WAY4™ Statistical Report Data Preparation

Contents

Introduction

Statistical reports are used to analyse a financial institution's transaction activity over a specified reporting period.

This document describes preparation of data for statistical reports in WAY4™.

This document is intended for WAY4 users, bank or processing centre employees responsible for generation of statistical reports.

While working with this document, it is recommended that users refer to the following reference material from OpenWay's documentation series:

- "DB Manager Manual"
- "Documents"
- "WAY4™ Dictionaries"

The following notation is used in the document:

- Field labels in screen forms are shown in *italics*.
- Button labels used in screen forms are placed in square brackets, such as [Approve].
- Menu selection sequences are shown with arrows, for example Issuing → Contracts Input & Update.
- Sequences for selecting system menu items are shown with a different type of arrow, as in Database => Change password.
- The names of directories and/or files that vary for each local instance of the program are encased in angular brackets, like <OWS_HOME>.
- Warnings about potentially hazardous situations or actions are marked with the  sign.
- Messages marked with the  sign contain information about important features, additional options, or the best use of certain system functions.

Chapter 1. Preparing Data for Gathering Statistics

According to the WAY4 concept, a financial institution's transaction activity is reflected by documents of various types (see the section "Document Links" in the Documents Administrator Manual).

Only financial documents with the "Posted" status are considered when preparing data for generating statistical reports.

To generate statistics:

- Configure classifiers and statistic attributes for mapping data (see the section "Classifiers and Statistic Attributes").
- Prepare transaction data for the reporting period (see "Preparing Transaction Data").
- When necessary, execute automatic data grouping according to the requirements for the report type (see "Automatic Data Grouping in the "Contract Statistics Groups" Dictionary").
- When necessary, execute custom data grouping (see "Manual Data Grouping in the "Contract Statistics Groups" Dictionary").

List of the database's main tables used in preparing and collecting statistics:

- STAT_ATTR – list of statistic attributes.
- STAT_ATTR_VAL – values of statistic attributes.
- STAT_ATTR_REF – references of attribute values, contract groups, and transaction groups.
- CONTR_GROUP – contract groups (see the section "Subtypes of Contracts for which Statistics are Generated").
- TRANS_GROUP – transaction groups (see the section "Transaction Types for which Statistics are Generated").
- DOC_STATISTICS – document groups, data are grouped according to contract groups (source, target) and transaction groups (see the section "Consolidated Data").
- STAT_CONTRACT_GR – inclusion a contract into a certain group.
- STAT_CONTRACT_ACT – information about each recorded contract:
  - Contract group identifier.
  - Transaction group identifier.
  - Document group identifier.
  - Identifier of the macrotransaction for which the document was created.
- STAT_DOC – information about documents generated when Apple Pay/Google Pay payments are processed.

- STAT_COUNTER – consolidated information for the Apple Pay/Google Pay payments.

Classifiers and Statistic Attributes

Classifier configuration data is imported from the DWH_SY_CONF_GROUP_ENG.txt (\opt\stat_reporting\db\datam) file. Values of statistic attributes are imported from the IPS_STAT_ATTR_ENG.txt (\opt\ips_statistic\db\datam) file. For more information about importing data, see the section "Data Import" of the document "Importing Configurations Using the Configuration Inspector Module".

The list of classifiers and statistic attributes used for a certain statistic report and rules for mapping data are provided in the documentation for the relevant report.

Preparing Transaction Data

To optimise system performance during report generation, a financial institution's transaction data is selected from an intermediate table, not from the general table of documents. The intermediate table contains consolidated data, where data on transactions of one type involving counterparties of the same type executed during one banking day is shown as one table record.

It is recommended to regularly execute a special procedure to prepare intermediate table data. To execute the procedure, select the "Full → Statistics → Collect Doc Statistics" menu item. As a result, the "Date From - To" form (see Fig. 1) will be displayed. The *Date From* and *Date To* fields in the form are used to specify the period for which intermediate data for reports must be created.

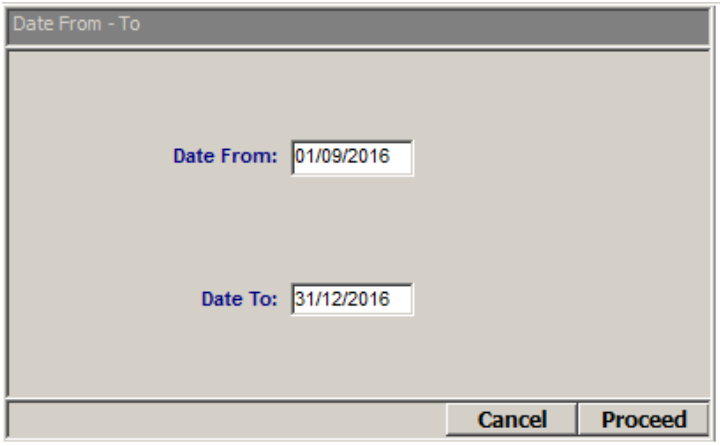


Fig. 1. Form for specifying a data generation period

Note that regular execution of this procedure decreases the system workload. It is recommended that the procedure be executed as frequently as once a day during the banking day, depending on the bank's issuing and acquiring volumes. To increase speed, it is recommended to generate statistics in several parallel threads (see the section "Parallel Generation of Consolidated Data"). In addition, it is recommended to delete obsolete consolidated data (see the section "Deleting Obsolete Data").

When generating consolidated transaction data, the the "Contract Statistics Groups" (see Fig. 2) and "Transaction Statistics Groups" (see Fig. 3) dictionaries are also generated.

Subtypes of Contracts for which Statistics are Generated

Information on the subtype of every contract that participated in a transaction is added to the "Contract Statistics Groups" dictionary. To access the dictionary, select the "Full → Statistics → Dictionaries → Contract Statistics Groups" menu item.

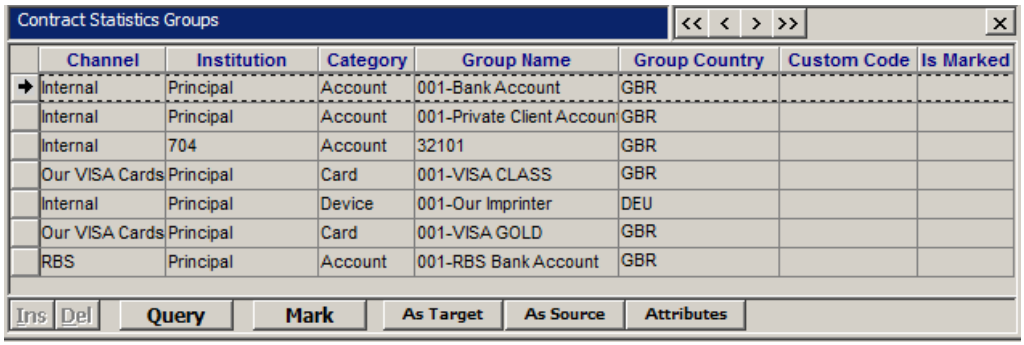


Fig. 2. "Contract Statistics Groups" dictionary

The [Mark] button is used to manually mark contracts if data in reports should be shown in another logging level (see the section "Manual Data Grouping in the "Contract Statistics Groups" Dictionary").

The [As Target] button is used to access the list of transactions where the contracts acted as the transaction data target. The list contains transactions made during the period for which statistical information is stored in the system.

The [As Source] button in this form is used to access the list of transactions where the contracts acted as the transaction data source. The list contains transactions made during the period for which statistical information is stored in the system.

Transaction Types for which Statistics are Generated

Information on all transaction types to which transactions that were made belong is entered in the "Transaction Statistics Groups" dictionary. The menu item "Full → Statistics → Dictionaries → Transaction Statistics Groups" is used to access this dictionary.

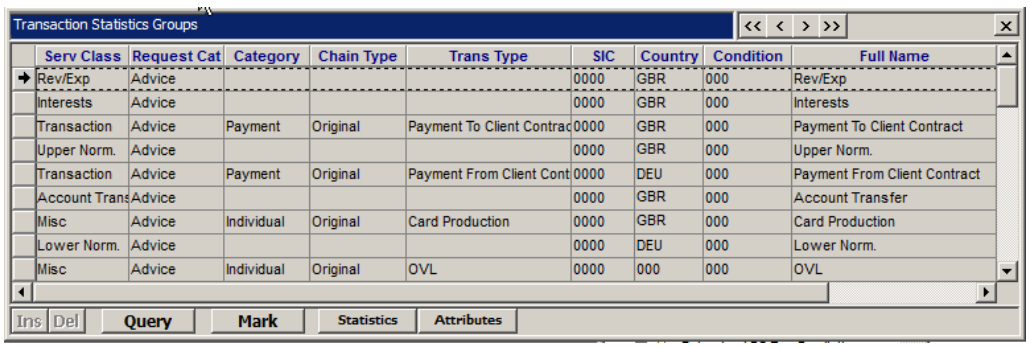


Fig. 3. "Transaction Statistics Groups" dictionary

The [Mark] button is used to manually mark transactions.

The [Statistics] button in this form is used to access the list of transactions of this type that were made during the period for which statistical information is stored in the system.

Consolidated Data

To access the intermediate table data, open the "Doc Statistics" form (see Fig. 4) by selecting the "Full → Statistics → Doc Statistics" menu item.

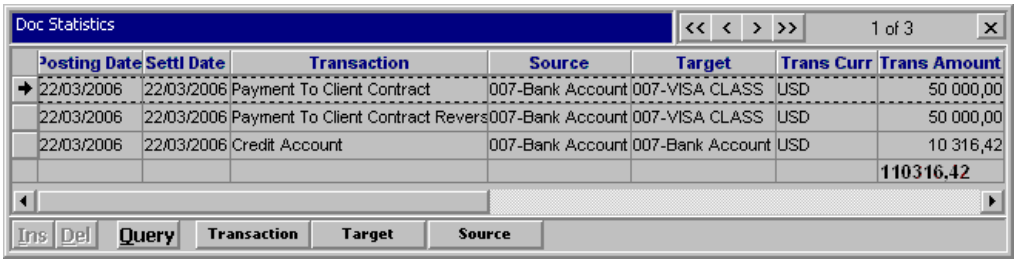


Fig. 4. Form containing intermediate data on transaction activity

The intermediate table contains consolidated transaction data, where data on transactions of one type involving counterparties of the same type executed during one banking day is shown as one table record.

The [Transaction] button in this form is used to access the "Transaction Groups" dictionary.

The [Target] button in this form is used to access the list of target contracts.

The [Source] button in this form is used to access the list of source contracts.

Deleting Obsolete Data

Consolidated transaction data should be deleted if:

- Settings for generating statistical reports change. These settings include:
  - Classifiers that mark contract subtypes (for example, a classifier for marking interest accrual transactions).
  - Statistic attributes according to which data are consolidated (for example, an attribute identifying e-commerce transactions).

  In this case, consolidated data should be deleted for the entire period during which statistics were gathered.
- Statistics for previous periods are not used. In this case, the period for which data are being deleted is determined by the user. This make it possible to speed up report generation.

Procedure for deleting obsolete data:

- Use the "Drop Statistics" procedure to delete data collected earlier, menu item "Full → Statistics → Drop Statistics". When this menu item is selected the "Date From - To" form (see Fig. 1) will be displayed. The *Date From* and *Date To* fields in the form are used to specify the period for which data must be deleted.

- Delete the "Contract Statistics Groups" dictionary (see Fig. 2) by selecting the menu item "Full → Statistics → Dictionaries → Purge Obsolete Statistical Groups".
- If statistics gathered earlier have been deleted completely, use the "Full → Statistics → Collect Doc Statistics" menu item to generate statistics data according to the new rules.

Parallel Generation of Consolidated Data

Work in several parallel threads makes it possible to significantly shorten the time it takes to prepare data.

Process parameters are set in the "Process Parameters" form, menu item "Full → Configuration Setup → Main Tables → Process Parameters". Work with the "Process Parameters" form is described in more detail in the section "Process Parameters" of the document "WAY4 Dictionaries™".

If statistics are generated once in a reporting period, for example once a month or once a quarter, it is recommended to run the processes "Collect Doc Statistics", "Collect Auth Statistics", "Fill Statistic Contract Groups" in several parallel threads(see Fig. 5).

Before running the processes, parameter values should be approved by the DB administrator.

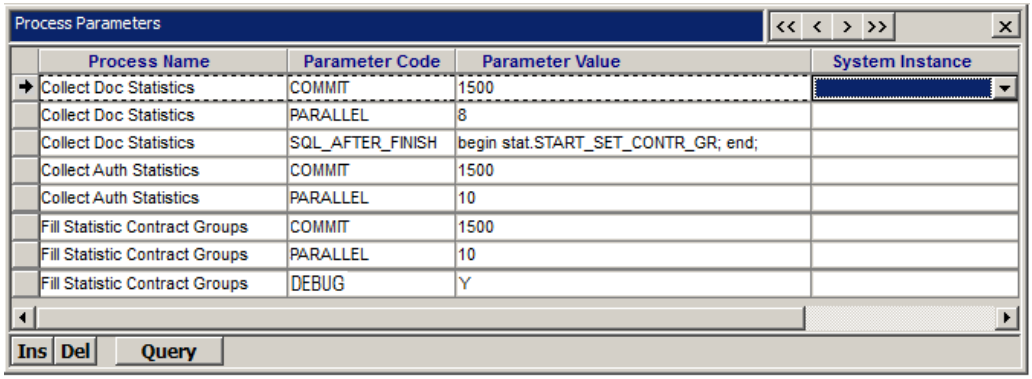


Fig. 5. Parameters for configuring statistics gathering processes

Records are inserted into the STAT_CONTRACT_ACT and STAT_DOC tables in a "batch", the number of records in a batch is regulated by the COMMIT parameter.

If it is planned to generate statistics more frequently, for example, every day, to avoid marking only contracts that have just been created, for which there hasn't been any activity yet (no transactions have been made), the *Parameter Code* = "SQL_AFTER_FINISH" parameter should not be set.

Processes are started using the menu item "Full → Statistics → Collect Doc Statistics".

Consolidated Data for Inactive Cards

In some statistical reports it is necessary to show data about card contracts with which no transactions were made in the reporting period.

Data for inactive cards are generated using the menu item "Full → Statistics → Contract Statistics Groups Update ".

It is recommended to run this menu item after the "Collect Doc Statistics" item.

To show debug information when consolidating data on inactive cards using the "Fill Contract Groups Update" process, configure the process parameter DEBUG='Y' (see Fig. 5).

Chapter 2. Additional Data Grouping in the "Contract Statistics Groups" Dictionary

According to custom rules for generating reports at some banks, detailed statistics are not required. In WAY4, transaction data can be presented in a less detailed form than that shown in the "Contract Groups" dictionary (see Fig. 2).

To present data in a less detailed form, assign custom codes to the "Contract Statistics Groups" dictionary. Information on transactions with the same custom code will be presented as one record during report generation.

Custom codes can be assigned either automatically (see "Automatic Data Grouping in the "Contract Statistics Groups" Dictionary") or manually (see "Manual Data Grouping in the "Contract Statistics Groups" Dictionary").

Automatic Data Grouping in the "Contract Statistics Groups" Dictionary

Custom codes are automatically assigned to "Contract Statistics Groups" dictionary records by copying contract subtype custom codes.

After group codes have automatically been assigned to contract subtypes, these values must be copied to the "Contract Statistics Groups" dictionary.

Preparing Custom Codes

To assign standard codes to contract subtypes, select the "Full → Statistics → Dictionaries → Prepare Statistics Custom Codes" menu item. As a result, a special custom codes preparation procedure will be executed.

To access custom codes assigned to contract subtypes, open the "<Contract category> Contract Types" form (Full → Configuration Setup → Contract Types → <contract category> Contract Types), select the required contract type and click the [SubTypes] button. As a result, the "SubTypes for <name of contract type>" form will be displayed. The form's attributes (on working with attributes, see the section "Use of Additional Fields (Attributes)" in the document "DB Manager Manual") contain the custom codes assigned to the contract type to generate reports of various types (see Fig. 6):

- Issuer reports (the "CB Iss Stat Code" tab).
- Acquirer reports (the "CB Acq Stat Code" tab).
- Other statistical reports (the "Stat Code" tab).

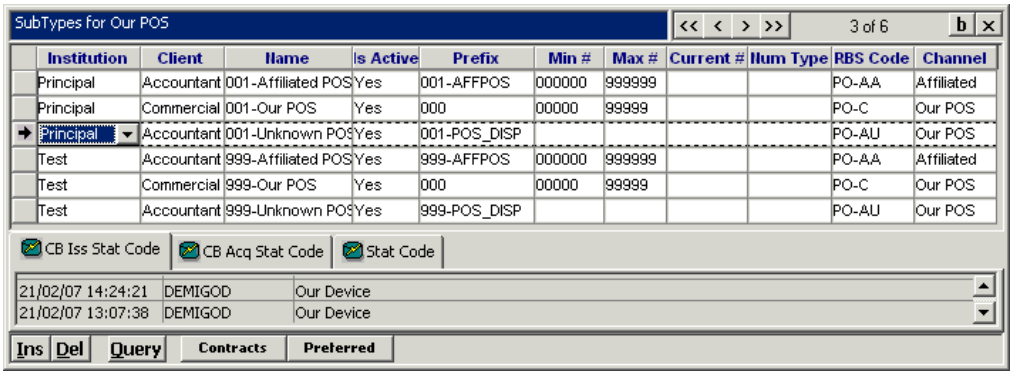


Fig. 6. DemiGod group code assigned to the "Our POS"

Copying Custom Codes to the Dictionary

For groups codes to automatically be assigned to contract subtypes, use the "Filling Contract Custom Code" procedure of the "Full → Statistics → Dictionaries → Filling Contract Statistics Custom Codes" menu item.

When this procedure is started, the "Custom Codes" form (see Fig. 7) will be displayed. In the *Custom Codes* field of the form, select the required code from the list and click the [Proceed] button.

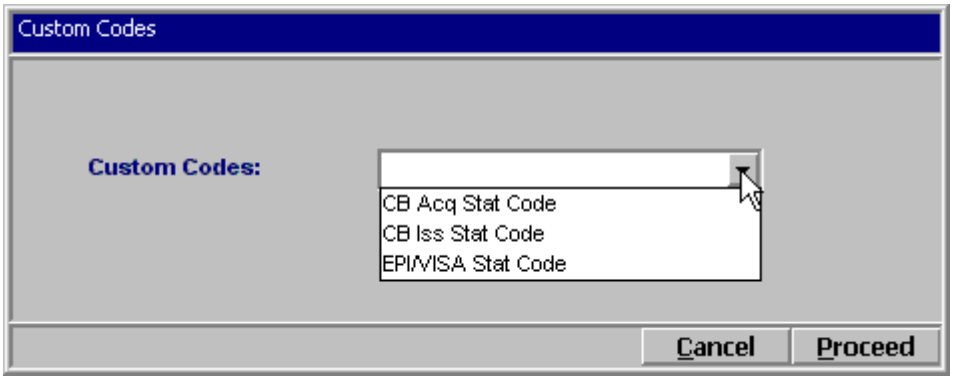


Fig. 7. Form for copying custom codes to the "Contract Groups" dictionary

Note that the procedure must be executed immediately before generating a report of the required type with the corresponding *Custom Codes* value.

It is not necessary to rerun the "Collect Doc Statistics" procedure before generating a report with another *Custom Code* value. It is sufficient to select another report type in the *Custom Codes* field (see Fig. 7) and execute the procedure of copying custom codes again.

Manual Data Grouping in the "Contract Statistics Groups" Dictionary

To manually assign a custom code, in the "Contract Statistics Groups" dictionary select the records to which the same code must be assigned, click the [Mark] button and choose "Set Custom Code" from the context menu. As a result, the "Update Value" form (see Fig. 8) will be displayed. In the form, specify a custom code value and click the [Proceed] button. As a result, the code specified in the "Update Value" form will be assigned to every selected record.

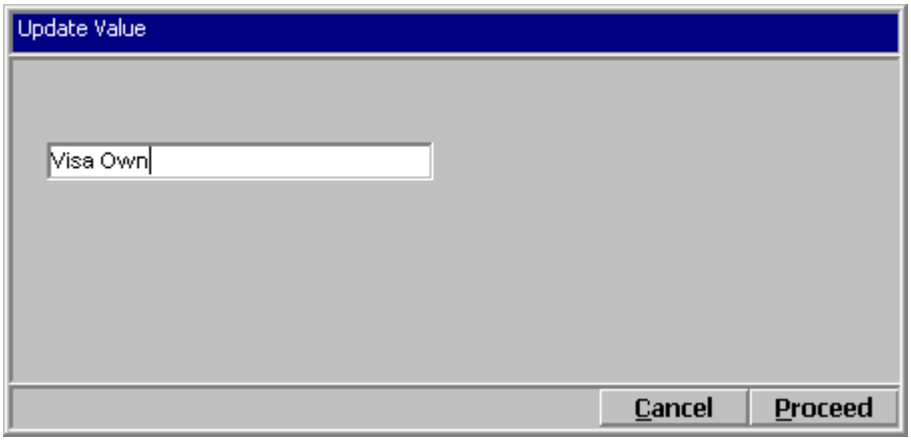


Fig. 8. Form for manually assigning custom codes

Chapter 3. Generating Statistics for Apple and Google Mobile Payment Systems

Statistics for Apple and Google mobile payment systems are generated in the same way as standard statistics:

1. Configure classifiers and statistic attributes based on which data are mapped and grouped (see the section "Classifiers and Statistic Attributes").

   The list of classifiers based on which data are mapped is shown in the "Configuration Groups" form, the menu items "Apple Pay Statistics Reports → Dictionaries → Configuration Groups", or "Google Pay Statistics Reports → Dictionaries → Configuration Groups" form (see Fig. 9).

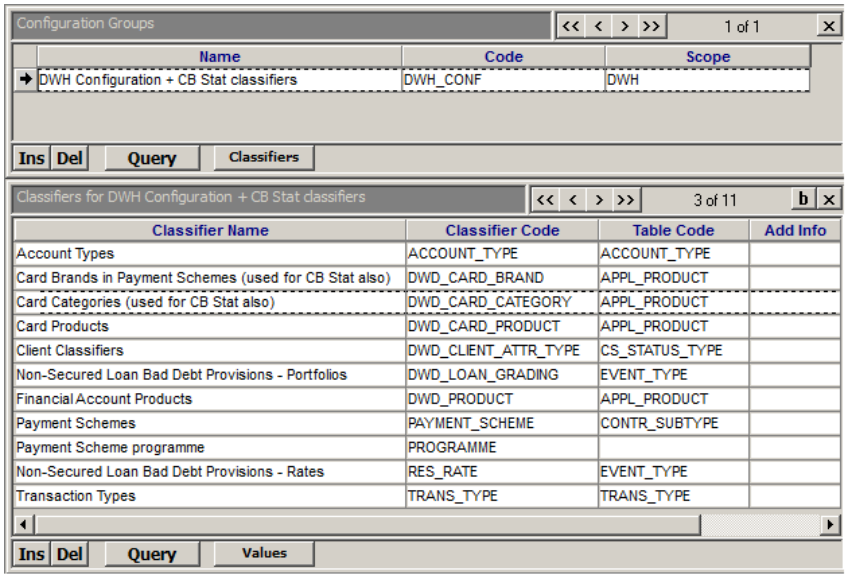
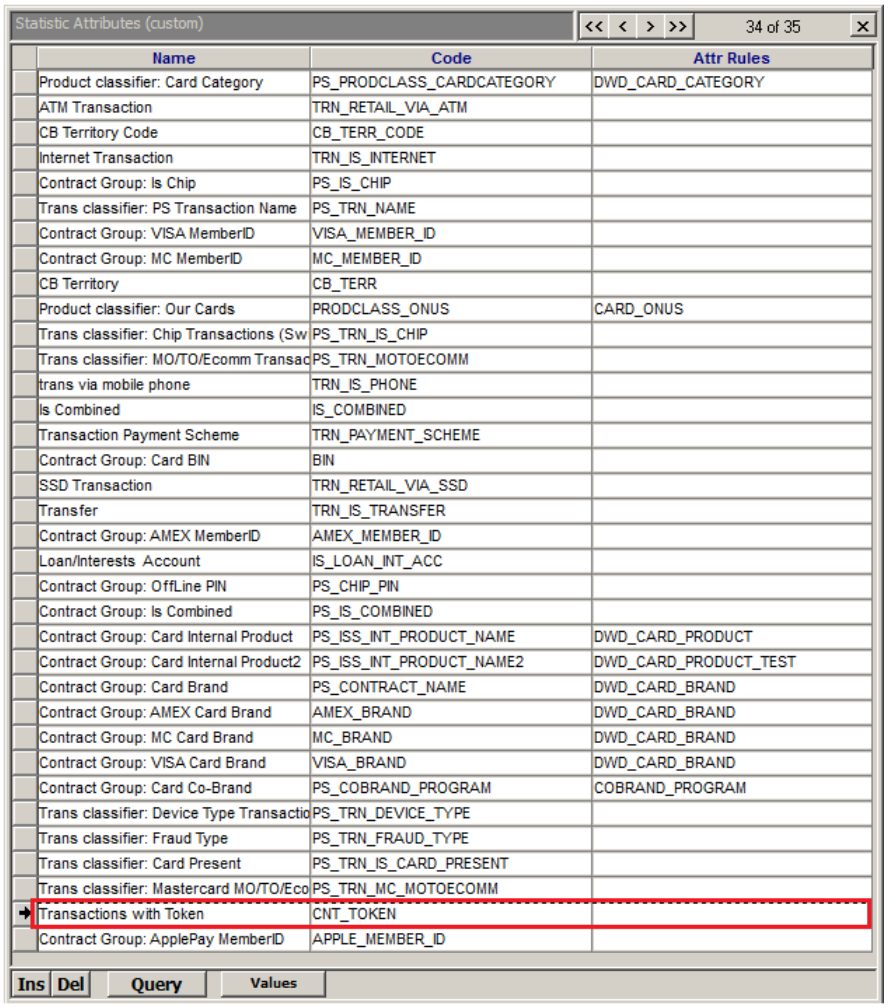


Fig. 9. List of classifiers

   The list of statistic attributes based on which data are grouped is shown in the "Statistic Attributes (custom)" form, the menu items "Apple Pay Statistics Reports → Dictionaries → Statistic Attributes (custom)", or "Google Pay Statistics Reports → Dictionaries → Statistic Attributes (custom)" (see Fig. 10).



Statistic Attributes (custom) << < > >> 34 of 35

Name	Code	Attr Rules
Product classifier: Card Category	PS_PRODCLASS_CARDCATEGORY	DWD_CARD_CATEGORY
ATM Transaction	TRN_RETAIL_VIA_ATM	
CB Territory Code	CB_TERR_CODE	
Internet Transaction	TRN_IS_INTERNET	
Contract Group: Is Chip	PS_IS_CHIP	
Trans classifier: PS Transaction Name	PS_TRN_NAME	
Contract Group: VISA MemberID	VISA_MEMBER_ID	
Contract Group: MC MemberID	MC_MEMBER_ID	
CB Territory	CB_TERR	
Product classifier: Our Cards	PRODCLASS_ONUS	CARD_ONUS
Trans classifier: Chip Transactions (Sw	PS_TRN_IS_CHIP	
Trans classifier: MO/TO/Ecomm Transac	PS_TRN_MOTOECOMM	
trans via mobile phone	TRN_IS_PHONE	
Is Combined	IS_COMBINED	
Transaction Payment Scheme	TRN_PAYMENT_SCHEME	
Contract Group: Card BIN	BIN	
SSD Transaction	TRN_RETAIL_VIA_SSD	
Transfer	TRN_IS_TRANSFER	
Contract Group: AMEX MemberID	AMEX_MEMBER_ID	
Loan/Interests Account	IS_LOAN_INT_ACC	
Contract Group: OffLine PIN	PS_CHIP_PIN	
Contract Group: Is Combined	PS_IS_COMBINED	
Contract Group: Card Internal Product	PS_ISS_INT_PRODUCT_NAME	DWD_CARD_PRODUCT
Contract Group: Card Internal Product2	PS_ISS_INT_PRODUCT_NAME2	DWD_CARD_PRODUCT_TEST
Contract Group: Card Brand	PS_CONTRACT_NAME	DWD_CARD_BRAND
Contract Group: AMEX Card Brand	AMEX_BRAND	DWD_CARD_BRAND
Contract Group: MC Card Brand	MC_BRAND	DWD_CARD_BRAND
Contract Group: VISA Card Brand	VISA_BRAND	DWD_CARD_BRAND
Contract Group: Card Co-Brand	PS_COBRAND_PROGRAM	COBRAND_PROGRAM
Trans classifier: Device Type Transactio	PS_TRN_DEVICE_TYPE	
Trans classifier: Fraud Type	PS_TRN_FRAUD_TYPE	
Trans classifier: Card Present	PS_TRN_IS_CARD_PRESENT	
Trans classifier: Mastercard MO/TO/Eco	PS_TRN_MC_MOTOECOMM	
Transactions with Token	CNT_TOKEN	
Contract Group: ApplePay MemberID	APPLE_MEMBER_ID	

Ins Del Query Values

Fig. 10. List of statistic attributes

For data to be processed correctly, configure a statistic attribute with the "CNT_TOKEN" code (see Fig. 10). If the attribute is not in the list, it must be added manually.

2. Map Products with a card category classifier DWD_CARD_CATEGORY (CREDIT/DEBIT/PREPAID). Special menu items imported in the usual way from the file opt\stat_reporting\client\dbm\menu\Card_Products_mapping_for_stat_reporting.UPG are used for mapping.

   It is recommended to create a separate custom menu group, for example "IPS Stat Reporting Mapping", and import new items to it. For more information about how to import menu items from a file, see the section "Importing Menu Groups and Items from a File" of the document "Menu Editor".

   As the result of import, the menu items "Re-classify Card Products with DWD_CARD_CATEGORY" will be created – automatic mapping of card Products with a card category classifier.

If the client already generates reports for payment systems (Visa, MasterCard), it is not necessary to import classifiers and statistic attributes or to map the Products with the DWD_CARD_CATEGORY classifier. However, a

check must be made that the "CNT_TOKEN" statistic attribute is present (see Fig. 10).

3. If necessary, delete obsolete consolidated data. Cases when it is necessary to do so are specified in the section "Deleting Obsolete Data".

   Data are deleted using the menu items "Apple Pay Statistics Reports → Statistics → Drop Statistics", or "Google Pay Statistics Reports → Statistics → Drop Statistics".

   The "Contract Groups" dictionary can be deleted using the menu items "Apple Pay Statistics Reports → Statistics → Purge Obsolete Statistical Groups", or "Google Pay Statistics Reports → Statistics → Purge Obsolete Statistical Groups".

4. Prepare transaction data for the reporting period.

   Data are prepared using the menu items "Apple Pay Statistics Reports Statistics → Statistics → Collect Doc Statistics", or "Google Pay Statistics Reports → Statistics → Collect Doc Statistics". The procedure for preparing data is standard (see "Preparing Transaction Data").

5. To show data for card contracts with which no transactions were made in the reporting period, generate data for inactive cards. Data for inactive cards are generated using the menu items "Apple Pay Statistics Reports → Statistics → Contract Statistics Groups Update", or "Google Pay Statistics Reports → Statistics → Contract Statistics Groups Update".

   It is recommended to run this menu item after running the "Collect Doc Statistics" menu item.

6. Authorisation data are grouped using the menu items "Apple Pay Statistics Reports Statistics → Statistics → Collect Auth Statistics", or "Google Pay Statistics Reports → Statistics → Collect Auth Statistics".

   It is recommended to run this menu item after running the "Contract Statistics Groups Update" menu item.

   Furthermore, authorisation data are not grouped in several parallel threads.

   Note the order of activities when generating statistics:

   - Collect Doc Statistics.
   - Contract Statistics Groups Update.
   - Collect Auth Statistics.

   Information about all subtypes of counterparty contracts that participate in processed transactions is automatically generated in the "Contract Groups" dictionary; the menu items "Apple Pay Statistics Reports → Dictionaries → Contract Statistics Groups, or Google Pay Statistics Reports → Dictionaries → Contract Statistics Groups".

   Transactions are automatically grouped by transaction types and are shown in the "Transaction Groups" dictionary; menu items "Apple Pay Statistics Reports → Dictionaries → Transaction Statistics Groups", or "Google Pay Statistics Reports → Dictionaries → Transaction Statistics Groups".

7. If necessary, group data automatically pursuant to the requirements for this report type (see "Automatic Data Grouping in the "Contract Statistics Groups" Dictionary").
8. If necessary, manually group data using a custom code (see "Manual Data Grouping in the "Contract Statistics Groups" Dictionary").

Chapter 4. Troubleshooting

This chapter covers possible problems related to incorrect collection of statistics and describes actions for discovering and eliminating these problems.

No Data in a Report File

Troubleshooting procedure:

1. Check that there are data in the STAT_ATTR_REF and STAT_ATTR_VAL, STAT_ATTR tables.
2. Check that there are statistics (records in DOC_STATISTICS) for the reporting period (P_DATE_FROM and P_DATE_TO) for the member (P_MEMBER_ID).
3. Run the report in debugging mode. Debugging mode is configured using the process parameter *Process Name* = "Report" *Parameter Code*="TRACE" *Parameter Value*="Y". For more information, see the document "Running WAY4™ Processes in Parallel".

Statistics Collection Process is Slow

To save time, it is recommended to collect statistics in parallel.

To do so, configure the process parameter: *Process Name* = "Collect Doc Statistics", *Parameter_Code* = "PARALLEL". It is recommended to approve the value of *Parameter Value* – the number of parallel processes – with the database administrator. For more information, see the document "Running WAY4™ Processes in Parallel".

Section in the Report File is Missing or Duplicated

Troubleshooting procedure:

1. In the report template, determine the query used to generate the section.
2. Determine classifiers, statistic attributes and parameters that affect the presentation of data in the section. Check their values.
3. Check that data have been mapped correctly with the query (for the query text, see the section "No Data in a Report File").
4. If necessary, remap data and run the statistics collection procedure.

Data for a Certain Contract or Document are Missing from a Report Section

Troubleshooting procedure:

1. In the report template, determine the query used to generate the section.

2. Determine classifiers, statistic attributes and parameters that affect presentation of data in the section.
3. Check the values of attributes based on which data that were not included in the section are generated in the CONTR_GROUP and TRANS_GROUP tables.
4. Correct attribute values if they do not meet the conditions for generating the section.
5. Remap data and run the statistics collection procedure.

Report Generation is Slow

Troubleshooting procedure:

1. Run the report in debugging mode (see the section "No Data in a Report File"). Give the results of debugging to the WAY4 vendor.
2. If parameters (P_FILTER, P_FILTER_1, etc.) are used to configure additional filters, it is recommended to set the value "1=2" for these parameters. This makes it possible to establish which query requires more time for execution.