empty Customer Info.     3rd_PARTY--&gt;&gt;Customer: Get Customer Info.     3rd_PARTY--&gt;&gt;Customer: Attach CSC-P to Customer     3rd_PARTY--&gt;&gt;Customer: Link Customer/Card     Customer-&gt;&gt;TOM: CSC-P Release     Customer-&gt;&gt;TOM: Empty Customer Info.     TOM--&gt;&gt;Customer: Personalization: Attach Card to Customer Record   </pre> |

Integration Design Document

| Flows   | <p>The diagram illustrates the architecture of the USCT system. At the top is a large box labeled 'USCT'. Below it is a red rounded rectangle labeled 'USCT Integration Layer Manager'. A blue arrow labeled '(REST API)' points from the USCT box down to the layer manager. To the right of the layer manager is a 'WAF' (Web Application Firewall) represented by a red circle with a white center. A green arrow points from the layer manager to the WAF. From the WAF, a green arrow points to a group of three people icons labeled 'Customers Mobile App / Web Site'. Below the layer manager is a vertical blue arrow labeled 'USER MANAGEMENT'. This arrow points down to a box containing several components: 'CBO' (top), 'LCU' (middle), 'SCU' (bottom), 'STATION' (dashed box), 'TOM' (bottom), and 'TICKET' (bottom). A blue arrow labeled 'USER MANAGEMENT' also connects the 'STATION' box to the 'TICKET' box.</p> <p><b>Diagram key:</b></p> <ul style="list-style-type: none"> <li>● Web Service Management</li> <li>● USCT Channels flow</li> </ul> |
|---------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Process | <p><b>Flow I:</b></p> <ol style="list-style-type: none"> <li>1. The user downloads and installs the mobile app or accesses the website.</li> <li>2. The user manually registers by entering their personal data.</li> <li>3. The user is created on the USCT platform.</li> </ol> <p><b>Flow II:</b></p> <ol style="list-style-type: none"> <li>1. The Customer goes to the TOM to physically request the CSC-P, providing their registration details.</li> <li>2. The operator connects to the USCT via Web Service and retrieves the user information.</li> <li>6. The system retrieves user information from the USCT system.</li> <li>7. The flow follows the standard process for card personalization.</li> <li>8. The card is associated with the customer.</li> </ol> <p><b>Alternative 1:</b></p> <ul style="list-style-type: none"> <li>• The USCT system provides the event file to the CBO.</li> </ul>                                                                                                                                                       |

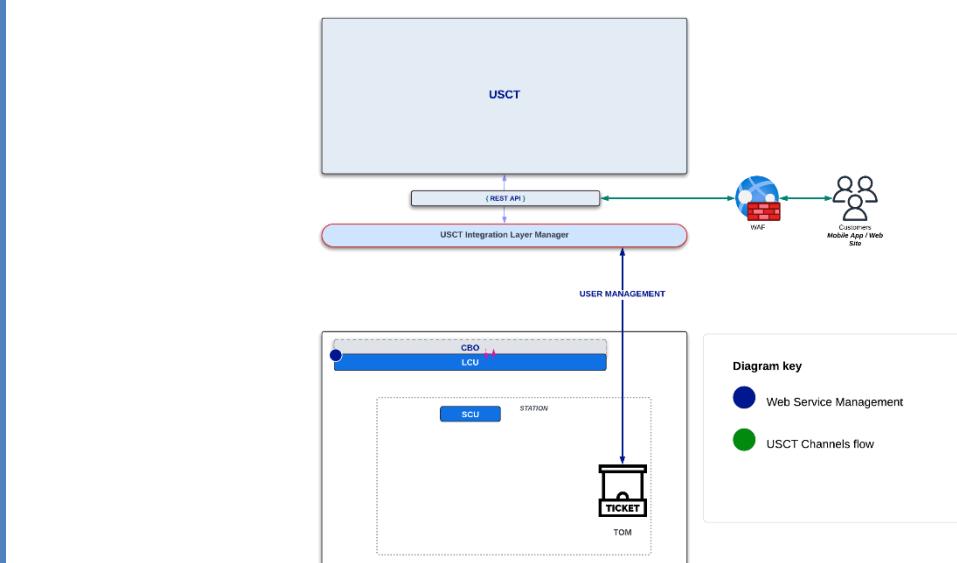
## Integration Design Document

## 3.1.3 UC-CM07 - Attachment of a CSC-A to a customer at the TOM

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>               | UC-CM07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Title</b>            | Attachment of a CSC-A to a customer at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Goal</b>             | <p>The customer is previously registered in the CBO.</p> <p>The Commercial Agent attaches an anonymous card to the customer (this card has been previously sold to the customer).</p> <p>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOMs.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Actors</b>           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• LCU/CBO</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Precondition(s)</b>  | <ul style="list-style-type: none"> <li>• The TOM is configured for accessing the USCT Web Service Interface. The Customer is previously registered, and customer record is displayed on the TOM</li> <li>• The customer owns a CSC-A (Anonymous CSC)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Postcondition(s)</b> | <ul style="list-style-type: none"> <li>• The CSC-A is attached to the customer</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Assumption(s)</b>    | <ul style="list-style-type: none"> <li>• None.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Synoptic</b>         | <pre> graph LR     CUSTOMER((CUSTOMER)) --&gt; SelectCard[Select Card to Attach]     SelectCard --&gt; AttachCard[Attach Card to Customer Record]     AttachCard --&gt; AttachCSCP[Attach CSC-P to Customer]     AttachCSCP --&gt; LinkCustomer[Link Customer/Card]      SelectCard &lt;--&gt; SearchILM[Search for the CSC]     SearchILM &lt;--&gt; SearchMOOVA[Search for the Card]     AttachCSCP &lt;--&gt; LinkCustomer   </pre> <p>The synoptic diagram illustrates the data flow between three systems: TOM, ILM, and MOOVA. A customer interacts with the TOM system. Within the TOM, a customer selects a card to attach. This leads to the 'Attach Card to Customer Record' step. Simultaneously, the 'Select Card to Attach' step sends a request to both the ILM and MOOVA systems to search for the CSC and the card respectively. Once found, the 'Attach CSC-P to Customer' step is executed, followed by the 'Link Customer/Card' step. Finally, the 'Attach Card to Customer Record' step is completed.</p> |

Integration Design Document

**Flows**



**Process**

**Flow I:**

1. Registered user who already has a CSC-A goes to the TOM.
2. Requests the operator to connect the CSC-A to his account.

**Flow II:**

1. Operator identifies the customer, identifies the card and associated the card to the customer.

**Flow III:**

1. The USCT platform generates an information message about the activity.

**Alternative Flow (after Flow I):**

1. The operator attempts to associate the CSC-A to the customer's account.
2. During the process, the system identifies that the CSC-A is already associated with another user.
3. The process is blocked, and an error message is displayed to the operator, stating that the CSC-A is already linked to a different account.
4. The decision on the next steps is handed over to the "Commercial Agent".

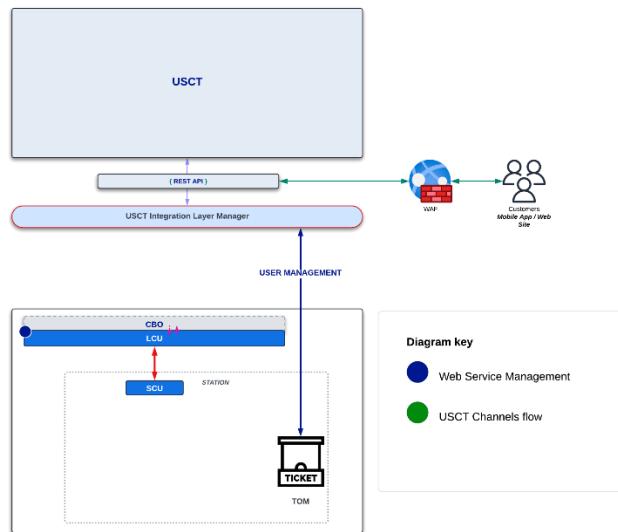
## Integration Design Document

## 3.1.4 UC-CM03 - Check / Update Customer flow via TOM or USCT Channels

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-CM03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Title            | Check / Update Customer flow via TOM or USCT Channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Goal             | The goal of this use case is to enable users to check and update their customer information through the Ticket Office Machine (TOM) or via USCT Channels, ensuring accurate and up-to-date records in the USCT system.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• CBO (Open Shift)</li> <li>• USCT (Customer Management)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The TOM is configured for accessing the USCT Web Service Interface.</li> <li>• The shift is open on the TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agent can check the Customer sheet.</li> <li>• Optionally, the Commercial Agent updates the Customer Record.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• TOM (Ticket Office Machines) are connected to the USCT Platform.</li> <li>• The USCT Platform exposes web services that are utilized by TOM.</li> <li>• These web services are connected to the USCT Platform and invoke API standard channels.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Synoptic         | <pre> sequenceDiagram     participant CUSTOMER     participant TOM     participant ILM     participant MOOVA     participant USCT_CHANNELS      CUSTOMER-&gt;&gt;TOM:      activate TOM     TOM-&gt;&gt;CustomerData:      activate CustomerData     CustomerData-&gt;&gt;EnquiryCustomerInfo:      activate EnquiryCustomerInfo     EnquiryCustomerInfo-&gt;&gt;DisplayCustomerInfo:      activate DisplayCustomerInfo     DisplayCustomerInfo-&gt;&gt;UpdateCustomerInfo:      activate UpdateCustomerInfo     UpdateCustomerInfo-&gt;&gt;ExecuteUpdate:      activate ExecuteUpdate     ExecuteUpdate-&gt;&gt;DisplayCustomerInfo:      activate DisplayCustomerInfo     DisplayCustomerInfo-&gt;&gt;UpdateCustomerInfo:      activate UpdateCustomerInfo     UpdateCustomerInfo-&gt;&gt;CustomerData:      deactivate UpdateCustomerInfo     CustomerData-&gt;&gt;GetCustomerInfo:      activate GetCustomerInfo     GetCustomerInfo-&gt;&gt;ReadCustomerInfo:      activate ReadCustomerInfo     ReadCustomerInfo-&gt;&gt;CustomerData:      deactivate ReadCustomerInfo     CustomerData-&gt;&gt;AccessPlatform:      activate AccessPlatform     AccessPlatform-&gt;&gt;CUSTOMER:      deactivate AccessPlatform     </pre> <p>The diagram illustrates the interaction between four systems: TOM, ILM, MOOVA, and USCT CHANNELS. It starts with a Customer sending a message to the TOM system. The TOM system then performs several steps: retrieving Customer Data, querying for Enquiry Customer Info, displaying the info, and performing an optional update. Simultaneously, the Customer Data is sent to the ILM, MOOVA, and USCT CHANNELS systems. The ILM and MOOVA systems both query for Enquiry Customer Info and return it to the Customer. The USCT CHANNELS system also queries for Get Customer Info and Read Customer Info, which are then displayed to the Customer. Finally, the Customer Data is updated in the USCT CHANNELS system, and a message is sent back to the Customer.</p> |

Integration Design Document

**Flows**



**Process**

**Flow I:**

1. The Customer goes to the TOM and provides their personal information to be identified.
2. The operator enters the information and retrieves the user's profile.
3. The customer's information is displayed on the screen and can be modified.

**Optional:**

- The operator proceeds to update some of the customer's information.

**Flow II:**

- The Customer accesses the web application or mobile app and navigates to the personal data section.

**Optional:**

- The Customer proceeds to update the editable fields.

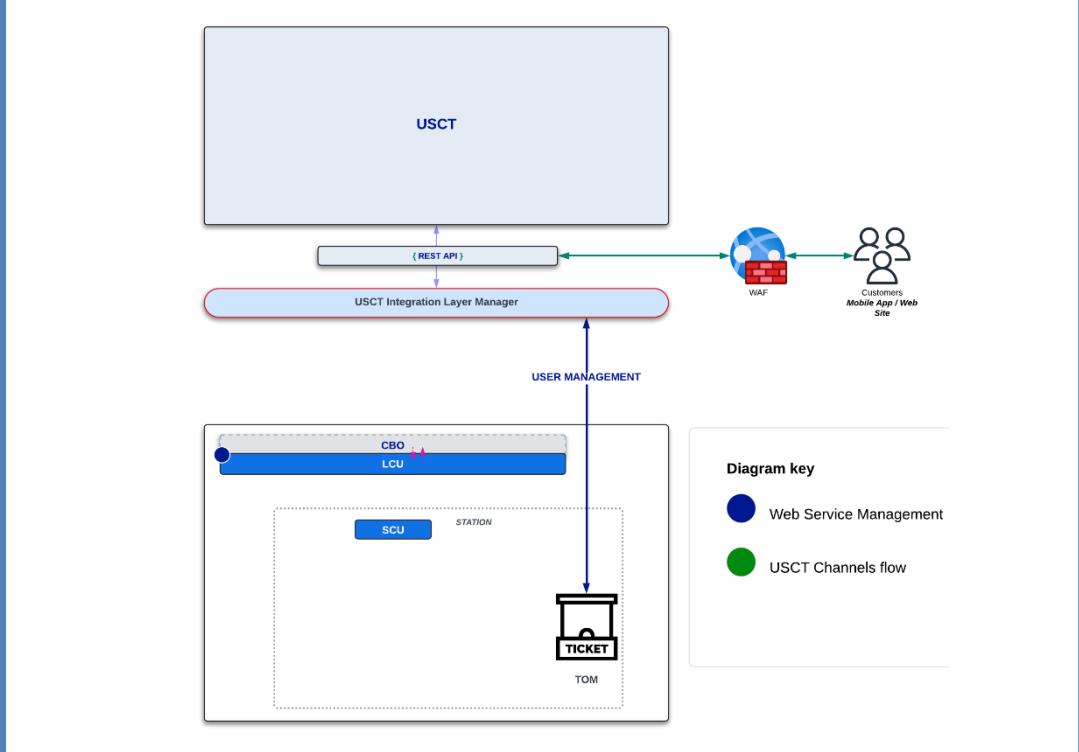
## Integration Design Document

## 3.1.5 UC-CM04 - Creation/update of a claim at the TOM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-CM04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Title            | Creation/update of a claim at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Goal             | <p>The commercial agent registers or updates a claim at the request of the customer. The claim is processed by the USCT. However, it can be reviewed and updated at any time at the TOM.</p> <p>Raising a claim requires the customer's record to be created. If the customer is not yet registered when they want to raise a claim, they must register first.</p> <p>Note that the claim status cannot be changed at the TOM; this is restricted to the USCT Claim Team.</p>                                                                                                                                                                                                                                                                                                                                                 |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• USCT (Customer Management - CRM Module)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The TOM is configured for accessing the USCT Web Service Interface.</li> <li>• The Customer is previously registered, and customer record is displayed on the TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• Claim information is registered.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Synoptic         | <pre> sequenceDiagram     participant CUSTOMER     participant TOM     participant ILM     participant MOOVA     CUSTOMER-&gt;&gt;TOM:      activate TOM     TOM-&gt;&gt;CustomerIdentification: Customer Identification     CustomerIdentification--&gt;&gt;EnquiryCustomerInfo: Enquiry Customer Info.     EnquiryCustomerInfo--&gt;&gt;DisplayCustomerInfo: Display Customer Info.     DisplayCustomerInfo--&gt;&gt;EnteringClaimInformation: Entering Claim Information     EnteringClaimInformation--&gt;&gt;ClaimSubmission: Claim Submission     ClaimSubmission--&gt;&gt;Message: Message     deactivate TOM     activate ILM     ILM-&gt;&gt;EnquiryCustomerInfo: Enquiry Customer Info.     deactivate ILM     activate MOOVA     MOOVA-&gt;&gt;GetCustomerInfo: Get Customer Info.     deactivate MOOVA     </pre> |

Integration Design Document

**Flows**



**Process**

**Flow I:**

1. On request of a customer, the commercial agent selects the "Create a claim" function. In the claim description, the commercial agent provides necessary information that is not already provided in customer record.
2. The commercial agent validates the form, and the TOM calls the USCT 'Create claim' service.

**Flow II:**

1. The USCT creates the claim record and provides back the claim id from this point.  
See use case UC-CM06.

**Flow III:**

1. Later, the customer can come back to the Ticket office and ask for information on the claim.
2. The commercial agent can review the claim status and inform the customer.
3. The claim text is displayed in several lines with the TOM agent comments and the Claim Team comments.
4. The commercial agent can modify the claim description adding if needed additional information from the customer.
5. The commercial agent validates the form, and the TOM calls the USCT 'Update claim' service.

**Flow IV:**

1. The USCT platform registers the claim record modification.
2. The update is available to the Claim Team.

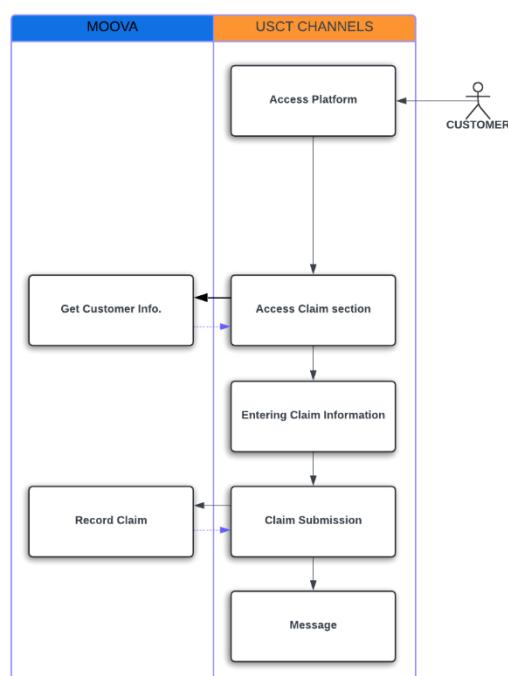
## Integration Design Document

### 3.1.6 UC-CM05 - Creation/update of a claim via Digital Channels (web site / app mobile)

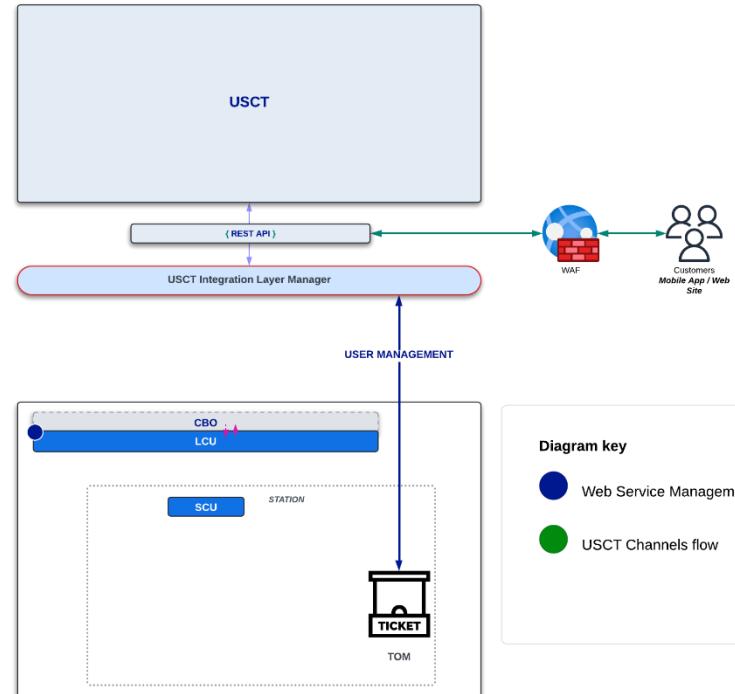
|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-CM05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Title            | Creation/update of a claim via Digital Channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Goal             | <p>The user logs into the website or mobile app and accesses the "Claims" section.</p> <p>The user selects "Create a new claim," fills out the necessary information, and submits the form. The system calls the USCT 'Creation of a user claim' service to create the claim record, and a claim ID is generated and displayed.</p> <p>The user can log back in later, navigate to the "Claims" section, search for their claim, review its status and comments, and make any necessary updates. The system calls the USCT 'Update claim' service to update the claim record.</p> <p>The USCT registers the claim modifications, making the updates available to the Claim Team.</p> |
| Actors           | End-Customer<br>USCT Channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Technical Scope  | <ul style="list-style-type: none"><li>USCT (Customer Management – CRM Module)</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Precondition(s)  | <ul style="list-style-type: none"><li>The Customer is previously registered</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Postcondition(s) | <ul style="list-style-type: none"><li>Claim information is registered.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Assumption(s)    | <ul style="list-style-type: none"><li>None.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

Integration Design Document

**Synoptic**



**Flows**



**Process**

**Flow I:**

1. The user logs into the website or mobile app using their credentials.
2. The user navigates to the "Claims" section.
3. The user selects the option to "Create a new claim."
4. In the claim creation form, the user provides the necessary information that is not already present in their customer record.
5. The user submits the form to create the claim.
6. The system calls the USCT 'Creation of a user claim' service to create the claim record.

Integration Design Document

7. The claim ID is generated and displayed to the user.

**Flow II:**

1. The USCT creates the claim record and provides back the claim ID.
2. The claim is now available to the USCT officer for further action (Refer to use case UC-CM06).

**Flow III:**

1. The customer returns to the website or mobile app and logs in.
2. The customer navigates to the "Claims" section.
3. The user searches for their existing claim using the claim ID or other relevant information.
4. The user reviews the claim status, including the comments from the Claim Team.
5. The user can modify the claim description by adding any additional information.
6. The user submits the form to update the claim.
7. The system calls the USCT 'Update of a user claim' service to update the claim record.

**Flow IV:**

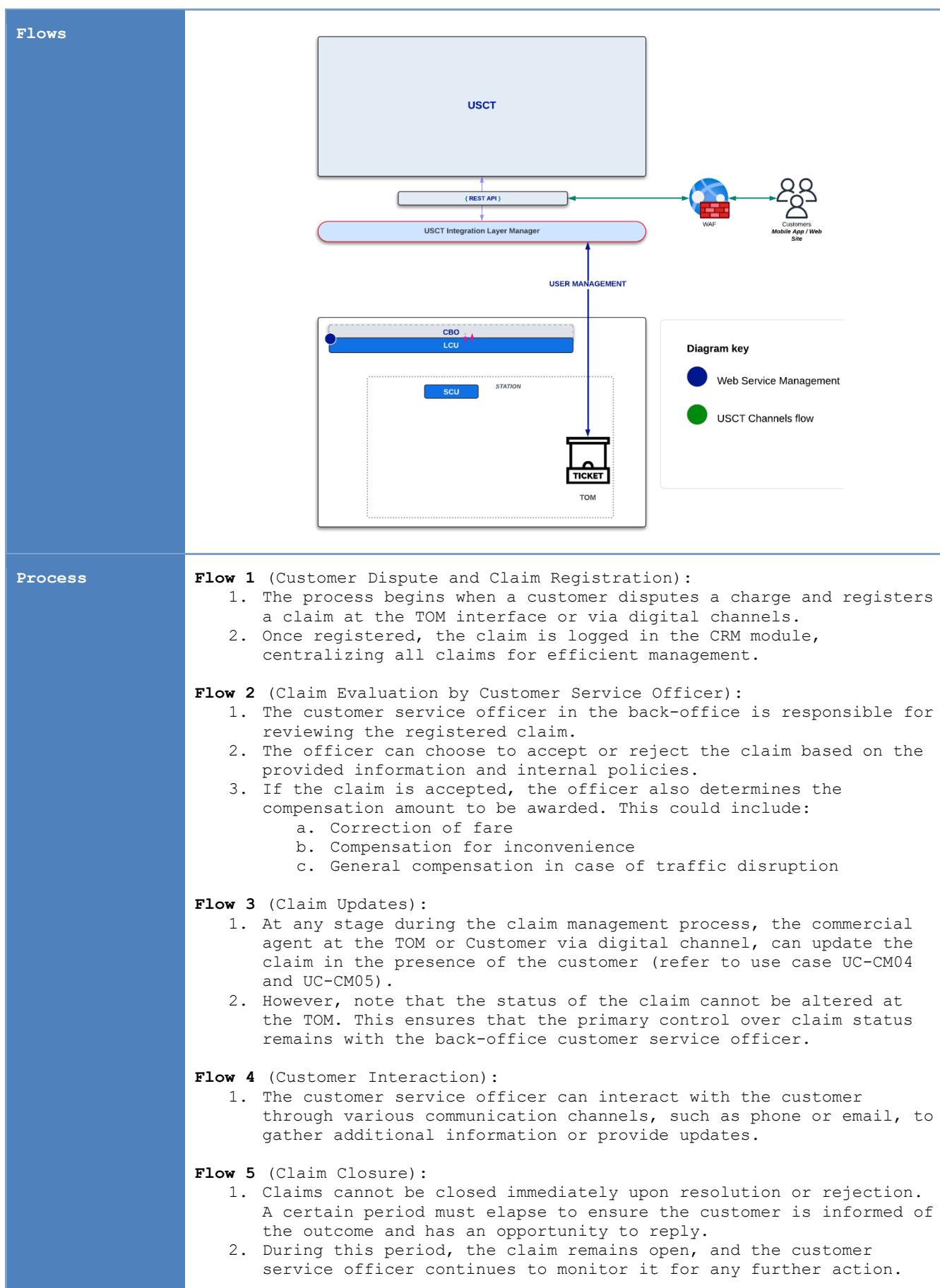
1. The USCT registers the claim record modification.
2. The update is now available to the Claim Team.

Integration Design Document

### 3.1.7 UC-CM06 - Management of customer claims at the USCT

| ID               | UC-CM06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | Management of customer claims at the USCT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Goal             | <p>The claim management process involves the following steps, with all claims centralized and managed within the CRM module for efficient handling:</p> <ul style="list-style-type: none"> <li>• Customer Dispute and Claim Registration</li> <li>• Claim Evaluation by Customer Service Officer</li> <li>• Claim Updates</li> <li>• Customer Interaction</li> <li>• Claim Closure</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Actors           | Claim Team (Customer service officer)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Technical Scope  | <ul style="list-style-type: none"> <li>• USCT (Customer Management – CRM Module)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• A Claim has been registered</li> <li>• Claim Team is logged onto the CRM Module web portal and is granted adequate access rights</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• Claim is approved or rejected by customer service officer.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Synoptic         | <pre> graph TD     subgraph CT [Claim Team Office]         CR[Claim Review] --&gt; CA[Claim Analysis]         CA --&gt; CAU[Claim approval]         CAU --&gt; CRJ[Claim rejection]     end     subgraph ILM [ILM]         ROC[Retrieve Open Claims] --&gt; RCH[Read Card History]         RCH --&gt; CS1[Change status]         CS1 --&gt; CC[Claim Close]     end     subgraph MOOVA [MOOVA]         GO[Get Open Claims] --&gt; GH[Get Card History]         GH --&gt; CS2[Change status]         CS2 --&gt; CC     end     CR --&gt; ROC     RCH --&gt; CAU     CAU --&gt; CS1     CS1 --&gt; GO     GO --&gt; GH     GH --&gt; CS2     CS2 --&gt; CC     </pre> <p>The synoptic diagram illustrates the integrated workflow for managing customer claims. It is divided into three main vertical columns representing different systems: Claim Team Office, ILM, and MOOVA. The process starts with the Claim Team Office, where a 'Claim Team' actor interacts with 'Claim Review' and 'Claim Analysis' steps. The 'Claim Analysis' step leads to 'Claim approval'. From 'Claim approval', the flow can lead to either 'Claim rejection' (as an alternative) or directly to 'Change status' in the ILM system. In the ILM system, 'Change status' leads to 'Claim Close'. Simultaneously, the 'Claim Review' step in the Claim Team Office triggers 'Retrieve Open Claims' in the ILM system. The ILM system also performs 'Read Card History' and 'Change status' steps. Finally, 'Get Open Claims' from the MOOVA system triggers 'Get Card History' in the ILM system, which then leads to another 'Change status' step before reaching 'Claim Close'.</p> |

Integration Design Document



Integration Design Document

Note

At any point of time, the claim management (create/update/manage claim) can be handled through the CRM admin portal, with the possibility of doing all the above-mentioned activities related to the claim management.

## Integration Design Document

## 3.2 Sales

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                                                                   | USCT-Integration Design Document | 63248442-305 |
|----------------------------------------------------------------------------|----------------------------------|--------------|
| Issuing of a MT at the TOM                                                 | UC-SA01                          | UC-SA02      |
| Issuing of a CSC-A at the TOM                                              | UC-SA02                          | UC-SA03      |
| T-Purse Reload / Sell / Renew Fare Product at TOM                          | UC-SA03                          | UC-SA04      |
| T-Purse Reload CSC flow via PVU                                            | UC-SA04                          | UC-SA05      |
| Purchase / Renew Fare Product via Digital Channels (web site / app mobile) | UC-SA05                          | N.A.         |

**Important Note:** The following chapter refers to all transactions that can be performed by a Customer at the TOM. It does not report the specific use case of the **TVM**, as the main purpose of the TVM is the sale of products/tickets which, in turn, generate transactions that must be routed to the USCT system.

Therefore, all use cases that involve an operation by the Customer and can also be executed at the TVM are implicitly included in the TOM use case.

### 3.2.1 UC-SA01 - Issuing of a MT at the TOM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-SA01                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Title            | Issuing of a MT at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Goal             | The Commercial Agent issues a new magnetic ticket (possibly several tickets of the same type)<br>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change in the process of issuing of MT will be required on the existing TOM. The main change resides in the fact that the sale event will be stored in USCT System for reporting purpose. |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                        |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agents issues MTs</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                 |

Integration Design Document

|               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Assumption(s) | <ul style="list-style-type: none"> <li>None</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Synoptic      | <p>The synoptic diagram illustrates the process flow across six systems: TOM, SCU, LCU, CBO, ILM, and MOOVIA. The process starts with a customer interacting with the TOM system, leading to a sequence of actions: "Commercial agent select the Ticket", "Payment Performed", "Ticket is generated", and "Event". The "Event" action is sent via an "Action" interface to the SCU, LCU, and CBO systems. From the CBO system, the event is sent via an "Action" interface to the ILM system using SFTP. The ILM system then sends the event via an "Action" interface to the MOOVIA system, which performs a "Conversion MoovA model" and stores the data in a "Queues" queue before finally sending it to the "Store" system.</p> |
| Flows         | <p>The flow diagram shows the USCT system interacting with the USCT Integration Layer Manager. The USCT system connects to the Integration Layer Manager via a REST API. The Integration Layer Manager then manages the connection between the USCT system and the PTO (Ticket Office Machine) component. The PTO component consists of the CBO, LCU, and SCU systems. The SCU system interacts with the STATION and TICKET components. The CBO system receives data from the SCU system via a "SALES" interface. The Integration Layer Manager also manages the connection between the USCT system and the SCU/LCU/CBO component.</p>                                                                                              |
| Process       | <p><b>Flow I:</b></p> <ol style="list-style-type: none"> <li>1. The Customer presents themselves at the Ticket Office Machine (TOM) to purchase one or more magnetic tickets (MT).</li> <li>2. The TOM Operator selects the products requested by the customer.</li> <li>3. The payment is performed.</li> <li>4. The TOM Operator issues the ticket(s) to the customer.</li> </ol> <p><b>Flow II:</b></p> <ol style="list-style-type: none"> <li>1. TOM generates the event and transfers it to CBO/LCU for reporting.</li> <li>2. CBO/LCU provides the same event file to USCT.</li> </ol>                                                                                                                                        |

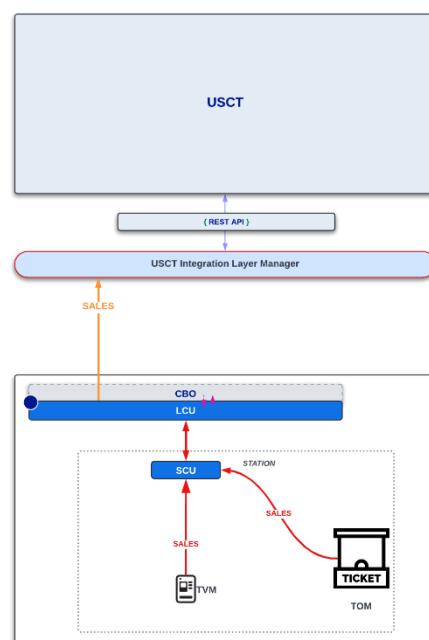
## Integration Design Document

## 3.2.2 UC-SA02 - Issuing of a CSC-A at the TOM/TVM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-SA02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Title            | Issuing of a CSC-A at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Goal             | The Commercial Agent issues a new anonymous media (CSC-A)<br>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM. The main change resides in the fact that the sale event will be stored by USCT for reporting.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agents issues CSC-A</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Synoptic         | <p>The synoptic diagram illustrates the process flow across various systems:</p> <ul style="list-style-type: none"> <li><b>TOM/TVM:</b> Handles the initial request and payment processing.</li> <li><b>SCU:</b> Handles CSC-A writing.</li> <li><b>LCU:</b> Handles the event.</li> <li><b>CBO:</b> Handles the action (indicated by a dashed line).</li> <li><b>ILM:</b> Handles the action via SFTP.</li> <li><b>MOOVA:</b> Handles the final conversion and storage.</li> </ul> <p>Key steps in the flow include:</p> <ol style="list-style-type: none"> <li>Customer initiates a "Request for CSC-A".</li> <li>A "Payment Performed" step follows.</li> <li>The process moves to "CSC-A Written".</li> <li>An "Event" step is triggered.</li> <li>The "Event" leads to an "Action" step.</li> <li>The "Action" step leads to another "Action" step (indicated by a dashed line).</li> <li>A red dashed line labeled "Flow active if PTO lacks a CBO" connects the second "Action" step to a third "Action" step.</li> <li>The third "Action" step is connected via SFTP to a fourth "Action" step.</li> <li>The fourth "Action" step is associated with a "Queue" icon.</li> <li>The fifth "Action" step is associated with a "Conversion Moova model" icon.</li> <li>The final step is "Store".</li> </ol> |

Integration Design Document

**Flows**



**Diagram key**

- Standard PTO Process
- File Exchange (XML via SFTP)

**Process**

**Flow I:**

1. The Customer presents themselves at the Ticket Office Machine (TOM) to purchase a new anonymous media.
2. The TOM Operator selects to sell a CSC-A to the customer.
3. The payment is performed.
4. The TOM Operator issues the CSC-A.

**Flow II:**

1. TOM generates the event and transfers it to CBO/LCU for reporting.
2. CBO/LCU provides the same event file to USCT.

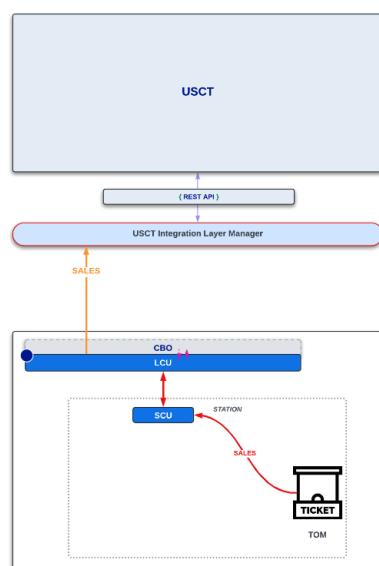
Integration Design Document

### 3.2.3 UC-SA03 – T-Purse Reload / Sell / Renew Fare Product at TOM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-SA03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Title            | T-Purse Reload / Sell / Renew Fare Product at TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Goal             | The Commercial Agent reloads a CSC (T-purse reload or product purchase) The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM. The main change resides in the fact that the event is processed by USCT.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agents reloaded CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Synoptic         | <pre> graph TD     CUSTOMER((CUSTOMER)) --&gt; Reload / Sell / Renew Fare Product  Payment[Payment Performed]     Payment --&gt; CSC[CSC Written]     CSC --&gt; Event[Event]     Event -- Action --&gt; SCU[SCU]     Event -- Action --&gt; LCU[LCU]     Event -- Action --&gt; CBO[CBO]     CBO -- Action --&gt; ILM[ILM]     ILM -- Action --&gt; MOOVA[MOOVA]     MOOVA -- "Conversion MoovA model" --&gt; Store[Store]     </pre> <p>The diagram illustrates the integration flow between various systems. The process starts with a CUSTOMER initiating a payment. This leads to a sequence of events: Payment Performed, CSC Written, and finally Event. The Event is then sent via Action to three systems: SCU, LCU, and CBO. A dashed red box labeled "Flow active if PTO lacks a CBO" surrounds the connection to CBO. From CBO, the event continues via Action to ILM, and then to MOOVA via Action and SFTP. In MOOVA, the event triggers a "Conversion MoovA model", which then leads to a "Store".</p> |

Integration Design Document

**Flows**



**Diagram key**

- Standard PTO Process
- File Exchange (XML via SFTP)

**Process**

**Flow I:**

1. The Customer presents themselves at the Ticket Office Machine (TOM) to reload or purchase a new product to be written on the CSC.
2. The TOM Operator selects operation to performed.
3. The payment is performed.
4. CSC is Written.

**Flow II:**

1. TOM generates the event and transfers it to CBO/LCU.
2. CBO/LCU provides the same event file to USCT.

**Flow III:**

1. Card image is updated and in particular the card products and T-purse
2. Transaction is taken into account for reporting.

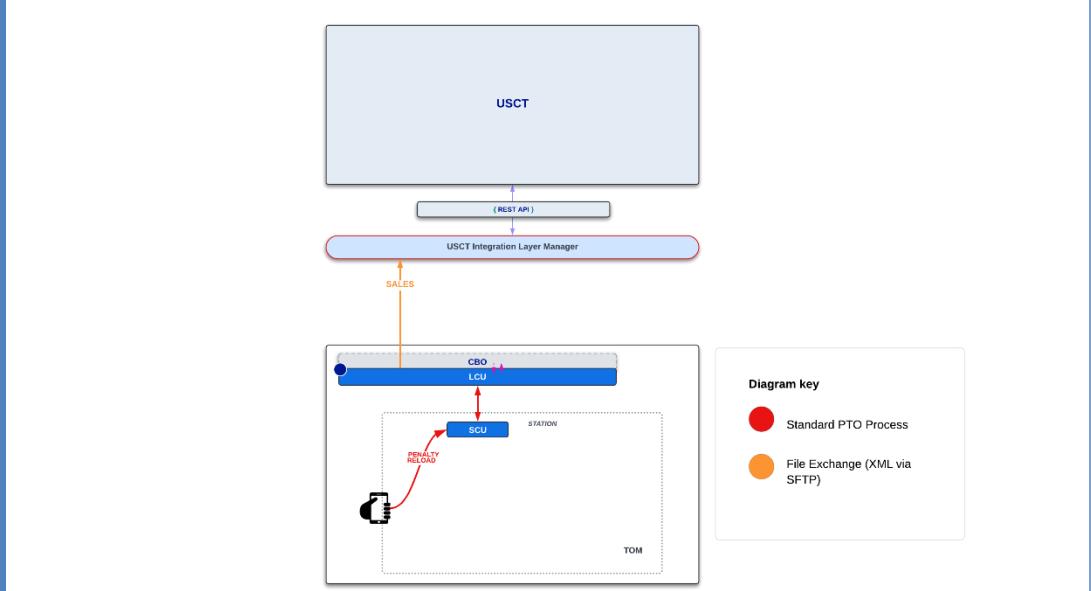
## Integration Design Document

## 3.2.4 UC-SA05 – T-Purse Reload CSC flow via PVU

| ID               | UC-SA05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | T-Purse Reload CSC flow via PVU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Goal             | The Enforcement Officer reloads a CSC (T-purse reload or product renew).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Actors           | End-Customer, Enforcement officer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Technical Scope  | <ul style="list-style-type: none"> <li>• PVU</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Enforcement officer is logged on PVU</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Enforcement officer reloads the CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Assumption(s)    | <p><b>Sale limitation</b></p> <ul style="list-style-type: none"> <li>• The enforcement officer is authorized to renew products and reload T-purse but not to sell new products on the card.</li> </ul> <p><b>Sale parameters</b></p> <ul style="list-style-type: none"> <li>• Sale parameters are recovered from legacy fare parameters that shall be downloaded by the PVU equipment.</li> </ul>                                                                                                                                                                                                                                                    |
| Synoptic         | <pre> graph TD     CUSTOMER((CUSTOMER)) --&gt; PVU[PVU]     PVU --&gt; ReloadCSC[Reload CSC]     PVU --&gt; PaymentPerformed[Payment Performed]     PVU --&gt; CSCWritten[CSC Written]     CSCWritten --&gt; Event[Event]     Event --&gt; Action1[Action]     Action1 --&gt; Action2[Action]     Action2 --&gt; Action3[Action]     Action3 --&gt; Action4[Action]     Action4 --&gt; ConversionMoovA[Conversion MoovA model]     ConversionMoovA --&gt; Store[Store]     subgraph Flow [Flow active if PTO lacks a CBO]         Action3         Action4         Action5[Action]         Action6[Action]         Action7[Action]     end     </pre> |

Integration Design Document

**Flows**



**Process**

**Flow 1 (Reload CSC) :**

1. The Enforcement Officer selects the reload function on the PVU.
2. The card is read by the PVU that displays the products that can be reloaded.
3. The Enforcement Officer selects the product or chooses the T-purse reload.
4. The price is displayed.
5. The customer pays
6. Once the payment is completed, the Enforcement Officer validate the reload of the card.
7. On demand, a receipt is delivered to the Customer.

**Flow 2 (Generate event) :**

1. The PVU generates the event and transfers it to CBO/LCU.
2. CBO/LCU provides the same event file to USCT.

**Flow 3 (Process the event) :**

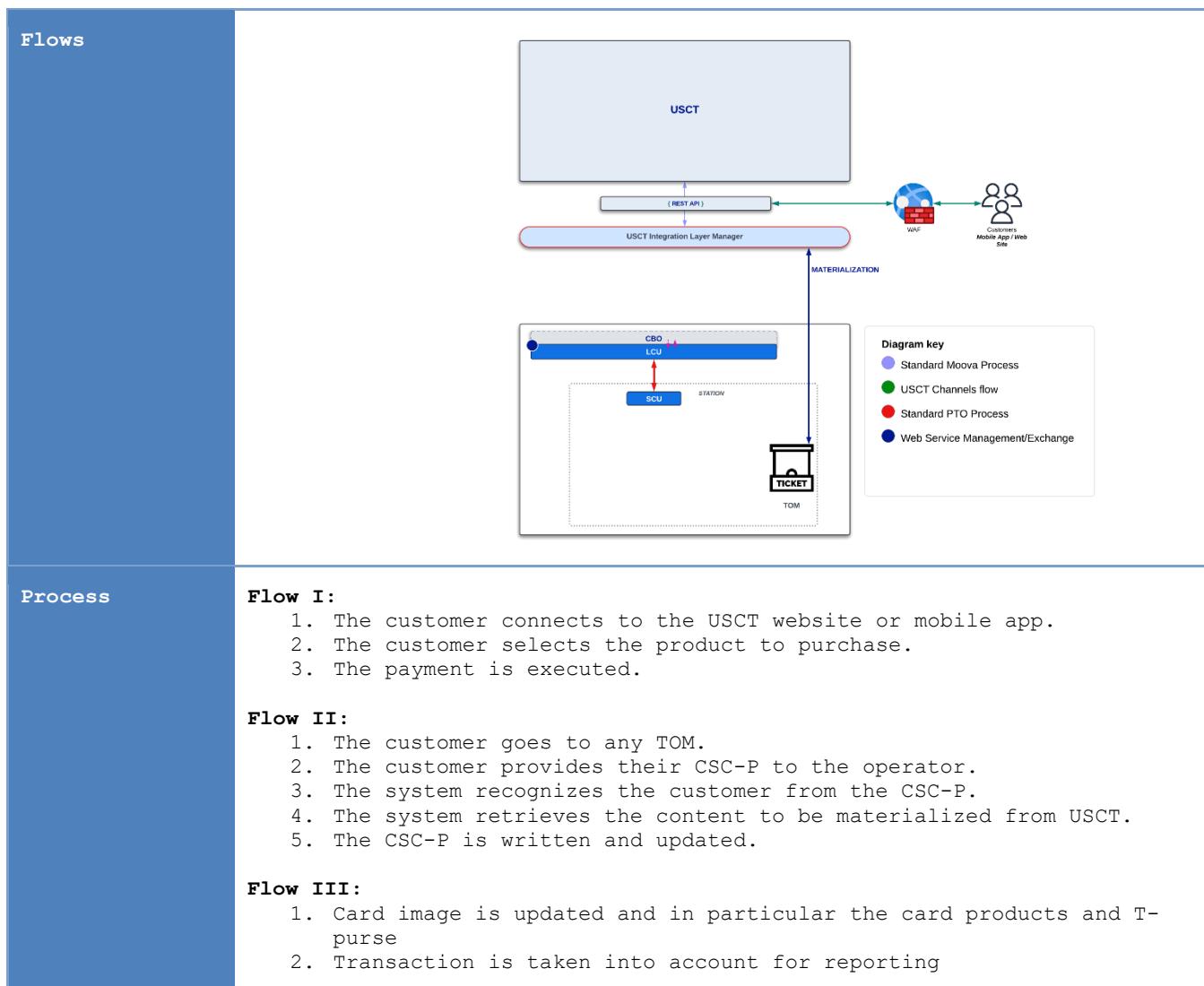
1. Card image is updated and in particular the card products and T-purse
2. Transaction is taken into account for reporting

## Integration Design Document

### **3.2.5 UC-SA06 - Purchase / Renew Fare Product via Digital Channels (web site / app mobile)**

| ID                      | UC-SA06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Title</b>            | Purchase / Renew Fare Product via web site / app mobile                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Goal</b>             | The goal of this process is to enable customers to purchase various products using digital channels (website or mobile app) and to materialize the purchased content onto their CSC-P smartcard via the Ticket Office Machine (TOM).                                                                                                                                                                                                                                                                                         |
| <b>Actors</b>           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Precondition(s)</b>  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Postcondition(s)</b> | <ul style="list-style-type: none"> <li>• The Commercial Agents materialized the purchase on CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Assumption(s)</b>    | <ul style="list-style-type: none"> <li>• TOM (Ticket Office Machines) are connected to the USCT Platform and are enabled to retrieve data from the Web Service and to materialize it onto the CSC-P smartcard</li> <li>• The USCT Platform exposes web services that are utilized by TOM.</li> </ul>                                                                                                                                                                                                                         |
| <b>Synoptic</b>         | <pre> graph TD     CUSTOMER((Customer)) --&gt; AP[Access Platform]     AP --&gt; SFP[Select Fare Product]     SFP --&gt; PFP[Purchase Fare Product]     PFP --&gt; PP[Payment Performing]     PP --&gt; MSG[Message]     MSG --&gt; PG[Product Generated]     PG --&gt; PAYMENT[Payment]     PAYMENT --&gt; PG     ILM[ILM] --&gt; MSG     ILM -- "Message generated for PTOs" --&gt; PTO[Message generated for PTOs]     PTO --&gt; CSC[CSC]     CSC --&gt; CSCWritten[CSC Written]     CSCWritten --&gt; CUSTOMER   </pre> |

Integration Design Document



**Important Note: Alternative Materialization Process via File Exchange**

The standard proposal for materializing products on the smartcard involves the TOM software invoking a web service to download the content to be written on the card. As an alternative, file exchange process can be considered:

- **USCT Sale and Product Generation:**
  - USCT generates the sale and the product information.
- **File Structuring:**
  - USCT structures the file according to Hitachi specifications.
- **File Propagation:**
  - The file is provided to CBO/LCU for its propagation to TOM.
- **Content Writing on Smartcard:**
  - TOM is enabled to write the content to the CSC-P smartcard.

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*This process provides an alternative method for materializing products on the smartcard, although it is not advised due to potential security risks and operational inefficiencies: the content synchronizer must ensure the uniqueness of writing a product onto the smart card.*

*The following constraints must be respected:*

- *When multiple TOMs exist within a station, once a product has been materialized onto the card at one TOM, other TOMs in the same station should not materialize the same product again.*
- *If the product has been materialized onto the card at a TOM in one station, TOMs in other stations should not materialize the same product again.*
- *If the product has been materialized onto the card at a TOM managed by one PTO, TOMs operated by other PTOS should not materialize the same product again.*

*Moreover, this process will also have a significant impact on the user experience as there will always be a delay in the propagation of this information to the TOM (**USCT > CBO > LCU > SCU > TOM**). As such, it will not be possible for the user to perform the materialization instantly after the purchase is made on the digital channels.*

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## Integration Design Document

### 3.3 After Sale Services

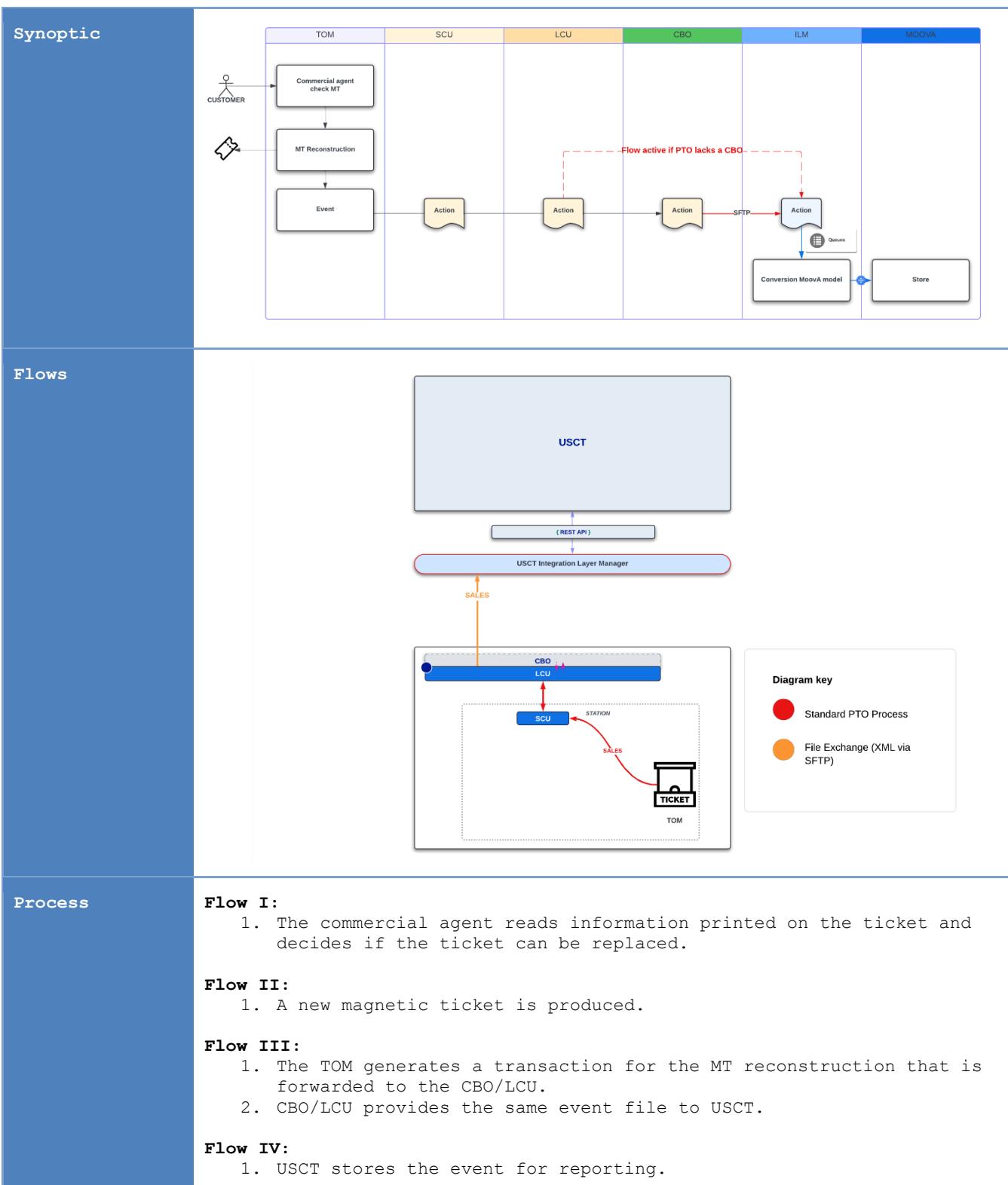
The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                                                | USCT-Integration Design Document | 63248442-305 |
|---------------------------------------------------------|----------------------------------|--------------|
| Exchange of a MT at the TOM                             | UC-AS01                          | UC-AS03      |
| Refund of a transport product or a CSC at the TOM       | UC-AS02                          | UC-AS06      |
| Cancellation of a transport product or a CSC at the TOM | UC-AS03                          | UC-AS07      |
| Reconstruction of a CSC at the TOM                      | UC-AS04                          | UC-AS08      |
| Blocking of a CSC at the TOM                            | UC-AS05                          | UC-AS09      |
| Blocking of a CSC by Digital Channels                   | UC-AS06                          | N.A.         |
| Unblocking of a CSC at the TOM                          | UC-AS07                          | UC-AS10      |
| Unblocking of a CSC by Digital Channels                 | UC-AS08                          | N.A.         |

#### 3.3.1 UC-AS01 - Exchange of a MT at the TOM

|                  |                                                                                                                                                                                                                                                                                                                                                             |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-AS01                                                                                                                                                                                                                                                                                                                                                     |
| Title            | Exchange of a MT at the TOM                                                                                                                                                                                                                                                                                                                                 |
| Goal             | <p>At the TOM, the Commercial Agent exchanges an MT. The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM.</p> <p>The main change resides in the fact that the event is stored by USCT</p> |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                              |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                               |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                       |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agents exchange MT.</li> </ul>                                                                                                                                                                                                                                                                      |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• none.</li> </ul>                                                                                                                                                                                                                                                                                                   |

Integration Design Document



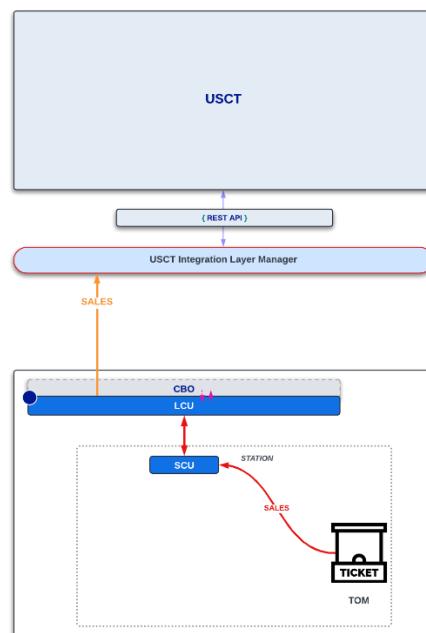
## Integration Design Document

## 3.3.2 UC-AS02 - Refund of a transport product or a CSC at the TOM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-AS02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Title            | Refund of a transport product or a CSC at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Goal             | <p>At the TOM, the Commercial Agent refunds a transport product or a CSC.</p> <p>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM.</p> <p>The main change resides in the fact that the event is stored by USCT</p>                                                                                                                                                                                                                                                                                                      |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agent refunded a transport product or a CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• none.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Synoptic         | <p>The synoptic diagram illustrates the flow of events across six systems: TOM, SCU, LCU, CBO, ILM, and MOOVA. The process starts with a CUSTOMER sending a 'Request for Refund' to the TOM. The TOM then performs a 'Pay back' action, followed by a 'CSC-P Written' action, which generates an 'Event'. This event is sent to the SCU, LCU, and CBO via 'Action' steps. A red dashed arrow labeled 'Flow active if PTO lacks a CBO' indicates an alternative path from the CBO to the ILM. From the ILM, the event is sent via an 'Action' step to a 'Conversion Moova model' step, which then leads to a 'Store' step. The 'Conversion Moova model' step is associated with 'Queues'.</p> |

Integration Design Document

**Flows**



**Diagram key**

- Standard PTO Process
- File Exchange (XML via SFTP)

**Process**

**Flow I:**

1. The device reads the CSC content

**Flow II:**

1. The Commercial Agent selects a fare product or card refund.
2. The Commercial proceeds to the pay-back.

**Flow III:**

1. The TOM generates transactions for the refund

**Flow 4 (Pass Refund, T-purse Refund, Card Refund) :**

1. Card image is updated and in particular the card products and T-purse
2. Transaction is taken into account for reporting.
3. CBO/LCU provides the same event file to USCT..

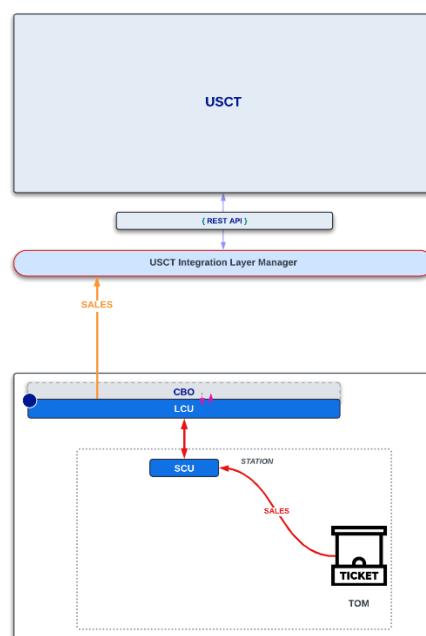
## Integration Design Document

## 3.3.3 UC-AS03 - Cancellation of a transport product or a CSC at the TOM

| ID               | UC-AS03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | Cancellation of a transport product or a CSC at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Goal             | <p>At the TOM, the commercial agent started a sale with several purchases and cancels the sale session.</p> <p>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM. The main change resides in the fact that the event is stored by USCT</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agent cancelled a transport product or CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Synoptic         | <p>The synoptic diagram illustrates the flow of cancellation events across different systems:</p> <ul style="list-style-type: none"> <li><b>TOM:</b> The process starts with a "CUSTOMER" actor interacting with the TOM system. The sequence of events is: "Reload / Sell / Renew Fare Product" → "Payment Performed" → "CSC Written" → "Event" → "Cancellations" → "CSC Written" → "Event".</li> <li><b>SCU:</b> The "Event" and "CSC Written" steps are connected to the SCU via "Action" nodes.</li> <li><b>LCU:</b> The "Event" and "CSC Written" steps are connected to the LCU via "Action" nodes.</li> <li><b>CBO:</b> The "Event" and "CSC Written" steps are connected to the CBO via "Action" nodes. A note indicates: "Flow active if PTO lacks a CBO".</li> <li><b>ILM:</b> The "Event" and "CSC Written" steps are connected to the ILM via "Action" nodes. An "SFTP" connection links the CBO and ILM. The ILM then processes the data through a "Conversion Moova model" and stores it.</li> <li><b>MOOVA:</b> The "Event" and "CSC Written" steps are connected to the MOOVA via "Action" nodes. An "SFTP" connection links the ILM and MOOVA. The MOOVA then processes the data through a "Conversion Moova model" and stores it.</li> <li><b>Queues:</b> Queues are shown between the CBO and ILM, and between the ILM and MOOVA, indicating intermediate storage points.</li> </ul> |

Integration Design Document

**Flows**



**Diagram key**

- Standard PTO Process
- File Exchange (XML via SFTP)

**Process**

**Flow I:**

1. The Commercial Agent performs a sale operation (product, CSC or T-purse) and starts adding a new sale operation.
2. The sale operation is finalized with electrical writing on CSC

**Flow II:**

1. TOM generates a transaction for the sale operation.

**Flow III:**

1. Card image is updated and in particular the card products and T-purse
2. CBO/LCU provides the same event file to USCT.
3. Transaction is taken into account for reporting

**Flow IV:**

1. The Commercial Agent cancels the sale.

**Flow V:**

1. TOM generates a transaction for the sale cancellation operation.

**Flow VI:**

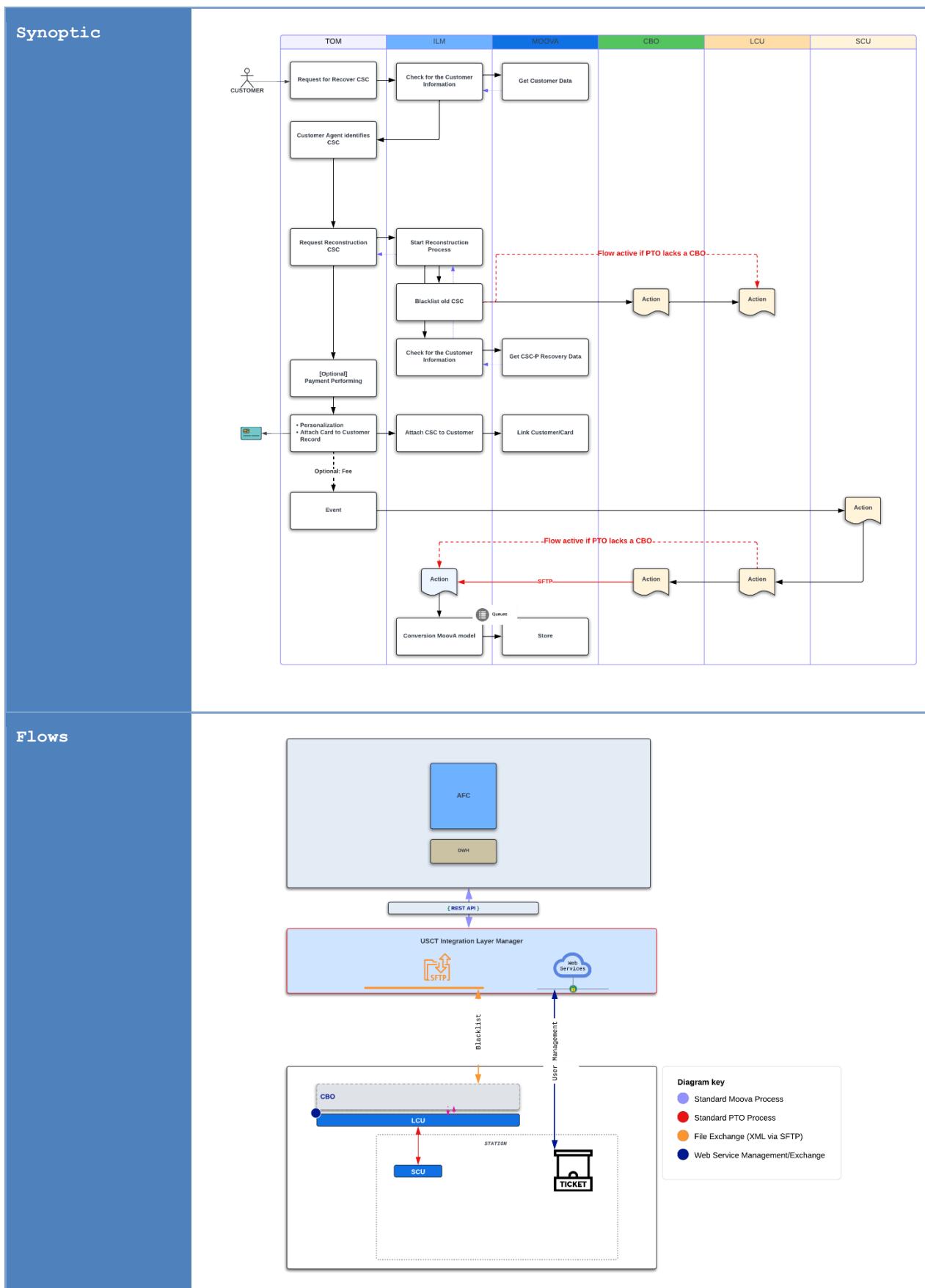
1. Card image is updated and in particular the card products and T-purse .
2. The event is generated from the TOM and transmitted via SCU/LCU/CBO (if it exists).
3. CBO/LCU provides the same event file to USCT.
4. Transaction is taken into account for reporting.

## Integration Design Document

## 3.3.4 UC-AS04 - Reconstruction of a CSC at the TOM

| ID               | UC-AS04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | Reconstruction of a CSC at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Goal             | <p>At the TOM, the commercial agent reconstructs a CSC from card information in USCT Platform.</p> <p>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM. The main change resides in the fact that the reconstruction is based on USCT information.</p> <p>The card reconstruction is applicable for CSC-A and CSC-P. In this later case, the card has to be re-printed as in the case of a first sale</p> |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The Commercial Agent reconstructed a CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• none.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

## Integration Design Document



Integration Design Document

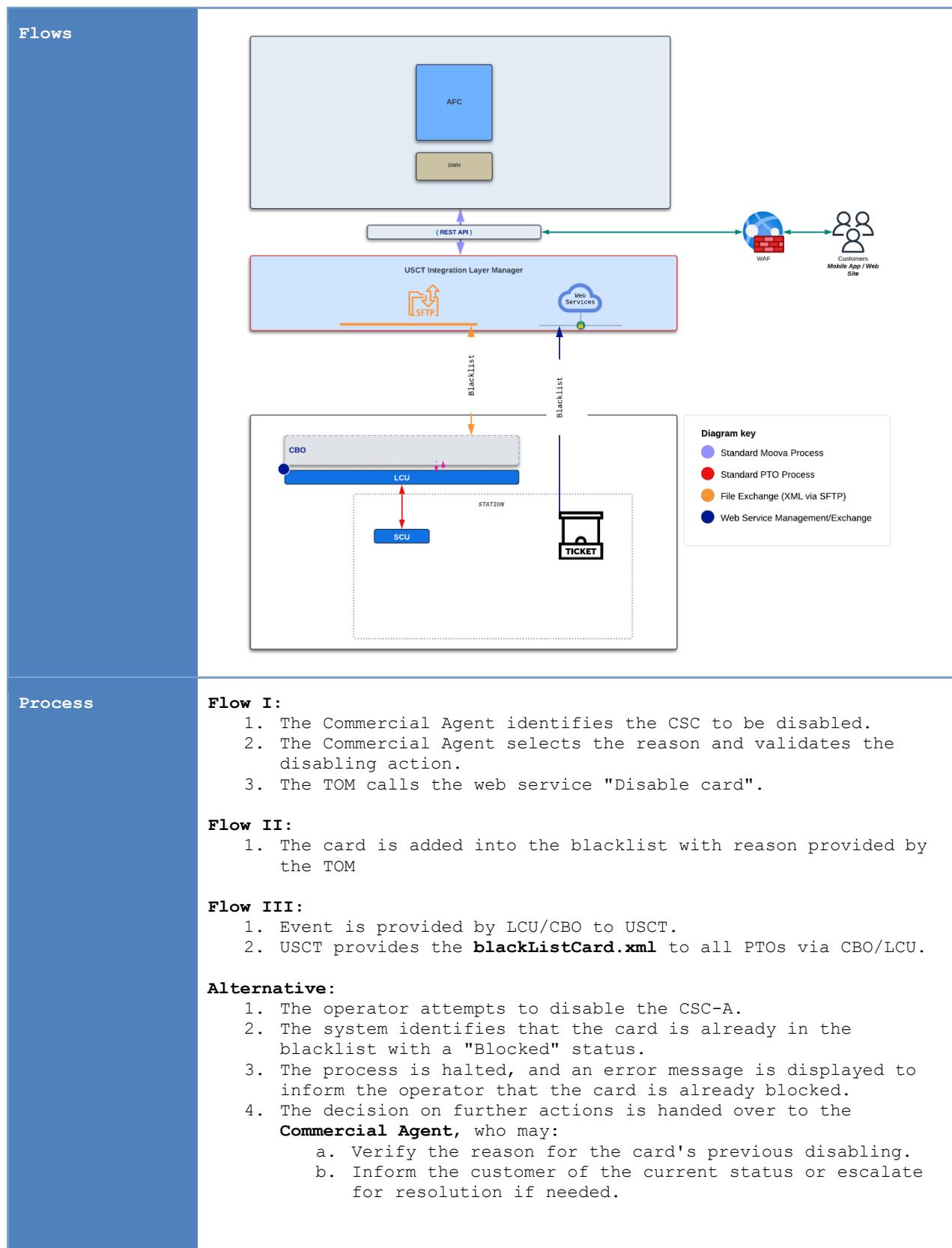
| Process |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|         | <p><b>Flow I:</b></p> <ol style="list-style-type: none"><li>1. The operator enters the customer data.</li><li>2. The backend checks for registered users in the new platform.</li><li>3. If the user is identified, the system returns the relevant information and data.</li></ol> <p><b>Flow II:</b></p> <ol style="list-style-type: none"><li>1. The process retrieves the existing smartcard and requests to blacklist it.</li><li>2. USCT will generate a new blacklist file to be sent and CBO/LCU.</li><li>3. It retrieves the customer information from the database and reconstructs the available data.</li><li>4. The system returns the information to the TOM client to proceed with writing it onto the smartcard.</li></ol> <p><b>Flow III:</b></p> <ol style="list-style-type: none"><li>1. <b>Optional:</b> A fee may be applied for the activity.</li><li>2. The card is personalized.</li><li>3. The card is associated with the customer.</li></ol> <p><b>Optional (fee):</b></p> <ol style="list-style-type: none"><li>1. TOM generates the event and transfers it to CBO/LCU.</li><li>2. CBO/LCU provides the same event file to USCT.</li></ol> |

## Integration Design Document

## 3.3.5 UC-AS05 - Blocking of a CSC at the TOM

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-AS05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Title            | Blocking of a CSC at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Goal             | <p>The commercial agent at the TOM disables the CSC on request of the customer.</p> <p>The objective is that the process will not change from the commercial agent and the End-Customer perspective compared to the existing solution.</p> <p>The main change resides in the fact that the event is processed by USCT, which is responsible for providing the <b>blackListCard.xml</b> to CBO/LCU.</p>                                                                                                                                                                                  |
| Actors           | End-Customer, Commercial Agent                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Commercial agent is logged on TOM</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The CSC is disabled upon request of the customer</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• Disabling the card will add it into blacklist whatever the reason if not already blacklisted.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Synoptic         | <pre> sequenceDiagram     participant CUSTOMER     participant GATE     participant TOM     participant SCU     participant LCU     participant CBO     participant ILM     participant MOOVA     CUSTOMER-&gt;&gt;TOM: Enable / Disable CSC-P     activate TOM     TOM-&gt;&gt;CUSTOMER: Information to Customer     deactivate TOM     Note over ILM: already blocked?     Note over MOOVA: Blacklist Card     Note over CBO: Blacklist Card     ILM--&gt;&gt;CBO: Action     CBO--&gt;&gt;ILM: Action     ILM--&gt;&gt;MOOVA: Action     MOOVA--&gt;&gt;ILM: Action     end   </pre> |

Integration Design Document



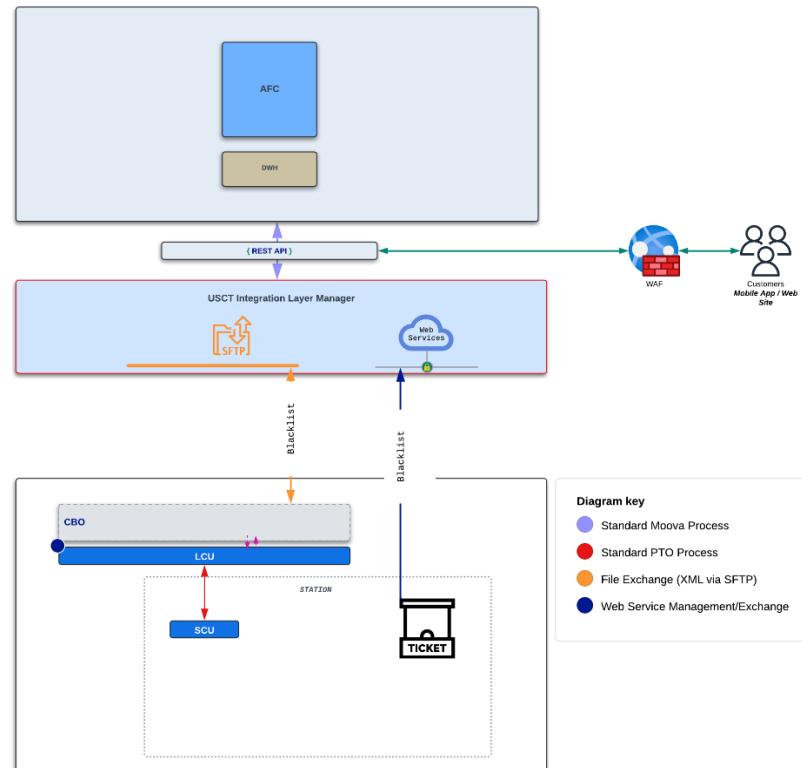
## Integration Design Document

### **3.3.6 UC-AS06 - Blocking of a CSC by Digital Channels**

| ID               | UC-AS06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | Blocking of a CSC by Digital Channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Goal             | <p>Using digital channels, the customer can disable a CSC. Access to the digital functionality allows immediate identification of the status of a card and, in the event of a block, the reason why it is blocked.</p> <p>USCT is responsible for providing the <b>blackListCard.xml</b> to CBO/LCU.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Actors           | End-Customer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Technical Scope  | <ul style="list-style-type: none"> <li>TOM</li> <li>SCU</li> <li>LCU</li> <li>CBO (if any)</li> <li>USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Precondition(s)  | <ul style="list-style-type: none"> <li>Customer is logged on one of digital channels</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Postcondition(s) | <ul style="list-style-type: none"> <li>Customer disabled a CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Assumption(s)    | <ul style="list-style-type: none"> <li>Disabling the card will add it into blacklist whatever the reason if not already blacklisted.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Synoptic         | <pre> graph LR     AP[Access Platform] --&gt; R[Request for Enable/Disable CSC-P]     R --&gt; M[Message]     R --&gt; BC1[Blacklist Card]     BC1 --&gt; CBO[CBO]     BC1 --&gt; LCU[LCU]     BC1 --&gt; ILM[ILM]     CBO --&gt; BC2[Blacklist Card]     LCU --&gt; BC2     ILM --&gt; BC2     BC2 --&gt; MOOVA[MOOVA]     MOOVA --&gt; SCU[SCU]     </pre> <p>The diagram illustrates the flow of information for blocking a CSC. It starts with an 'Access Platform' sending a 'Request for Enable/Disable CSC-P' message to a 'Message' box. This request also triggers a 'Blacklist Card' action at the 'CBO', 'LCU', and 'ILM' stages. The 'Blacklist Card' action leads to a 'Blacklist Card' box at each stage. Finally, the 'Blacklist Card' box at the 'MOOVA' stage sends a message to the 'SCU'.</p> |

Integration Design Document

**Flows**



**Process**

**Flow I:**

1. The customer connects to the digital channels.
2. The customer select the functionalities related to the card.
3. The customer check the status of the card.
4. The customer selects the "Disable Card" option and provides one of the valid reasons.
5. The customer proceeds with disabling the card, which is then added to the Blacklist.
6. USCT is responsible for providing the blackListCard.xml to CBO/LCU.

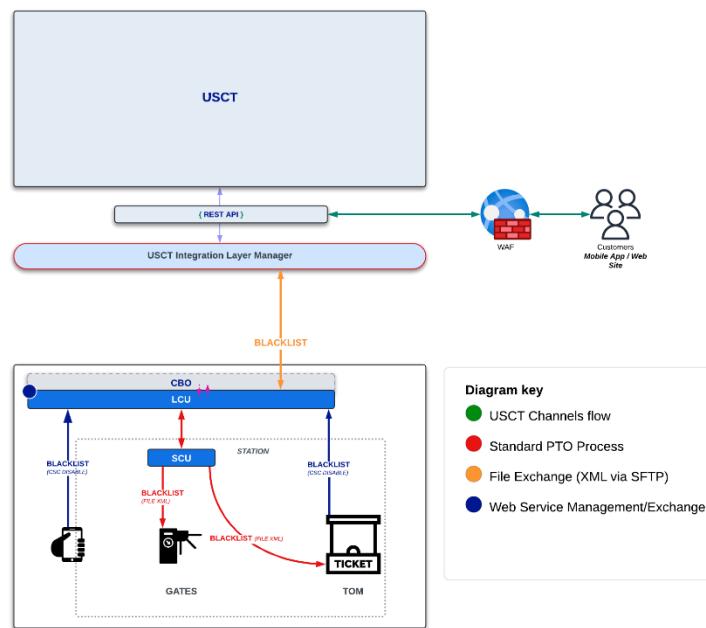
Integration Design Document

### 3.3.7 UC-AS07 – Unblocking of a CSC at the TOM

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>               | UC-AS07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Title</b>            | Unblocking of a CSC at the TOM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Goal</b>             | <p>At the TOM, the commercial agent unblocks a CSC.</p> <p>The objective is that the process will not change from the Commercial Agent and End-Customer perspective compared to the existing solution. The objective is also that no change will be required on the existing TOM.</p> <p>The main change resides in the fact that the event is processed by USCT.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| <b>Actors</b>           | End-Customer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Precondition(s)</b>  | <ul style="list-style-type: none"> <li>• Commercial Agent is logged on TOM.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Postcondition(s)</b> | <ul style="list-style-type: none"> <li>• The Commercial Agent unblocked a CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Assumption(s)</b>    | <ul style="list-style-type: none"> <li>• None</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Synoptic</b>         | <p>The synoptic diagram illustrates the flow of actions across different systems:</p> <ul style="list-style-type: none"> <li><b>GATE:</b> Initiates the process with a "Enable / Disable CSC-P" action.</li> <li><b>TOM:</b> Handles the initial request and sends an "Action" back to the customer.</li> <li><b>SCU:</b> Receives an "Action" from the TOM.</li> <li><b>LCU:</b> Receives an "Action" from the SCU.</li> <li><b>CBO:</b> Receives an "Action" from the LCU. A note specifies: "Flow active if PTO lacks a CBO".</li> <li><b>ILU:</b> Receives an "Action" from the CBO and sends an "Action" to the MODUA.</li> <li><b>MODUA:</b> Receives an "Action" from the ILU and sends an "Action" to the USCT CHANNELS.</li> <li><b>USCT CHANNELS:</b> Receives an "Action" from the MODUA and interacts with the Access Platform. The Access Platform sends a "Request for Enable/Disable CSC-P" to the CBO and receives a "Message" in return.</li> <li><b>CUSTOMER:</b> Interacts with the TOM and receives responses from the Access Platform.</li> </ul> |

## Integration Design Document

### Flows



### Process

#### Flow I:

1. The Commercial Agent checks that conditions for unblocking are fulfilled.
2. The ticket office agent can ask the customer to pay an amount in order to unblock the related blocked item.
3. The Commercial Agent unblocks the CSC.

#### Flow II:

1. TOM generates transactions for the unblocking operation.
2. Event is provided by LCU/CBO to USCT.
3. USCT provide **blackListCard.xml** vs CBO/LCU.

#### Flow III:

1. USCT processes the event "**Card action**".
2. Transaction is taken into account for updating the card image.
3. Transaction is taken into account for reporting
4. USCT processes the event "**accounting operation**"

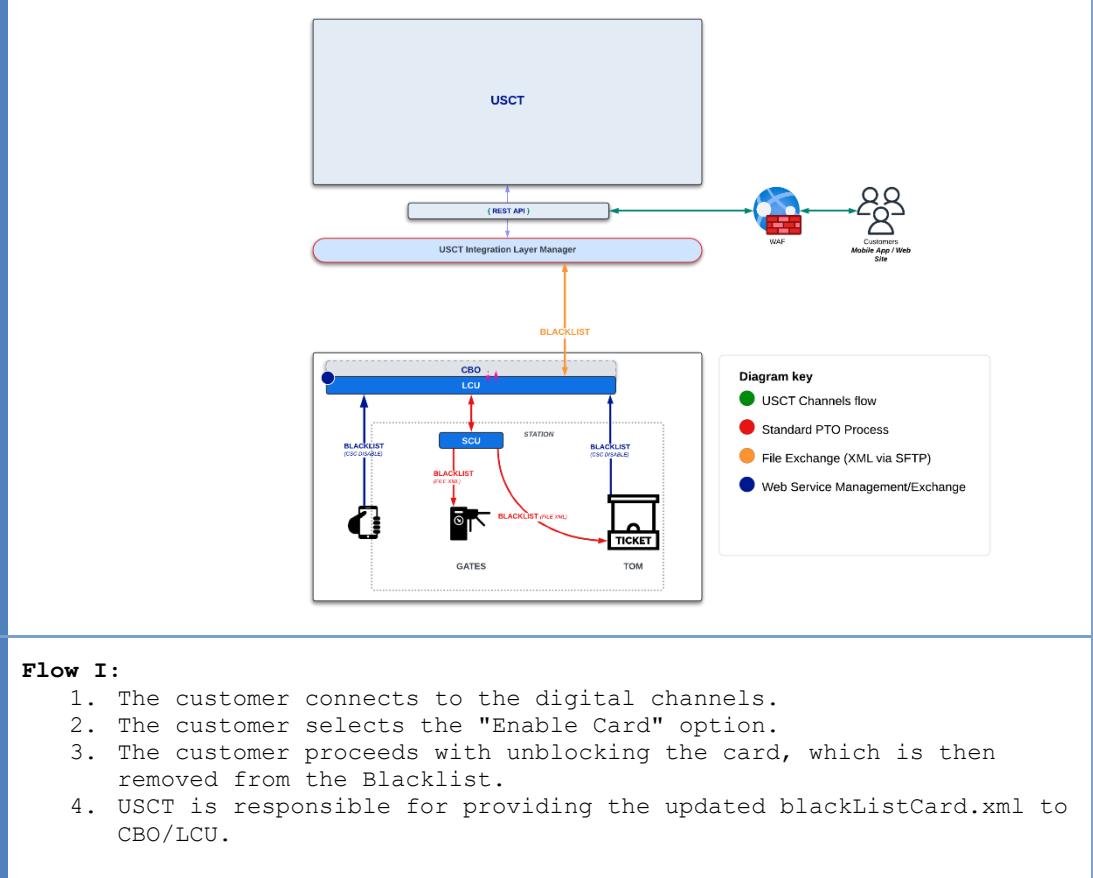
Integration Design Document

### 3.3.8 UC-AS08 – Unblocking of a CSC by Digital Channels

| ID               | UC-AS08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | Unblocking of a CSC by Digital Channels                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Goal             | Using digital channels, the customer can unblock a CSC.<br>USCT is responsible for providing the <b>blackListCard.xml</b> to CBO/LCU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Actors           | End-Customer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Technical Scope  | <ul style="list-style-type: none"> <li>• TOM</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• Customer is logged on one of digital channels</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• Customer unblocks the CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• Unblocking the card will remove it from blacklist.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Synoptic         | <pre> sequenceDiagram     participant GATE     participant TOM     participant SCU     participant LCU     participant CBO     participant ILM     participant MODVA     participant USCT_CHANNELS     participant CUSTOMER      GATE-&gt;&gt;TOM: Enable / Disable CSC-P     activate TOM     TOM-&gt;&gt;SCU: Action     activate SCU     SCU-&gt;&gt;LCU: Action     activate LCU     LCU-&gt;&gt;CBO: Action     activate CBO     CBO-&gt;&gt;ILM: Blacklist Card     activate ILM     ILM-&gt;&gt;MODVA: Blacklist Card     activate MODVA     MODVA-&gt;&gt;USCT_CHANNELS: Blacklist Card     activate USCT_CHANNELS     USCT_CHANNELS-&gt;&gt;CUSTOMER: Access Platform     CUSTOMER-&gt;&gt;USCT_CHANNELS: Request for Enable/Disable CSC-P     activate USCT_CHANNELS     USCT_CHANNELS--&gt;&gt;CUSTOMER: Message   </pre> <p>The diagram illustrates the process flow for unblocking a CSC. It starts with a Customer action on the GATE, which triggers an 'Enable / Disable CSC-P' message to the TOM. The TOM then sends an 'Action' message to the SCU. The SCU sends an 'Action' message to the LCU. The LCU sends an 'Action' message to the CBO. The CBO sends a 'Blacklist Card' message to the ILM. The ILM sends a 'Blacklist Card' message to the MODVA. The MODVA sends a 'Blacklist Card' message to the USCT CHANNELS. Finally, the USCT CHANNELS sends an 'Access Platform' message back to the Customer. Additionally, there is a feedback loop where the Customer sends a 'Request for Enable/Disable CSC-P' message to the USCT CHANNELS, which then returns a 'Message' to the Customer. A note indicates that the flow is active if the PTO lacks a CBO.</p> |

Integration Design Document

**Flows**



## Integration Design Document

## 4 Usage Of the Transport Mode

### 4.1 Travel

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

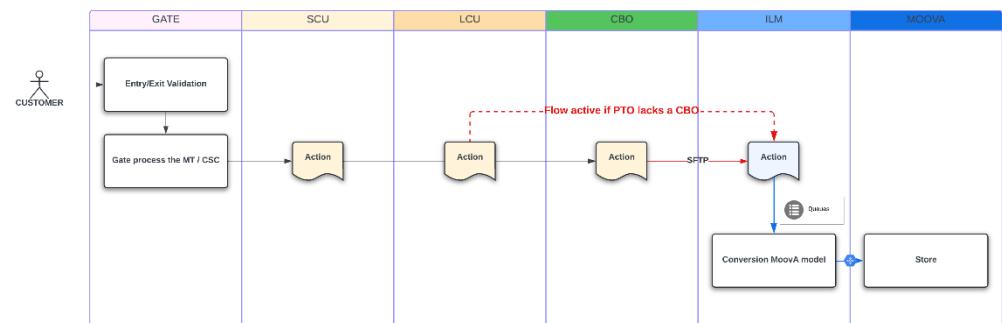
| Use-Case          | USCT-Integration Design Document | 63248442-305 |
|-------------------|----------------------------------|--------------|
| Journey with a MT | UC-TR01                          | UC-TR01      |
| Journey with CSC  | UC-TR02                          | UC-TR02      |

#### 4.1.1 UC-TR01 - Journey with an MT

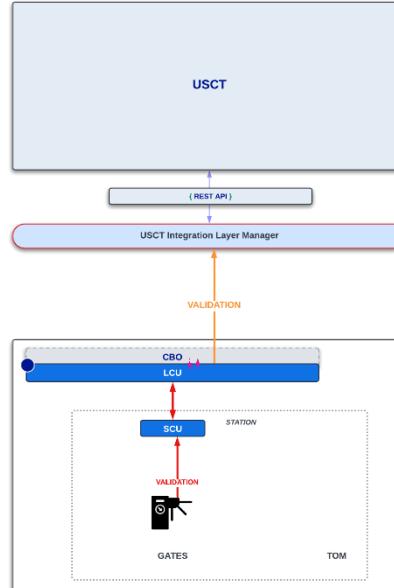
|                  |                                                                                                                                                                                                                                                                                                                    |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-TR01                                                                                                                                                                                                                                                                                                            |
| Title            | Journey with an MT                                                                                                                                                                                                                                                                                                 |
| Goal             | <p>This use case follows the existing structure detailed in use case 3.3.1.1 UC-TR01 - Journey with a MT of <b>Hitachi document number 63248442-305</b>.</p> <p>This use case applies to all <b>transports</b> involved in initiatives that follow the standard specified by Hitachi in the previous document.</p> |
| Actors           | Traveler                                                                                                                                                                                                                                                                                                           |
| Technical Scope  | <ul style="list-style-type: none"> <li>• GATE</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                     |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The traveller has a valid MT</li> </ul>                                                                                                                                                                                                                                   |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The journey is successful</li> <li>• The MT validation transaction is uploaded to the USCT and successfully processed</li> </ul>                                                                                                                                          |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None.</li> </ul>                                                                                                                                                                                                                                                          |

Integration Design Document

**Synoptic**



**Flows**



**Diagram key**

- Standard PTO Process
- File Exchange (XML via SFTP)

**Process**

**Entry:**

**Flow I:**

This use case follows the existing process detailed in use case "3.3.1.1 UC-TR01 - Journey with a MT" of Hitachi document number **63248442-305**.

**Flow II:**

CBO/LCU provides the event file to USCT.

**Exit:**

Same as Entry

**Alternative (Entry denied, Exit denied):**

Partial validations, such as unauthorized exit (and the same applies to entry), will generate transactions that will be provided to the platform for subsequent archiving.

CBO/LCU provides the event file to USCT.

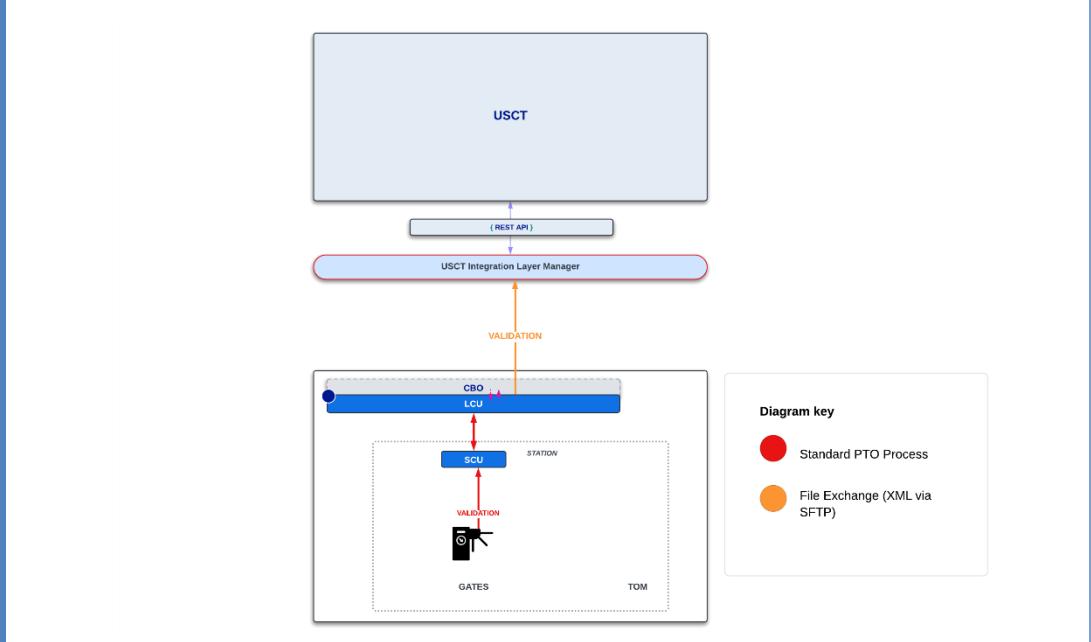
## Integration Design Document

## 4.1.2 UC-TR02 - Journey with CSC

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-TR01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Title            | Journey with CSC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Goal             | <p>This use case follows the existing structure detailed in use case "3.3.1.2 UC-TR02 - Journey with CSC" of <b>Hitachi document number 63248442-305</b>.</p> <p>This use case applies to all <b>transports</b> involved in initiatives that follow the standard specified by Hitachi in the above mentioned document.</p>                                                                                                                                                                                                                                                                                       |
| Actors           | Traveller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Technical Scope  | <ul style="list-style-type: none"> <li>• GATE</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The traveller has a valid CSC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The journey is successful</li> <li>• The CSC validation transaction is uploaded to the USCT and successfully processed</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• None.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Synoptic         | <pre> graph LR     CUSTOMER((Customer)) --&gt; GATE[GATE]     GATE --&gt; EEV[Entry/Exit Validation]     GATE --&gt; GPMTCSC[Gate process the MT / CSC]     EEV --&gt; GPMTCSC     GPMTCSC --&gt; ACTION1[Action]     ACTION1 --&gt; SCU[SCU]     SCU --&gt; ACTION2[Action]     ACTION2 --&gt; LCU[LCU]     LCU --&gt; ACTION3[Action]     ACTION3 --&gt; CBO[CBO]     CBO --&gt; SFTP[SFTP]     SFTP --&gt; ILM[ILM]     ILM --&gt; ACTION4[Action]     ACTION4 --&gt; MOOVA[MOOVA]     ACTION4 --&gt; CM[Conversion MoovA model]     CM --&gt; STORE[Store]     </pre> <p>Flow active if PTO lacks a CBO:</p> |

Integration Design Document

**Flows**



**Process**

**Entry:**

**Flow I:**

1. This use case follows the existing process detailed in use case "3.3.1.2 UC-TR02 - Journey with CSC" of Hitachi document number **63248442-305**.

**Flow II:**

1. CBO/LCU provides the event file to USCT.

**Exit:**

Same as Entry

**Alternative (Entry denied, Exit denied):**

Partial validations, such as unauthorized exit (and the same applies to entry), will generate transactions that will be provided to the platform for subsequent archiving.

CBO/LCU provides the event file to USCT.

## Integration Design Document

## 4.2 Enforcement

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

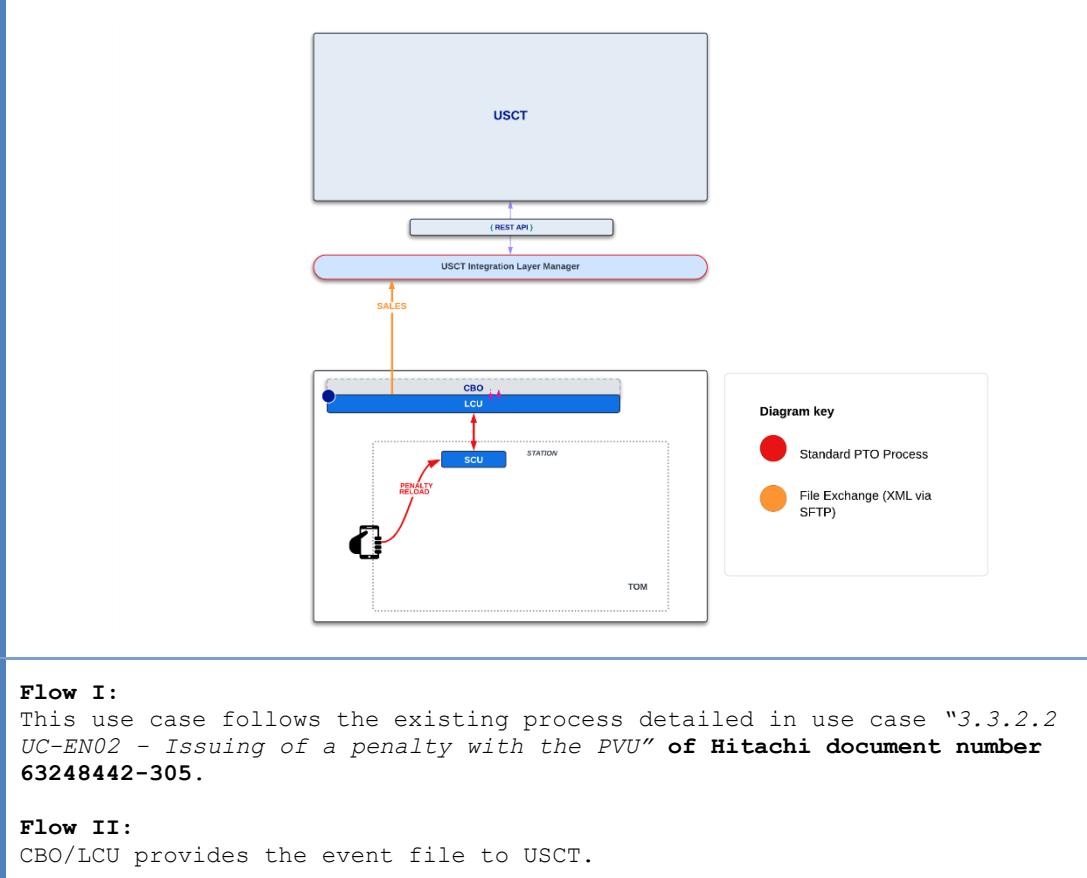
| Use-Case                          | USCT-Integration<br>Design Document | 63248442-305 |
|-----------------------------------|-------------------------------------|--------------|
| Issuing of a penalty with the PVU | UC-EN01                             | UC-EN02      |

### 4.2.1 UC-EN01 - Issuing of a penalty with the PVU

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-EN01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Title            | Issuing of a penalty with the PVU                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Goal             | <p>The enforcement officer is on duty. He has controlled a fare dodger who had either no ticket at all or an invalid ticket/CSC.</p> <p>The enforcement officer issues a penalty.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Actors           | Enforcement Officer, Traveller                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Technical Scope  | <ul style="list-style-type: none"> <li>• PVU</li> <li>• SCU</li> <li>• LCU</li> <li>• CBO (if any)</li> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The traveller has a valid MT ticket</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The enforcement officer is in the metro with the PVU ready for inspection (shift is open).</li> <li>• The Enforcement Officer is about to fine a fare dodger.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Assumption(s)    | <ul style="list-style-type: none"> <li>• In case the penalty is not paid immediately, the recovery process is out of the scope of the system as indicated inside <b>Hitachi document number 63248442-305</b>.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Synoptic         | <pre> graph LR     PVU[PVU] --&gt; IssuePenalty[Issue Penalty]     IssuePenalty --&gt; GenerateTransaction[Generate Transaction]     GenerateTransaction --&gt; Action1[Action]     Action1 --&gt; Action2[Action]     Action2 --&gt; Action3[Action]     Action3 --&gt; Action4[Action]     Action4 --&gt; Action5[Action]     Action5 --&gt; Conversion[Conversion MoovA model]     Conversion --&gt; Store[Store]     Action5 -- "Flow active if PTO lacks a CBO" --&gt; Action6[Action]     Action6 --&gt; Queue[Queues]     Queue --&gt; Conversion     </pre> <p>The diagram illustrates the flow of data between various components. It starts with a PVU (Penalty Vending Unit) which performs two actions: 'Issue Penalty' and 'Generate Transaction'. The 'Generate Transaction' action leads to an 'Action' step. This is followed by a series of 'Action' steps through the SCU, LCU, CBO, and ILM (Information and Logic Module) components. The flow then continues to the MOOVA (Mobile Operator) component, where it is processed by a 'Conversion MoovA model' and stored. A red dashed arrow labeled 'Flow active if PTO lacks a CBO' points from the CBO step to an 'Action' step, which then leads to a 'Queues' step.</p> |

Integration Design Document

**Flows**



**Process**

**Flow I:**

This use case follows the existing process detailed in use case "3.3.2.2 UC-EN02 - Issuing of a penalty with the PVU" **of Hitachi document number 63248442-305**.

**Flow II:**

CBO/LCU provides the event file to USCT.

## Integration Design Document

# 5 AFC Operation

## 5.1 Blacklist Management

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                                                 | USCT-Integration Design Document | 63248442-305 |
|----------------------------------------------------------|----------------------------------|--------------|
| Blacklisting a CSC from the PVU                          | UC-BM01                          | UC-BM05      |
| Insertion of a CSC in the blacklist in USCT admin portal | UC-BM02                          | UC-BM02      |
| Removal of CSC from blacklist in the USCT admin portal   | UC-BM03                          | UC-BM03      |
| Display of CSC blacklist at the USCT admin portal        | UC-BM04                          | UC-BM04      |

### 5.1.1 UC-BM01 - Blacklisting a CSC from the PVU

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-BM01                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Title            | Blacklisting a CSC from the PVU                                                                                                                                                                                                                                                                                                                                                                                             |
| Goal             | <p>The objective is for the enforcement officer to put illegal cards in blacklist. This is the case where he gets informed that an illegal card is used (he is not in possession of the card).</p> <p>NOTE: the implementation of this use cases depends on the mobile network (3G/4G) that will be provided for the PVU. This network is out of scope as indicated inside <b>Hitachi document number 63248442-305</b>.</p> |
| Actors           | Enforcement Officer                                                                                                                                                                                                                                                                                                                                                                                                         |
| Technical Scope  | <ul style="list-style-type: none"> <li>• PVU</li> <li>• USCT</li> <li>• CBO/LCU</li> </ul>                                                                                                                                                                                                                                                                                                                                  |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The PVU is connected to the USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                        |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• The enforcement officer is in the metro with the PVU ready for inspection (shift is open).</li> <li>• The Enforcement Officer is about to fine a fare dodger.</li> <li>• The CSC is blacklisted.</li> </ul>                                                                                                                                                                        |
| Assumption(s)    |                                                                                                                                                                                                                                                                                                                                                                                                                             |

## Integration Design Document

| Synoptic |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Flows    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Process  | <p><b>Flow I:</b></p> <ol style="list-style-type: none"> <li>The enforcement officer wants to insert a CSC in blacklist. He is in possession of the card tag id.</li> <li>He uses the card blacklisting function at the PVU and keys the tag-id.</li> <li>The PVU calls the USCT Web Service card disabling service.</li> </ol> <p><b>Flow II:</b></p> <ol style="list-style-type: none"> <li>The CSC is added into the blacklist with reason.</li> </ol> <p><b>Flow III:</b></p> <ol style="list-style-type: none"> <li>USCT provide <b>blackListCard.xml</b> vs CBO/LCU.</li> </ol> <p><b>Alternative:</b></p> <ol style="list-style-type: none"> <li>The operator attempts to disable the CSC.</li> <li>The system identifies that the card is already in the blacklist with a "Blocked" status.</li> </ol> |

Integration Design Document

3. The process is halted, and an error message is displayed to inform the enforcement officer that the card is already blocked.

Integration Design Document

### 5.1.2 UC-BM02 - Insertion of a CSC in blacklist at the USCT Admin Portal

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>               | UC-BM02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Title</b>            | Insertion of a CSC in blacklist at the USCT admin portal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Goal</b>             | The in charge at the admin portal level can add an item in the blacklist. It allows blocking either the card or a range of cards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Actors</b>           | In-charge Officer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• USCT admin portal</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Precondition(s)</b>  | <ul style="list-style-type: none"> <li>• CSC is declared at the USCT back office</li> <li>• The in-charge officer is logged into the admin portal and is granted appropriate access rights</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Postcondition(s)</b> | <ul style="list-style-type: none"> <li>• CSC is added to the blacklist</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Assumption(s)</b>    | <ul style="list-style-type: none"> <li>• Items that can be blacklisted           <ul style="list-style-type: none"> <li>◦ Card</li> <li>◦ Range of cards</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Synoptic</b>         | <pre> graph LR     subgraph GATE [GATE]         direction TB         GATE --&gt; TOM         GATE --&gt; SCU         GATE --&gt; LCU         GATE --&gt; CBO         GATE --&gt; ILM         GATE --&gt; MOOVA     end     subgraph CBO [CBO]         direction TB         CBO --&gt; ILM     end     subgraph LCU [LCU]         direction TB         LCU --&gt; ILM     end     subgraph ILM [ILM]         direction TB         ILM --&gt; MOOVA     end     subgraph MOOVA [MOOVA]         direction TB         MOOVA --&gt; InChargeOfficer((In-Charge Officer))     end     BlacklistCard1[Blacklist Card] --&gt; BlacklistCard2[Blacklist Card]     BlacklistCard2 --&gt; InChargeOfficer     InChargeOfficer --&gt; BlacklistCard1     InChargeOfficer --&gt; Decision{already blocked?}     Decision --&gt; Done[Done]     Done --&gt; Info[Information to In-Charge Officer]     Info --&gt; InChargeOfficer     </pre> <p>The synoptic diagram illustrates the system architecture across various components: GATE, TOM, SCU, LCU, CBO, ILM, and MOOVA. The In-Charge Officer interacts with the CBO and LCU to manage the Blacklist Card. A decision point checks if the card is already blocked; if so, the process ends. Otherwise, it proceeds to mark the card as done and inform the In-Charge Officer.</p> |
| <b>Flows</b>            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| <b>Process</b>          | <p><b>Flow I:</b></p> <ol style="list-style-type: none"> <li>1. The in-charge officer wants to insert a CSC (or a range of CSCs) in blacklist. He is in possession of the card serial numbers.</li> <li>2. He uses the card blacklisting function at to add the card inside the blacklist</li> <li>3. The in-charge officer selects a reason for blacklisting the CSC/CSCs.</li> <li>4. The in-charge office validates the action.</li> </ol> <p><b>Flow II:</b></p> <ol style="list-style-type: none"> <li>1. USCT provide <b>blackListCard.xml</b> to CBO/LCU.</li> </ol> <p><b>Alternative:</b></p> <ol style="list-style-type: none"> <li>1. The in-charge officer attempts to insert a CSC in the blacklist.</li> </ol>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

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2. The system identifies that the card (or some of them) is already in the blacklist with a "Blocked" status.
3. The process is halted, and an error message is displayed to inform the operator.

### 5.1.3 UC-BM03 - Removal of a CSC from blacklist at the USCT Admin Portal

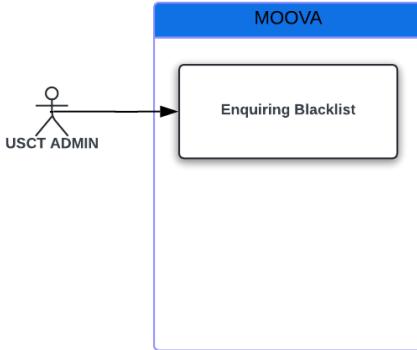
|                  |                                                                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-BM03                                                                                                                                                                                                      |
| Title            | Removal of a CSC from the blacklist at the USCT admin portal                                                                                                                                                 |
| Goal             | The in-charge officer at the admin portal level can remove an item in the blacklist. It allows blocking either the card or a range of cards.                                                                 |
| Actors           | In-charge Officer                                                                                                                                                                                            |
| Technical Scope  | <ul style="list-style-type: none"><li>• USCT</li><li>• USCT Admin portal</li></ul>                                                                                                                           |
| Precondition(s)  | <ul style="list-style-type: none"><li>• CSC is declared at back office and is blacklisted</li><li>• The in-charge officer is logged into the admin portal and is granted appropriate access rights</li></ul> |
| Postcondition(s) | <ul style="list-style-type: none"><li>• CSC is removed to the blacklist</li></ul>                                                                                                                            |
| Assumption(s)    | <ul style="list-style-type: none"><li>• Items that can be removed from blacklist<ul style="list-style-type: none"><li>◦ Card</li><li>◦ Range of cards</li></ul></li></ul>                                    |

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|          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Synoptic | <pre> graph TD     InChargeOfficer[In-Charge Officer] --&gt; InsertCSC[Insert CSC S. Number or Range of CSCs]     InsertCSC --&gt; UnblockCSC[Unblocking CSC]     UnblockCSC --&gt; ConfirmAction[Confirm Action]     ConfirmAction --&gt; ResultOperation[Result of the operation]   </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Flows    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Process  | <p><b>Flow I:</b></p> <ol style="list-style-type: none"> <li>1. The in-charge officer wants to remove a CSC (or a range of CSCs) from the blacklist.</li> <li>2. He uses the card unblocking function at to remove the card/range of cards from the blacklist.</li> <li>3. The in-charge office validates the action.</li> </ol> <p><b>Flow II:</b></p> <ol style="list-style-type: none"> <li>1. USCT provides the updated <b>blackListCard.xml</b> to CBO/LCU.</li> </ol> <p><b>Alternative:</b><br/>Regarding a massive process, one or more cards may not undergo the desired action because they are already in the required state. The system will inform the operator about which cards were impacted and which were not.</p> |

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## 5.1.4 UC-BM04 - Display of CSC blacklist at the USCT Admin Portal

|                         |                                                                                                                                                                                                                                                                                                                               |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>               | UC-BM04                                                                                                                                                                                                                                                                                                                       |
| <b>Title</b>            | Display of the CSC blacklist at the USCT admin portal                                                                                                                                                                                                                                                                         |
| <b>Goal</b>             | The in-charge officer can display the CSC blacklist on the USCT web portal.                                                                                                                                                                                                                                                   |
| <b>Actors</b>           | Enforcement Officer                                                                                                                                                                                                                                                                                                           |
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• USCT Admin portal</li> </ul>                                                                                                                                                                                                                                         |
| <b>Precondition(s)</b>  | <ul style="list-style-type: none"> <li>• The in-charge officer is logged into the admin portal and is granted appropriate access rights</li> </ul>                                                                                                                                                                            |
| <b>Postcondition(s)</b> | <ul style="list-style-type: none"> <li>• CSC blacklist is displayed at the admin portal</li> </ul>                                                                                                                                                                                                                            |
| <b>Assumption(s)</b>    |                                                                                                                                                                                                                                                                                                                               |
| <b>Synoptic</b>         |  <pre> sequenceDiagram     participant USCTADMIN as USCT ADMIN     participant MOOVA as MOOVA     actor EB as Enquiring Blacklist     USCTADMIN-&gt;&gt;MOOVA:      activate MOOVA     MOOVA-&gt;&gt;EB:      deactivate MOOVA     </pre> |
| <b>Flows</b>            |                                                                                                                                                                                                                                                                                                                               |
| <b>Process</b>          | <p><b>Flow:</b></p> <ol style="list-style-type: none"> <li>1. The in-charge office selects the card blacklist page from the USCT admin portal.</li> <li>2. The list of blacklisted cards and card ranges (if any) is displayed on the portal.</li> </ol>                                                                      |

## Integration Design Document

## 5.2 Business Parameter Management

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                                      | USCT-Integration<br>Design Document | 63248442-305 |
|-----------------------------------------------|-------------------------------------|--------------|
| Configuration of CSC Fare and Time Parameters | UC-BPM01                            | UC-PM-03     |
| Configuration of MT fare parameters           | UC-BPM02                            | UC-PM-04     |
| Configuration of Topology at USCT             | UC-BPM03                            | UC-PM-02     |

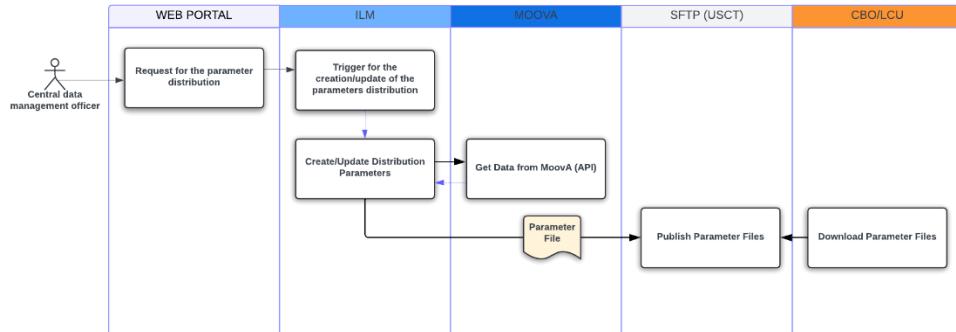
### 5.2.1 UC-BPM01 Configuration of CSC Fare and Time Parameters

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-BPM01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Title            | Configuration of the CSC fare and time parameters on USCT (MoovA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Goal             | The central data management officer can utilise the USCT/MoovA AFC backoffice to configure the CSC fare and time parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Actors           | <ul style="list-style-type: none"> <li>• Central Data Management Officer</li> <li>• AFC operator</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Technical Scope  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• MoovA AFC</li> <li>• USCT Web Portal</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Precondition(s)  | The Central Data Management Officer/AFC operator is signed into MoovA AFC module with the necessary access rights.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Postcondition(s) | The CSC fare and time parameters are configured/updated in the Moova Backend                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Assumption(s)    | <p>Fare Parameters that can be configured:</p> <ul style="list-style-type: none"> <li>• Global fare parameters.</li> <li>• Customer profiles (adult, child, student...).</li> <li>• Fares applied for travels with T-Purse.</li> <li>• Fare reduction applied on time periods for travel with T-Purse.</li> <li>• Fare media.</li> <li>• Fare tables for the period pass products.</li> <li>• Families of fare products.</li> <li>• Period pass fare products.</li> </ul> <p>Time Parameters that can be configured:</p> <ul style="list-style-type: none"> <li>• Days</li> <li>• SpecialDays</li> <li>• Day Types</li> </ul> <p>Note:</p> <ul style="list-style-type: none"> <li>• The parameter files are detailed inside the Unified Interface Definition Interface Control Document (ICD).</li> </ul> |

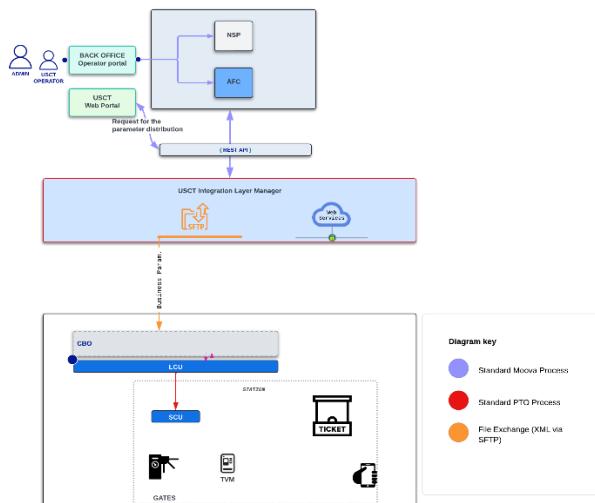
Integration Design Document

- The configuration will be done as per the existing structure, with the only difference being that now it will be done at the Moova AFC module and the file generation in the required format(XML) will be done inside the USCT Web Portal.
- The file format will be **XML**(similar to existing solution).

**Synoptic**



**Flows**



**Process**

**Flow I:**

- The Central data management officer/AFC operator signs into the AFC module and selects the Fare or time parameters option.
- The Officer/Operator can retrieve the existing fare or time parameters.
- The Officer/Operator can use the 'edit' option to update any fare or time parameters.
- Once the updates are performed, the operator can use the 'Save' option to complete the process.
- Once the changes are saved, the new parameters are live now.

**Flow II:**

- The central data management officer signs into the USCT web portal and retrieves the parameter data from the Moova.
- The Web portal generates the parameter files in the standard CBO format (XML) and publishes the files on the SFTP server.

**Flow III:**

- The CBO having access to the SFTP server downloads the new parameters files.

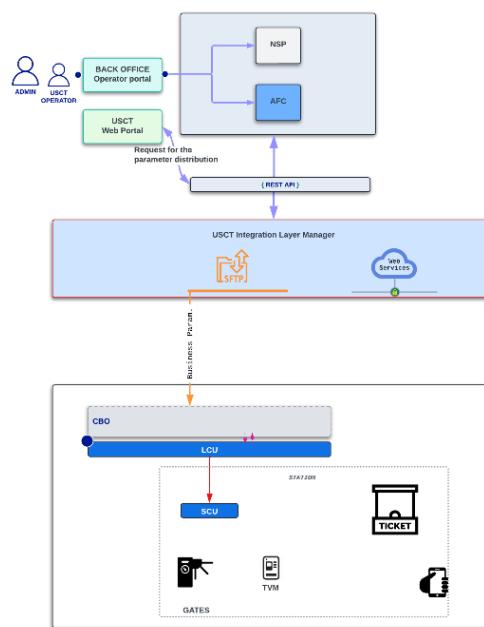
## Integration Design Document

## 5.2.2 UC-BPM02 Configuration of MT fare parameters

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-BPM02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Title            | Configuration of MT fare parameters on USCT/MoovA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Goal             | The process for configuring the MT fare parameters in MoovA is similar to the process that is done for the CSC fare parameters. The central data management officer can utilise the USCT/MoovA AFC backoffice to configure MT fare parameters.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Actors           | <ul style="list-style-type: none"> <li>• Central Data Management Officer</li> <li>• AFC operator</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Technical Scope  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• MoovA AFC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Precondition(s)  | The Central Data Management Officer/AFC operator is signed into MoovA AFC module with the necessary access rights.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Postcondition(s) | The MT fare parameters are updated in the USCT backend(MoovA) .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Assumption(s)    | <p>The MT fare parameters can be updated related to the following magnetic tickets:</p> <ul style="list-style-type: none"> <li>• singleRideTicket</li> <li>• dailyPassTicket</li> <li>• weeklyPassTicket</li> <li>• monthlyPassTicket</li> <li>• seasonPassTicket</li> <li>• agentPassTicket</li> <li>• freePassTicket</li> </ul> <p>Note:</p> <ul style="list-style-type: none"> <li>• The parameter files are detailed inside the Unified Interface Definition Interface Control Document (ICD).</li> <li>• The configuration will be done as per the existing structure, with the only difference being that now it will be done at the Moova AFC module and the file generation in the required format(XML) will be done inside the USCT web portal.</li> <li>• The file format will be <b>XML</b>(similar to existing solution) .</li> </ul> |
| Synoptic         | <pre> sequenceDiagram     participant CP as Central data management officer     participant WP as WEB PORTAL     participant ILM as ILM     participant MOOVA as MOOVA     participant SFTP as SFTP (USCT)     participant CBOILCU as CBOILCU      CP-&gt;&gt;WP: Request for the parameter distribution     activate WP     WP-&gt;&gt;ILM: Trigger for the creation/update of the parameters distribution     activate ILM     ILM-&gt;&gt;MOOVA: Create/Update Distribution Parameters     activate MOOVA     MOOVA-&gt;&gt;SFTP: Get Data from MoovA (API)     activate SFTP     SFTP-&gt;&gt;CBOILCU: Publish Parameter Files     activate CBOILCU     CBOILCU-&gt;&gt;SFTP: Download Parameter Files     deactivate SFTP     deactivate CBOILCU     </pre>                                                                                  |

## Integration Design Document

### Flows



### Process

#### Flow I:

1. The Central data management officer/AFC operator signs into AFC module and selects the Fare or time parameters option.
2. The Officer/operator can retrieve the existing fare or time parameters.
3. The Officer/operator can use the 'edit' option to update any fare or time parameters.
4. Once the updates are performed, the operator can use the 'Save' option to complete the process.
5. Once the changes are saved, the new parameters are live now.

#### Flow II:

1. The central data management officer log into the USCT web portal and retrieves the parameter data from the MoovA.
2. The Web portal generates the parameter files in the standard CBO format (XML) and publishes the files on the SFTP server.

#### Flow III:

1. The CBO having access to the SFTP server downloads the new parameters files.

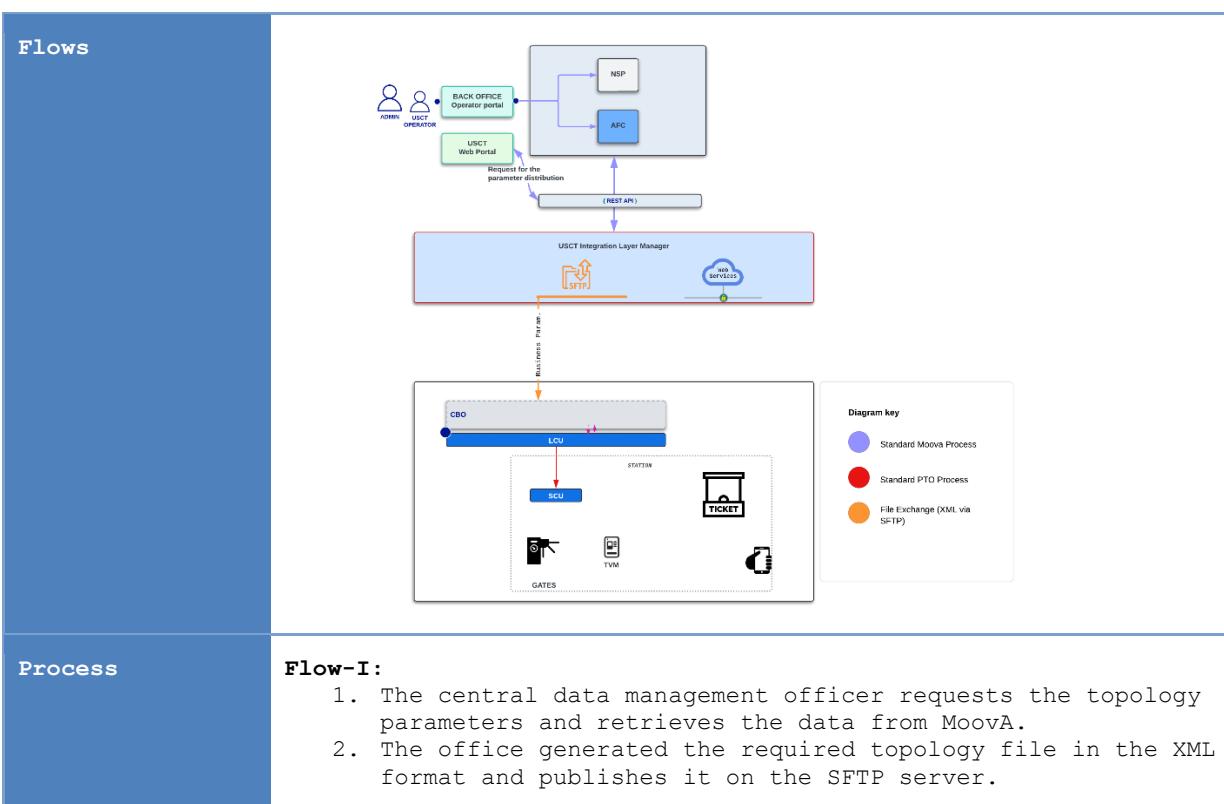
**Note:** As stated earlier, In USCT/MoovA the configuration of the MT fare parameters is similar to the CSC fare parameters, and both are done inside the AFC module of MoovA. The only difference is that separate XML files are generated for CSC and the MT.

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## 5.2.3 UC-BPM03 Configuration of Topology in USCT

|                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ID</b>               | UC-BPM03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Title</b>            | Configuration of Topology in USCT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Goal</b>             | The topology parameters can be configured inside MoovA and the USCT web portal can retrieve the data and generate the parameters files to be made available on the SFTP server.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Actors</b>           | <ul style="list-style-type: none"> <li>• Central Data Management Officer</li> <li>• AFC operator</li> <li>• NSP Operator</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| <b>Technical Scope</b>  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• Moova AFC</li> <li>• Moova NSP</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Precondition(s)</b>  | The Concerned Officer/Operator is signed into MoovA NSP module with the necessary access rights.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>Postcondition(s)</b> | The Topology parameters are updated in the USCT backend (MoovA)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <b>Assumption(s)</b>    | <p>The following topology parameters can be configured:</p> <ul style="list-style-type: none"> <li>• Lines</li> <li>• Floating Zones</li> <li>• Zones</li> <li>• Stations</li> <li>• Inter-Station Matrix</li> <li>• Zone to Zone matrix</li> </ul> <p>Note:</p> <ul style="list-style-type: none"> <li>• In MoovA, the parameters related to the network (i.e. the lines and the stations) are imported using the General Transit Feed Specification - <b>GTFs</b>, that is an open standard for public transit data, created by Google.</li> <li>• The parameter files are detailed inside the Unified Interface Definition Interface Control Document (ICD).</li> <li>• The configuration will be done as per the existing structure, with the only difference being that now it will be done at the Moova NSP and AFC modules and the file generation in the required format(XML) will be done inside the USCT web portal.</li> <li>• The file format will be <b>XML</b>(similar to existing solution).</li> </ul> |
| <b>Synoptic</b>         | <pre> sequenceDiagram     participant CDMO as Central data management officer     participant WP as WEB PORTAL     participant ILM as ILM     participant MOOVA as MOOVA     participant SFTP as SFTP (USCT)     participant CBO as CBO/LCU      CDMO-&gt;&gt;WP: Request for the parameter distribution     activate WP     WP-&gt;&gt;ILM: Trigger for the creation/update of the parameters distribution     activate ILM     ILM-&gt;&gt;MOOVA: Create/Update Distribution Parameters     activate MOOVA     MOOVA-&gt;&gt;SFTP: Get Data from MoovA (API)     activate SFTP     SFTP-&gt;&gt;CBO: Publish Parameter Files     activate CBO     CBO-&gt;&gt;SFTP: Download Parameter Files     deactivate CBO     deactivate SFTP     deactivate MOOVA     deactivate ILM     deactivate WP   </pre>                                                                                                                                                                                                               |

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### Note:

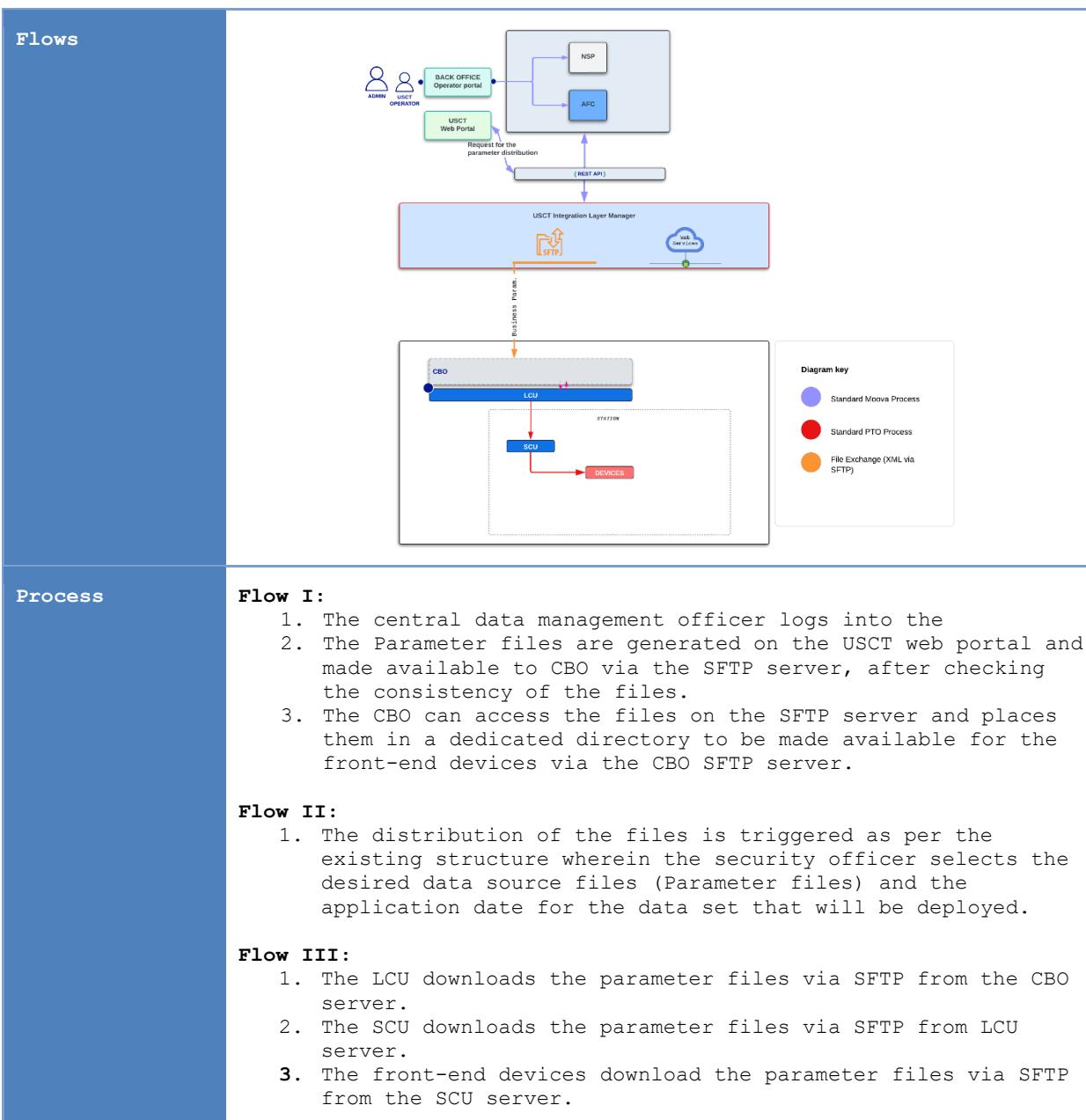
*NSP Operator refers to the operator who has the rights and credentials to access the network and service planning (NSP) module of the Moova platform, where the network configuration of a transport operator is managed, such as stops, lines and zones.*

## Integration Design Document

## 5.2.4 UC-BPM04 Distribution of the parameters to the equipment from the CBO

| ID               | UC-BPM04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Title            | Distribution of the parameters to the equipment from the CBO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Goal             | <p>The topology, CSC Fare and time parameters, and MT parameters are sent to the CBO and then distributed from the CBO to LCU/SCU/Devices.</p> <p>The distribution process from the CBO will remain as per the existing structure. However, the main change lies in the fact that parameter files will now be generated inside the USCT web portal and will be available to the CBO via the SFTP server.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Actors           | Central Data Management Officer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Technical Scope  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• USCT Web Portal</li> <li>• CBO</li> <li>• LCU/SCU/Front-end Devices</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Precondition(s)  | The Central Data Management Officer is signed into the USCT web portal with the necessary access rights.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Postcondition(s) | The parameters are distributed to LCU/SCU/Front end devices                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Assumption(s)    | The third-party devices conform to the parameter download mechanism from CBO (Using the SFTP server)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Synoptic         | <p>The synoptic diagram illustrates the flow of parameter files across different components:</p> <ul style="list-style-type: none"> <li><b>MOOVA:</b> Publishes Parameter Files to the USCT Web Portal.</li> <li><b>SFTP (USCT):</b> Receives Parameter Files from MOOVA and distributes them to the CBO, LCU, SCU, and Devices.</li> <li><b>CBO:</b> Receives Parameter Files from SFTP and distributes them to LCU, SCU, and Devices.</li> <li><b>LCU:</b> Receives Parameter Files from SFTP and CBO.</li> <li><b>SCU:</b> Receives Parameter Files from SFTP and CBO.</li> <li><b>DEVICES:</b> Receives Parameter Files from SFTP and CBO.</li> </ul> <p>A red dashed arrow labeled "Flow active if PTO lacks a CBO" points from the SFTP (USCT) box to the CBO box.</p> <pre> graph LR     MOOVA[MOOVA] --&gt; Publish[Publish Parameter Files]     Publish --&gt; SFTP[SFTP (USCT)]     SFTP --&gt; CBO[CBO]     SFTP --&gt; LCU[LCU]     SFTP --&gt; SCU[SCU]     SFTP --&gt; DEVICES[DEVICES]     CBO --&gt; LCU     CBO --&gt; SCU     CBO --&gt; DEVICES     LCU --&gt; DEVICES     SCU --&gt; DEVICES     </pre> |

## Integration Design Document



## Integration Design Document

## 5.3 Media Management

The new platform will logically integrate with the **CIS** (Card Initialization System). In fact, there is no direct integration between the systems: the integration is just functional in nature, and CIS is responsible for initializing the cards.

The initialized cards will be provided by the CIS to the central system, which in this case is the new USCT platform and it must acquire the cards into its own inventory and act as a central warehouse for all the PTOs. This process will hence involve both the physical as well as the digital record exchange of the Initialized cards. From this warehouse, the Media will be distributed to different PTOs (Metro, LRT, etc) as per the request. However, it must be noted that, individually for each PTO, the distribution process of the Media stocks to its sub-systems (Lines, stations, etc) will remain as per the existing process and hence all PTOs will monitor the media stocks at their respective points of sale as per the existing process.

Also, the monitoring of the media stocks in the central warehouse (USCT) will be managed at the PTO level only.

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                                  | USCT-Integration Design Document | 63248442-305 |
|-------------------------------------------|----------------------------------|--------------|
| Reception of a batch of CSCs from the CIS | UC-MM01                          | UC-MM01      |
| Checking of the CSC status                | UC-MM02                          | UC-MM02      |
| Distribution of Media Stocks              | UC-MM03                          | UC-MM03      |
| Monitoring of the point-of-sale stocks    | UC-MM04                          | UC-MM04      |

### 5.3.1 UC-MM01 Reception of a batch of CSCs from the CIS

|                 |                                                                                                                                                                                                                                                                                         |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID              | UC-MM01                                                                                                                                                                                                                                                                                 |
| Title           | Reception of a batch of CSCs from the CIS                                                                                                                                                                                                                                               |
| Goal            | Whenever new CSC media are needed, they are created at the Card Initialization System (CIS). Upon delivery, a file containing the details of the produced media accompanies the shipment. This file is then imported into the USCT Backoffice to individually identify each media item. |
| Actors          | <ul style="list-style-type: none"> <li>• Data Management Officer</li> <li>• AFC operator</li> </ul>                                                                                                                                                                                     |
| Technical Scope | <ul style="list-style-type: none"> <li>• USCT</li> <li>• MoovA AFC</li> </ul>                                                                                                                                                                                                           |
| Precondition(s) | <ul style="list-style-type: none"> <li>• A card delivery file is received</li> </ul>                                                                                                                                                                                                    |

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|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | <ul style="list-style-type: none"> <li>The Data Management Officer/AFC operator is signed into Moova AFC module with the necessary access rights.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Postcondition(s) | CSC Batch are uploaded in the system                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Assumption(s)    | <ul style="list-style-type: none"> <li><b>CIS</b> The current CIS will continue to be used.</li> <li><b>CSC Content:</b> Received CSC are anonymous and not pre-loaded with any product, T-purse amount or personalization data.</li> </ul>                                                                                                                                                                                                                                                                                                                                                             |
| Synoptic         | <pre> sequenceDiagram     participant DM_O as Data Management Officer     participant MOOVA     participant CIS     DM_O-&gt;&gt;MOOVA: Request for new stock distribution     MOOVA-&gt;&gt;CIS: Initialize CSC Batch     CIS--&gt;&gt;MOOVA: Provide CSC Batch file and Media Stock     MOOVA-&gt;&gt;DM_O: Receive the Batch file and Media Stock     MOOVA-&gt;&gt;MOOVA: Access the Moova AFC Module     MOOVA-&gt;&gt;CIS: Upload CSC Batch file   </pre>                                                                                                                                         |
| Flows            | <p>The diagram illustrates the integration architecture. It shows the interaction between the Card Initialization System, BACK OFFICE Operator portal, AFC, USCT Integration Layer Manager, and various terminal units (CBO, LCU, SCU, TVM, TICKET). The process involves the BACK OFFICE Operator portal sending requests to the AFC and USCT Integration Layer Manager. The USCT Integration Layer Manager interacts with external services via SFTP and manages stock levels. The AFC interface connects to the CBO, LCU, SCU, TVM, and TICKET units, which handle ticketing and status updates.</p> |
| Process          | Flow I:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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1. The data management officer import of the Batch file on the Backoffice portal. They select the file to be imported and confirm the action.
2. The AFC Module imports the file and populates the Media Management database with each card listed in the file. Upon completion, a status message is displayed, indicating the number of cards that were created.

**Alternatives**

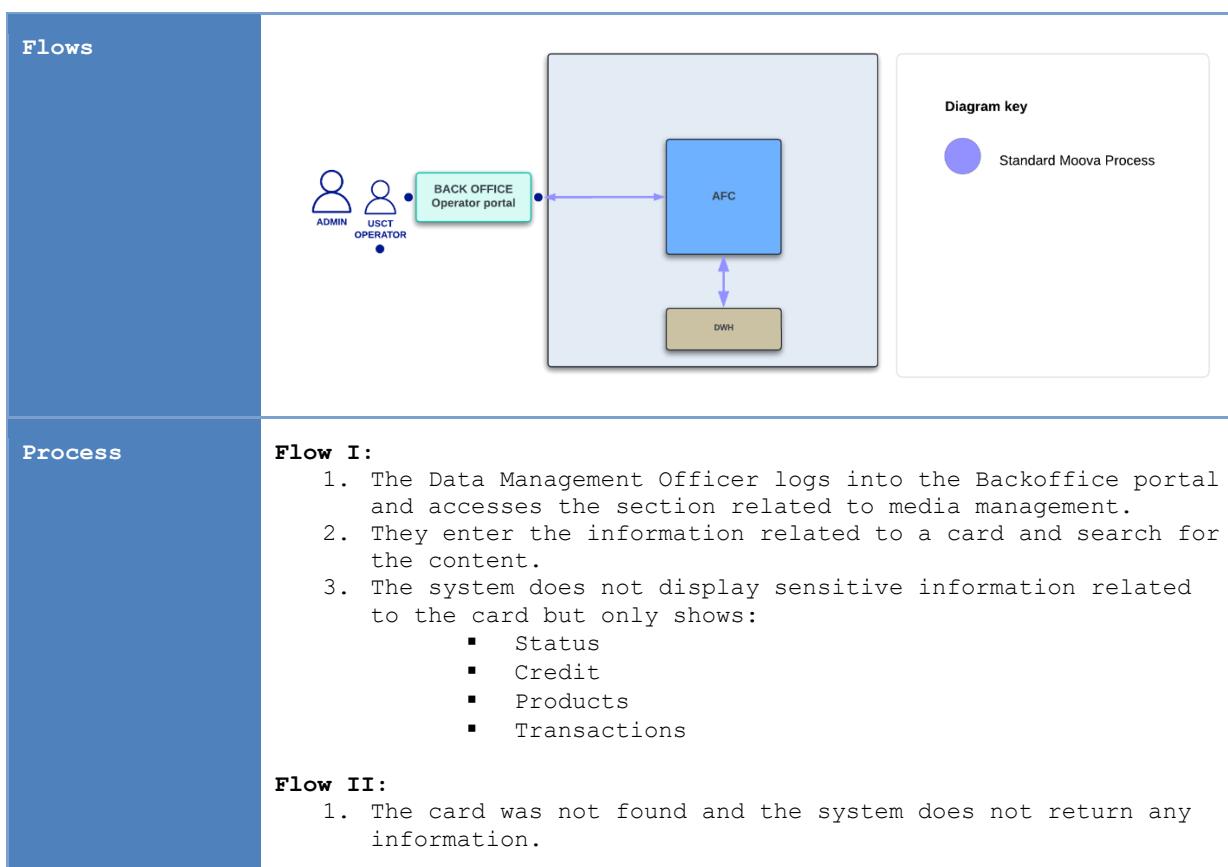
- Incorrect file structure If the file structure is incorrect, the import is aborted, and an error message is displayed to the operator.
- CSC already declared in database If the file contains a CSC that is already declared in the database, the entire file content is discarded.

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## 5.3.2 UC-MM02 Checking of the CSC status

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-MM02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Title            | Checking of the CSC status                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Goal             | The goal of the process is to enable staff to verify if a specific CSC Card exists and determine its status.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Actors           | <ul style="list-style-type: none"> <li>• Data Management Officer</li> <li>• AFC operator</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Technical Scope  | <ul style="list-style-type: none"> <li>• USCT</li> <li>• Moova AFC</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• The Data Management Officer/AFC operator is signed into Moova AFC module with the necessary access rights.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Postcondition(s) | The staff has queried the system and received the relevant information about the card                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Assumption(s)    | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Synoptic         | <pre> graph TD     DM[Data management officer] --&gt; Insert[Insert the CSC Graphical Number and Search]     Insert --&gt; Receive[Receive the information about the CSC]     Receive --&gt; Missing[The CSC is missing from the Database]     subgraph Backoffice [Backoffice]         Insert         Search[Search Card Database]         Insert --&gt; Search         Search --&gt; Receive     end     subgraph MOOVA [MOOVA]         Search     end   </pre> <p>The synoptic diagram illustrates the process flow. A 'Data management officer' actor interacts with the 'Backoffice' system. Inside the Backoffice, the 'Insert the CSC Graphical Number and Search' step is performed, which then triggers the 'Search Card Database' step in the MOOVA system. The result of the search is then received by the Backoffice, leading to the final outcome: 'The CSC is missing from the Database'.</p> |

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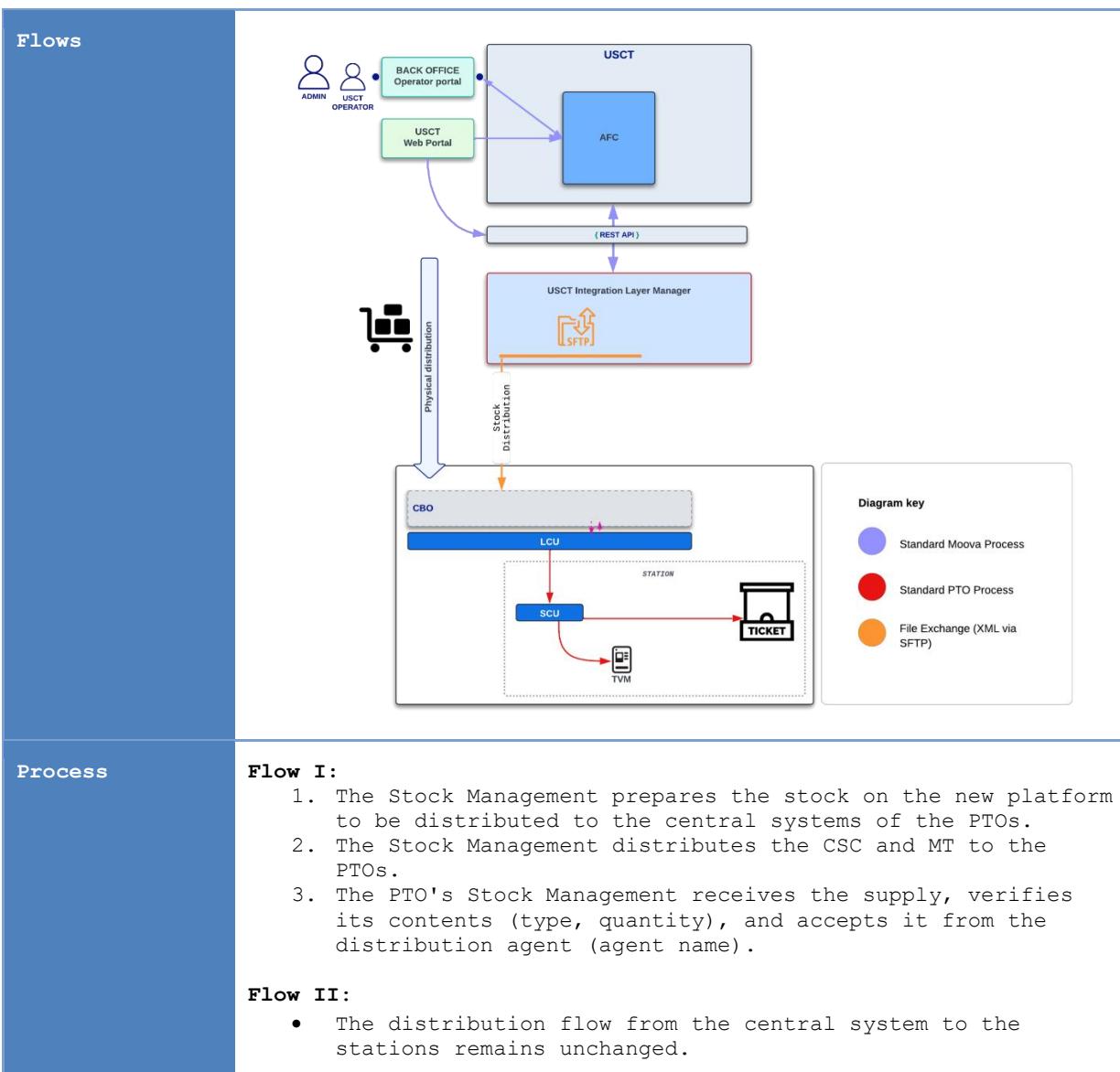
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## 5.3.3 UC-MM03 Distribution of Media Stocks

**Important Note:** The physical distribution method of the Stock is not within the scope of the Consortium.

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-MM03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Title            | Distribution of Media Stocks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Goal             | <p>The new process will be responsible for generating a supply containing smartcards and tickets for the central systems of the service operators. <b>The distribution from the operator's central system to the distribution points will remain unchanged.</b></p> <p>The key change is that the operator will now create the distribution to the PTO system (CBO or LCU) through the USCT Backoffice (AFC Module). The Data Management Officer at the USCT Web Portal will retrieve the data from MoovA and generate the necessary XML files, which will then be made available to the CBO/LCU via the SFTP Server.</p>                                                     |
| Actors           | <ul style="list-style-type: none"> <li>Stock Management Agent</li> <li>AFC Operator</li> <li>Data management Officer</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Technical Scope  | <ul style="list-style-type: none"> <li>USCT</li> <li>MoovA AFC</li> <li>CBO/LCU</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Precondition(s)  | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Postcondition(s) | The stocks are distributed to the PTOs central system. The XML files are distributed to the PTOs via SFTP.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Assumption(s)    | None.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Synoptic         | <p>The diagram illustrates the flow of stock distribution. On the left, a user (USCT ADMIN / Stock Management Agent) initiates a 'Request for the new distribution' to the Web Portal. The Web Portal triggers a 'Generation of XML files' in the II.M (Intelligent Information Management) system, which then generates a 'File Generated'. This file is sent via SFTP to the MoovA system, where it is received by the 'Warehouse'. From the Warehouse, the file is sent to the CBO (Central Business Office) or LCU (Local Control Unit). The CBO or LCU then receives the stock from the central system. A note indicates that the 'Flow active if PTO lacks a CBO-'.</p> |

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### 5.3.5 UC-MM04 Monitoring of the point of sale stocks

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-MM04                                                                                                                                                                                                                                                                                                                                                                                                                |
| Title            | Monitoring of the point of sale stocks                                                                                                                                                                                                                                                                                                                                                                                 |
| Goal             | The objective is to ensure efficient oversight of the stock levels managed by the central system, while recognizing that detailed monitoring of individual points of sale (such as TOMs in stations) will be under the jurisdiction of the PTO owners.                                                                                                                                                                 |
| Actors           | <ul style="list-style-type: none"> <li>Stock Management Agent</li> </ul>                                                                                                                                                                                                                                                                                                                                               |
| Technical Scope  | <ul style="list-style-type: none"> <li>USCT</li> <li>Moova AFC</li> </ul>                                                                                                                                                                                                                                                                                                                                              |
| Precondition(s)  | <ul style="list-style-type: none"> <li>The Data Management Officer/AFC operator is signed into Moova AFC module with the necessary access rights.</li> </ul>                                                                                                                                                                                                                                                           |
| Postcondition(s) | Stock records are uploaded from the PTO central system and correctly checked and processed                                                                                                                                                                                                                                                                                                                             |
| Assumption(s)    | None.                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Synoptic         |                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Flows            | <p>Diagram key:<br/>Standard Moova Process</p>                                                                                                                                                                                                                                                                                                                                                                         |
| Process          | <p><b>Flow I:</b></p> <ol style="list-style-type: none"> <li>The new platform serves as the central warehouse and is aware of the number of CSCs, both those in storage and those distributed to PTO systems.</li> <li>The operator in the central warehouse has the ability to access the new USCT Web Portal and check the remaining stocks in the different PTOs based on what has been supplied and the</li> </ol> |

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sales that have been made (sales including MT and new CSCs issued).

3. The data aggregation process will allow the information to be built based on the timing of transaction receipts.

**Flow II:**

1. PTOs will be responsible for using the standard tools already existing in their systems to monitor the stock situation at lines, stations and the TOMs/TVMs.

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## 5.4 Business Intelligence

The following table summarises the mapping of the use cases within this document with the use cases as per the Hitachi documents:

| Use-Case                   | USCT-Integration<br>Design Document | 63248442-305 |
|----------------------------|-------------------------------------|--------------|
| ETL processing at the USCT | UC-BI01                             | UC-BI02      |

### 5.4.1.1 UC-BI01 - ETL processing at the USCT

|                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ID               | UC-BI01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Title            | ETL processing at the USCT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Goal             | <p>The scope of this process is the preparation of the business data that will be used by the Business Intelligence (BI) Solution. This process is often referred to as ETL, which stands for Extracting data from various sources, transforming it to meet business requirements, and loading it into the BI storage.</p> <p>This is an automatic process carried out by the USCT system (no human actor involved). However, the description hereafter helps in understanding the functional design of the proposed solution. Business users and analysts who utilize the USCT BI solutions are responsible for managing the data resulting from the ETL process.</p> <p>Technical Details:</p> <ul style="list-style-type: none"> <li>• <b>Data Extraction:</b> Data is extracted from various sources, including transactional databases, web services, and other external data repositories.</li> <li>• <b>Data Transformation:</b> Extracted data is cleansed, enriched, and transformed to meet the analytical requirements. This includes data normalization, deduplication, and integration of multiple data sources.</li> <li>• <b>Data Loading:</b> Transformed data is loaded into the BI storage, which may include data warehouses and data lakes designed for high-performance analytics and reporting.</li> </ul> <p>Note: Long-term archiving is also managed after the completion of the ETL process, ensuring historical data is stored and accessible for future analysis.</p> |
| Actors           | N.A.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Technical Scope  | <ul style="list-style-type: none"> <li>• USCT</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Precondition(s)  | <ul style="list-style-type: none"> <li>• N.A.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| Postcondition(s) | <ul style="list-style-type: none"> <li>• A daily batch of business data is loaded into the BI storage, and the source data is subsequently archived.</li> <li>• Creation of Sales Reporting document related to the sales generated by USCT Platform</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

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|                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Assumption(s)</b> | <p><b>USCT Business Intelligence solution:</b> Apache Superset</p> <p><b>Data Sources:</b> The data used for the processing is as follows</p> <ul style="list-style-type: none"> <li>• Event files sent by the CBO to USCT (XML via SFTP).</li> <li>• Information exchanged for claim registration and management. (Both from web channels and the TOM)</li> <li>• Transaction data managed directly by the USCT (Web services/APIs).</li> </ul> <p><b>Performances:</b></p> <p>BI on-line detailed storage capacity: x Months<br/>Offline archiving capacity: y years<br/>ETL process frequency: z day/s</p>                                                                                                                                                                                        |
| <b>Synoptic</b>      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| <b>Flows</b>         | <p>The diagram illustrates the data flow architecture. At the top, two user icons (ADMIN and USCT OPERATOR) connect to a large central box labeled "USCT". Below "USCT" is a "REST API" interface. A blue arrow labeled "MULTIMODAL PRODUCTS" points from the ADMIN icon to a "CBO LCU" box. The "CBO LCU" box contains several components: "SCU", "STATION", "TVM", and "TOM". Data flows between these components include "SALES", "SALES REPORTING", "VALIDATION", "BLACKLIST", and "MATERIALIZATION". External interfaces include "WAF" (Web Application Firewall) and "Customers Mobile App / Web Site", which interact with the "USCT Integration Layer Manager" (a red bar above the CBO LCU). The "Diagram key" on the right defines symbols for different types of flows and processes.</p> |
| <b>Process</b>       | <p><b>Data collection:</b></p> <p>The process of data collection involves the management of all the information required to manage the reports. That involves the following steps:</p> <ul style="list-style-type: none"> <li>• Data collection from all the event files received from the CBO/LCU.</li> <li>• Data sent from USCT to the CBO/LCU.</li> <li>• Data collection from all the transactions/events managed directly on the USCT.</li> </ul> <p>The ETL process is triggered depending on the pre-defined time as per the requirements. A frequency based (Daily/weekly etc) cut-off time is pre-set for this trigger</p> <p><b>ETL</b></p>                                                                                                                                               |

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The following data is extracted and transformed to meet the requirements of the BI solution. This process takes place on a pre-defined cut-off time (Daily or weekly depending on the requirements):

- The data (Event files) sent by the CBO to the USCT (XML via SFTP)
  - Accounting operation
  - Card action
  - Penalty
  - Personalisation (Issuing CSC-P)
  - Personalisation reconstruction (Duplication)
  - Validation
  - MT accounting operation
  - MT validation
- The data sent by the USCT to the CBO/LCU
  - Blacklist
  - Sales Transactions
- The data related to the any transactions/events generated directly from the platform (webservices/APIs)
  - Claim management information
  - Sales transactions on web channels
  - Backoffice data management

## 6 Customer Migration

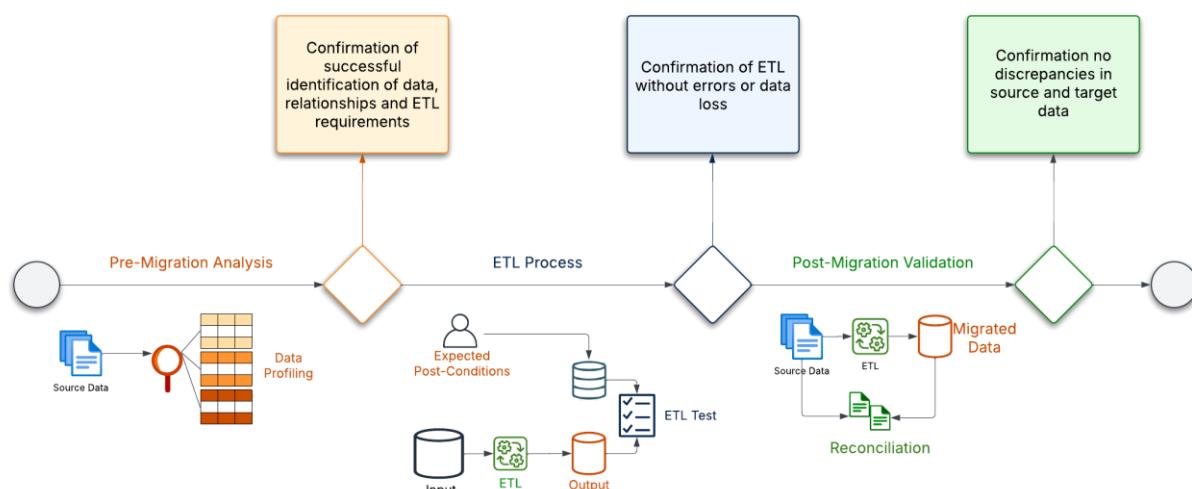
In today's fast-paced, customer-centric world, seamless data migration isn't just a technical necessity—it's a cornerstone of building trust, driving growth, and unlocking new opportunities. With the increasing demands for scalability, precision, and enhanced user experiences, our approach to **Customer Migration** is designed to set the foundation for transformation.

This chapter outlines a preliminary roadmap, combining proven methodologies, strategic insights, and innovative approaches tailored to ensure a smooth migration journey. While serving as a guide, this document also leaves room for evolving requirements, guaranteeing flexibility as we analyze specific needs and address the multifaceted dimensions of this initiative.

From aligning business objectives to implementing best practices, these guidelines aim to deliver not just a successful migration but a tangible impact on customer satisfaction and business efficiency. Let's embark on this journey to redefine what's possible.

### 6.1 Data Profiling- ETL Testing – Reconciliation

Data migration, the process of transferring data between different storage types, formats, or application systems, is a critical operation in the modern digital landscape. This intricate process often arises during system upgrades, consolidations, or the integration of new technologies. Ensuring data integrity, accuracy, and consistency throughout the migration is paramount to maintain business continuity and operational efficiency. Employing robust methodologies and leveraging industry standards, data migration involves meticulous planning, thorough testing, and careful execution. This chapter explores the essential strategies and best practices that organizations should adopt to achieve a seamless and successful data migration process. Through real-world examples and practical insights, readers will gain an understanding of the complexities involved and the solutions to mitigate potential risks.



### 6.1.1 Data Profiling

Data profiling is the first step in the data migration process and involves analyzing the data to understand its structure, content, and quality. The objectives of data profiling include:

- Identifying data anomalies and inconsistencies.
- Ensuring data completeness and accuracy.
- Understanding data relationships and dependencies.
- Establishing baseline metrics for data quality.

### 6.1.2 ETL Testing

ETL (Extract, Transform, Load) testing is crucial to ensure that the data migration process is accurate and reliable. ETL testing involves:

- **Extract Testing:** Verifying that the data is correctly extracted from the source system.
- **Transform Testing:** Ensuring that data transformations, such as data cleaning and normalization, are performed correctly.
- **Load Testing:** Confirming that the transformed data is accurately loaded into the target system.
- **Performance Testing:** Evaluating the performance of the ETL process to ensure it can handle the required data volume within acceptable timeframes.

### 6.1.3 Reconciliation

Reconciliation is the process of validating that the data in the target system matches the data in the source system. This involves:

- **Data Comparison:** Comparing the data in the source and target systems to identify any discrepancies.
- **Data Validation:** Ensuring that the data in the target system meets the required quality standards.
- **Issue Resolution:** Investigating and resolving any discrepancies or data quality issues identified during the reconciliation process.

### 6.1.4 Example of User Data Migration Process

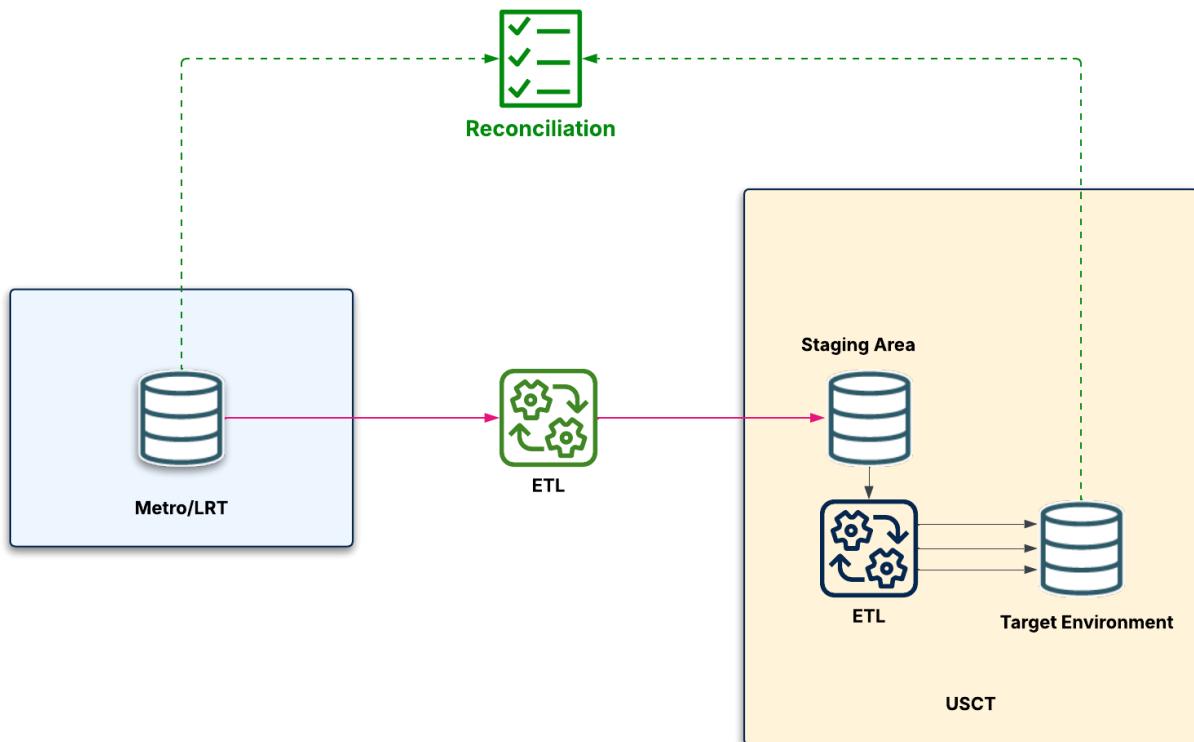
#### 1. Data Exchange Documentation:

- Provide detailed documentation of the information to be exchanged. This includes:
  - Description of the Data
  - Glossary of Terms
  - Table Structures
  - Field Definitions
  - Data Dictionary

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- Default Values
- Primary Keys
- Foreign Keys
- Integrity Constraints
- Provide security information regarding the data, including:
  - Encryption
  - Data Access
- Provide sample data to help analyze and test the ETL process, including:
  - Sample Datasets
  - Use Cases

## 6.2 User Data Migration Process



### 6.2.1 Data Exchange Documentation

**Step 1.1:** Provide detailed documentation of the information to be exchanged. This includes:

- **Description of the Data:** A document describing the content and purpose of the data provided.
- **Glossary of Terms:** A glossary defining the terms and abbreviations used in the data.
- **Table Structures:** A schema of the tables, including table names and their relationships.
- **Field Definitions:** Detailed list of fields in each table, including data types and constraints (e.g., maximum length, allowed values, etc.).
- **Data Dictionary:** Detailed descriptions of each field, including their utility and validation rules.
- **Default Values:** List of default or encoded values used in fields (e.g., status codes, categories, etc.).
- **Primary Keys:** Identification of primary keys for each table.
- **Foreign Keys:** Identification of foreign keys and relationships between tables.
- **Integrity Constraints:** Description of referential integrity constraints and other constraints applied to the data.

**Step 1.2:** Provide security information regarding the data, including:

- **Encryption:** Details on any encryption applied to the data and the necessary decryption keys.

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- **Data Access:** Information on how access to the data will be granted for the ETL process (e.g., access credentials, authorized IPs, etc.).

**Step 1.3:** Provide sample data to help analyze and test the ETL process, including:

- **Sample Datasets:** A small sample of real data for analysis and testing.
- **Use Cases:** Examples of common use cases and scenarios to better understand the data and its applications.

### *6.2.2 Creating a Staging Area*

- **Step 2.1:** A new staging environment will be created to host the raw data extracted from the metro system.
  - The infrastructure and resources required for the staging environment will be set up.
  - The database and storage systems will be configured to accommodate the raw data.
- **Step 2.2:** The raw data from the metro system will be imported into the new staging environment.
  - All relevant data, including customer information, profiles, smartcard relationships, and claims, will be accurately imported.
- **Step 2.3:** Data security measures will be implemented to protect the data in the staging environment.
  - Encryption will be applied to sensitive data to ensure it is securely stored.
  - Access controls and permissions will be set up to restrict access to authorized personnel only.

### *6.2.3 Connecting ETL to the Metro System*

- **Step 3.1:** The ETL (Extract, Transform, Load) process will be configured to connect directly to the metro system's database.
  - The connection parameters, such as database credentials and access permissions, will be set up to ensure secure and authorized access.
- **Step 3.2:** The ETL process will be used to extract the provided data from the metro system's database.
  - The data to be extracted will include customer information, profiles, smartcard relationships, transactions, and active claims.
- **Step 3.3:** The extracted data will be transformed to match the format and standards required by the new system.
  - Data transformation tasks may include cleaning, normalizing, and enriching the data to ensure consistency and accuracy.
- **Step 3.4:** The transformed data will be loaded into the staging area for further processing.
  - Ensure that the data is accurately and completely transferred to the staging area, ready for the next steps in the migration process.

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#### 6.2.4 Data Verification and Cleaning

- **Step 4.1:** Verify the accuracy and completeness of the imported data in the staging area.
- **Step 4.2:** Clean and normalize the data to match the format and standards required by the USCT system.

#### 6.2.5 Structuring Information

- **Step 5.1:** The process of structuring the information will be executed to meet the requirements of the USCT System. This may include data transformation and enrichment tasks.
- **Step 5.2:** An ETL (Extract, Transform, Load) process will be created to feed WSO2 and the central system with the structured data.
- **Step 5.3:** Validation rules will be implemented to ensure the data meets the necessary quality standards before feeding it into the USCT System.

#### 6.2.6 Retrieving Transactions and Claims

- Step 6.1: Rules for retrieving transactions and active claims will be defined.

Annual Subscriptions: Transactions from the last 10 days will be retrieved.

Quarterly Subscriptions: Transactions from the last 10 days will be retrieved.

Monthly Subscriptions: Transactions from the validity of the subscription will be retrieved.

Claims: Only active claims will be retrieved.

- **Step 6.2:** The ETL (Extract, Transform, Load) process will be configured to retrieve the defined transactions and active claims from the metro system's database.
- **Step 6.3:** The retrieved transactions and claims will be transformed to match the format and standards required by the USCT System.
  - Data transformation tasks may include cleaning, normalizing, and enriching the data to ensure consistency and accuracy.
- **Step 6.4:** The transformed transactions and claims will be loaded into the staging area for further processing.
  - Ensure that the data is accurately and completely transferred to the staging area, ready for the next steps in the migration process.

#### 6.2.7 Massive Data Load to Moova Platform

- **Step 7.1:** Once the data transfer from the metro system to the staging area is complete, an ETL (Extract, Transform, Load) process will be initiated to perform the massive data load to the Moova platform.
  - The first step will be to migrate the users to the Moova platform.
  - The quality of the user migration will be determined by the presence of the user and all associated information.
- **Step 7.2:** Following the user migration, the accompanying information (such as **customer profiles**, smartcard relationships, transactions, and active claims) will be retrieved and loaded.

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- **Step 7.3:** The data load process will be executed in stages to manage the volume of data and to monitor progress.
  - The data will be loaded in batches to ensure that any issues can be identified and resolved promptly.
- **Step 7.4:** Data integrity and accuracy checks will be performed throughout the data load process.
  - Continuous monitoring will be conducted to ensure that the data load process is proceeding as expected and that any anomalies are addressed immediately.
- **Step 7.5:** Once the data load process is complete, a final validation will be performed to ensure that the data in the Moova platform is accurate and complete.
  - Any discrepancies will be investigated and resolved to ensure the integrity of the data.

### *6.2.8 Validation and Testing*

- **Step 8.1:** Verify the integrity and accuracy of the migrated data in the USCT system.
- **Step 8.2:** Perform functional and load testing to ensure the USCT system meets the requirements and is ready for go-live.
- **Step 8.3:** Conduct user acceptance testing (UAT) with a selected group of users to gather feedback and identify any issues.

## 6.3 List of Activities with Details

### 1. Preparation of workshops

- Include practical exercises for participants.
- Provide post-workshop guidelines such as follow-ups or additional materials.

### 2. Requirement gathering

- Identify both functional and non-functional requirements (e.g., performance, security, scalability).
- Collect information from legacy systems to get a clear overview of the data and processes to be migrated.

### 3. Requirement analysis

- Conduct an impact analysis to understand how migration will affect existing processes.
- Create an alignment document to resolve any discrepancies with stakeholders.

### 4. Process definition

- Integrate the migration process with company policies, ensuring compliance with regulations (e.g., GDPR).
- Identify potential operational disruptions and plan for seamless migration.

### 5. Environment identification (development, testing, production)

- Assess whether intermediate environments (e.g., sandbox for non-intrusive testing) are needed.

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- Ensure environments are synchronized and accurately represent production data.

**6. Opening communication routes between environments**

- Establish secure communication protocols (e.g., VPN, encryption) between environments.
- Monitor real-time connections to avoid delays or errors during migration.

**7. Definition of data domain (partial or full)**

- Create a detailed inventory of the data, classifying it by importance and priority.
- Analyze the pros and cons of partial vs. full migration and document the choices made.

**8. Identification of ETL tools (Extract, Transform, Load)**

- Perform technical trials on selected tools to verify their effectiveness and compatibility.
- Consider tools that allow automation and real-time error management.

**9. Identification of QA reports (Quality Assurance)**

- Prepare comparative reports (e.g., data before and after migration).
- Identify key metrics such as error rate, loading speed, and data integrity.

**10. Definition of acceptance methodology**

- Involve end-users to test the migrated data and provide feedback.
- Create a rollback plan to address potential failures during acceptance.

**11. Task duration definition (for all stakeholders)**

- Build a Gantt chart to visualize the timing of activities.
- Allocate resources to ensure no bottlenecks arise.

**12. Re-work management (if necessary)**

- Create a structured process for tracking and resolving errors.
- Analyze the causes of re-work to improve future phases.

**13. Migration implementation**

- Execute pilot migrations before the full implementation.
- Use monitoring tools to verify performance during execution.

**14. Validation and final testing**

- Use quality control tools to ensure data is complete and accurate.
- Plan for a stabilization period to monitor the post-migration system.

**Note:** In order to manage the migration process smoothly, it is necessary that the "USCT-Migration Questionnaire" must be replied by the CBO(Hitachi).

## 6.4 Points to Address and Manage

### Detailed Requirements & Data Mapping

- ✓ The parties shall clarify the data migration objectives, business requirements, and technical constraints.
- ✓ A comprehensive review of the documentation shall verify that it includes a complete data dictionary, table schemas, field definitions, primary and foreign keys, default values, and integrity constraints.
- ✓ An agreement must be reached on the mapping between source fields and target fields, with any ambiguities resolved.

### Data Profiling & Quality Metrics

- ✓ A data profiling strategy shall be established to analyze the structure, patterns, and anomalies in the source data.
- ✓ Acceptable quality metrics—such as data completeness, consistency, and accuracy—must be defined as prerequisites for the migration.
- ✓ Baseline data quality benchmarks are to be agreed upon to serve as references for the ETL process and reconciliation efforts.

### Risk Assessment & Mitigation

- ✓ Potential risks, such as data loss or performance bottlenecks, shall be identified.
- ✓ The involved parties shall develop mitigation strategies, including contingency plans and backup and recovery procedures, to address any issues that may arise during the migration.
- ✓ Clear communication channels and escalation processes shall be established to handle emergent issues.

### ETL Process Planning & Testing

- ✓ The design of the ETL process shall be defined in detail, outlining how data will be extracted from the source, transformed (via cleaning, normalization, and enrichment), and loaded into the target system.
- ✓ A comprehensive testing strategy shall be planned—including unit, integration, performance, and load testing—to ensure the reliability and efficiency of the ETL process.
- ✓ Reconciliation methods shall be agreed upon to compare data between the source and target systems after each ETL cycle.

### Performance Optimization & Scalability

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- ✓ The infrastructure requirements for the staging area, ETL processing, and target system load shall be discussed and established.
- ✓ Strategies such as batch processing and parallel ETL execution shall be defined to efficiently manage large volumes of data.
- ✓ Monitoring and reporting tools shall be selected to track performance and promptly identify and resolve issues.

## Data Security & Governance

- ✓ Security protocols, including encryption for data at rest and in transit, along with access controls, shall be reviewed and established to comply with data privacy regulations.
- ✓ Governance policies such as data retention, audit trails, and data quality standards shall be defined and documented.
- ✓ The management of credentials, IP whitelisting, and other secure methods of access shall be clearly outlined.

## Communication & Change Management

- ✓ A clear communication plan shall be established to ensure that all relevant stakeholders—such as technical teams, business owners, and data stewards—are engaged throughout the migration process.
- ✓ Regular status updates, review meetings, and the documentation of key decisions shall be scheduled.
- ✓ The objective is to define a process that guarantees that the end-user experience remains unchanged. Specifically, in the context of a Closed-Loop Base Ticketing (CBT) system, the system will automatically recognize products stored on users' cards and allow their uninterrupted use. The continuity to be ensured covers activities performed at the ticket counters, thereby ensuring that the logical operations and user interactions remain unaffected.

## Timeline, Resource Alignment & Continuous Improvement

- ✓ The project timeline, including critical milestones and key dependencies, shall be thoroughly reviewed by all parties.
- ✓ Resource allocation, including roles and responsibilities, shall be closely aligned between the data provider and the migration team.

A framework for continuous process improvement shall be established, incorporating lessons learned during the workshops, to iteratively refine the migration process.

## 7 Use Cases Not Impacted by Integration

The following use cases will remain governed by existing structures and current stakeholders, with no changes anticipated as part of this project and integration.

These use cases have been categorised and referenced from the Hitachi/Thales document named as **LINE 1 & 2 SSS - System Specification**.

### 7.1 Sales

- UC-SA06 - MT mass production. [3.2.2.6]

### 7.2 Business Intelligence

- UC-BI01 – Usage of the accounting, traffic, maintenance and system reports at the LCU. [3.4.3.1]
- UC-BI03 – Usage of reports at the CBO. [3.4.3.3]
- UC-BI04 – Design of reports and dashboards at the CBO. [3.4.3.4]
- UC-BI05 – ERP interface management at the CBO. [3.4.3.5]

### 7.3 Staff Management

- UC-SM01 – Management of front office agents. [3.5.1.1]
- UC-SM02 – Creation of a front office agent card at the CIPS. [3.5.1.2]
- UC-SM04 – Management of CBO agent access rights. [3.5.1.4]
- UC-SM05 – Management of LCU/SCU agent access rights. [3.5.1.5]
- UC-SM06 – Start and end of shift at the TOM. [3.5.1.6]
- UC-SM07 – Start and end of shift at the PVU. [3.5.1.7]

### 7.4 Equipment Management

- UC-EM01 – Check of the equipment list at the CBO. [3.5.2.1]
- UC-EM02 – Management of the equipment at the LCU/SCU. [3.5.2.2]
- UC-EM03 – Management of the equipment technical parameters and application software at the LCU. [3.5.2.3]
- UC-EM04 – Equipment Revocation. [3.5.2.4]

### 7.5 Security

- UC-SE01 – Installation of AV2 SAMs- Fare gate case. [3.5.3.1]
- UC-SE02 – Installation of AV2 SAMs - TOM and PVU case. [3.5.3.2]
- UC-SE03 – Automatic update of the SAM AV2 quotas. [3.5.3.3]
- UC-SE04 – AV2 SAM blacklisting. [3.5.3.4]
- UC-SE05 – Certificate and keys management for CBO, LCU and TOM. [3.5.3.5]
- UC-SE06 – PKI-SAM creation and installation. [3.5.3.6]

### 7.6 Administration

- UC-AD01 – Monitoring and control of the front-end equipment. [3.5.4.1]
- UC-AD02 – Monitoring and control of the CBO. [3.5.4.2]

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- UC-AD03 – Monitoring and control of the LCU and SCUs. [3.5.4.3]

## 8 Integration points to be analysed (Open Points):

1. Synchronisation of purchased content on digital channels: Refers to the synchronisation of the content onto the CSC, purchased by the customer online using the USCT web channels.
2. The format used to exchange the data regarding the sales. (sales reporting).
3. SAM Quota V2 Ceiling Update: on this point, it was agreed and accepted that each different company, if it uses the SAM Quota Ceiling must manage it on its own.
4. Usage of the accounting, traffic, maintenance and system reports at the LCU (UC-BI01).
5. CIS Process and Specifications.
6. Stock Management Process.
7. Missing TOM Documentation.
8. Missing TVM Documentation.
9. HSM, KMS and SAM Specifications & security issues.
10. EOD Matrix Description and Specifications.
11. Products sharing method.
12. Different sales devices connectivity & construction logic.
13. Line, Station and the equipment data.
14. Missing XML Samples
  - The following **XML samples** are required to ensure the smooth development of the proposed integration:
    - Example of the sale of a MT.
    - Example of validation (entry) of a MT.
    - Example of validation (exit) of a MT.
    - Example of the exchange of a MT (*see use case UC-AS01: Exchange of a MT at the TOM*).
    - Example of validation (entry) of a subscription.
    - Example of validation (exit) of a subscription.
    - Example of validation (entry) using T-PURSE.
    - Example of validation (exit) using T-PURSE.
    - Example of a Penalty.
    - Example of EOD topology and fare files.
    - Example of products definition files.

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## 9 Annex

- 1- USCT-Security Aspects.V1.0
- 2- USCT-Migration Questionnaire-V0.1