Business Analytics and Data Warehouse Management

Case Study: Process Mining

Alexander Prosser, 2026

Institute of Production Management, WU Vienna

1. Background

This case study deals with conformance-oriented process mining in a sales process. Our manufacturing company produces umbrellas and sun shades.

The process – in its ideal variation has the following steps (see details below):

- Write quote (and send it, automatically included in the SAP functionality via customized channels);
- Change quote (if necessary);
- Convert quote into order and write order;
- Change order (should be the absolute exception);
- Outbound delivery;

Each process step is considered on a line item level, as a quote or order may have several line items.

For an introduction to process mining, see Aalst, W. vd, Process Mining - Discovery, Conformance and Enhancement of Business Processes, Springer, 2011.

2. The Process

In the following, the process to be analysed is depicted in SAP S/4Hana.

For more details see Bagnato, D., Müller-Török, R., Prosser, A., Business Computing with SAP, Facultas, 2022.

As a first step, we are going to create a quote (sales information is disregarded). This is done via the following menu path.

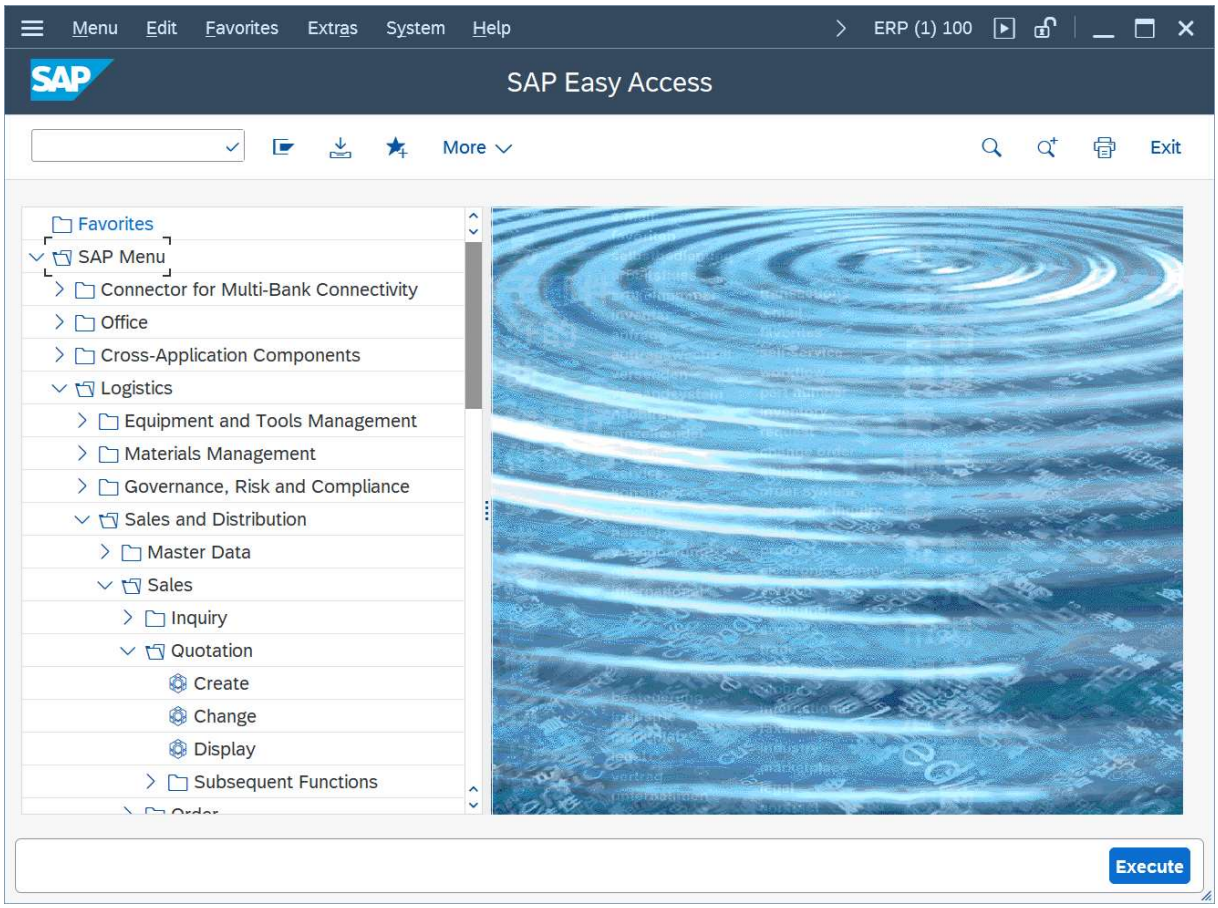

Figure 1: Menu path create quote (© SAP SE)

In the initial screen, select Quotation type “QT”, Sales organisation 3910, Channel 01 and Division 01 and confirm with <Enter>. In the following quotation document, select a customer (as sold-to and ship-to party) and the following line items (three sunshades available in the system). Also select a valid-to date for the quote.

The quote may now be saved, but let us explore the transaction status, which can be done via menu *System => Status*. The transaction, cf. circle in Figure 3, is VA21. This will be one of the main characteristics in the process mining cube to be defined.

Close the status window and save the quote by clicking on the floppy disk symbol. The system answers with a message that quotation <Document Number> has been saved. Changing the quotation is done via transaction VA22.

Also the material/s selected, the customer (we will disregard the case that sold-to and ship-to party are different) and the user will be included in our analysis. Regarding the user the assumption will be that the system user is also the person responsible for the transaction.

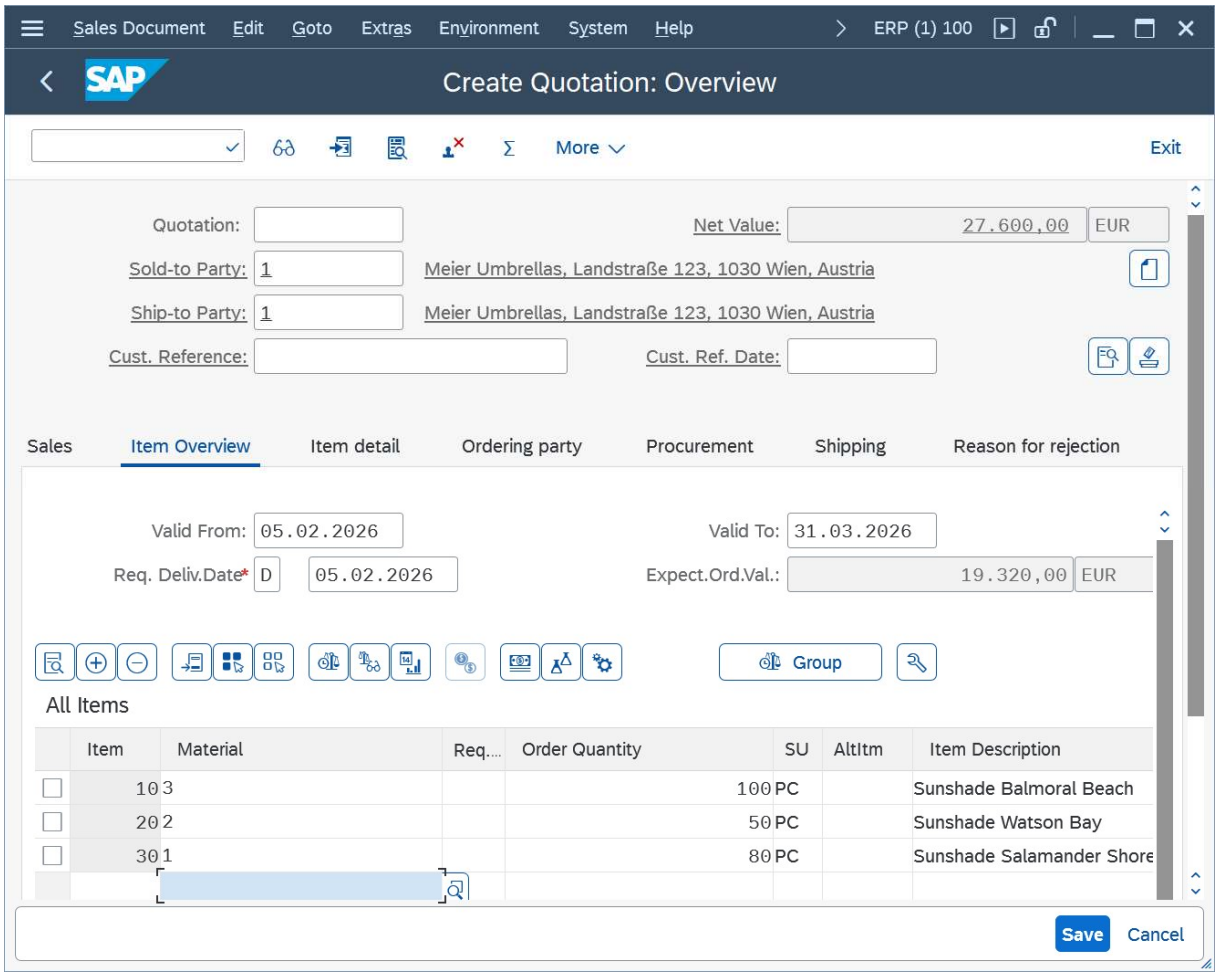

Figure 2: Create quote (© SAP SE)

As usual, the date of the posting will be decomposed into its components and serve as the time dimension.

After saving the document, the order is created from the quote. For the menu path, see Figure 4.

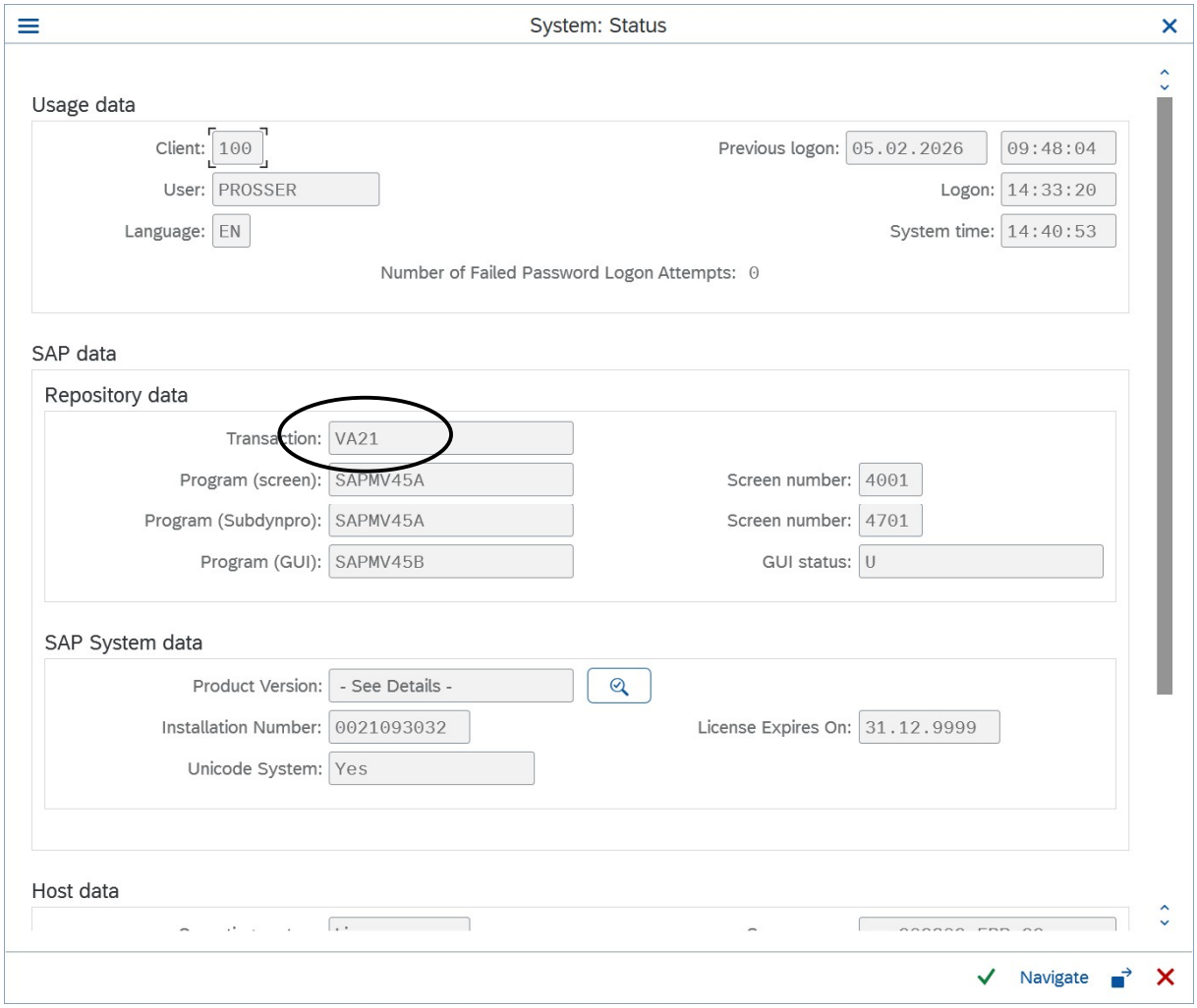

Figure 3: Transaction status (© SAP SE)

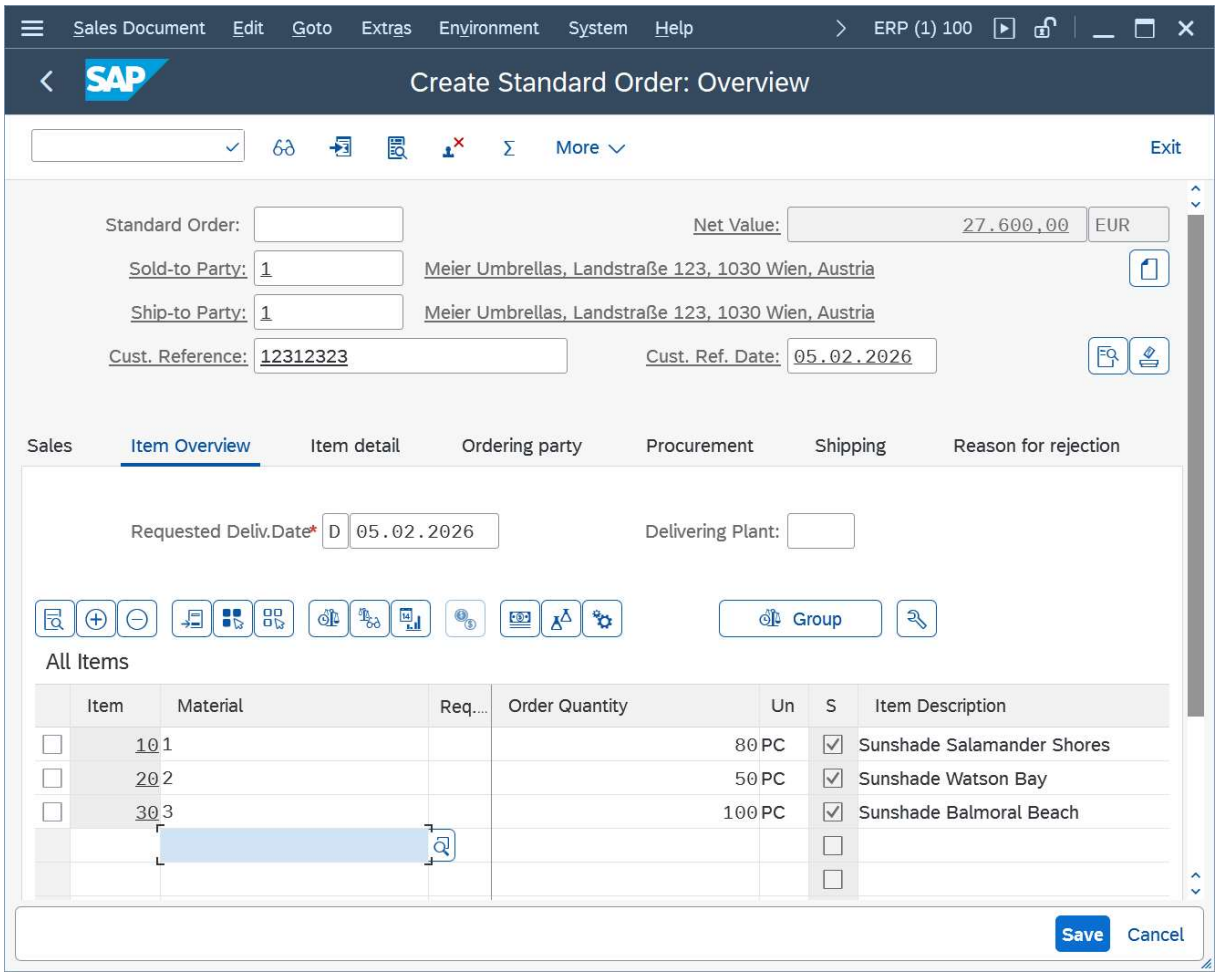

Figure 4: Menu path create order (© SAP SE)

Sales organisation, channel and division are already filled in, select Document type “OR”. However, the existing quote will be used as a reference for the order, hence select “Create with reference”.

You will find the quote copied into the order. Let us assume, however, that one line item “Balmoral Beach” was not ordered and is to be cancelled. Select the line header of the line item and the “Delete item” button below (see bubble in Figure).

Also enter PO number and date as shown in Figure . Save the document with the floppy disk symbol and you will again receive a confirmation “Standard order <Document Number> has been saved. Selecting *System => Status* again reveals the transaction number shown in Figure , VA01.

One may also enter the document in change mode and edit the data. The status information reveals another transaction, VA02 (cf. Figure).

All transactions are recorded with user information and timestamp. This enables us to build a data warehouse cube for process mining.

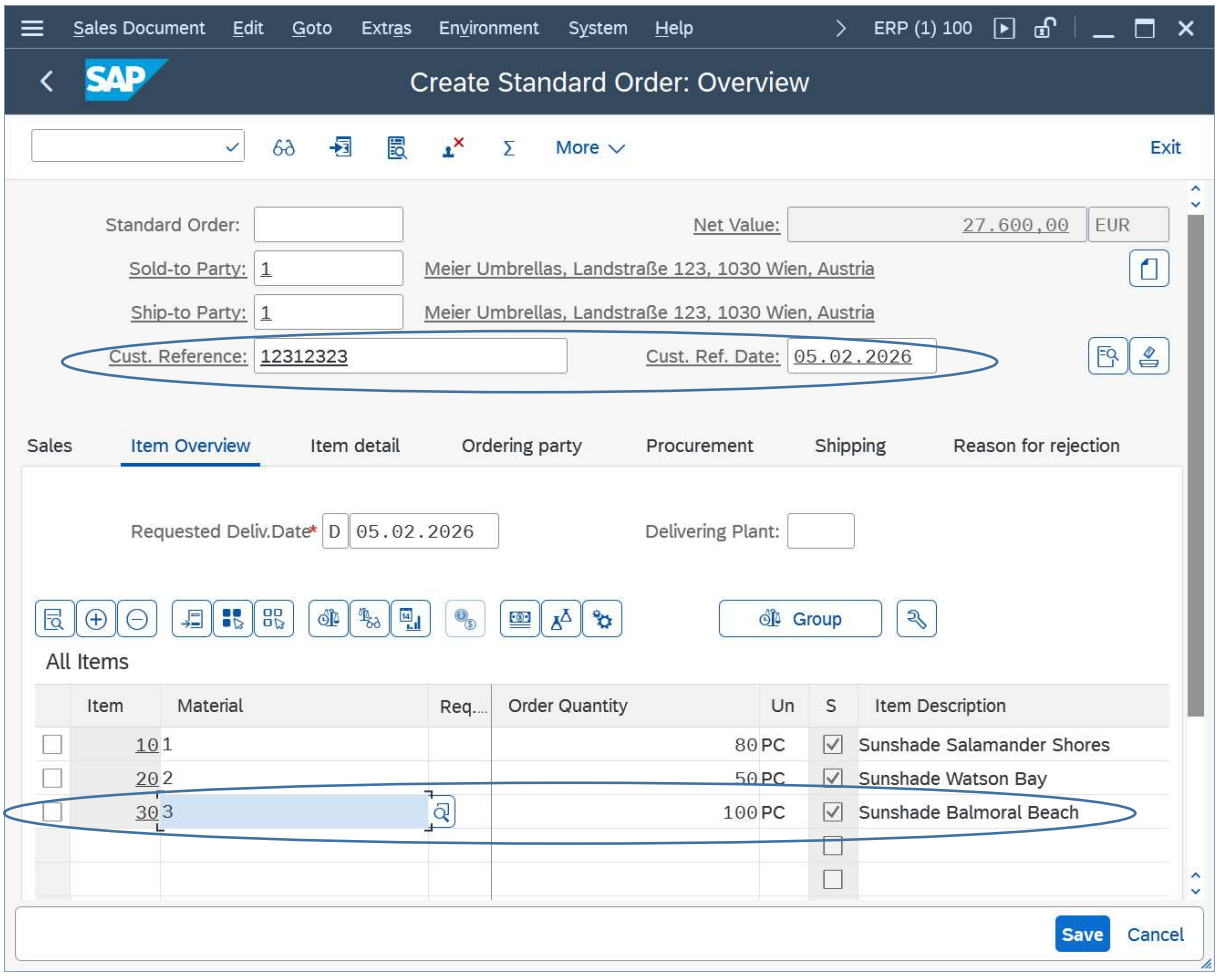

Figure 5: Delete line item (© SAP SE)

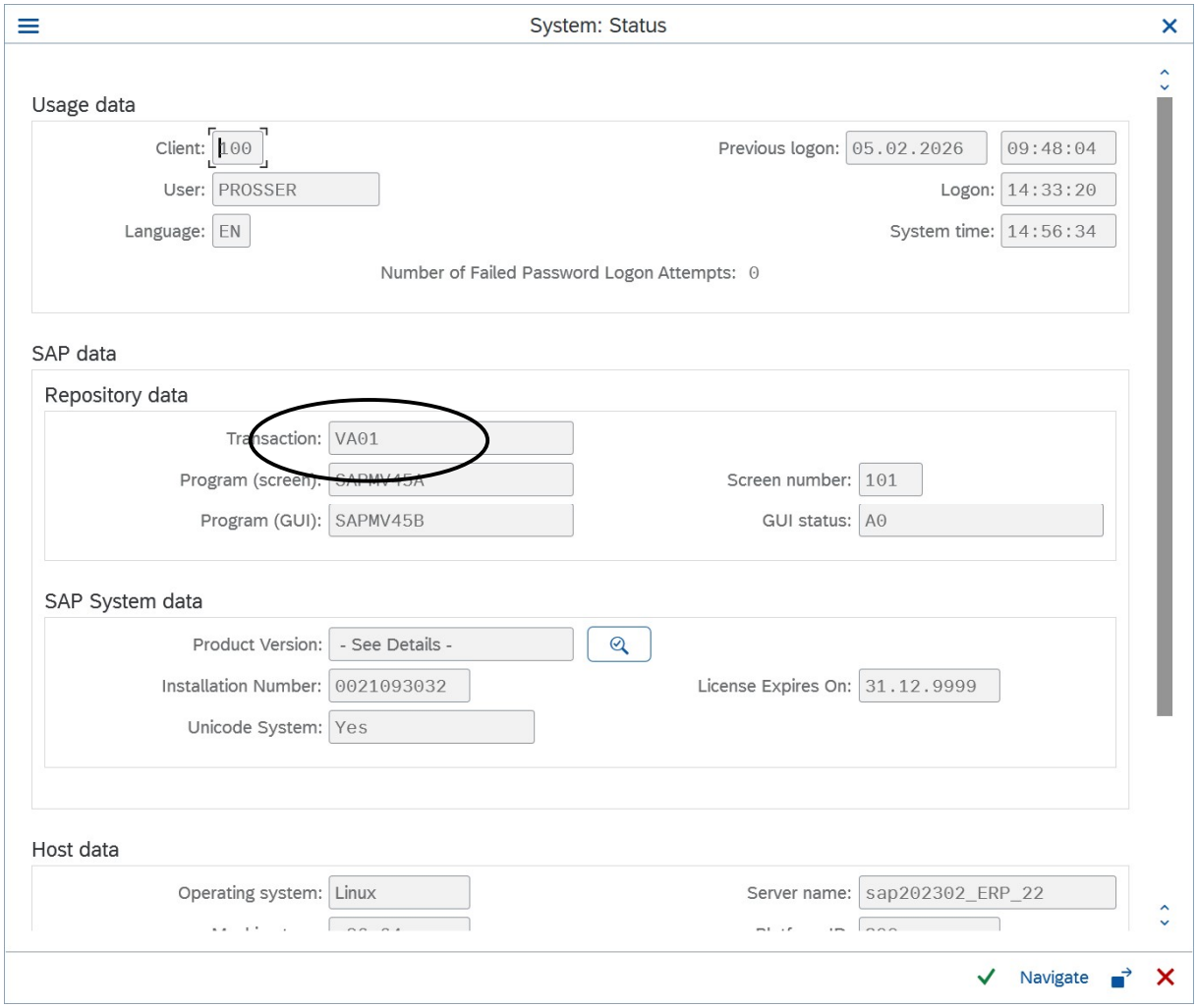

Figure 6: Status information for create order transaction (© SAP SE)

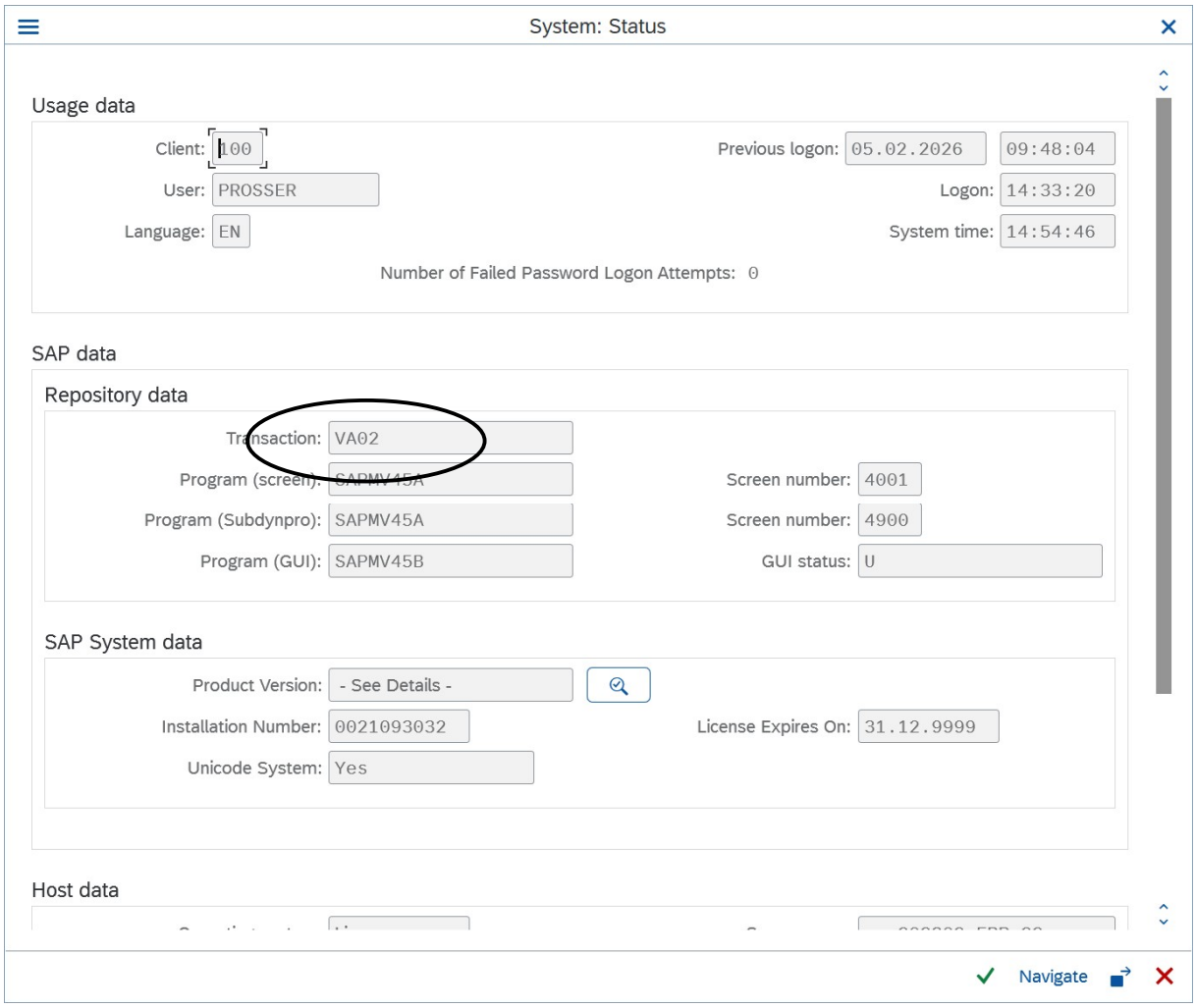

Figure 7: Status information for change order transaction (© SAP SE)

3. The DFM

This gives the following DFM:

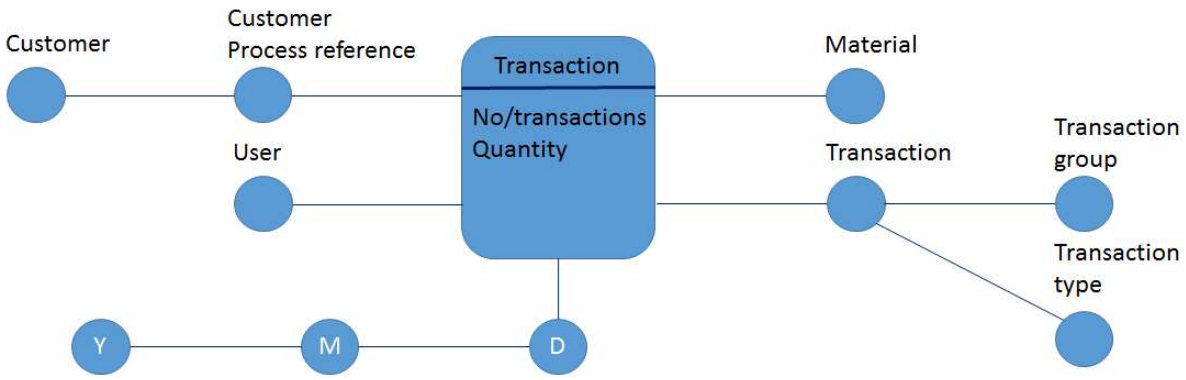

Figure 8: DFM Process Mining

Note that there is a parallel hierarchy: The transactions are grouped by the transaction type (create, change, display) and the transaction group (quotation, order, delivery). Therefore there is a parallel hierarchy. Individual transactions are grouped into a customer process reference, which is in turn grouped into customers.

4. Implementation

You find the data for this case study on the same page, where you downloaded this file from (zip archive). Use BEx to answer the following questions:

1. Quotes should not be changed once issued. Did this occur in a relevant number of cases and are there any discernible patterns when this occurs. Provide an analysis.
2. The same question applies to orders …
3. … and to deliveries.
4. Are there significant and regular changes in the quantity offered and the quantity ordered for a process reference?
5. Transaction VL01NO (Delivery w/o order) occurred regularly? By which users? For certain materials? Quantity framework?