

# **Data Warehouse implementation success and failure factors: Case Study IBM BDW implementation at the State Savings Bank of Ukraine**

A Master's Thesis submitted for the degree of  
"Master of Science"

supervised by  
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April 2016, Wien

## Affidavit

I, Anton Romanenko, hereby declare

1. that I am the sole author of the present Master's Thesis, "Data Warehouse implementation success and failure factors: Case Study IBM BDW implementation at the State Savings Bank of Ukraine", 78 pages, bound, and that I have not used any source or tool other than those referenced or any other illicit aid or tool, and
2. that I have not prior to this date submitted this Master's Thesis as an examination paper in any form in Austria or abroad.

Vienna, 26.03.2016

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# 1 Introduction

## 1.1 Objectives and Motivation of the Research

The author of this paper had been worked as Lead ETL and Lead BI developer in DWH and MIS implementation project at the State Savings Bank of Ukraine for 2,5 years. He has an experience in integration of different systems with IBM BDW as well as in development of IBM Cognos BI reports.

The first project release had been implemented within 12 months with the budget up to \$6 million, and went to production in 2012. People, who supported and managed it, built a new functionality at the bank, and let more than 300 users in different regions of Ukraine to use developed MIS system to obtain the needed information and to reduce manual work. The project was organized from scratch and included the following steps:

- Business requirements development
- Vendors' analysis and RFP
- MIS unit organization
- Project organization, project plan and budget
- MIS IT architecture design
- IBM BDW and Cognos BI implementation
- Financial applications development
- Integration of IBM BDW and Deloitte Fineware for IAS 39

Such projects usually imply fundamental changes in an organization, which, in, turn may create a significant resistance to changes. One of the objectives of this paper is to study success and risks factors of the MIS implementation at the biggest Ukrainian bank, as well as to extend the acquired experience in the new releases of the bank MIS.

The key assumptions, the author presented in this work, are based on empirical research of relevant IBM project management literature as well as based on the case study of the bank project. The author has assumed that the end users involvement in MIS project may mitigate the resistance to changes during the future project releases. To test his assumptions the author has devel-

oped the questionnaire. This questionnaire is strived to involve of the end-users in the MIS development process and to facilitate the information exchange between end-users and MIS implementation team.

## 1.2 The State Saving Bank Of Ukraine Introduction

In the USSR, there were five main banking institutions, one of which was the State Savings Bank of USSR, whose main objective was to keep citizens' savings. After the USSR breakup in 1991, the State Savings Bank of USSR was also broken up and became the State Specialized Commercial Savings Bank of Ukraine. Since that time, over 130 banking institutions emerged in Ukraine, including two systemic state-owned banks.

The Public Joint-Stock Company "State Savings Bank of Ukraine" was officially established in compliance with Decree of the Cabinet of Ministers of Ukraine of May 21, 1999, N 866 through the transformation of the State Specialized Commercial Savings Bank of Ukraine into an open joint-stock company.

The founder of the Bank is the State in the person of the Cabinet of Ministers of Ukraine. JSC "State Savings Bank of Ukraine" is one of the largest financial institutions of Ukraine. Over 6 thousand of its offices carry out their functions, including the disbursement of pensions, social aid, processing of utility payments and other banking transactions. Taking into account its social orientation, the Bank aims at maintaining a wide presence in all regions of Ukraine.

The State Savings Bank of Ukraine is the only Ukrainian bank, where the deposits and other valuables of citizens are fully guaranteed by the state by law. The Bank has confirmed its status of a stable financial institution; its economic potential empowers it to meet all its liabilities.

The Bank is actively working in almost all sectors of the Ukrainian financial market; it provides services to large corporate clients, such as offices of the Pension Fund of Ukraine, Ukrainian Post „Ukrposhta”, members of the

wholesale electrical energy market at a modern level.

The State Savings Bank of Ukraine is a universal banking institution focusing its efforts on creating favourable conditions for customers servicing, expanding the banking services and products range in the market.

Five years ago, the bank management made a decision to implement an MIS based on the IBM BDW model. Case study of this project as well as the study of literature will be used by the author to respond to research questions presented below.

### **1.3 Main Research Questions**

The main research questions of this study are as follows:

1. What is the connection between business architecture, IT&MISarchitectureof the bank?
2. What are the main drivers for successful DWH and MIS project implementation?
3. How can be mitigated the resistance to changes in such a complex IT projects?

### **1.4 Work Methodology**

In this work the author is assuming that the resistance to changes can be mitigated via the improvement of communications and via involvement of end-users into MIS development process. The main hypothesis of this study is that the communications with end users could be improved via a web-based annual interview.

The Introduction section offered a brief overview of objectives, goals and the author's motivation of this study. It also contains the short introduction of the State Savings Bank of Ukraineas the bank under investigation within this study.

In Chapter One, the author uses empirical analysis of ING IGA<sup>1</sup> consulting materials and IBM manual books used by the development team during the implementation project. The Chapter introduces the importance of the existence at the bank of the clearbusiness architecture and main organizational functions before the start of any fundamental changes.

The author uses materials of the EU-funded project conducted for the bank by ING IGA, ING's consulting subsidiary. Consulting materials had been developed by ING IGA based on ING Group experience and business practices. They formed the basis for the MIS development at the State Savings Bank of Ukraine, which the author joined as a MIS developer in 2013.

Chapter Two offers a case study of the MIS and DWH implementation at the State Savings Bank of Ukraine based on IBM BDW and IBM Cognos BI tools. It provides a short introduction and background of the project, and presents the project management methodology applied. This chapter summarizes the key success factors of the project. In this chapter, the author uses IBM manual books and presentation materials for the IBM BDW implementation projects.

Chapter Three presents the questionnaire that has been developed to involve the State Savings Bank of Ukraine' top and middle management into creating a shared vision of strategic KPIs of the bank for MIS.

The chapter introduces the methodological approach applied for the questionnaire development, and formulates the interview objectives. The author describes target groups of the interview, and explains the questionnaire structure.

Since December<sup>1</sup>, 2015, the questionnaire has been launched as an annual web-based interview on the bank's intranet to prioritize the development of

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<sup>1</sup>ING Institutional & Government Advisory Services

the management reporting and to involve the bank's middle and top management into the definition of KPIs for next releases of MIS. At the end of this chapter, the author presents the interview analysis and presents a summary of his main findings and assumptions.

At the conclusion the author is providing summary and final conclusions of the study. The author also presents limitations of the study and future needed researches as well as his ideas and suggestions for improvement of complex IT projects results.

## 2 Chapter 1:Bank MIS Organisation

In this chapter are presented examples of a bank business and IT architecture as key elements to be defined before the start of any fundamental IT changes in a bank.

### 2.1 Bank Business Architecture

Business architecture helps to understand how banks create value for stakeholders at all levels of organization. To be successful and competitive, banks should look at their own organization and functions from the point of view of additional value creation for their clients, counterparties, employees, etc.

This chapter provides an overview of banks' value chain and business architecture, and considers their influence on Management Information System and bank key performance indicators.

As an example, the author used the bank business architecture of ING Europe as well as the targeted business architecture of the State Savings Bank of Ukraine. Recommendations were provided for the bank by ING IGA within an EU-funded consulting project.

### 2.2 ING Business Model

Generally speaking, the value creation starts from the approval of the bank strategy. Figure 1 presents a connection between the bank's strategy, organization and IT architecture. Organizational processes and IT architecture build the bank's business model or business architecture.

Once the strategy has been created and approved by the bank top management, the bank should start to work on changes in own organization and process as well as should develop own IT strategy to fulfil strategy.

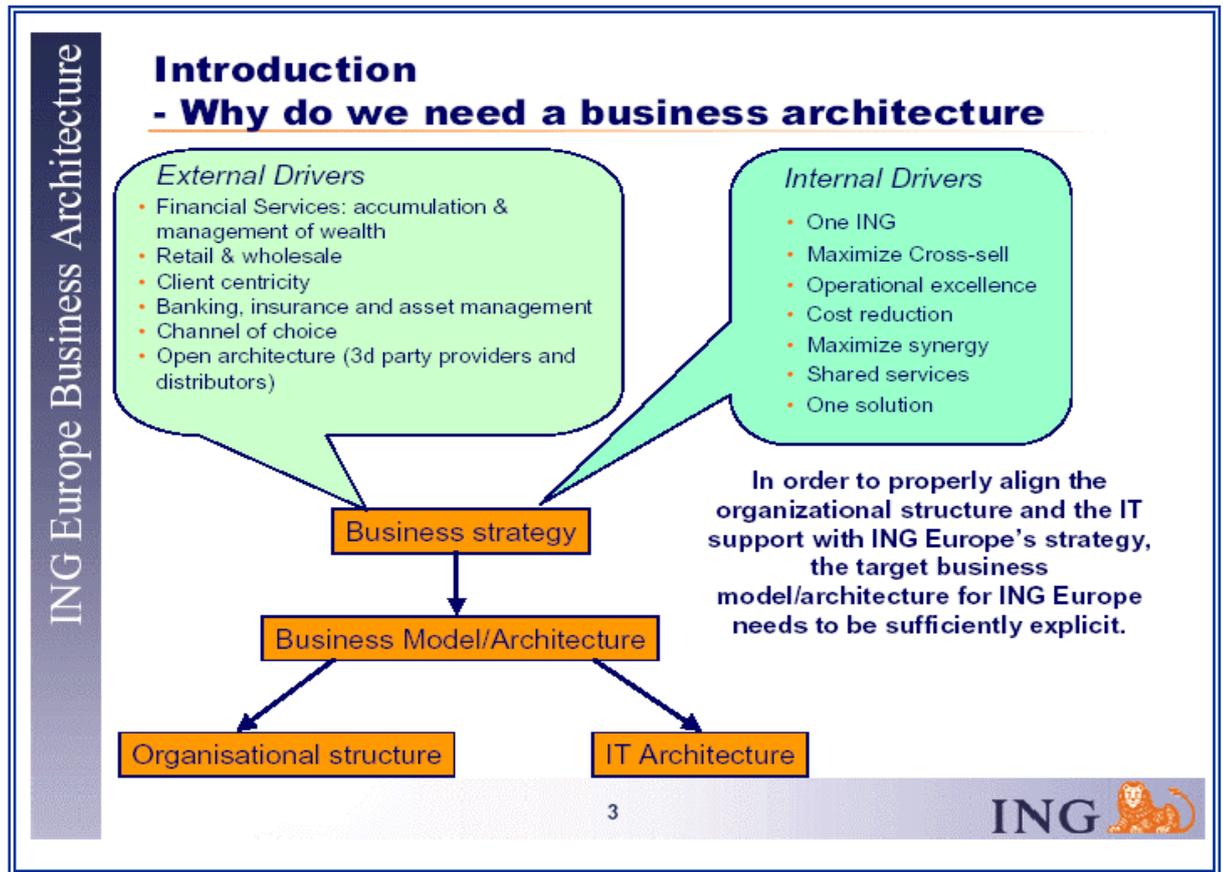


Figure 1: Business Architecture Definition. Presentation for the NBU, ING IGA, 2004-2007.

The business architecture is a model that is reflecting banks' strategic direction, defining functional building blocks or business domains and a set of guiding principles.

The business architecture provides:

- guidance for defining responsibility or ownership for the domains,
- guidance for structuring the organization, respecting functional and geographical lines within international matrix structure
- a reference model for defining the IT application architecture
- guideline for the migration from the current to the desired state

Figure 2 presents a high level Value Chain of ING Europe. The example had been introduced to the State Savings Bank of Ukraine and the National Bank of Ukraine within a consulting project by ING IGA.

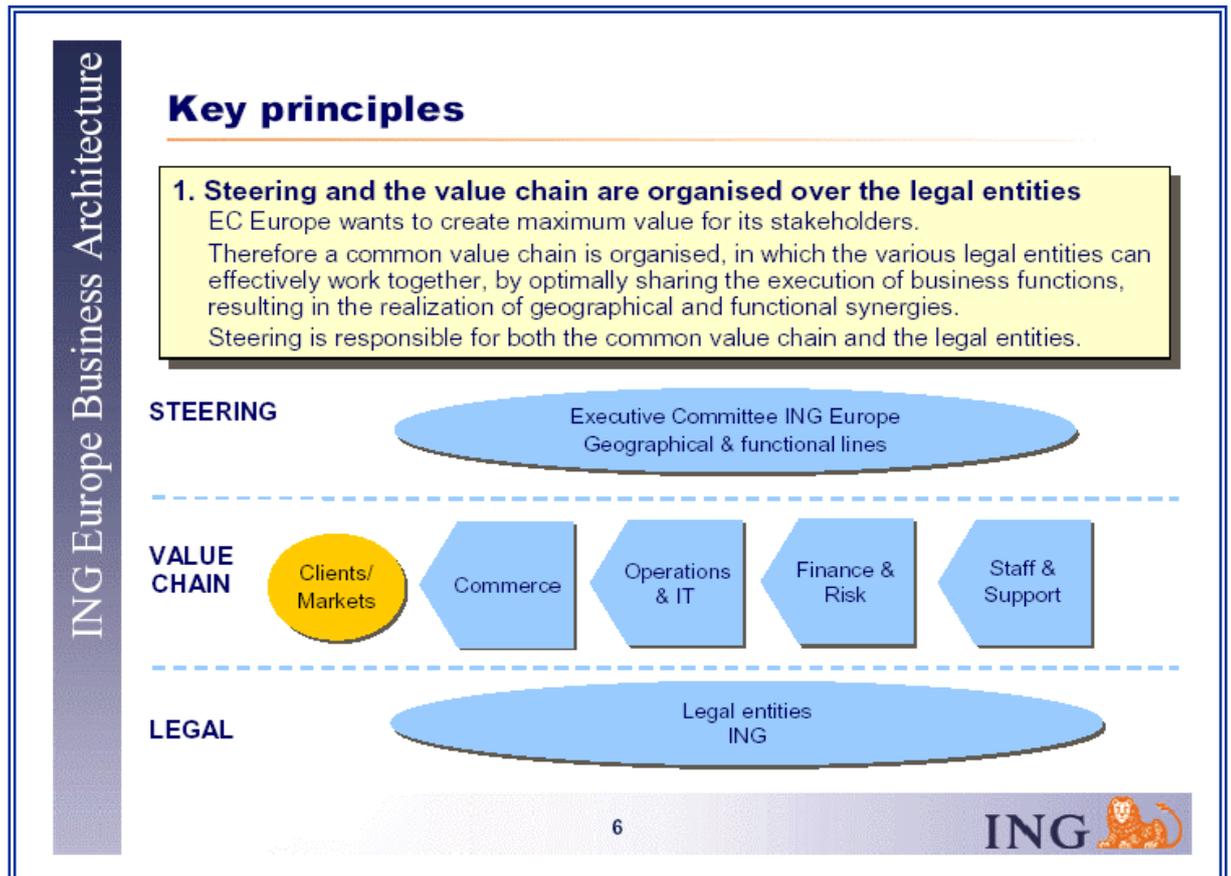


Figure 2: Example of ING Europe Business Architecture and Value Chain Presentation for the NBU, ING IGA, 2004-2007.

According to the example the main organizational domains for ING are:

- Executive Committee
- Commerce domain
- Operations & IT
- Finance & Risks
- Staff & Support
- Legal

For each country or geographical area, a bank has to understand the country value chain. The Figure 3 presents the example of ING Belgium Value Chain. The illustration was also presented to Ukrainian banks by ING Institutional & Government Advisory within the project, where author had taken a part as a local consultant.

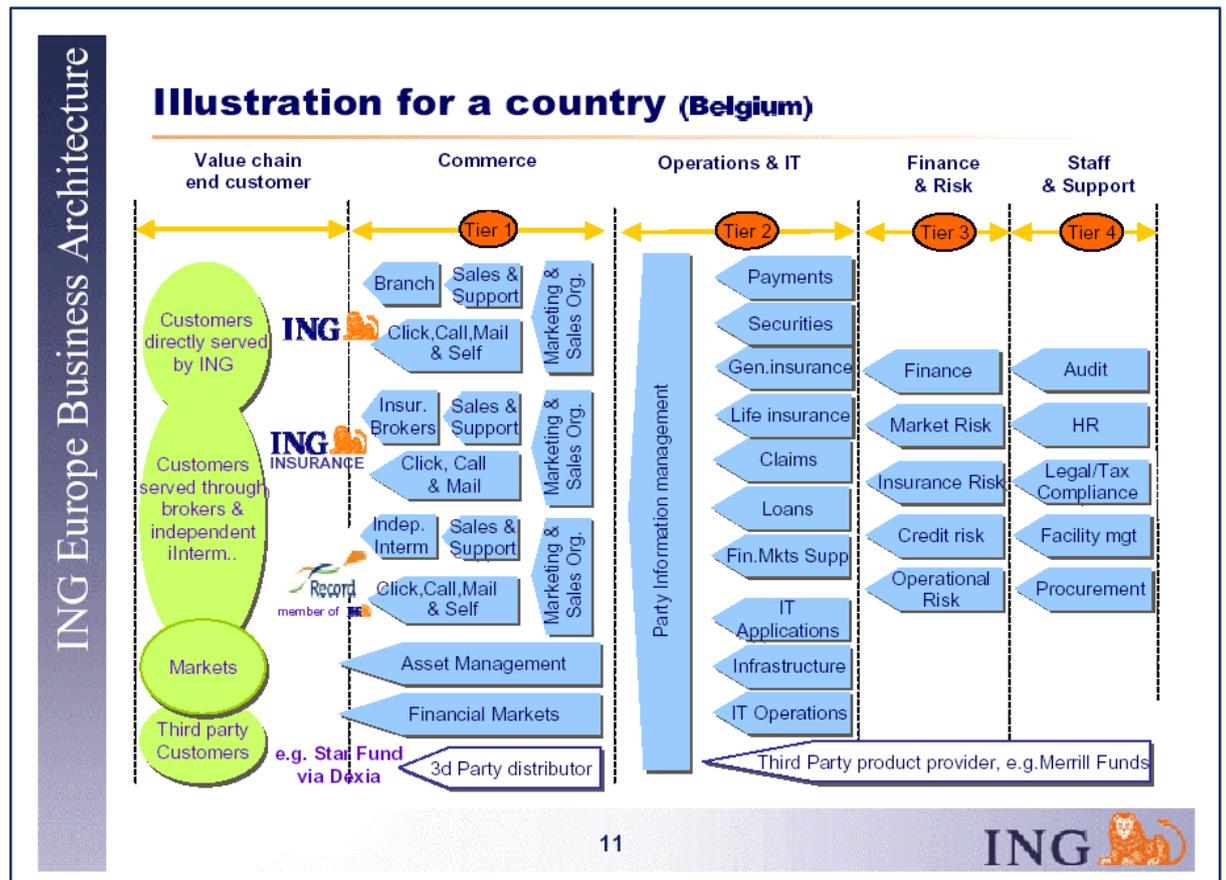


Figure 3: Example of ING Country (Belgium) Value Chain. Presentation for the NBU, ING IGA, 2004-2007.

The main components of ING Europe value chain are reflected in ING subsidiary in a particular country.

The commerce domain in ING Belgium was organized around country-relevant client market segments:

- Direct ING customers
- Customers served through brokers
- Financial market
- Third party clients

To create value for direct customers' market segment, the commerce domain of ING Belgium has following high-level function in the bank:

- Marketing function
- Sales organization function
- Branch sales organization function
- Branch sales support function
- Branch sales function

- Private Assets Management function
- Finance Markets Management function
- E-Channels function called Click-Call-Mail-Self

ING Belgium presents bank-wide multi-channel concept called Click-Call-Mail-Self that includes the following alternative distribution channels:

- Internet Sales
- Call Centre Sales
- Direct Mail Service
- Self Service

The second ING Belgium Value Chain domain is Operations and IT, which includes the following main functions of back office organization and operations:

- Payments
- Securities
- General insurance
- Life insurance
- Loans
- Financial Markets
- IT application support
- IT infrastructure support
- IT operations

The third Value Chain domain includes basically:

- Credit risk management
- Market risk management
- Operational risk management
- Insurance risk management
- Profitability management
- Planning and budgeting
- Management reporting
- Accounting

The fourth domain of bank Value Chain includes humane resources management and other support functions. At the level of bank business architec-

ture, each Value Chain domain has to have an owner and a clear organization structure with defined functions, including matrix responsibilities.

## 2.3 Bank Business Model and IT architecture

The next step in the value creation has to be clear IT applications and IT infrastructure architecture as well as clear plan for the migration from the present to the desired IT architecture.

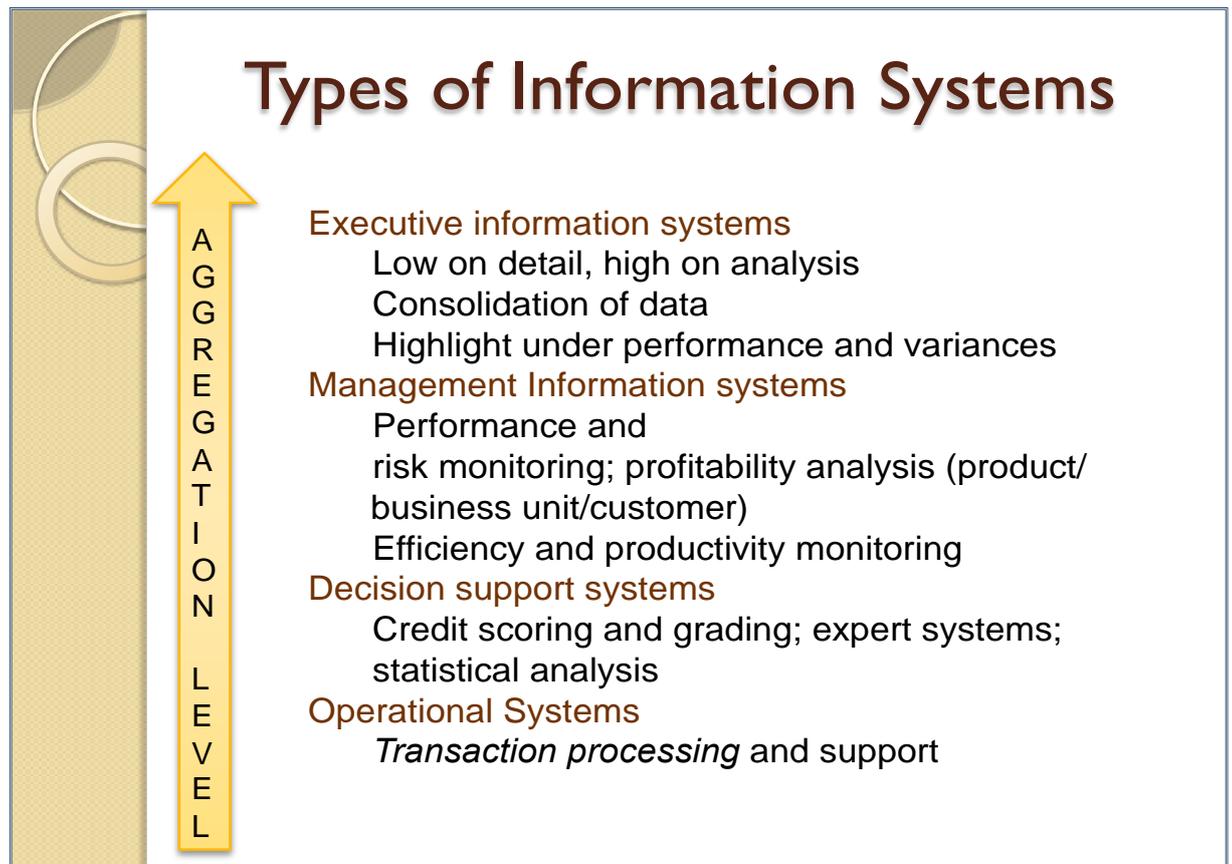


Figure 4: Types of Information Systems and Level of Information Aggregation. Presentation for the NBU, ING IGA, 2004-2007.

According to ING, the prerequisites for the successful strategy implementation and value creation are:

- Approved strategy of the bank
- Defined Value Chain and Business Architecture
- Clear Organization Structure and Functions
- Approved IT architecture including MIS

As soon as targeted business architecture, value chain and IT architecture is defined, it should find the reflection in the bank data model, which should al-

low for coherence and smooth transfer of information between different on-line transaction and off-line reporting systems:

- CRM applications
- Client Master Data Management
- Segment oriented applications (Wholesale, Retail, Financial Markets)
- Sales oriented applications
- Product oriented applications (Life insurance, Current Accounts, Payments)
- Accounting and support systems (General Ledger, Expense Accounting, HR)
- e-Banking environments
- Risk oriented applications (Risk Limits per Client, per Country)
- Data Warehouse and Management Information Systems (RAROC, Customer, Segment, Product Profitability, Sales Force Management)
- External systems (Insurance Brokers, SWIFT, Income Tax Reporting)

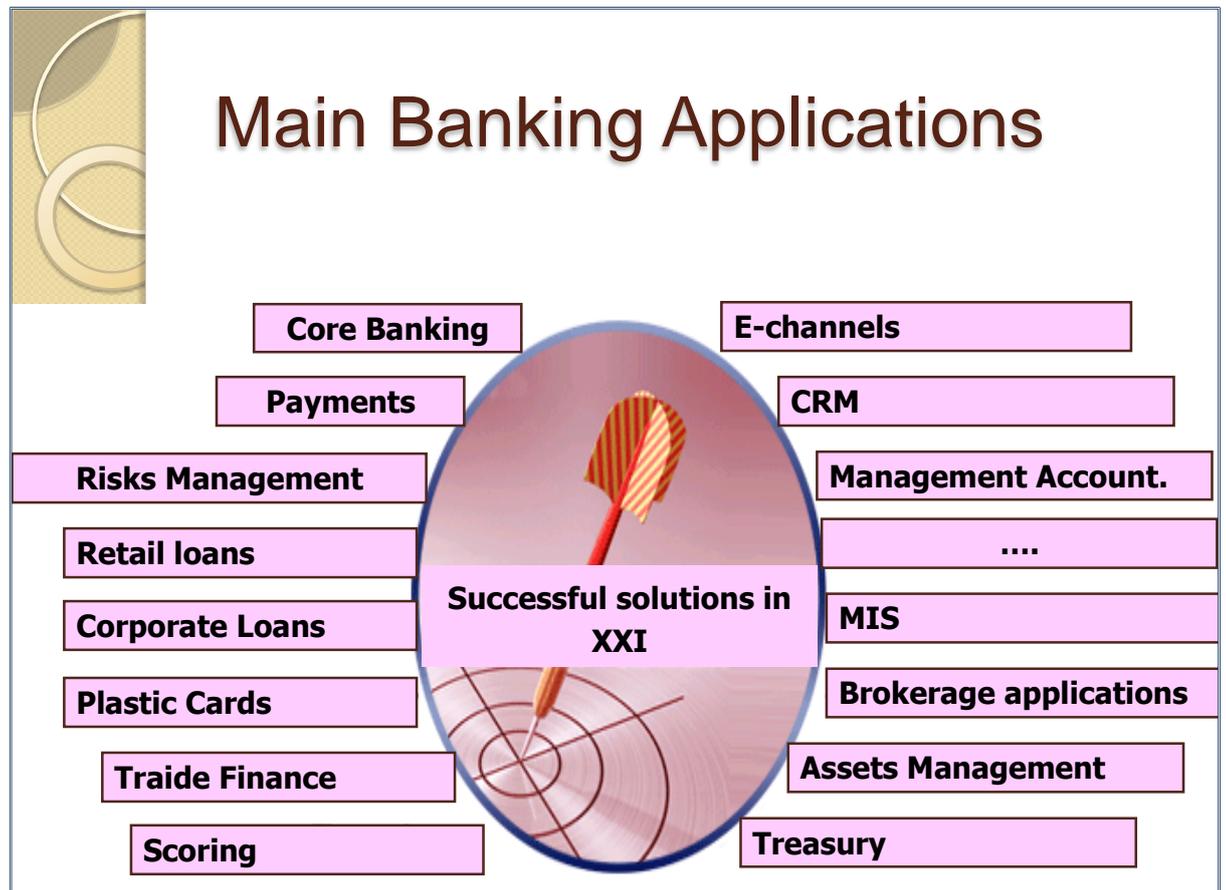


Figure 5: Bank IT Applications. Presentation for the NBU, ING IGA, 2004-2007.

Figure 6 presents the connection between ING Value Chain domains and the targeted IT architecture, which includes on-line transaction processing (OLTP) applications and off-line reporting applications.

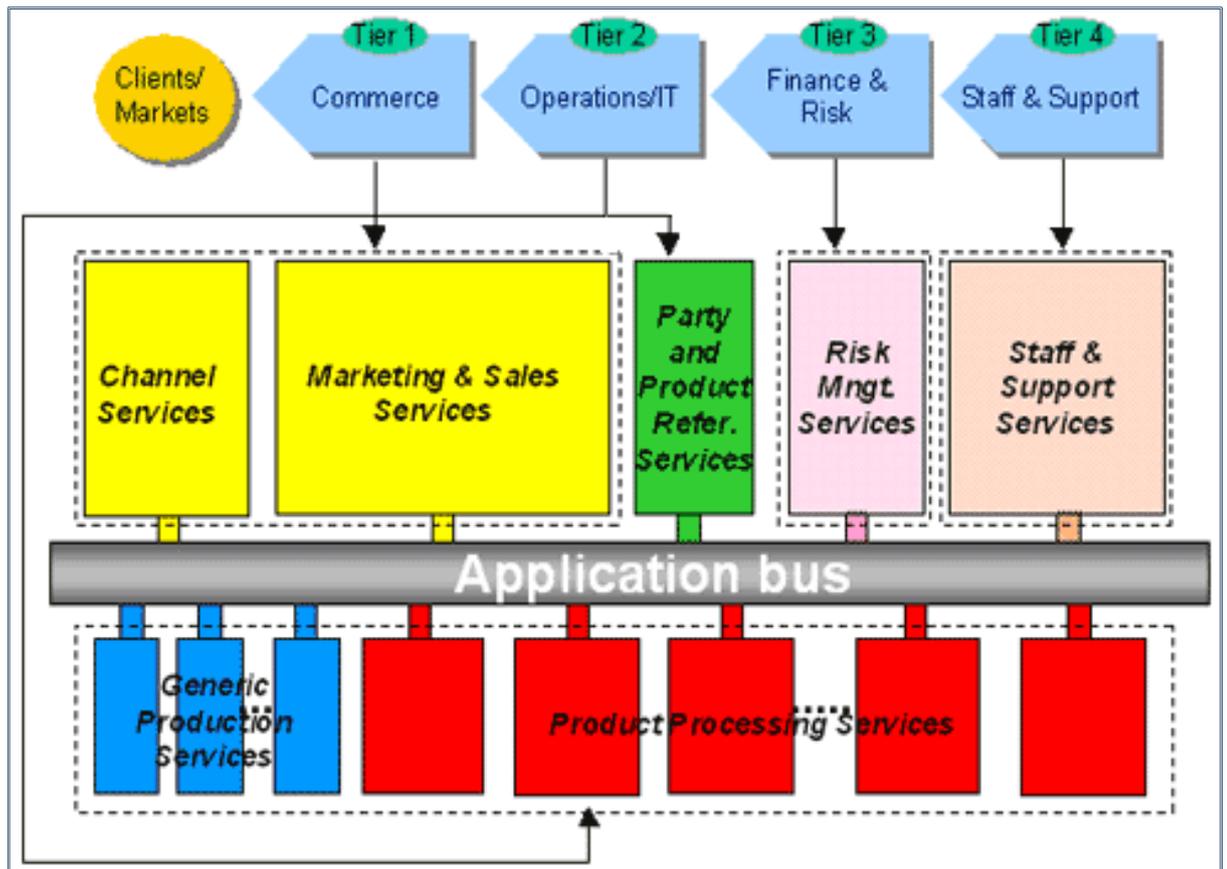


Figure 6: ING OLTP Applications IT Architecture and Value Chain. Presentation for the NBU, ING IGA, 2004-2007.

In addition to OLTP applications, each bank has to develop a management information and executive information system to monitor its current performance and to plan its business. A data warehouse is one of the key elements of the MIS IT architecture.

OLTP systems are not designed for the data analysis, because data is diverse and complex, user access is complex and user access slows down business operations. A data warehouse provides data quickly and in a format that facilitates business decisions. Data Warehouse allows banks:

- Exploit the potential of information previously locked in legacy systems
- Holds essential data on:
  - Relationship Management of customers
  - Risk management
  - Performance analysis by business unit, product and customer
  - Marketing & cross-selling

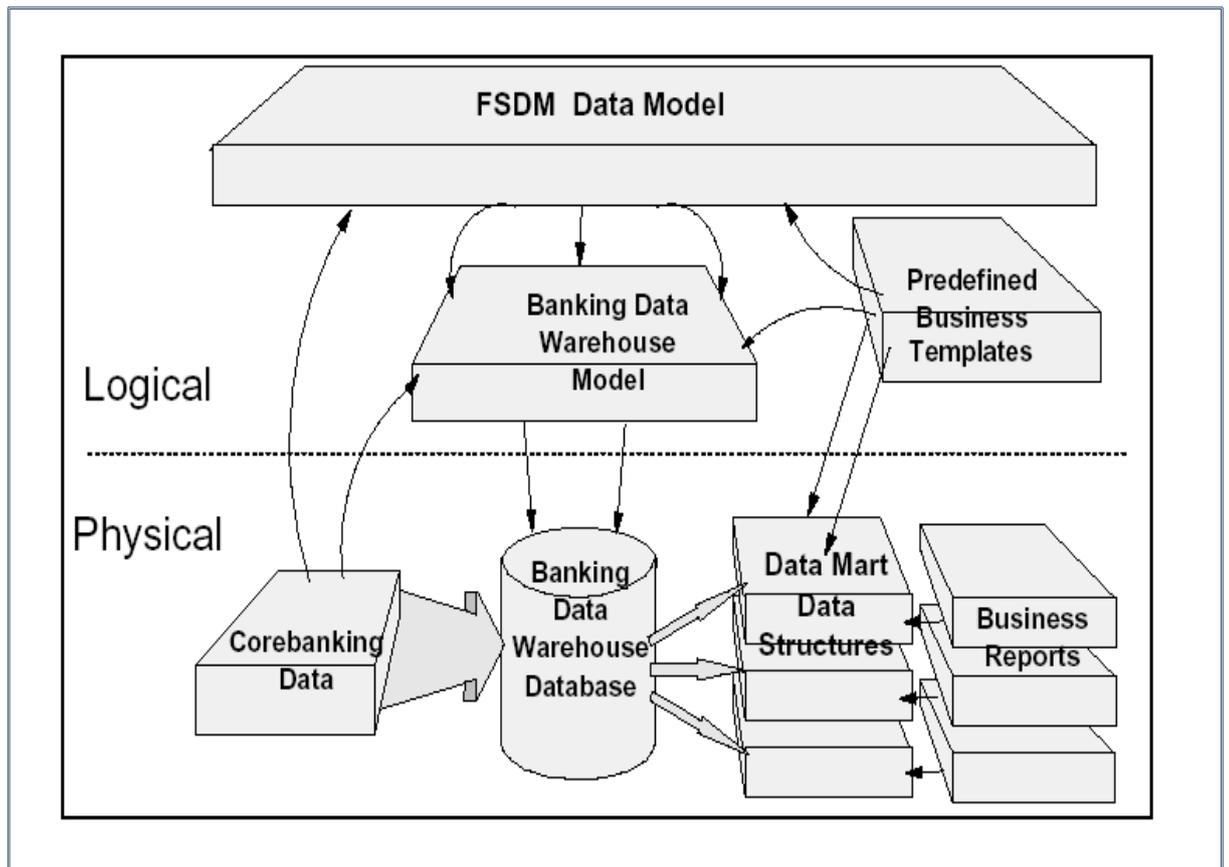


Figure 7: IBM Logical and Physical Data Warehouse Models. Presentation for the NBU, ING IGA, 2004-2007.

Figure 7 presents the logical and physical data models of IBM Banking Data Warehouse, which are used by the State Savings Bank of Ukraine, as well as ING Group Europe. The bank data model has to be properly reflected at a data warehouse level and at the level of OLTP systems, which are data sources for the data warehouse and the management reporting system.

The key data domain of any modern data models is Arrangement. If a banking organization is able to structure its own data around Arrangements and Clients, it will be able to get answers to any business analytical query.

In turn, an arrangement has to be connected with the general larger data, organizational units, business segments, etc. Moreover, a set of arrangements with similar conditions will create bank products.

The connection between a data model and an OLTP application is illustrated on Figure 8.

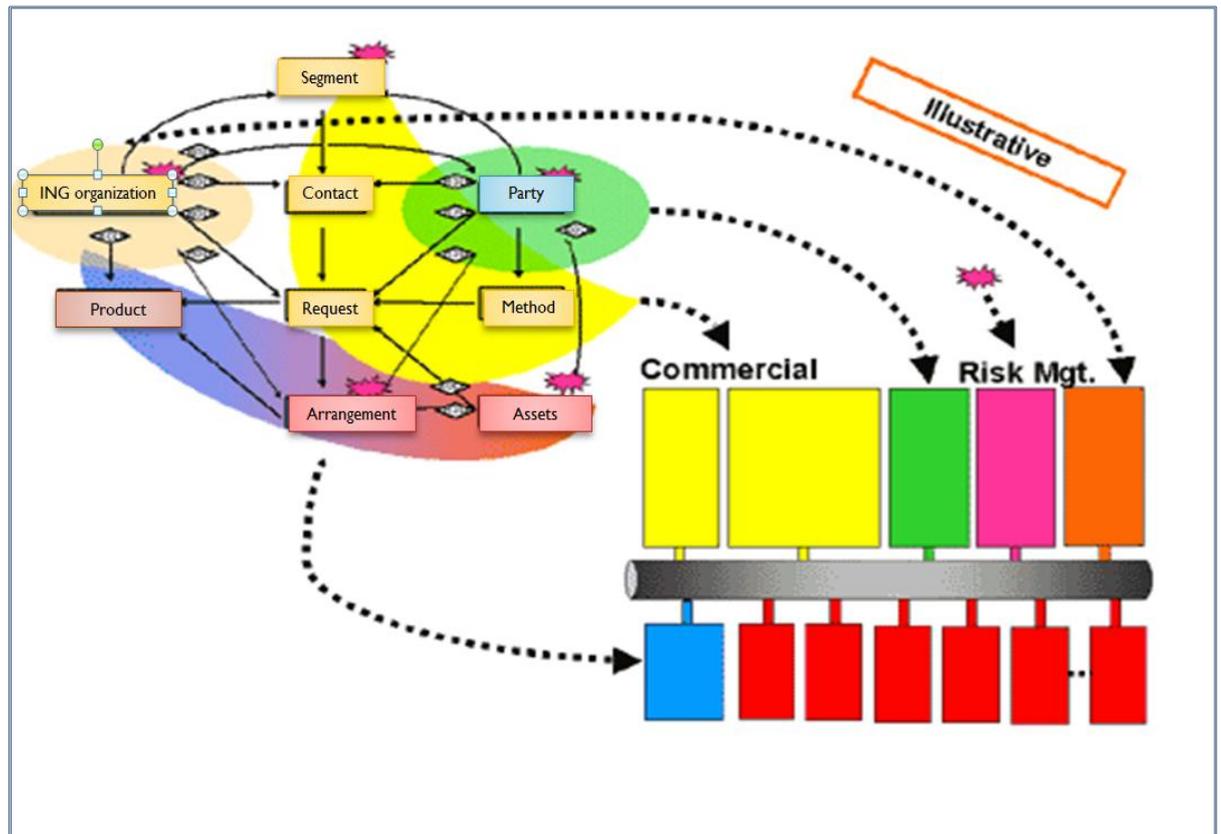


Figure 8: ING Data Model and OLTP Source Applications. Presentation for the NBU, ING IGA, 2004-2007.

The main focus of an MIS is to highlight deviations of performance from the target and to provide updated forecasts of expected results, as well as to monitor the strategic KPIs.

For example, the major areas of ING bank's MIS are structured among:

- Financial performance
- Risk management (including ALM reporting and compliance)
- Channel performance (scorecard)
- Commercial performance (customers, products & markets)
- Operational efficiency and resources management

### **3 Chapter 2: Case Study of MIS Implementation at the State Savings Bank of Ukraine**

The chapter contains the case study of MIS and DWH implementation at the State Savings Bank of Ukraine based on IBM BDW and IBM Cognos BI tools. It provides a short introduction and background of the project as well as presents the project management methodology applied.

The author investigates the State Savings Bank of Ukraine business architecture. He presents the project management approach used within the IBM BDW project. The project had been accepted by the Management Board of the bank and had been recognized as a successful.

The author wants to analyse obstacles and success factors, as well as lessons learned during MIS implementation at the bank to apply the best management practices during next steps of MIS development at the bank. This Chapter summarizes the key success factors of the MIS project that could be leveraged in the next MIS releases.

The author assumes that the top and middle management awareness as well as improvement of internal communications by conducting web-based interview with end-users related to evaluation of the existing Cognos BI may facilitate the success of future MIS releases.

#### **3.1 Project Background**

The State Saving Bank of Ukraine is the largest Retail bank with around 36 thousand employees and 26 regional branches, as well as over 5 thousand small offices all over Ukraine that carry out their functions, including retail savings, the disbursement of pensions and social benefits, the processing of utility payments and other banking transactions. The bank is 100% owned by State.

In 2011, the Management Board of the bank decided to implement IBM Banking Data Warehouse and IBM Cognos BI as the basis for its MIS. The external drivers for IBM BDW implementation were as follows:

- Pressure on the bank top management from World Bank that had monitored state institutions due to a stand-by lending of Ukrainian Government
- New IFRS legislation in Ukraine adopted in 2010
- The Bank' bonds placement at LSE in 2010
- Qualified 2010 Auditor's Report

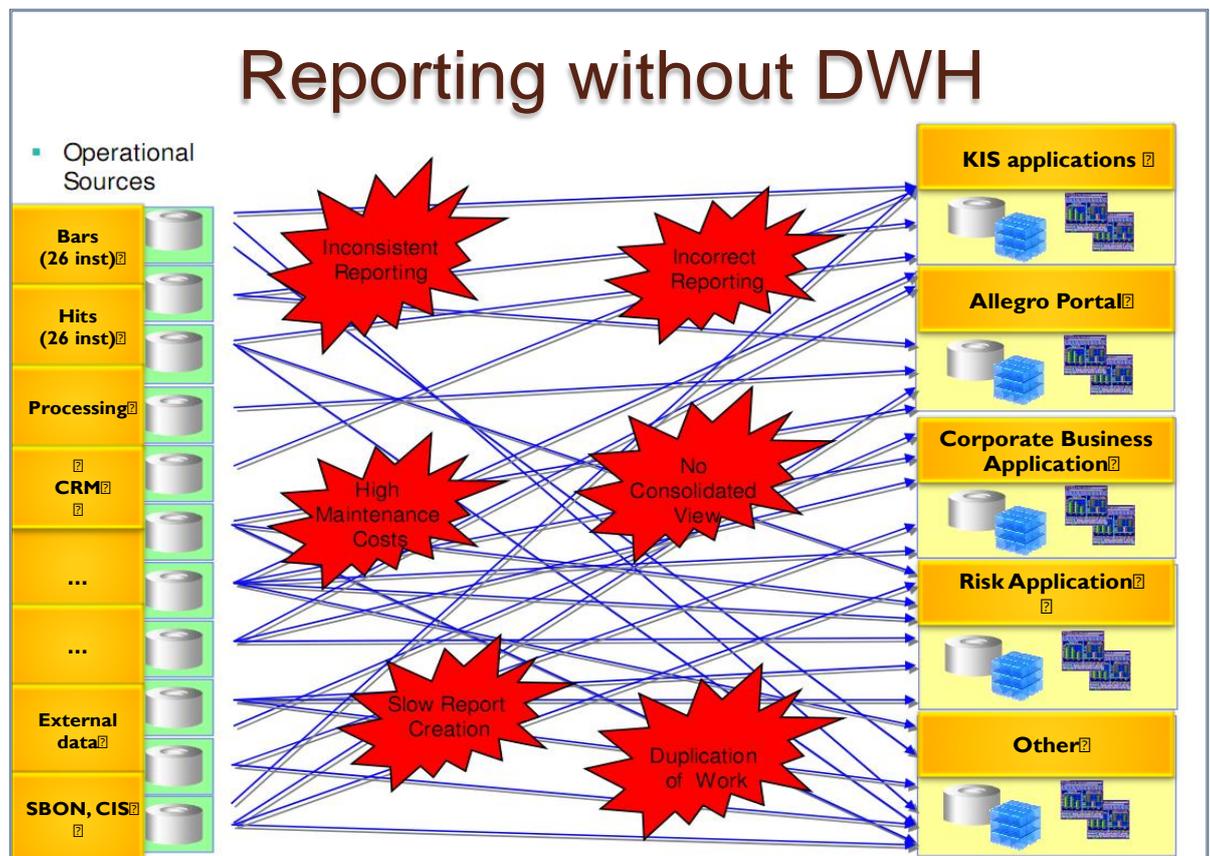


Figure 9: Reporting without Data Warehouse. Presentation of the SSBU. IBM Industry Lab Forum, Dublin, 18-21 March, 2015.

According to qualified 2010 Auditor's Report "it was impossible to confirm that the financial statements of the bank are true because of limitations in IT systems". The World Bank and new legislation required from the bank management:

- Credit portfolio centralization
- Provisioning according to IAS 37, 39, IFRS 7, 9
- Operational segments reporting according to IFRS 8

All the three analytical applications had required similar data. If the management had not prioritized projects, the bank would finance three parallel processes for similar data upload from 26 regional branches (Figure 9).

Moreover, the bank will get irreconcilable credit reporting and core banking system developer Bars will be overwhelmed by the overlapping tasks. Eventually, Management Board made the decision to start IBM Banking Data Warehouse implementation project in 2011.

The key strategic IT decisions made by Chairman are presented below. They were based on the following considerations:

- The domestic automated banking systems have limited functionality for IFRS reporting, management accounting and risk management, because all data are arranged around General Leger (GL) and accounting data, not contracts. Moreover, they are fully compatible with regulatory reporting requirements of the NBU
- International banking systems have supported IFRS reporting, management accounting and risk management reporting and have all data arranged around contracts, not GL. However, they are incompatible with regulatory reporting requirements of the NBU

The Management Board had decided not to implement a new international ABS, but, in turn, to finance the development of a local centralized ABS “Bars-Millennium” using IBM BDW data model as a data target for its own ABS improvement.

### **3.2 State Savings Bank of Ukraine KPI's**

Figure 10 presents the State Savings Bank of Ukraine's business model and its reflection in the bank organisation.

Sales & Commerce and Operations & IT functions of the bank are arranged among following clients' market segments:

- Big Corporate Clients
- Government Segment
- Micro-, Medium-, Small- Business Segment
- Individuals Segment
- Banks

To create value for bank's customers, the commerce domain of the bank has following high-level structure:

- Marketing function
- Segment & Product development function
- Branches support function
- Branch sales function
- E-Channels development function
- Processing & ATM channel
- Internet Bank
- Call centre

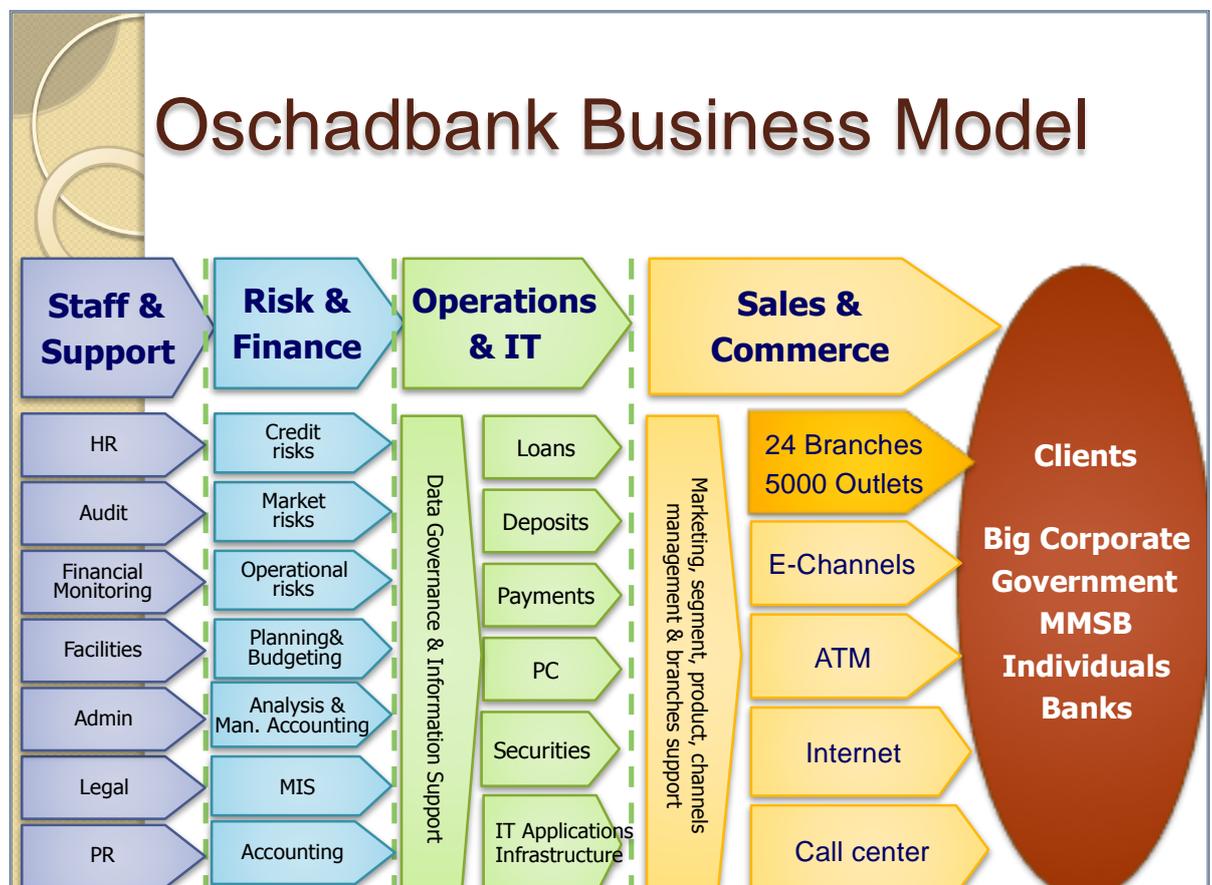


Figure 10: Business Model of the State Savings Bank of Ukraine. Presentation of the SSBU. IBM Industry Lab Forum, Dublin, 18-21 March, 2015.

The second domain is Operations and IT, which includes following main functions of back office organization and operations:

- Loans
- Deposits
- Payments
- Plastic Cards
- Securities
- IT application support
- IT infrastructure support

The third Risk & Finance domain includes basically:

- Credit Risk
- Market Risk
- Operational Risk
- Planning and Budgeting
- Analysis and Management Accounting
- Management Information System
- Accounting and Finance function

The four functional domain of the bank includes the main support functions of any financial organisation:

- Humane resources
- Internal Audit
- Financial Monitoring (AML)
- Administrative function
- Facilities
- Legal
- Public Relations

Figure 11 presents the current high-level KPIs of the bank comprising the basic set of regulatory ratios required by Basel II as well as the basic ratios related to the main financial data such as volumes of sales, volumes of investments and level of expenses by types.

To be able to create the required MIS reporting and to incorporate the needed KPIs in the MIS by each functional domain, the bank management

had decided to start a data warehouse implementation project using IBM data model and IBM development tools.

The implementation of IBM BDW has created technical pre-requisites at the bank for the implementation of proper MIS.

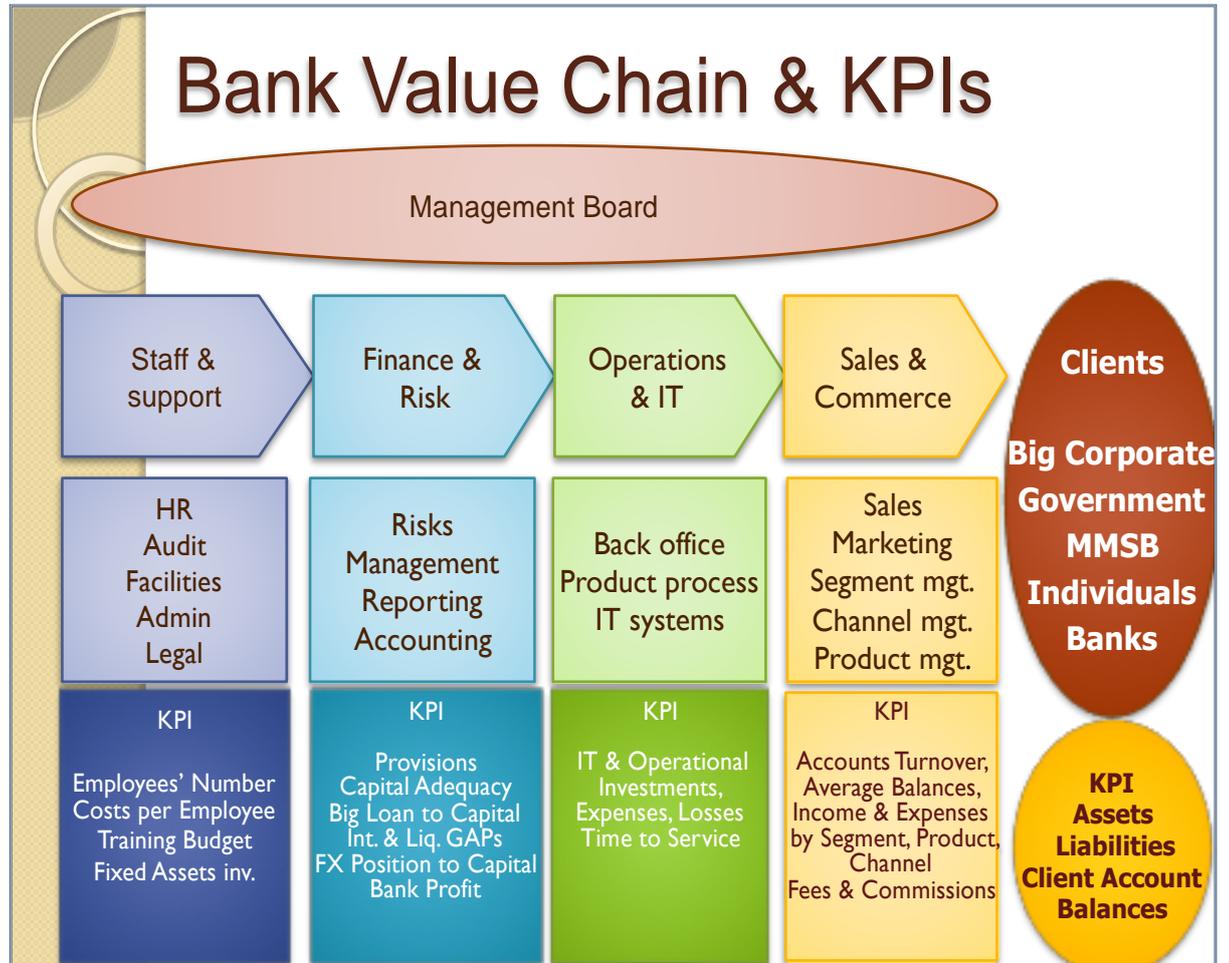


Figure 11: KPIs of the State Savings Bank of Ukraine. Presentation of the SSBU. IBM Industry Lab Forum, Dublin, 18-21 March, 2015.

A short description of IBM BDW project is presented in this chapter below and includes an analysis of obstacles and success factors, as well as lessons learned during the first release of the MIS project.

### 3.3 IBM BDW Data Model

During 2011, the bank had conducted a selection process to decide on the software vendor and the technical solution. The IBM BDW had been chosen among following vendors: Oracle, IBM, SAP, SAS.

IBM BDW logical data model of IBM BDW contains two key data areas:

- A System of Records model (SOR or Detailed Data Storage or Atomic Model)
- A Warehouse Data Marts model (Dimensional Model)

The SOR model makes it possible to:

- Centralize and store information from various sources in detailed breakdowns in a third normalized form
- Clearly define and save interdependencies between data model entities
- Fill up key entities with clean, rationalized and easily accessible data
- Structure and define data that needs history accumulation
- Simplify extraction of the required data from an array of clearly structured data
- Set up data areas, including detailed historical data required for BI systems and analytical applications
- Limit direct access of analysis and business users to the minimum; the SOR area is not focused on tackling any functional analytical problems

Conceptual SOR data model of IBM BDW is presented on Figure 12. According to IBM guideline any business situation can be described, explained and reported using the nine Data Concepts:



Figure 12: IBM Banking Data Warehouse Conceptual Model: System of Records. IBM Corporation publication, 2011.

- Arrangement: represents a potential or actual agreement between two or more Involved Parties, that provides and affirms the rules and obligations associated with the sale, exchange or provision of Products or Resources;
- Conditions: describes the specific requirements that pertain to how the business of a bank is conducted and includes information such as pre-requisite or qualification criteria and restrictions or limits associated with those requirement terms and conditions of a contract, a product, an account;
- Product: describes products and services that can be offered, sold or purchased by the bank, its competitors and other Involved Parties during the normal course of business. This Data Concept also includes non-financial goods and services that are of interest to the bank;
- Involved Party: represents all participants that may have contact with the bank or that are of interest to the bank and about which the bank wishes to maintain information (customers, counterparties). This includes information about the bank itself
- Event: describes a happening about which the bank wishes to keep information as a part of carrying out its mission and conducting its business
- Classification: organizes and manages business information by defining structures that provide classification categories applying to one or more Data Concepts. For example, the typology of key concepts, the interconnection between them, the parametrization of entities, classifiers and reference tables related to a contract, a product, a sales outlet, a customer, etc.
- Location: describes a place where something can be found, a destination of information or a bounded area, such as a country or state, about which the bank wishes to keep information the location of a sales outlet, a customer, a counterparty and a contractor
- Resource Item: includes and describes any value item, either tangible or intangible, that is owned, managed, used by, or of specific interest to the bank in pursuit and accomplishment of its business

The key Data Concept of IBM BDW's SOR is the Arrangement (see Figure 13), which is linked to general ledger accounts and transactions via the Accounting Unit, a special entity making it possible to store information about balances and transactions using any accounting method (IFRS, NAS, GAAP), and to keep record of non-monetary accounting units (metals, vehicles, buildings, etc.).

An Arrangement is made between Involved Parties. For example, a bank enters into contracts with customers, suppliers and contractors, and employees.

An Arrangement has Conditions (rates, currencies, limits) and related Events (payments and payment schedules, events of default, etc.).

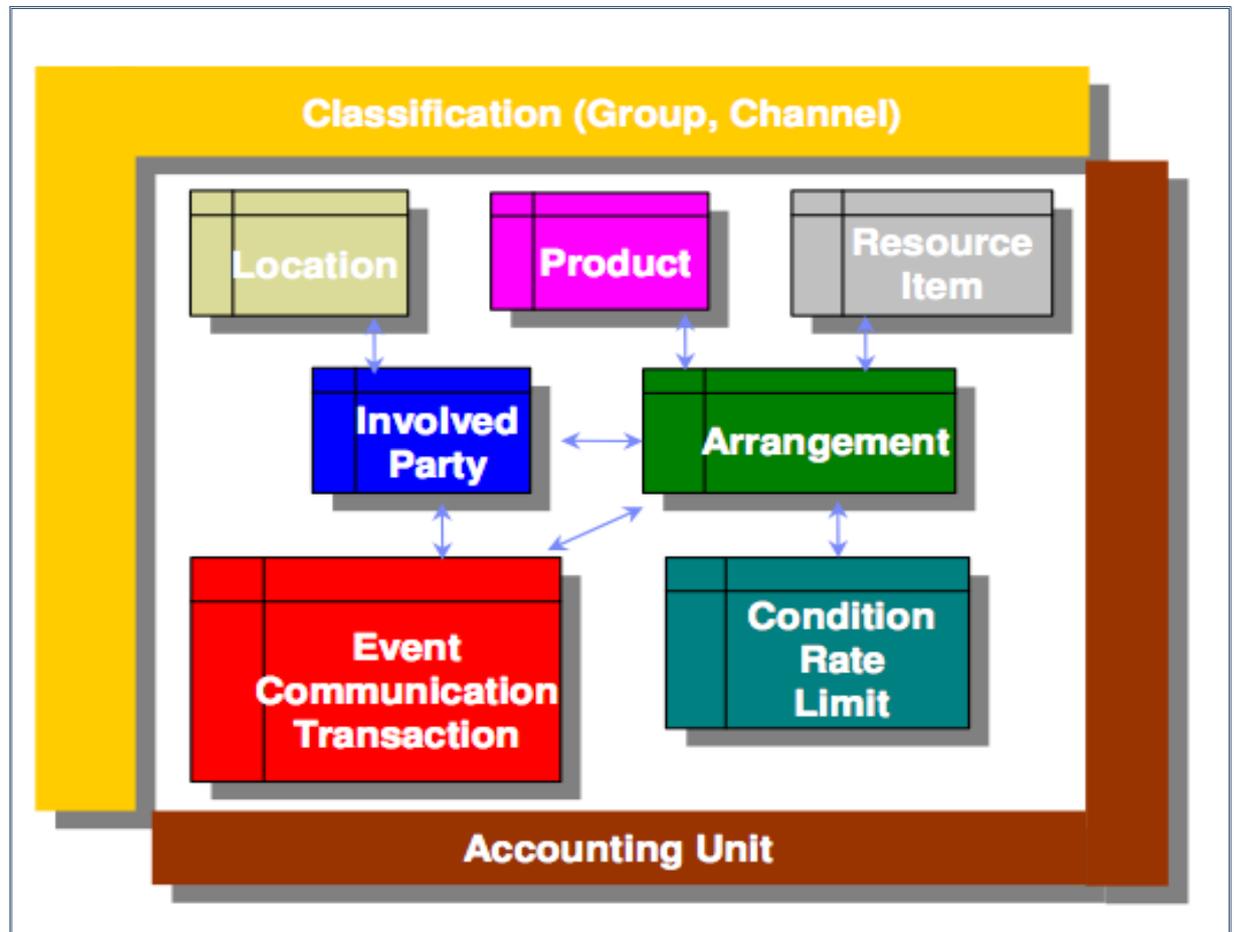


Figure 13: IBM Banking Data Warehouse System of Records: System of Records. IBM Corporation publication, 2011.

An Arrangement is made in a specific Location (a unit with an address). In addition, a set of unified contracts with the same conditions and risk profiles is linked to a bank's Product entity.

The Classification entity makes it possible to categorize all key entities of a warehouse on the basis of key reference tables of the bank.

Data Mart Model (Dimensional Model) includes Dimensions, Profiles, and Data Marts to facilitate proper MIS function in the bank. IBM Dimensional Model makes it possible to:

- Reduce time needed for the generation of reports by using prepared summary data tables and aggregated data based on SOR data

- Rapidly organize collaboration among business users, business analysis and developers by having warehouse modelling specialists to thoroughly establish the business requirements
- Establish business requirements in detail and optimize them to prepare summary tables and aggregates for building up reports
- Understand and implement the data mart logic and rules in terms of summing up, aggregating and analysing the data
- Rapidly create data tables in the summary, aggregation and analysis area to detail, optimize, aggregate and update information
- Expand the range of opportunities for the detailed data analysis in various business areas by turning from aggregate data to the most detailed (source) data in the warehouse
- Relieve resources of a bank's operating systems from inappropriate analytical functions

However, the customized IBM BDW-based data model for Ukrainian banks incorporates specific features of their source data structures.

It is a specific feature of core banking systems on these markets that they are mainly General Ledger solutions relying on an account (Accounting Structure Item) with a number of additional parameters used to analyses customers and products, rather than on an Arrangement as a key entity.

An Account and an Arrangement are linked to each other in the model via the Accounting Unit, a special entity making it possible to store information about balances and transactions using any accounting method (IFRS, NAS, GAAP).

However, the Accounts that cannot be linked to an Arrangement because of the lack of relevant links in the core banking system are directly linked to other key entities of the model (Product, Involved Party).

Furthermore, the IBM BDW data mart model in its customized form has been radically modified to take account of specific features of the financial and regulatory reporting of Ukrainian banks.

A data warehouse makes it possible to tackle the issue of consolidating, cleaning, processing and storing large volumes of data.

However, banks also need to analyse their performance, make additional calculations, carry out stress tests and develop forecasts for management accounting, risk management, marketing and customer relations tasks.

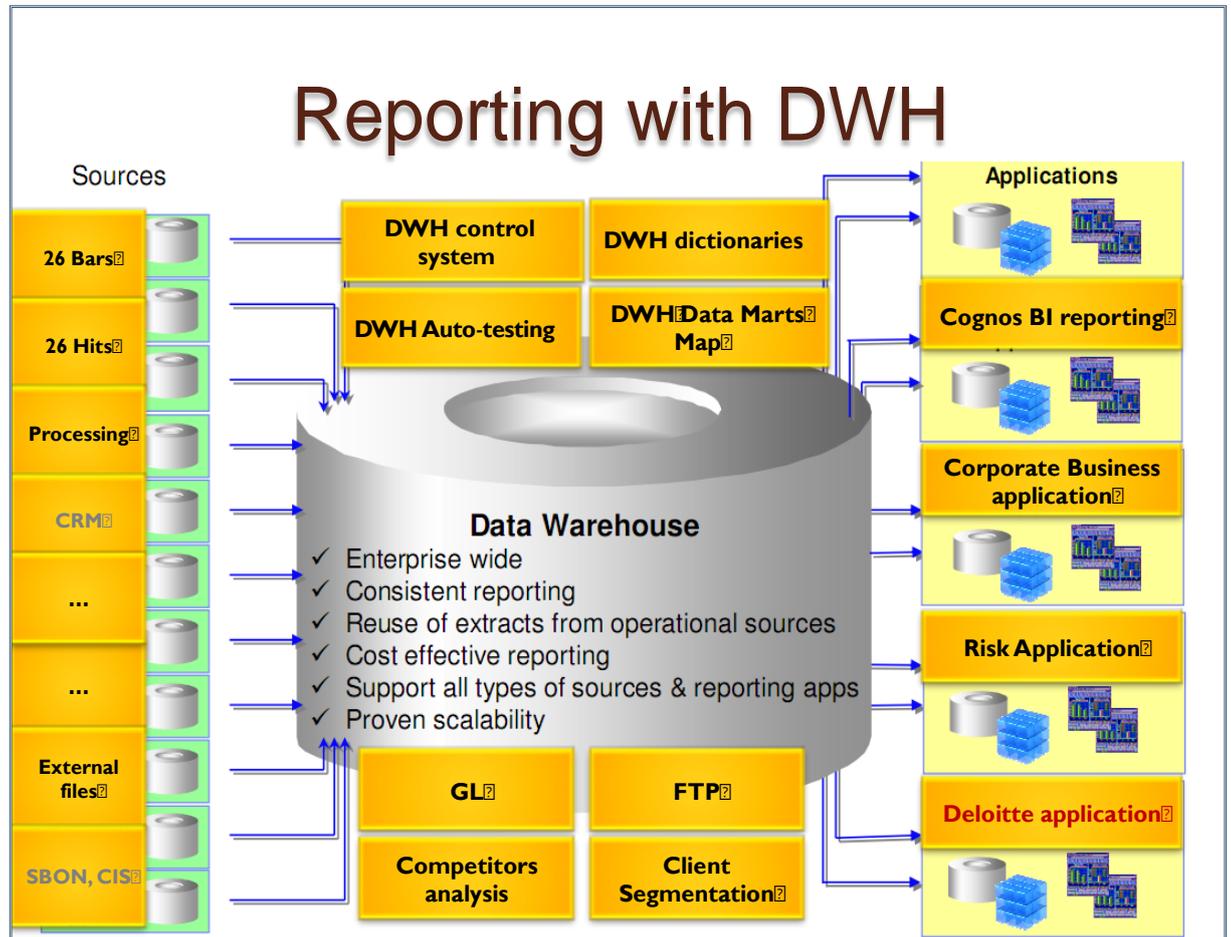


Figure 14: Reporting with Data Warehouse. Presentation of the SSBU.IBM Industry Lab Forum. Dublin, 18-21 March, 2015.

This is why the State Savings Bank had developed the following analytical financial applications within the MIS project:

- General Ledger Module
- Transfer Pricing Module
- Competitor Analysis Module
- Client Segmentation Module

DWH Control System was developed within the project to manage a complete lifecycle of the data warehouse.

This is the main tool for a DWH operator developed to manage and control the operation of a corporate data warehouse. It is a single centre for running and monitoring all processes of data processing in a warehouse.

On Figure 14 presents summary of data sources, reporting areas, analytical and technical applications of the bank DWH.

### 3.4 MIS Project Results

After the first project phase was presented, the joint press release of the State Savings Bank of Ukraine and IBM was published at the IBM web site containing, among others, the following statement of the bank's CEO "The first stage of the data warehouse implementation will give us an opportunity to make a quantum leap in improving the information management efficiency.

The Management Board of the Bank has approved data warehouse development priorities for years 2014 to 2015, including, for instance, its integration with the provisions calculation module for the generation of IAS 39 reports. We are going to start the work on the development of a single reference database of retail customers using the data cleaning and transformation tools offered by IBM<sup>2</sup>"

The MIS project deliverables were as follows (see also Figure 15):

- Downloaded General Ledger Data: postings and transactions; customers; products; arrangements; organization units structure
- Downloaded Clients' Data: golden number and master data for retail and corporate customers; customers data cleaning in ABS
- Developed Fund Transfer Pricing Application: daily calculations of transfer income/charge; FPT yield curves modelling
- Developed DWH Control Application: control data uploads from 51 sources; centralized management of dictionaries (400 reference files and technical tables); monitor and launch DWH financial applications'

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<sup>2</sup><http://www-03.ibm.com/press/ru/ru/pressrelease/41575.wss>  
Sergey Podresov, CEO of the State Savings Bank of Ukraine, 24.07.2013

settlements; running auto tests; running samples and web services for risk application.

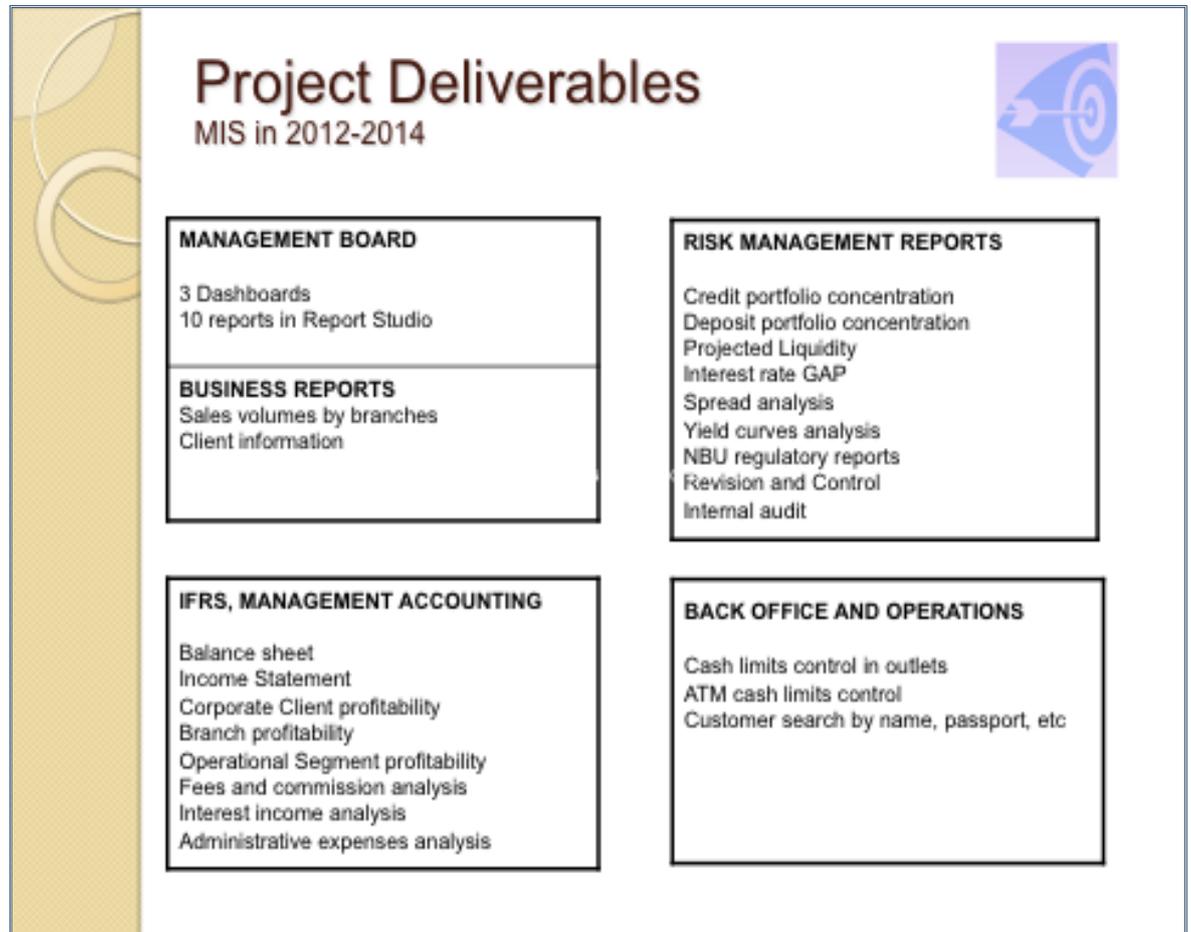


Figure 15: MIS Reporting of the State Saving Bank of Ukraine. Presentation of the SSBU.IBM Industry Lab Forum. Dublin, 18-21 March, 2015.

Since the beginning of 2015 the new release of MIS has been started. It includes:

- Integration with Deloitte Module IAS 39, Fineware
- Data Governance and Data Cleaning project

Examples of Cognos BI reports are presented in Appendix 7.3. The current shortlist of Cognos BI reports that are evaluated during the end-users interview within this case study is following:

#### Management Board Reports

- Dashboard: Competitor Banks Analysis
- Dashboard: Corporate Business
- Dashboard: Retail Business

- Dashboard: Data Quality Finevare
- Balance Sheet
- Income Statement
- Interest Income and Expenses Analysis
- Fees and Commissions Analysis
- Administrative Expenses Analysis
- Deposit Portfolio Analysis
- Credit Portfolio Analysis
- Interbank Market Operations
- Clients' Accounts and Accounts Balances Dynamics
- Operational Segments Performance
- Branch Performance
- Corporate Client Performance
- Top Clients by Financial Indicators

#### Risk Management Reports

- Nominal interest rates Analysis by currency (periodic)
- Nominal interest rates Analysis by currency (daily)
- Interest Rate Gap Analysis (periodic)
- Interest Rate Gap Analysis (daily)
- Accrued Interest on Interest-bearing Assets and Liabilities
- Loan Portfolio Dynamic (periodic)
- Commercial Reporting
- Retail Products' Sales Dynamic
- Retail Customers' Phone Summary
- Retail Term Deposits' Dynamic with Frozen Deposits
- Projected Cash Flow

#### Management Accounting Reports

- Management Balance Sheet
- Management Income Statement
- Transfer Rate Calculation
- FTP Trial Balance Sheet

#### Operational Reporting

- Account Balances' Dynamic
- Accrued Interest of Pension Fund and UkrPost
- Cash Trial Balance Sheet (quarterly)
- Cash Turnover Analysis by Purpose

- Number of Retail Loan Arrangements
- Corporate Clients Fees and Commissions
- Cash Limits Control at ATM and Cash-desks
- Trial Balance Sheet
- Customers' Accounts Search
- Ukrainian Investment Coins Sales
- Cash Flow on Accounts
- Projected Cash Flow on Securitized Loans
- Cash Flow on Cash Accounts
- Volumes of Fees and Projected Cash Flow on Term Deposits Commission Services

The summary of the bank BI reporting structure is presented on Figure 16.

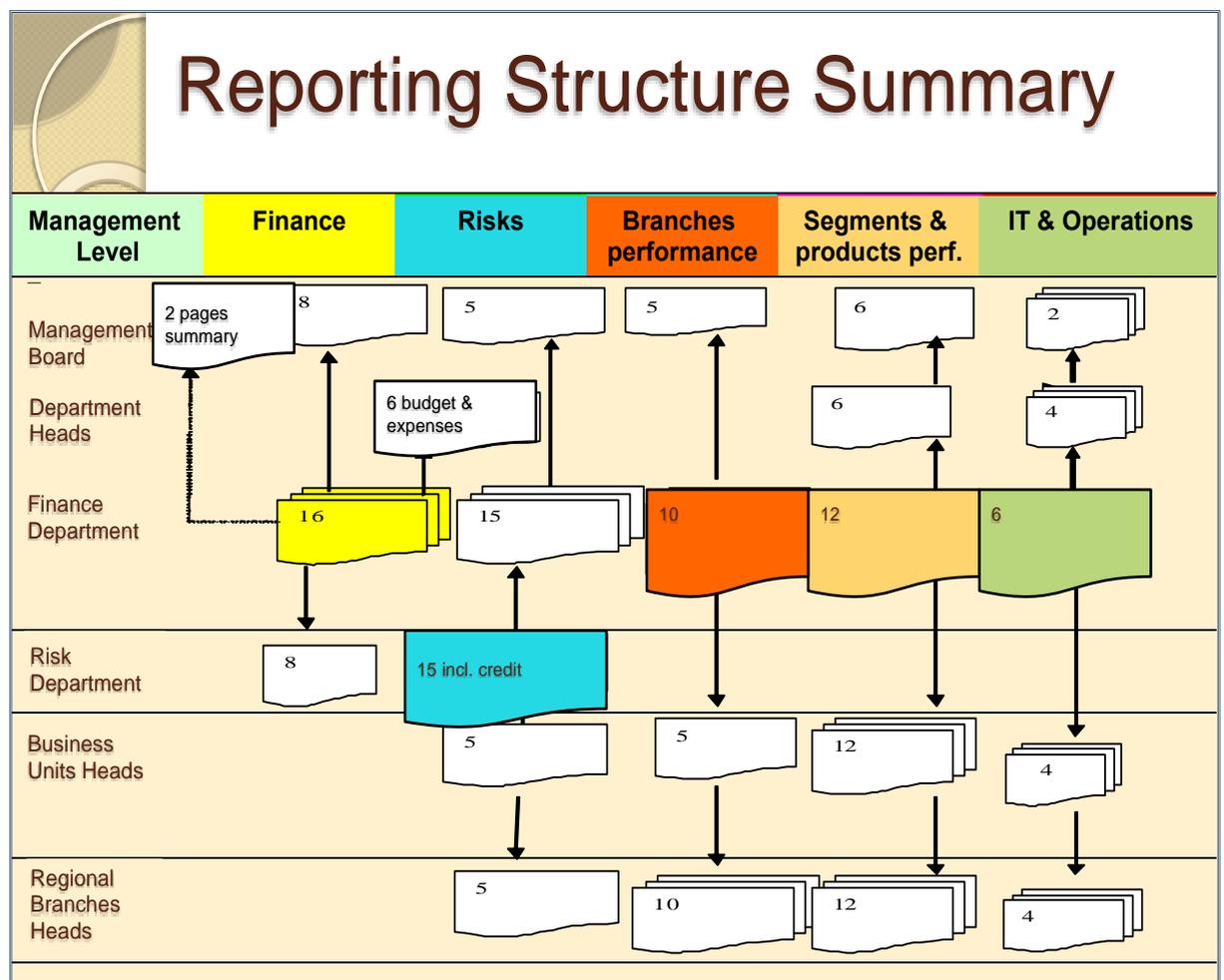


Figure 16: MIS Reports Summary of the State Savings Bank of Ukraine. Presentation of the SSBU.IBM Industry Lab Forum. Dublin, 18-21 March, 2015.

### 3.5 MIS Project Organization and Functions

The data warehouse implementation project included the following main steps:

- Project organization and management
- Development environment and technical support
- Business requirements and reports analysis
- Data analysis at source
- Logical design of the System of Records (SOR) and Dimensional Model (DM)
- Data mapping (sources data to SOR and DM)
- Design of the data upload architecture, ETL and BI architecture
- Development of technical specs and references
- Development of ETL procedures (SOR upload and DM)
- Development or integration of analytical and technical warehouse applications
- Development of BI reports
- Optimization of data warehouse databases and reports
- Testing, implementation and user training
- Data Governance, management of metadata and business terms

Project planning and organization are critical to the successful MIS implementation. During this project, it is crucial to find an executive sponsor, establish a data administration function, organize the project team, deliver training to the team, determine the implementation approach and document the project plan.

Obtaining sponsorship within the bank for the implementation of cross-enterprise data architecture is a key success factor. This management commitment should be high enough to provide leadership to achieve the implementation objectives and to assist in the resolution of issues<sup>3</sup>.

Development of DWH is also required the analysis of users' business requirements. If the subject area was "Customer" this would involve analysis of customer data requirements for the entire organization. For example, the

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<sup>3</sup>Licensed Materials of IBM: IBM Financial Services Data Model Implementation Guidelines, Release 8.2. (2009), IBM Corporation

bank may want to create a cross-enterprise customer database. In this case, it is needed to involve representatives from all business areas. Their "Customer" data requirements have to be mapped to the data warehouse model and customize.

The proper implementation planning is the next crucial components of the project success. The project manager has to create an implementation plan, with participation from the executive sponsor. The implementation plan lets the project manager and project sponsor to know what and how the implementation team has to do project. This document should include the following items<sup>4</sup>:

- Project Objectives
- Project Goals
- Project Critical Success Factors
- Project Scope
- Project Assumptions and Constraints
- Project Participants and Organization Structure
- Project Task Plan and Schedule
- Project Deliverables
- Project Logistics
- Project Tracking Plan

This plan should be reviewed and ratified by the executive sponsor. Project Objectives has to be realistic, clearly understood by the end users, the implementation team and executive sponsor. It has to answer following questions:

- What scope is to be considered? This defines the boundaries of the project.
- How much of data model will be implemented for this project? What has already been customized by other projects?
- What will be provided? This defines the project's needs
- What tasks are involved? This defines the work statement
- Who will perform the tasks? This outlines the responsibilities
- What controls will be used? This outlines ways to protect data integrity

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<sup>4</sup> Licensed Materials of IBM: IBM Financial Services Data Model Implementation Guidelines, Release 8.2. (2009), IBM Corporation

- How will the bank know when it is finished? Related to scope, this defines the completion criteria
- What facts and assumptions will affect the effort? This defines the assumptions
- What will not be provided? This helps to prevent misunderstandings

It is very important to document assumptions made when create the implementation plan and identify constraints that may inhibit the project progress. Clear documentation of assumptions and constraints will assist in the planning process.

Executive reports need to be timely to aid in the executive decision-making process. The reports need to be accurate and contain enough information to support the executive's decisions.

It is also important to determine at the project start critical success factors for the implementation effort<sup>5</sup>. For example, in subchapter 3.7 are presented the critical success factors that were defined for the State Savings Bank of Ukraine at the project start. Executive sponsorship and communications was mentioned as the key elements.

Another crucial factor for Ukraine was the availability of the highly skilled and knowledgeable data administration staff. Employees also need to understand the IBM BDW architecture and content. It is why the education was named as the next key success factor of the project.

The project needs to have an initial success story. For example, management will continue to support the project, if a new system successfully creates a report that management could not obtain previously.

Project participants and organization structure is very important competent of the MIS project.

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<sup>5</sup> Licensed Materials of IBM: IBM Financial Services Data Model Implementation Guidelines, Release 8.2. (2009), IBM Corporation

As described earlier, the key to a successful project is the identification of an executive sponsor and data administration personnel. Additional participants include a project lead, data modelling consultants and business area representatives.

Selecting business area representatives and involving them to participate in the validation and customization sessions to map requirements to and customize a data warehouse model is the one of the key successful factors of IBM BDW implementation<sup>6</sup>.

The following list summarizes the roles of key participants:

- Executive Sponsor
- Project Lead
- Data Administration Staff
- Data Modeller
- Business Area Representatives
- IT and Data Modelling Consultant

The following list identifies business area representatives within the State Savings Bank project:

- Product Management
- Customer Relations Management
- Operations Management
- Planning and Control Management
- Risk Management
- Accounting

The State Saving Bank of Ukraine project team is presented on Figure 17. Having the shortage of experienced developers using IBM tools and being the first bank in Ukraine to start the IBM BDW implementation, the bank management had decided to incorporate implementation team into the bank organization as a newly established MIS function.

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<sup>6</sup> Licensed Materials of IBM: IBM Financial Services Data Model Implementation Guidelines, Release 8.2. (2009), IBM Corporation

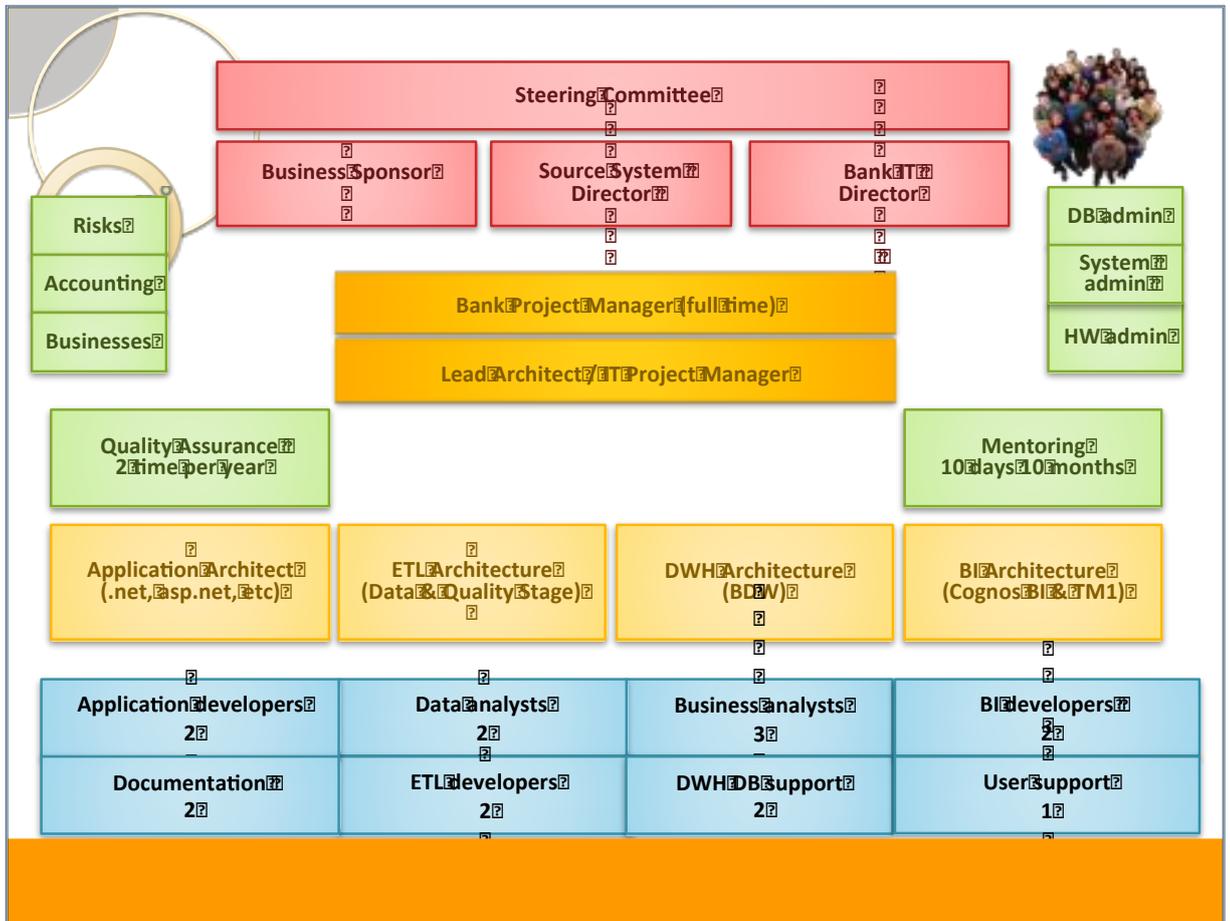


Figure 17: Project Teams and Project Roles of the State Savings Bank of Ukraine. Presentation of the SSBU.IBM Industry Lab Forum. Dublin, 18-21 March, 2015.

Apart of the above-mentioned key project functions required by IBM manual book, the MIS implementation team in the bank had included four development teams due to the project scope:

- ETL Architecture and Development Team
- Data Warehouse Architecture and Business Analysis Team
- BI Architecture and Development Team
- Data Warehouse Application Architecture and Development Team

The entire MIS team had comprised 26 people including 20 bank employees and 6 out-staffed employees of the bank ABS vendor as source system experts, data analysts and developers. A detailed list of IBM BDW implementation team for the State Saving Bank of Ukraine is provided in Appendix 7.4.

### 3.6 MIS Project Management Methodologies

IT projects are always limited by three key factors: time, cost and quality. It is the art of project management to keep equilibrium among these three key components. Otherwise, the project either would not be implemented on time, or would exceed the budget, or would have inferior quality.

Main phases of the project plan and elements of the implementation methodology for the State Savings bank of Ukraine are presented below on Figure 18.

All IT projects pass key phases of their lifecycle. There are specific processes at the each phase. During the IBM BDW implementation project at the State Savings Bank of Ukraine the IBM methodology has been used with some adjustments developed in the course of the practical implementation of projects in developing market and in large bank with mature organization.

MIS project team has actively applied state-of-the-art project management methodologies, such as Agile and Waterfall, depending on the project phase. For example, during the first project, when the major part of data warehouse had been modelled and developed within 12 months, the implementation team used Waterfall project management method.

Implementation methodology		Analysis	Design	Development	Testing	Operations
Diagnostic & Management consulting	Project organisation	Sponsor, Manager, Business Owner, Project Team, Project Goals	Project Plan & Budget: staff, outsource, training consulting, IT development	Project Management, Status Reports	Business owners involvement, dictionaries support, UAT	Training of PMO staff and MIS development team
	Methodology	Analysis of methodologies, functions, processes, technologies	Testing of methodologies on compliance with data model	Development and reconciliation of methodologies, business glossary, algorithms	UAT tests of calculations, methodology testing	Methodology & business glossary support & training
	Data Warehouse Model	Business Model & Data Model	MIS Conceptual model of SOR MIS Conceptual model of DM	Logical model of SOR & DM development Physical model development	DWH data model testing & optimization	DWH data model owners support & training
	Analytical Applications	Methodology & algorithms analysis	Business requirements, dictionaries, reports	Application architecture Applications development	Tests & optimization	Application owners support & training
	Data Quality & ETL	Data analysis in data sources, GAPs identification, Data Quality analysis	Data mapping Source to Target Source Systems Requirements	ETL architecture ETL development	Data download, ETL testing & optimization	ETL owners support & trainings
	BI Reporting	Methodology & reports analysis	BI reports design	BI architecture BI reports (incl. DQ) development	BI reports testing & optimization	BI users and BI owners support & training
	IT infrastructure	IT architecture, IT processes, IT support team	IT architecture, IT budget, IT team MIS architecture, budget, team	Tender & Purchase, Soft & Hard installation, Prod & Dev & Test, backup	Database optimization, Stress-testing, backup	Database admin, System admin., Hardware admin.
Project management & Data Governance						

Figure 18: Project Management Methodology. Presentation of the SSBU.IBM Industry Lab Forum. Dublin, 18-21 March, 2015.

At the latest stages, when MIS went in to production, the team switches to Agile method with elements of Kanban. Agile approach lets the project team to focus on business users’ requirements and plans development activities and project deliverables within one month. In combination with Kanban, it lets the project lead to effectively plan and track reports development across four development streams as well as focus on quick results to show “success story” to the end users and to the top management.

### 3.7 Key Success Factors of MIS Implementation

The main success drivers of the project implementation at the State Savings Bank of Ukraine can be summarized as follows:

- The Chairman must support and regularly control the performance of project milestones

- The Business Sponsor at the level of Deputy Chairman must be appointed in the bank to take over the deliverables within the project scope
- The Project Manager is a key function; he/she must have the business knowledge, as well as strong leadership and communication skills
- Endusers must spend their time on the development of business requirements, dictionaries and user acceptance tests
- It is important to involve source owners at early stages of the project
- A data administration staff (future MIS and DWH owners) should be appointed in the bank
- A Lead Architect of Data Warehouse and Applications is a very important role
- A qualified IBM BDW modeler is a key project function
- A reliable IT consultant is important to mentor in IBM BDW, ETL and BI tools
- Members of the implementation team must be selected thoroughly and be able to learn
- The Head of IT must organize and maintain the IT infrastructure of the MIS & DWH
- The proper project management techniques (Agile versus Waterfall) is very important during the implementation phases to focus and to deliver quick “success story” to end users
- The efficient information management and relationship management are crucial for the project success

### **3.8 Main Hypotheses for MIS Extension in CSR area**

Based on mentioned above success factors and taking into account lessons learned during the first release of MIS project, the author proposed to the head of MIS department to improve business area representatives' involvement in the future MIS releases by introducing the annual web-based interview.

Apart from improving the internal communications, the interview is targeted to:

- End users feedback gathering on MIS
- Endusers involvement in the MIS development at all levels of organization
- KPIs gathering at the all management levels of the bank
- Setting up of priorities for MIS development
- Creation of standards for proper users inquiry across the bank
- End users education and mitigation of the resistance to changes

## **4 Chapter 3: Interview Methodology and Results**

This chapter provides a summary of the methodological approach toward the interview, as well as the interview results. It describes target groups of the interview and explains the questionnaire structure.

Since December 1, 2015 the MIS unit of the bank has launched the annual web-based interview process using the developed questionnaire. The questionnaire has been developed by the author together with MIS employees to involve the bank top and middle management into the development of the shared vision of key strategic KPIs of the bank. The questionnaire has also to help in prioritizing MIS development in the next year.

At the end of this chapter, the author presents the statistics and conducts analysis of interview results as well as presents summary of main findings and assumptions. At the end of this chapter the author stresses out the importance of engagement of top management in MIS development process.

### **4.1 Interview tasks and Target Groups**

The main target groups of interview are presented in the first section of questionnaire and include all levels of Cognos BI end users in the bank:

- Chairman
- Management Board Members
- Heads of Departments in HO
- Middle-level Employees in HO
- Heads of Regional Branches
- Middle-level Employees in Regional Branches

The total number of Cognos BI user at the bank is equal to 295. The questionnaire reference had been sent to 183 end-users in the head office per e-mail. At the day of the analysis the number of the filled in questionnaires was equal to 15, which comprised 8,2% of respondents.

87% of respondents are middle-level employees. The most of them are business area representatives from the commercial domain (7 people). Four people represent the back office function, three people are from finance and economic department and two people are from the risk management function.

All respondents represent data owners at the head office level. Most of them are actively involved in the bank strategic and tactical planning, and they monitor the fulfilment of bank business plans as their own area of responsibility. Analysis of the interview results is presented in the subsection 4.3 of this paper.

## **4.2 Questionnaire Structure**

The first section of the questionnaire provides an introduction of the interviewee, and identifies his or her position, employment duration, banking experience and function at the bank.

The next section contains interviewees' feedback and evaluation of existing MIS reports and strives to identify the main areas of MIS development in 2016. The section lets to evaluate the existing MIS reporting and identify the main areas of improvements for MIS department in 2016.

The third section presents key performance indicators by main bank functional areas to give interviewees the brighter picture and to show possible KPIs, which the interviewee can use in his/her area of responsibility.

At the last section has been evaluated the future demand for reporting in 2016. This section strives to involve top management in BI reports systematization and prioritization MIS reporting. It also provides methodological standard as well as teach bank middle managers in proper tasks setting for MIS department.

The questionnaire layout provided in Appendix 7.1. It contains four main sections, which are divided by into the following sub-sections screenshots of

which are presented in Appendix 7.2.:

#### Interviewee introduction

- Name
- Date
- Years with the bank
- Years in banking industry
- Department
- Unit
- Function

#### Evaluation of Cognos BI Reports

- Completeness
- Data Quality
- Timeliness

#### Key Performance Indicators (KPIs) Scan

- Balance Sheet Structure & Financials
- Marketing & Business Strategy
- Corporate Social Responsibility
- Operations & IT
- Risk & Control
- Organization & HR

#### New Reports in Y2015-2016

- Report Owner Name
- Short Report Name
- Report Goal Description
- Report Periodicity
- Past periods needed
- Report Filters
- Report Dimensions
- Report Measures
- Report Attributes

As at January 15, 2015, 15 questionnaires out of 183 potential respondents were filled in. The analysis of interviews is presented in the next subsection.

### **4.3 Questionnaire Analysis and Results**

End Users Feedback Dashboard has been developed by author in Cognos BI to visualise interview data and to represent endusers feedback. The top-

leftsection of Dashboard presents number of end user broken down by main functional domains of the bank: risk, business, operations, support.

The bottom section presents satisfaction rate of end-user by each reporting domain<sup>7</sup> that were evaluated by three main factors:

- Completeness
- Data Quality
- Timeliness

It is easy to see that ad hoc reporting in Query Studio has to be improved from point of view of timeliness and completeness.

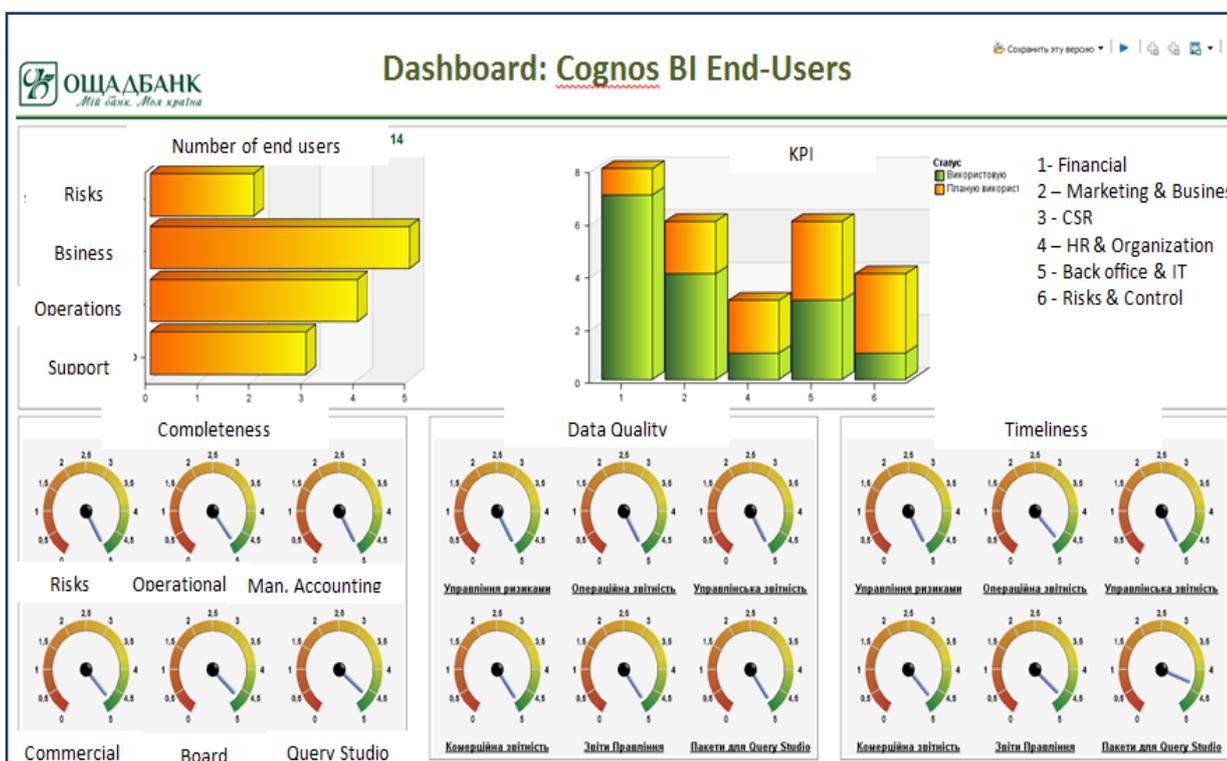


Figure 19: Screenshot of Dashboard: Cognos BI End Users Feedback Summary, Anton Romanenko

The top-right part of Dashboard presents end users' priorities in proposed KPIs. The green colour presents KPIs that has already been used and or-

<sup>7</sup>Management Board Reporting, Risk Management reporting, Operations and IT reporting, Management Accounting Reporting, Commercial Reporting, Ad Hoc or Query Studio Reporting.

ange reflects KPIs that users would like to use in the future. According to this figure, KPIs domains can be ranked from high to low priority as follows:

- Financials & Balance Sheet Structure KPIs
- Marketing & Business Strategy KPIs
- Operations & IT
- Risk & Control
- HR & Organisation

The Financial & Balance Sheet KPIs scan shows at figures below. The basic financial KPIs such as volumes, costs and profit are the most required by end users. However, the answers show that risk-based performance KPIs such as risk-adjusted return on economic capital (RAROC), structural balance sheet mismatches, loans to deposit ratio and impaired loans to gross loans ratio are not used or seldom used by the bank end users.

Lack of interest in risk-based KPIs reflects the low level of education of Ukrainian bankers.

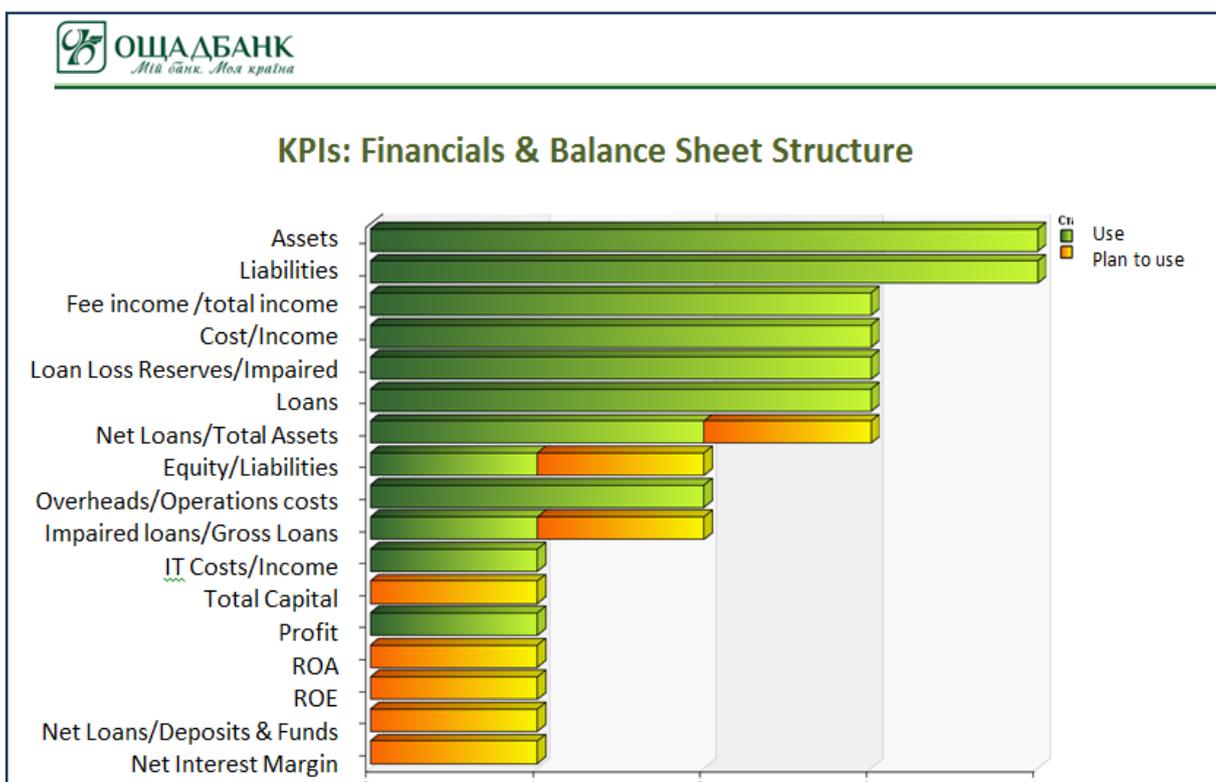


Figure 20: Screenshot of Dashboard: Feedback Financials & Balance Sheet Structure KPIs, Anton Romanenko

The RAROC model lets a bank to monitor not only rewards, but also risks involved in their operations as well as requires covering risks by the economic capital to mitigate the risk of a bank bankruptcy and insolvency. It is an industry standard for international banks as required by Basel regulation.

Based on the recommendation of ING IGA consulting team, the main KPIs that are the most important for the sustainability, risk mitigation and long-term value creation of banking institutions were included into the questionnaire:

- Sales Volumes (volume by loans, deposits)
- Balance Sheet Structural GAP (loans to deposit ratio)
- Bad debts (impaired loans to total loans and investments portfolio)
- Non-earning assets (to total assets ratio)
- Capital adequacy ratio (capital to RWA and capital to total assets ratios)
- Economic capital to cover unexpected losses
- RAROC (risk-adjusted return on economic capital)
- Interest income on earning assets
- Cost of interest bearing liabilities
- Fees and commissions growth
- Net gain or losses on trading assets
- Provisions expenses
- Operating expenses
- Number of employees

Marketing & Business Strategy KPIs is the second most used data domain at the bank, which is logical. Sales volumes and sales dynamics are the most tracked in any bank. However, customer satisfactions, customer complains as well as products and segments related KPIs are relatively seldom used at the bank.

Limitations of Ukrainian banks' core banking systems do not allow to record marketing and client relationship information by clients. The lack of well-educated bank analysts and methodologists is reflected in Ukrainian banks' processes and IT systems.

Local Ukrainian core banking systems basically record General Ledger data such as posting entries. It does not make it possible to create flexible report-

ing based on arrangement data. A Data Warehouse makes it possible to present marketing KPIs related to products' sales volumes and profit at the bank MIS reports.

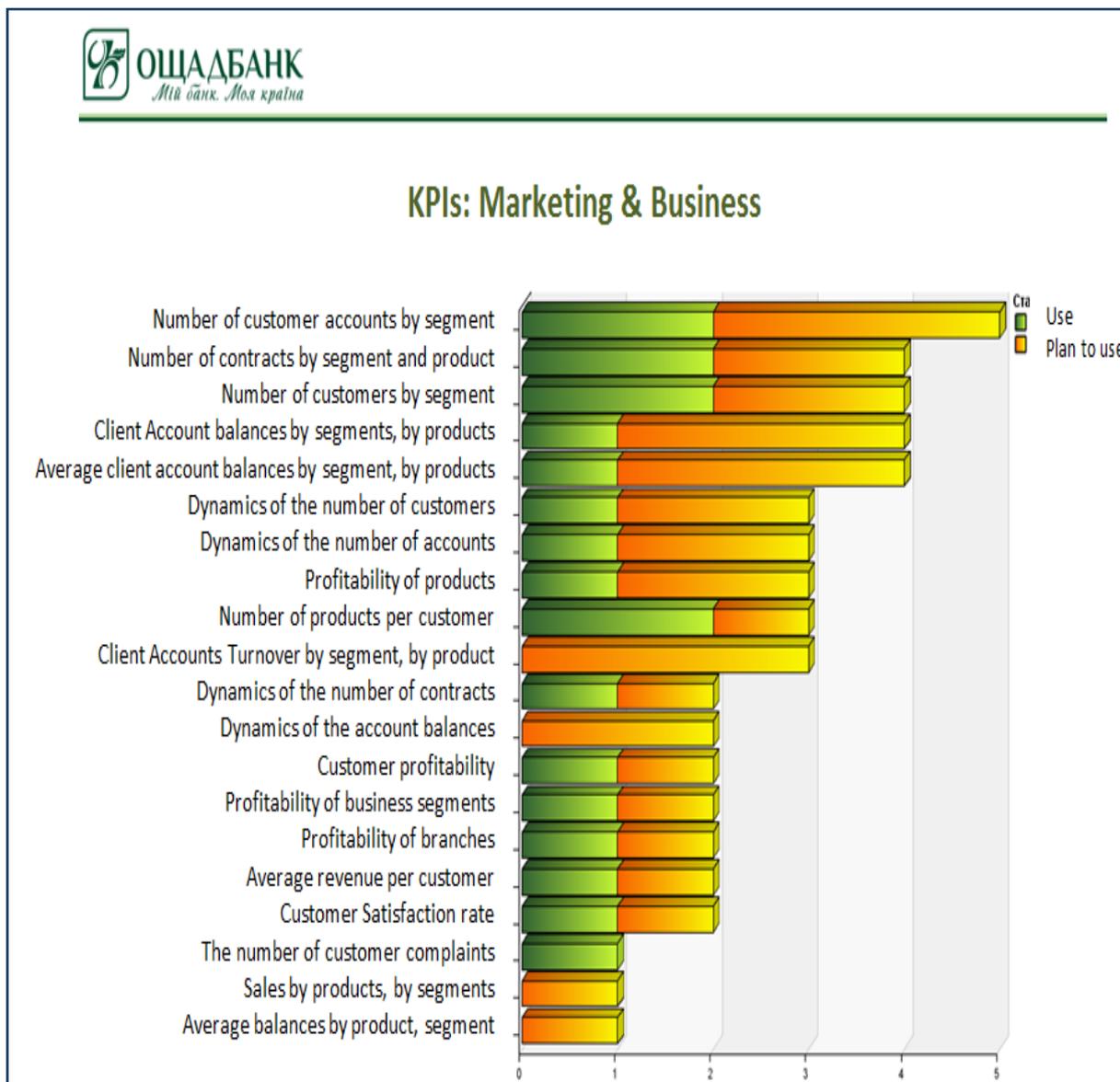


Figure 21: Screenshot of Dashboard: Feedback on Marketing & Business Strategy KPIs, Anton Romanenko

The MIS and Data Warehouse project at the State Savings Bank of Ukraine, which is a systemic bank, can shift this situation for the better. However, the knowledge sharing and experience dissemination are needed to make this changes sustainable in Ukraine.

As explained earlier, the KPIs, which are related mainly to risk mitigation, were included in the interview under appropriate sections. Figure 22 presents the interview results for Risk and Control section:

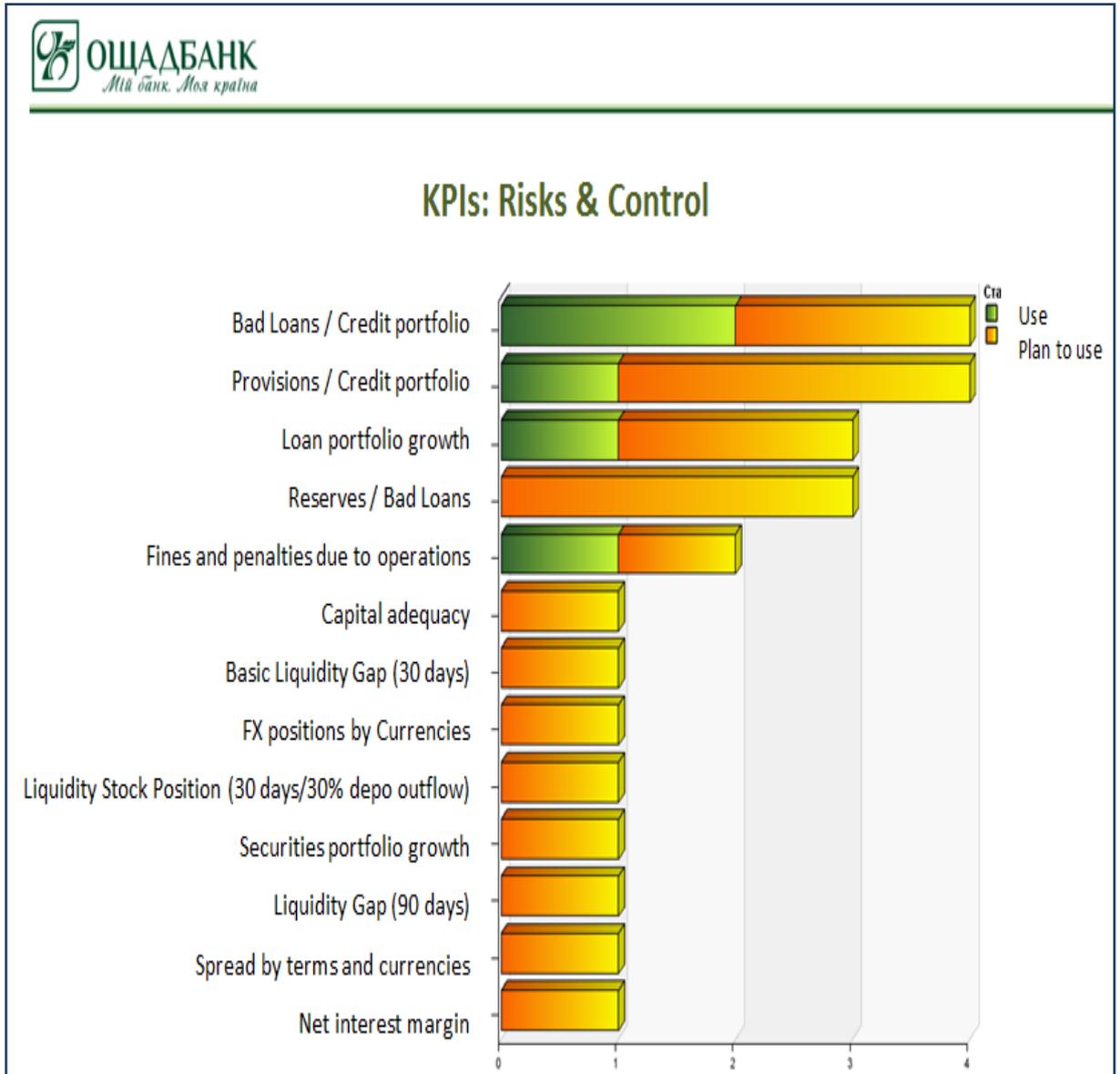


Figure 22: Screenshot of Dashboard: Feedback on Risk & Control KPIs, Anton Romanenko

In Operations (or Back Office) & IT domain the following KPIs were included and admitted by end-users as “used and/or desirable”:

- The outflow of Back Office Employees
- The outflow of IT Employees
- Training Costs / Staff IT
- Training Costs / Employees Back Office

On Figure 23 has presented screenshot of Dashboard that reflect the feedback of end-users on the questions of “Bank Office & IT KPIs”:

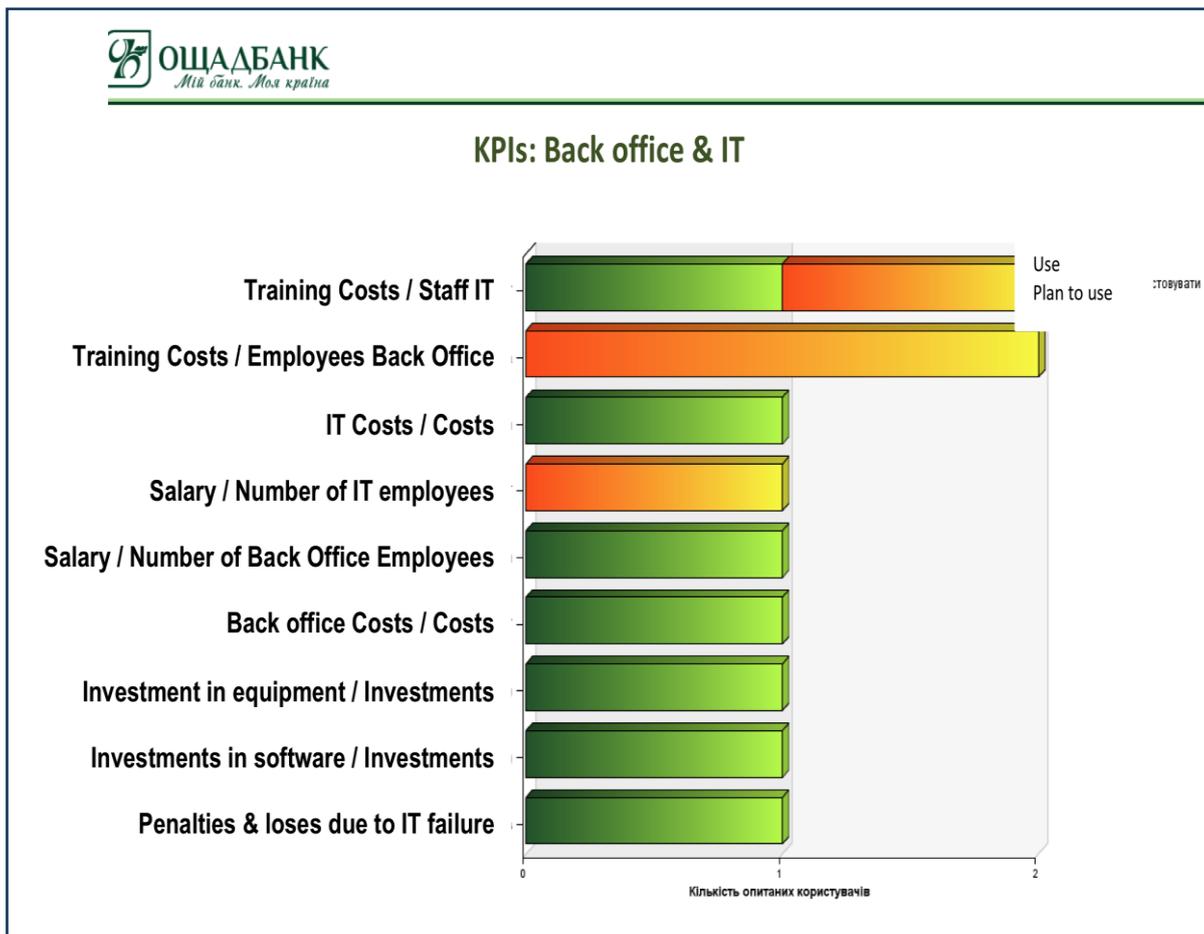


Figure 23: Screenshot of Dashboard:Feedback on Bank Office & IT KPIs, Anton Romanenko

KPIs included in Organisation & HR and marked as “used and/or desirable” are:

- Outflow of staff per year
- Percentage of full time employees
- Percentage of part time employees
- Senior Positions Non-Filled / Number of Senior Positions
- Men to Women ration by employees category
- Training Budget/ Total Cost

It is interesting to notice that KPIs that were not marked as “used or desirable” in this section are as follows:

- Employees Satisfaction Ratio
- Sick Leave Days / Total Working Days
- Average Salary per Employee
- Training Days / Number of Employee by Category

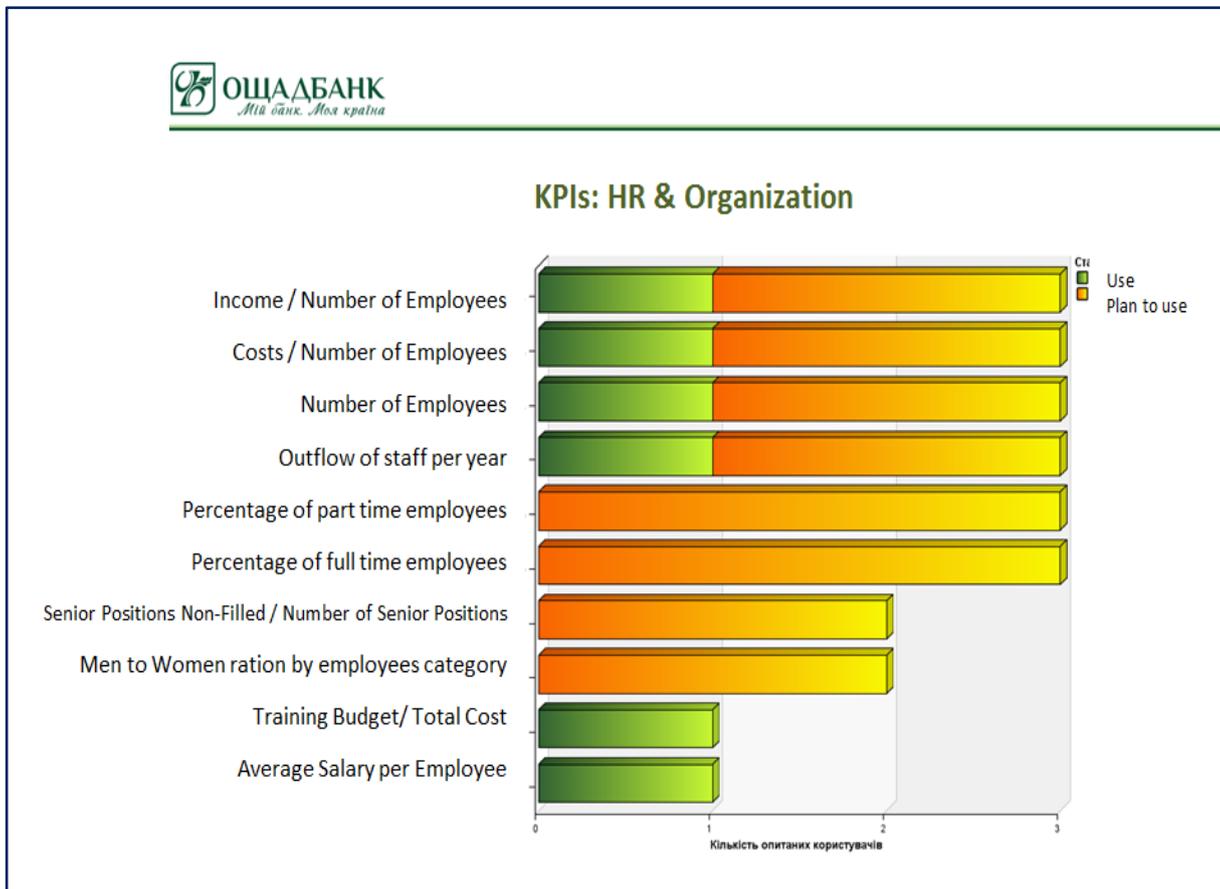


Figure 24: Screenshot of Dashboard:Feedback on HR &Organisation KPIs, Anton Romanenko

The questionnaire results allow the MIS team to prioritise KPIs and reports to be implemented in 2016.

## 5 Conclusion

This section offers the final conclusions of the study. The author also analyses limitations of the study and presents his ideas and suggestions for the further improvement of the MIS process at the bank.

### 5.1 Limitations of the Study and Assumptions

The web-based interview was started on December 1, 2015. The analysis of the interview was finished on January 15, 2015. The interview lasted for six weeks.

8,2 % of respondents were active and cooperative and presented representative sampling. They asked questions and provided their answers very quickly. It lets to conclude that the research basically reflects active endusers feedback correctly.

It is appropriate to mention that around 120 end users of Cognos BI in the regional branches were out of interview scope due to information security limitations. The information security department has required additional time to connect regional users to this web-based questionnaire.

To continue the endusers engagement, the author is going to connect regional managers to the web-based questionnaire, as well as to run this interview on an ongoing basis. The result of the interview will be constantly available on the bank corporate intranet portal.

The author would also like to admit that the influence of this interview should be evaluated on a long-term basis. He hopes that the annual web-based interview will have a long-term effect and its consequences should be evaluated in a one- or two-year timeframe.

He hopes that new KPIs will be gradually incorporated into the daily practise at all levels of the organisation.

The internal communications and relationship management are the key success factors in this process and the annual questionnaire could be used as a tool to build up this communication and to involve endusers in the MIS development process.

## **5.2 Summary and Final Conclusions**

The author is concluding that the clear sponsorship and leadership, as well as proper information and communications are crucial for the success of any big change in an organization. The Management Board has to play the crucial role in this process.

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## 7 Abbreviations

ABS	Automated Banking System
ATM	Automated Teller Machine
BI	Business Intelligence
CASE	Computer-Aided Software Engineering
CAR	Capital Adequacy Ratio
CER	Cost Efficiency Ratio
GL	General Leger
GRI	General Reporting Initiative
DB	Data Base
DM	Data Marts
DWH	Data Warehouse
ETL	Extract Transform Load
IAS	International Accounting Standards
ING IGA	ING Institutional & Government Advisory
IBM BDW	IBM Banking Data Warehouse
IFRS	International Financial Reporting Standards
ING IGA	ING Institutional & Government Advisory Services
KPI	Key Performance Indicators
MIS	Management Information System
MMSB	Micro, Medium, Small Businesses

Abbreviations



NBU	the National Bank of Ukraine
NPL	Non-performing Loans
OLTP	On-line transaction processing systems
SSBU	the State Savings Bank of Ukraine or Oschadbank
RAROC	Risk Adjusted Return on Capital at Risk
ROA	Return on Assets
ROE	Return on Capital

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## 9 Appendixes

### 9.1 Questionnaire Layout

#### Questionnaire MIS development in Y2015-2016

To plan MIS priorities in Y2015-2016 and to improve existing reporting Cognos BI system, please complete the questionnaire below. After filling in the questionnaire, please agree with your department head the five high-priority reports needed for your department or your regional branch in the next year.

When designing reports, please use the new application form with examples of reports formats that could be downloaded on the bank's corporate portal [by following link](#)

Application form and reports' formats should be sent by e-mail to Berezi-netsVV@oschadbank.ua

#### Tab.1. Whom to Interview?

Please indicate below your name, position and function at the bank

Name	
Date	
Years with the bank	
Years in banking industry	
Department	
Unit	
Function	

#### Tab.2. Evaluation of Cognos BI Reports

Please put the number from min 1 to max 5 (1- not sufficient, 2 - acceptable, 3 – sufficient, 4- good, 5 - excellent) to evaluate reports below for completeness, data quality and timeliness of generation. Please add your additional comments in the last column, if needed.

Report	Completeness	Data Quality	Timeliness
<b>Management Board Reports</b>			
Dashboard: Competitor Banks Analysis			
Dashboard: Corporate Business			
Dashboard: Retail Business			
Dashboard: Data Quality Finevare			

Balance Sheet			
Income Statement			
Interest Income and Expenses Analysis			
Fees and Commissions Analysis			
Administrative Expenses Analysis			
Deposit Portfolio Analysis			
Credit Portfolio Analysis			
Interbank Market Operations			
Clients' Accounts and Accounts Balances Dynamics			
Operational Segments Performance			
Branch Performance			
Corporate Client Performance			
Top Clients by Financial Indicators			
<b>Management Accounting Reports</b>			
Management Balance Sheet			
Management Income Statement			
Transfer Rate Calculation			
FTP Trial Balance Sheet			
<b>Risk Management Reports</b>			
Nominal interest rates Analysis by currency (periodic)			
Nominal interest rates Analysis by currency (daily)			
Interest Rate Gap Analysis (periodic)			
Interest Rate Gap Analysis (daily)			
Accrued Interest on Interest-bearing Assets&Liabilities			
Loan Portfolio Dynamic (periodic)			
Commercial Reporting			
Retail Products' Sales Dynamic			
Retail Customers' Phone Summary			
Retail Term Deposits' Dynamic with Frozen Deposits			
Projected Cash Flow			
<b>Operational Reporting</b>			
Account Balances' Dynamic			
Accrued Interest of Pension Fund and UkrPost			
Cash Trial Balance Sheet (quarterly)			
Cash Turnover Analysis by Purpose			
Number of Retail Loan Arrangements			
Corporate Clients Fees and Commissions			
Cash Limits Control at ATM and Cash-desks			
Trial Balance Sheet			
Customers' Accounts Search			
Ukrainian Investment Coins Sales			
Cash Flow on Accounts			
Projected Cash Flow on Securitized Loans			
Cash Flow on Cash Accounts			
Projected Cash Flow on Term Deposits			

**Tab.3. Key Performance Indicators (KPIs) Scan**

Please mark the key indicators that you use, plan to use or not use in your work. Please add other indicators, if not listed, but needed.

*Balance Sheet Structure & Financials*

<b>Indicators</b>	<b>Use</b>	<b>Plan to use</b>	<b>Not use</b>
Total Capital			
Assets			
Liabilities			
Equity/Liabilities			
Net Loans/Total Assets			
Net Loans/Total Deposits & Borrowed Funds			
Loan Loss Reserves/Impaired Loans			
Impaired loans/Gross Loans			
Net Interest Margin (NIM)			
Fee income /total income			
Cost/Income			
IT Costs/Income			
Overheads/Operations costs			
Profit			
ROA			
ROE			
RAROC			

*Marketing & Business Strategy*

<b>Indicators</b>	<b>Use</b>	<b>Plan to use</b>	<b>Not use</b>
Number of customer accounts by segment			
The number of customers by segment			
Number of contracts by segment and product			
The number of products per customer			
Client Account balances by segments, by products			
Average client account balances by segments, products			
Client Accounts Turnover by segment, by product			
Sales by products, by segments			
Average balances for the period by product, segment			
Dynamics of the number of customers			
Dynamics of the number of contracts			
Dynamics of the number of accounts			
Dynamics of the account balances			
Customer Satisfaction rate			
The number of customer complaints			
Profitability of business segments			
Profitability of products			
Profitability of branches			
Customer profitability			
Average revenue per customer			

Capital-at-risk on segments, subsidiaries, products			
---	--	--	--

*Corporate Social Responsibility indicators*

<b>Indicators</b>	<b>Use</b>	<b>Plan to use</b>	<b>Not use</b>
Loan Volumes to Renewable Energy Production & Transmission Companies			
Loan Volumes to Water Recycled and Reused Clients			
Loan Volumes to Bioagriculture Clients			
Loan Volumes to Habitants protection and restored Clients			
Loan Volumes to Greenhouse gas emission Clients			
Loan Volumes to Regional Infrastructural Projects			
Government Funds paid for Subsidies and Compensations to Population (by type)			

*Operations & IT*

<b>Indicators</b>	<b>Use</b>	<b>Plan to use</b>	<b>Not use</b>
Salary of Back Office Employees / Number of Back Office Employees			
Salary of IT Employees / Number of IT employees			
IT Costs / Costs			
Back office Costs / Costs			
Training Costs / Staff IT			
Training Costs / Employees Back Office			
The outflow of Back Office Employees			
The outflow of IT Employees			
External IT staff / Own IT staff			
Investment in equipment / Investments			
Investments in software / Investments			
Current IT Expenses			

*Risk & Control*

<b>Indicators</b>	<b>Use</b>	<b>Plan to use</b>	<b>Not use</b>
Capital adequacy			
Loan portfolio growth			
Securities portfolio growth			
Net interest margin			
Spread by terms and currencies			
Provisions / Credit portfolio			
Bad Loans / Credit portfolio			
Reserves / Bad Loans			

Basic Liquidity Gap (30 days)			
Liquidity Gap (90 days)			
Liquidity Stock Position (30 days GAP with 30% of deposits outflow)			
FX positions by Currencies			
Fines and penalties due to operational errors			
Fines and penalties due to IT failures			

#### *Organization & HR*

Indicators	Use	Plan to use	Not use
Number of Employees			
Income / Number of Employees			
Costs / Number of Employees			
Senior Positions Non-Filled / Number of Senior Positions			
Men to Women ration by employees category			
Percentage of full time employees			
Percentage of part time employees			
Outflow of staff per year			
Employees Satisfaction Ratio			
Number of Staff Appraisals/Total Staff			
Sick Leave Days / Total Working Days			
Average Salary per Employee			
Training Budget/ Total Cost			
Training Days / Number of Employee by category			

#### **Tab.4. New Report Inquiry in Y2015-2016**

Please indicate 5 new reports that you would need the next year in addition to the current reporting set.

#### *User Contact Data*

<b>Report Owner</b>	Specify the employee who creates a requirement to report and test the generated reports
<b>Report Name</b>	
<b>Short Report Name</b>	
<b>Report Goal Description</b>	

#### *Report description*

This is a technical section. You only need to fill it in, if you are a middle-level manager or analyst

<b>Report format</b>	Specify options
	Dashboard
	Report Studio
	Query Studio

	Web-service
	Developer decision
<b>Periodicity</b>	Specify options
	Daily
	Monthly
	Quarterly
	Annually
<b>Past periods needed</b>	Specify options
	Past Days
	Past Months
	Past Quarter
	Past Year
<b>Report Filters</b>	Specify options (see. Appendix 1)
	Currency
	Period
	Date
	Client Segment
	Region
	Report Measures
	.... (add, if needed)
<b>Report Dimensions</b>	Specify options (see. Appendix 1)
	Client Segment
	Organization Units
	Industry
	Business (Operational) Segment
	Product Group
	Product
	Arrangement
	Client
	Balance Sheet Items
	Analytical Accounts
	.... (add, if needed)
<b>Dimension's Attributes</b>	Specify options (see. Appendix 1)
Attribute 1	Start Date
Attribute Name in Report	
Attribute description	
Attribute calculation algorithm	
Additional information	
Attribute 2	End Date
Attribute Name in Report	
Attribute description	
Attribute calculation algorithm	

Additional information	
Attribute 3	Currency
Attribute Name in Report	
Attribute description	
Attribute calculation algorithm	
Additional information	
....	Type of Dimension
<b>Report Measures</b>	Specify options (see. Appendix 1)
	Number
	Amount of account balance
	Amount of account turnover
	Average Amount
	Initial Amount
	Current Amount

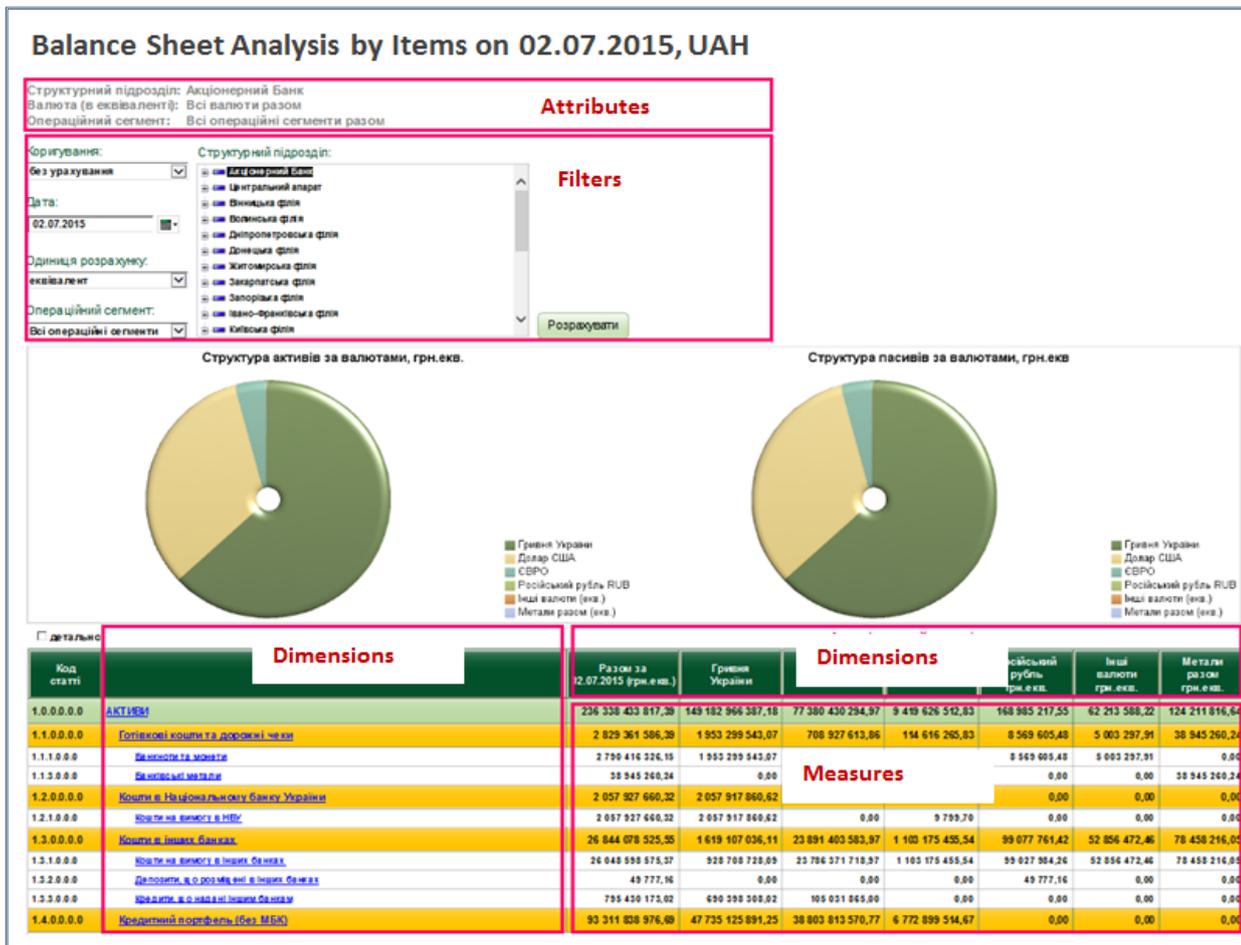
### 5. Example of Report Filters, Dimensions, Attributes and Measures

To plan MIS priorities in Y2015-2016 and to improve existing reporting Cognos BI system, please complete the questionnaire below.

After filling in the questionnaire, please, agree with your department head five high-priority reports needed for your department or your regional branch in the next year.

When designing reports, please use the new application form with examples of reports formats that could be downloaded on the bank's corporate portal [by following link](#)

Application form and reports' formats should be sent by e-mail to [BerezynetsVV@oschadbank.ua](mailto:BerezynetsVV@oschadbank.ua)



### Drill through to Accounts Dimension

За 02.07.2015 року, грн.

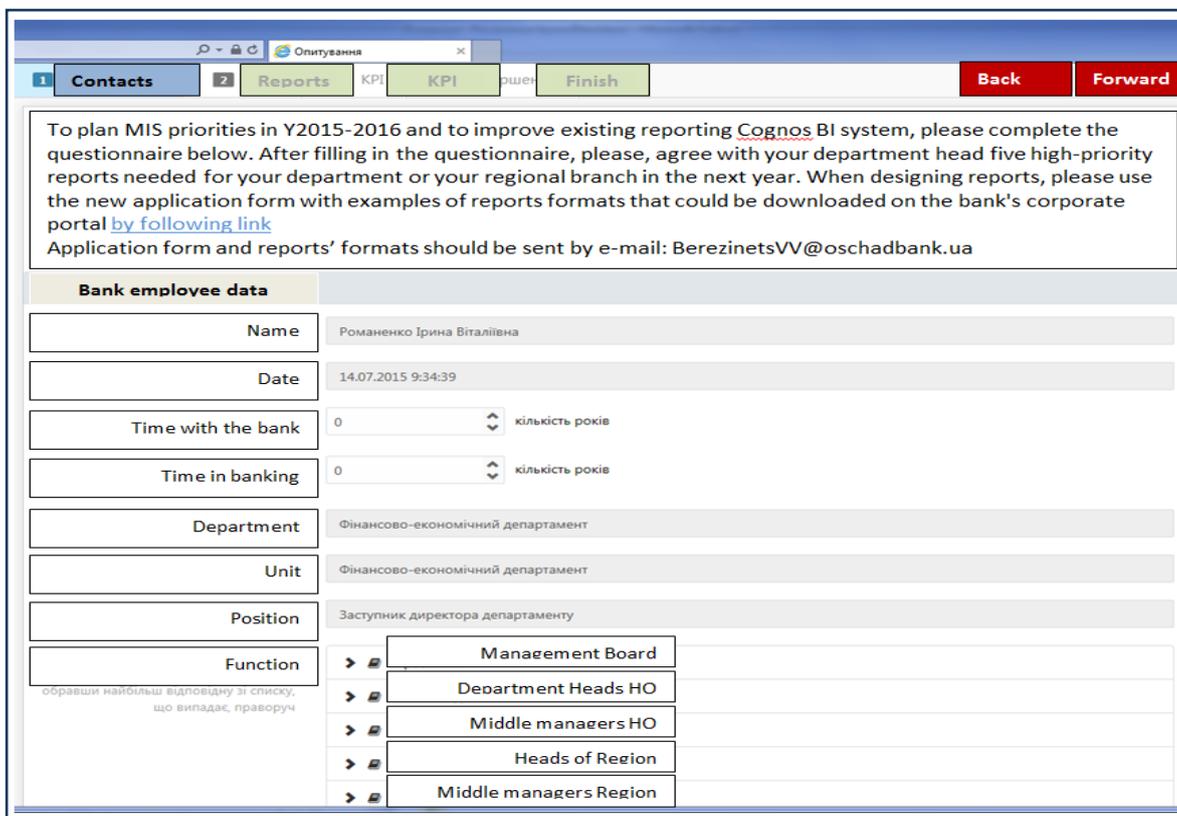
**Measures**

Стаття: 1.1.1.6.0.0 - Банківські кошти та монети в дорозі  
 Підрозділ вищого рівня: Вінницька філія

Регіон	Структурний підрозділ	Балансовий рахунок	Код ОБЗГ	Особовий рахунок	Валюта операції	Операційний сегмент	Назва рахунку	Залишок	На початок місяця		
									обсяг	Δ	%
Вінницька філія	ТБЕВ № 100010175	1007	01	10076986000001	UAH	Казначейський бізнес	Банківські відслани до підзвітних установ банку МІСТО	1 245 750,00	0,00	1 245 750,00	100,00%
Вінницька філія	ТБЕВ № 10001	1007	01	10074900000001	USD	Казначейський бізнес	Банківські відслани до підзвітних установ банку ОПЕРВ	409 624,27	100 978,80	308 645,47	305,65%
Вінницька філія	ТБЕВ № 100010175	1007	01	10076986000001	USD	Казначейський бізнес	Банківські відслани до підзвітних установ банку МІСЬКЕ	361 624,71	0,00	361 624,71	100,00%
Вінницька філія	ТБЕВ № 100010106	1007	01	10071936000001	UAH	Казначейський бізнес	Банківські відслани до підзвітних установ банку ТРОСТЯНЕЦЬ	100 000,00	0,00	100 000,00	100,00%
Вінницька філія	ТБЕВ № 100010175	1007	01	10076986000001	EUR	Казначейський бізнес	Банківські відслани до підзвітних установ банку МІСЬКЕ	97 232,20	0,00	97 232,20	100,00%
Вінницька філія	ТБЕВ № 100010120	1007	01	10072913000001	UAH	Казначейський бізнес	Банківські відслани до підзвітних установ банку ХМІЛЬНИК	47 000,00	0,00	47 000,00	100,00%
Вінницька філія	ТБЕВ № 100010148	1007	01	10077929000001	UAH	Казначейський бізнес	Банківські відслани до підзвітних установ банку ІЛІНЦІ	30 000,00	0,00	30 000,00	100,00%
Вінницька філія	ТБЕВ № 10001	1007	01	10074900000001	RUB	Казначейський бізнес	Банківські відслани до підзвітних установ банку ОПЕРВ	11 359,80	0,00	11 359,80	100,00%

Figure 25: Interview Section of Reports Inquiry: Example of Measures, Dimensions, Filters, Attributes

## 9.2 Screenshots of Questionnaire from the Bank Portal



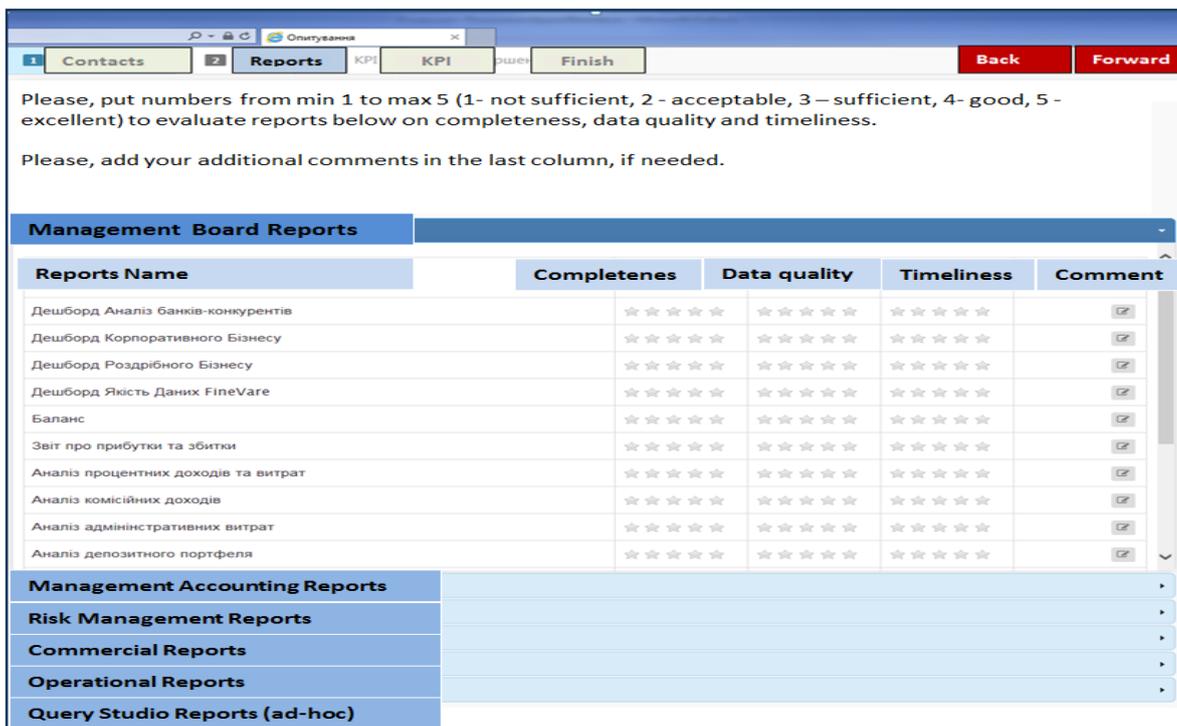
To plan MIS priorities in Y2015-2016 and to improve existing reporting Cognos BI system, please complete the questionnaire below. After filling in the questionnaire, please, agree with your department head five high-priority reports needed for your department or your regional branch in the next year. When designing reports, please use the new application form with examples of reports formats that could be downloaded on the bank's corporate portal by [following link](#)  
Application form and reports' formats should be sent by e-mail: BerezinetsVV@oschadbank.ua

**Bank employee data**

Name	Романенко Ірина Віталіївна
Date	14.07.2015 9:34:39
Time with the bank	0 <input type="text"/> кількість років
Time in banking	0 <input type="text"/> кількість років
Department	Фінансово-економічний департамент
Unit	Фінансово-економічний департамент
Position	Заступник директора департаменту
Function	<input type="checkbox"/> Management Board <input type="checkbox"/> Department Heads HO <input type="checkbox"/> Middle managers HO <input type="checkbox"/> Heads of Region <input type="checkbox"/> Middle managers Region

обрати найбільш відповідну зі списку, що випадає, праворуч

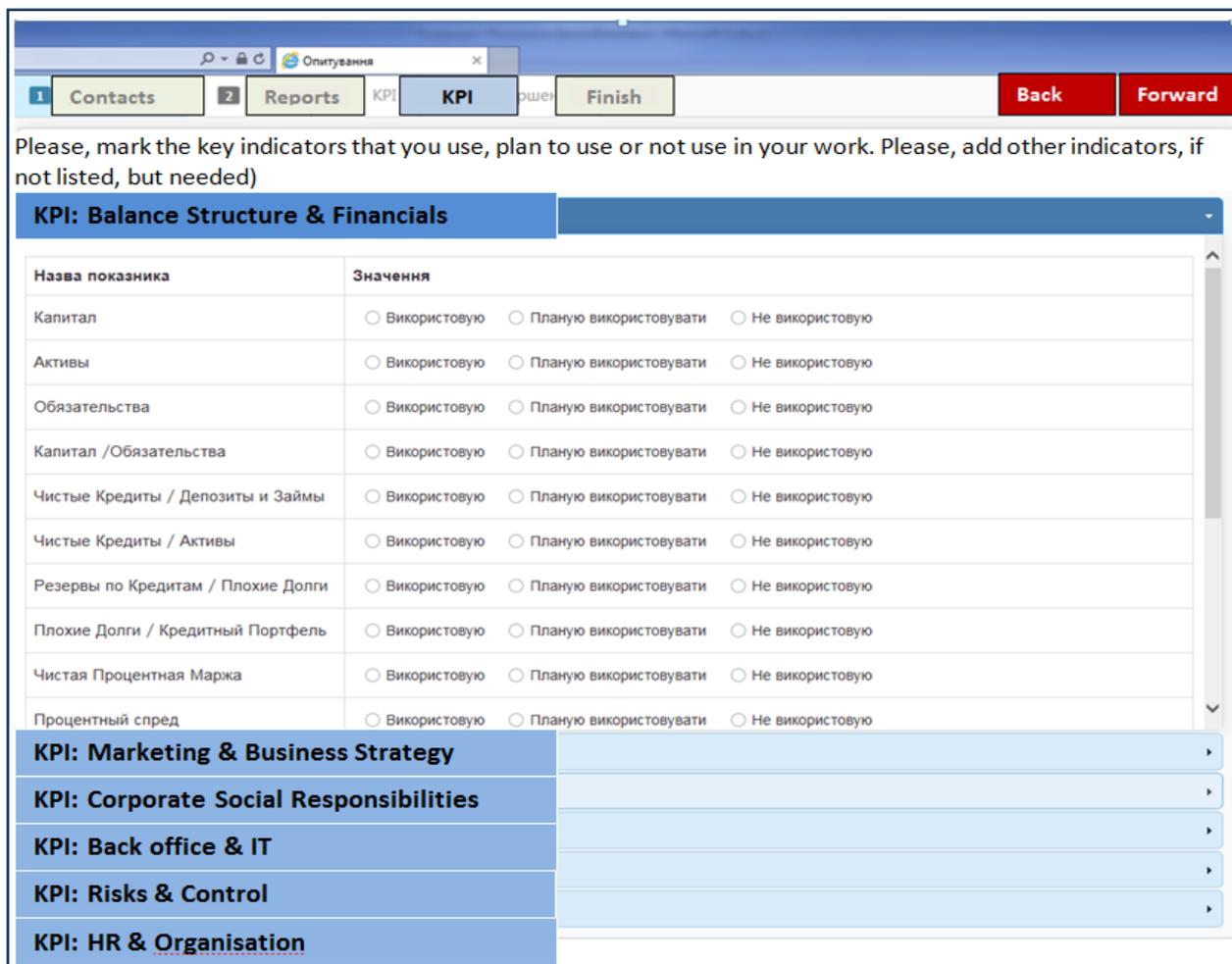
Figure 26: Screenshot of Questionnaire: Introduction Section



Please, put numbers from min 1 to max 5 (1- not sufficient, 2 - acceptable, 3 – sufficient, 4- good, 5 - excellent) to evaluate reports below on completeness, data quality and timeliness.  
Please, add your additional comments in the last column, if needed.

Reports Name	Completeness	Data quality	Timeliness	Comment
Дешборд Аналіз банків-конкурентів	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Дешборд Корпоративного Бізнесу	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Дешборд Роздрібного Бізнесу	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Дешборд Якість Даних FineVare	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Баланс	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Звіт про прибутки та збитки	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Аналіз процентних доходів та витрат	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Аналіз комісійних доходів	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Аналіз адміністративних витрат	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
Аналіз депозитного портфеля	☆☆☆☆☆	☆☆☆☆☆	☆☆☆☆☆	<input checked="" type="checkbox"/>
<b>Management Board Reports</b>				
<b>Management Accounting Reports</b>				
<b>Risk Management Reports</b>				
<b>Commercial Reports</b>				
<b>Operational Reports</b>				
<b>Query Studio Reports (ad-hoc)</b>				

Figure 27: Screenshot of Questionnaire: BI Reports Evaluation Section



1 Contacts 2 Reports KPI KPI ршен Finish Back Forward

Please, mark the key indicators that you use, plan to use or not use in your work. Please, add other indicators, if not listed, but needed)

**KPI: Balance Structure & Financials**

Назва показника	Значення
Капитал	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Активи	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Обязательства	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Капитал /Обязательства	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Чистые Кредиты / Депозиты и Займы	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Чистые Кредиты / Активы	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Резервы по Кредитам / Плохие Долги	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Плохие Долги / Кредитный Портфель	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Чистая Процентная Маржа	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую
Процентный спред	<input type="radio"/> Використовую <input type="radio"/> Планую використовувати <input type="radio"/> Не використовую

**KPI: Marketing & Business Strategy**

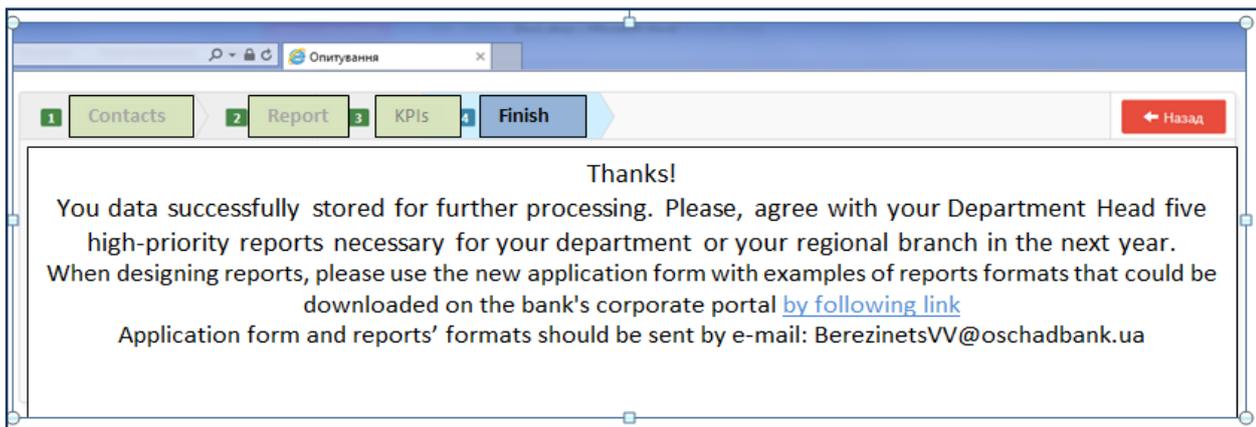
**KPI: Corporate Social Responsibilities**

**KPI: Back office & IT**

**KPI: Risks & Control**

**KPI: HR & Organisation**

Figure 28: Screenshot of Questionnaire: KPI's Scan Section



1 Contacts 2 Report 3 KPIs 4 Finish Назад

Thanks!

You data successfully stored for further processing. Please, agree with your Department Head five high-priority reports necessary for your department or your regional branch in the next year. When designing reports, please use the new application form with examples of reports formats that could be downloaded on the bank's corporate portal [by following link](#)  
Application form and reports' formats should be sent by e-mail: [BerezinetsVV@oschadbank.ua](mailto:BerezinetsVV@oschadbank.ua)

Figure 29: Screenshot of Questionnaire: New Reports Inquiry Section

### 9.3 Screenshots of Cognos BIReport Studioof the Bank

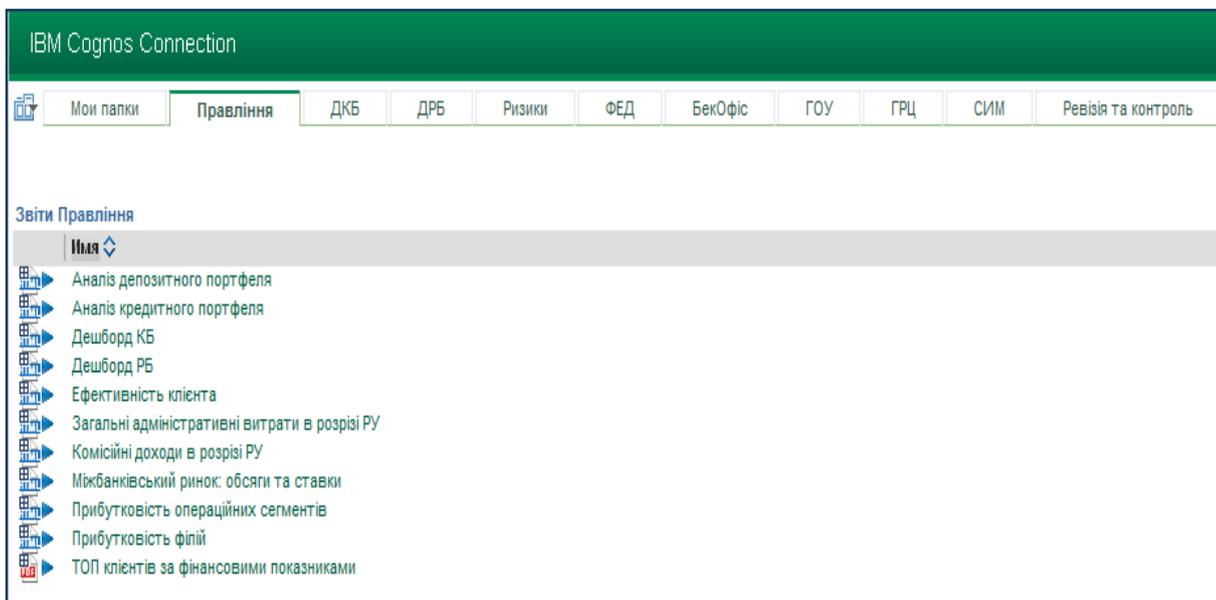


Figure 30: Screenshot of MIS Structure for Management Board

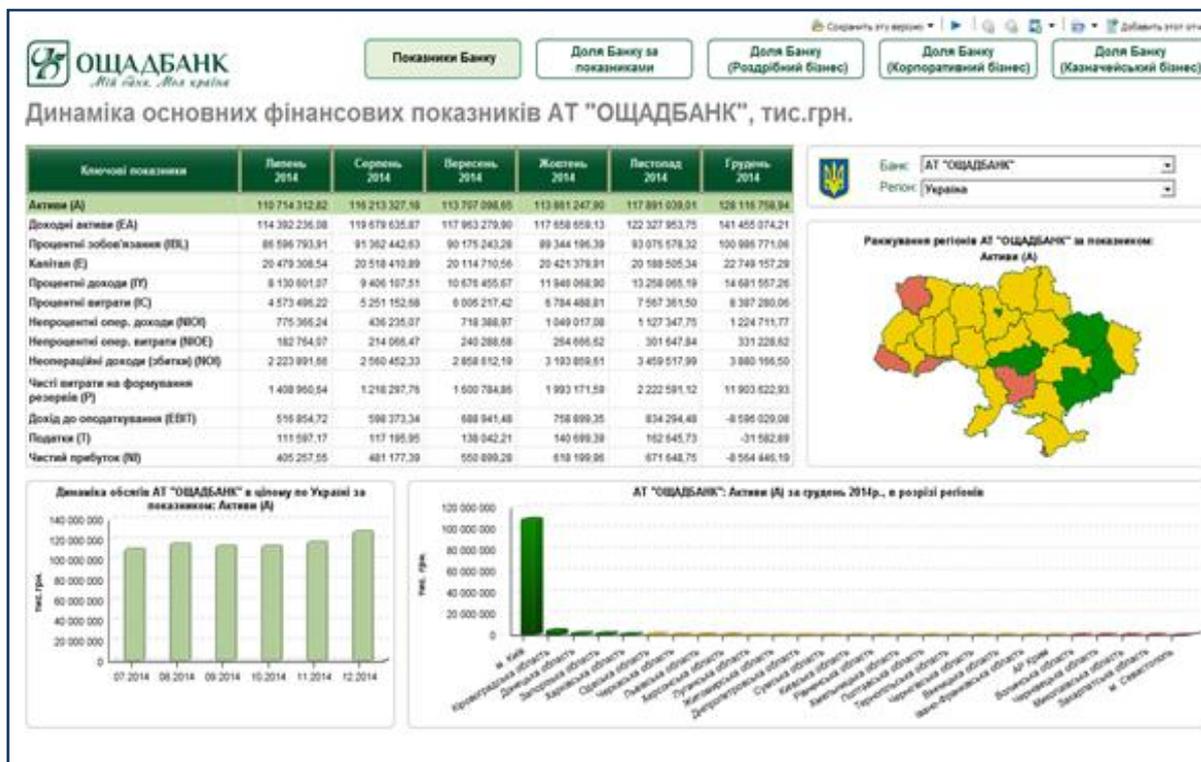


Figure31: Screenshot of Competitors Analysis Dashboard

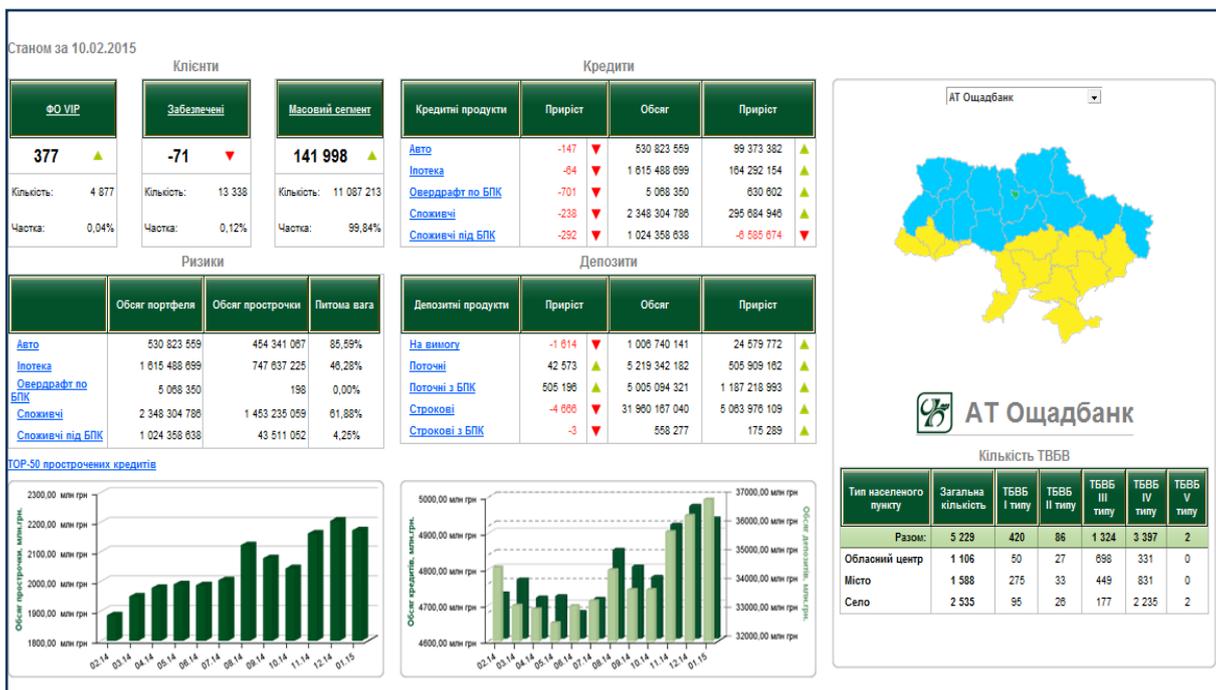


Figure 32: Screenshot of Retail Business Dashboard

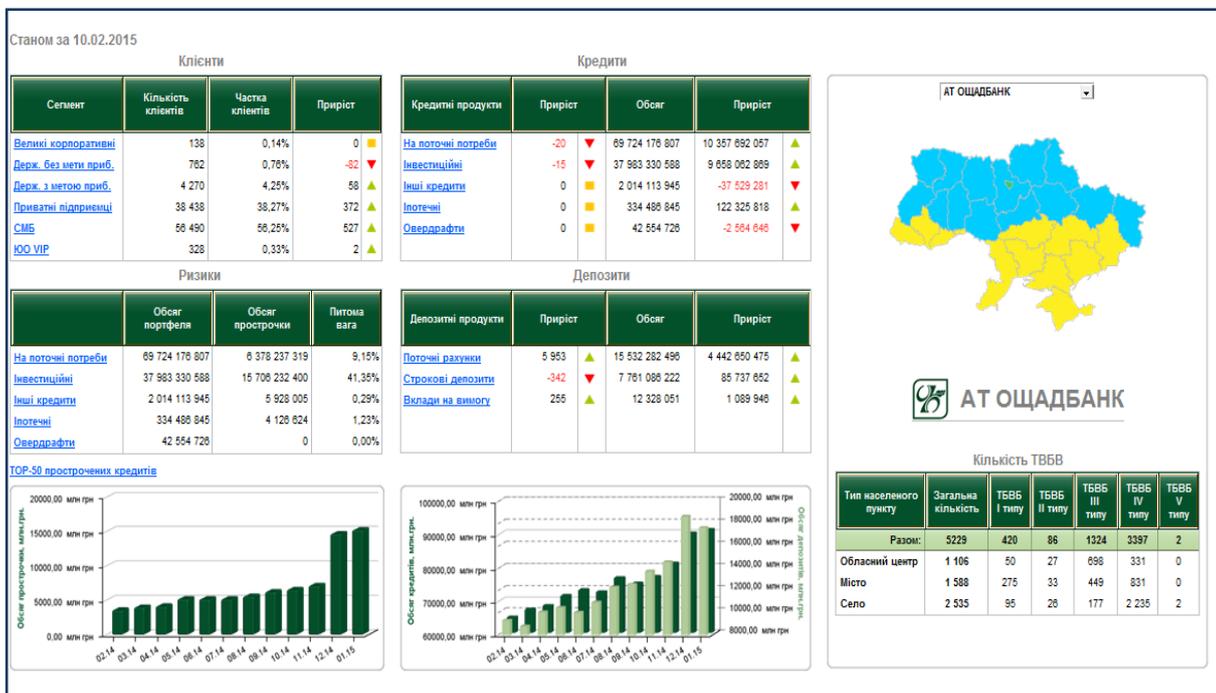


Figure 33: Screenshot of Corporate Business Dashboard

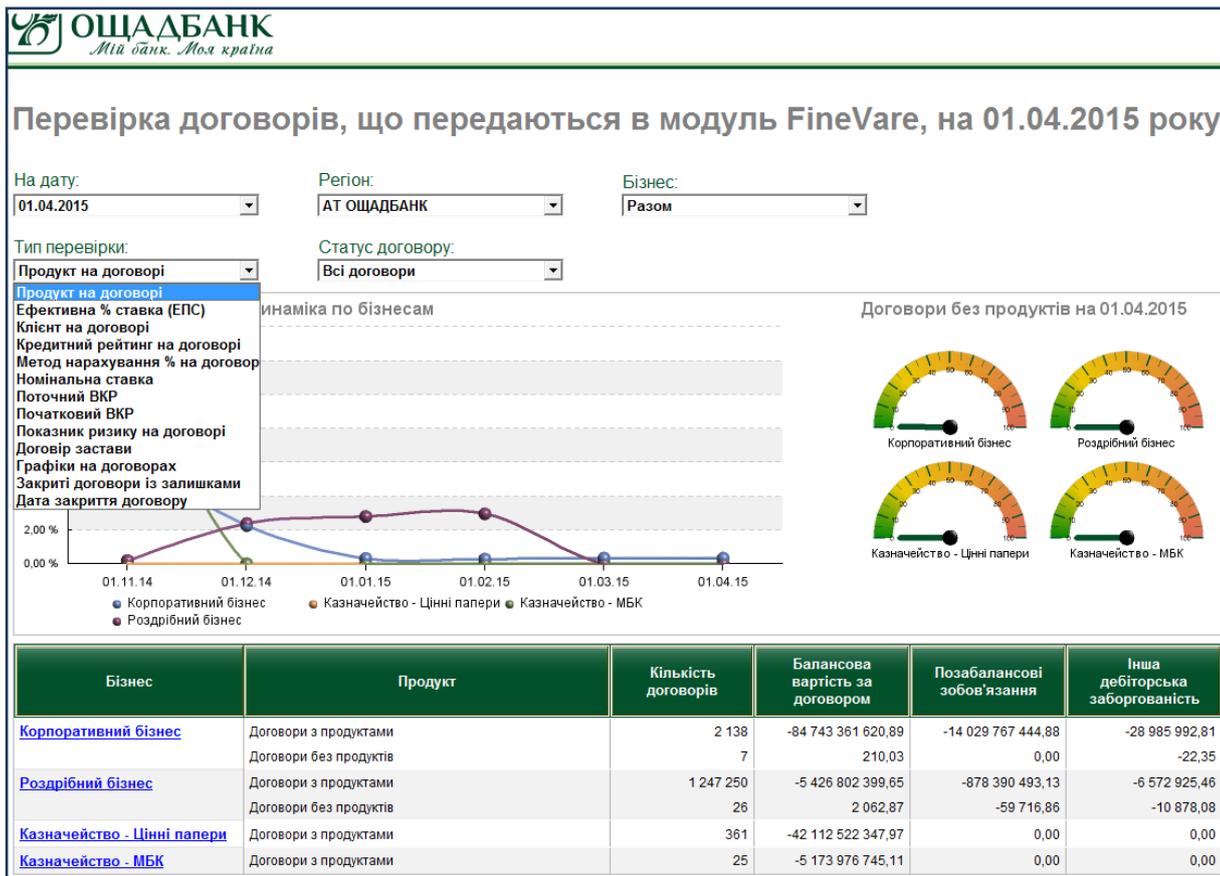


Figure 34: Screenshot of Data Governance Dashboard

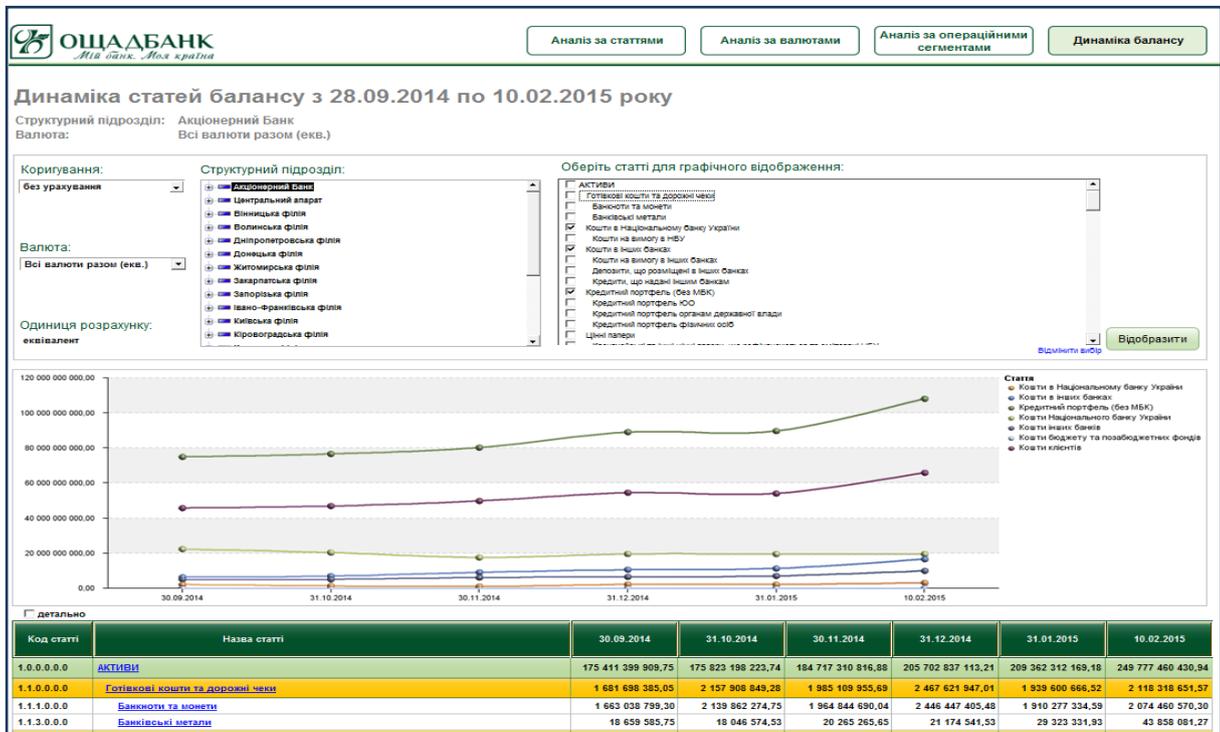


Figure 35: Screenshot of Interest Rates Analysis Report

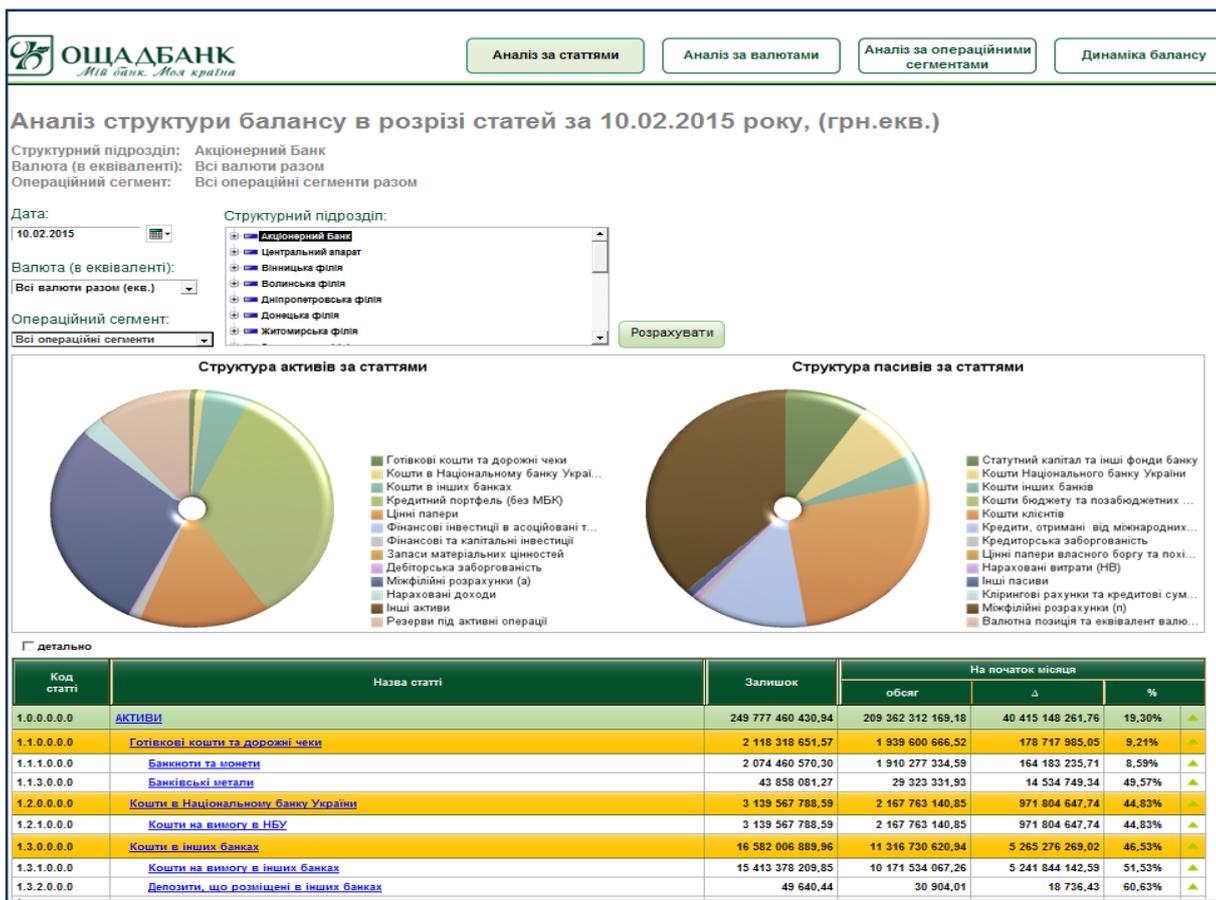


Figure 36: Screenshot of Balance Sheet Structure Report

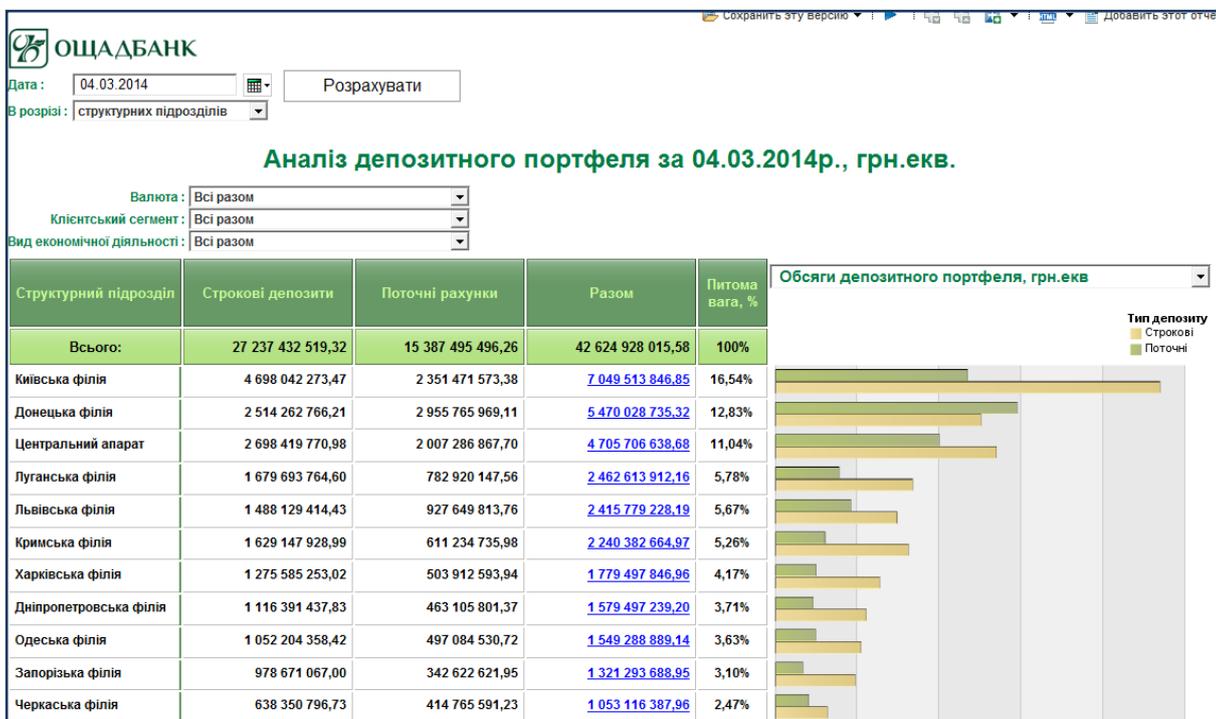


Figure 37: Screenshot of Deposit Portfolio Concentration Report

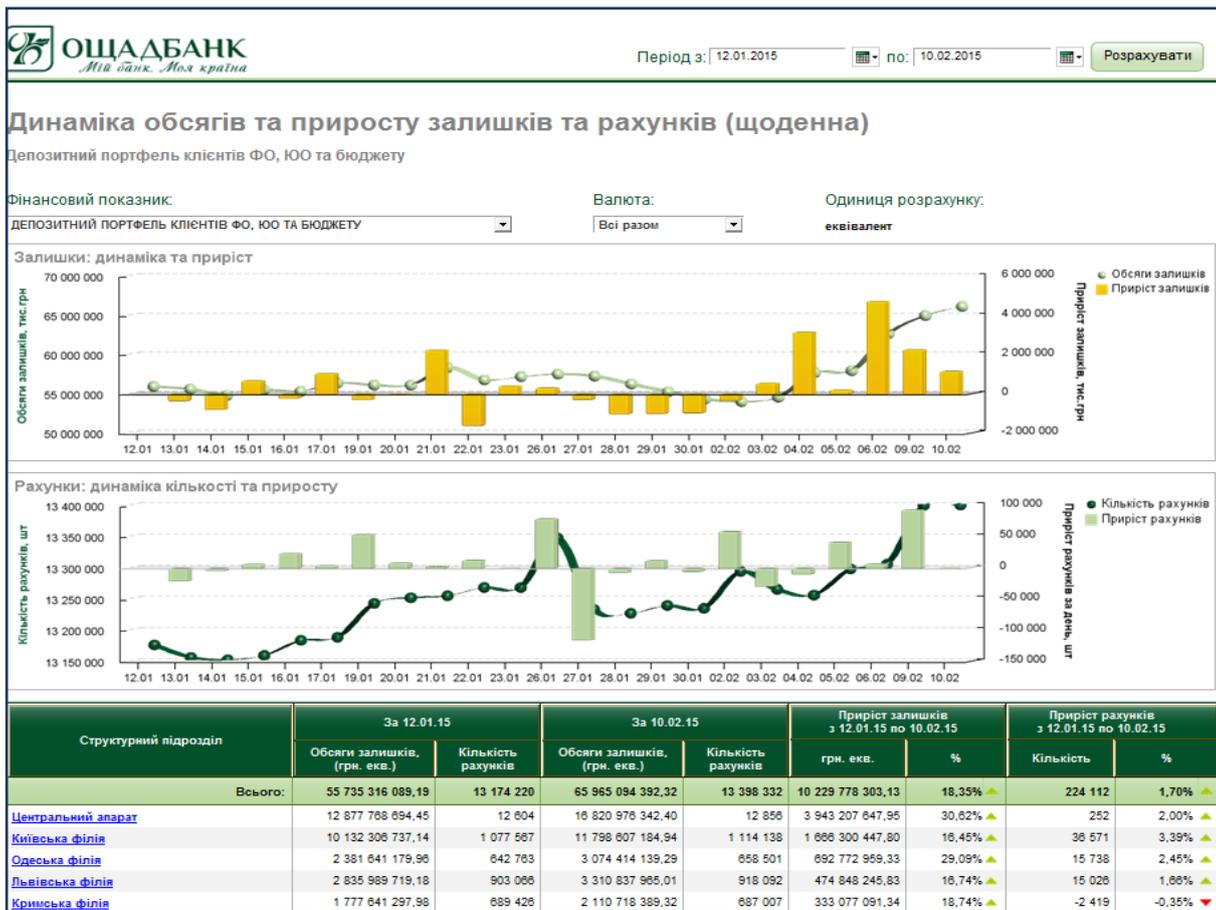


Figure 38: Screenshot of Daily Deposit Balances Report

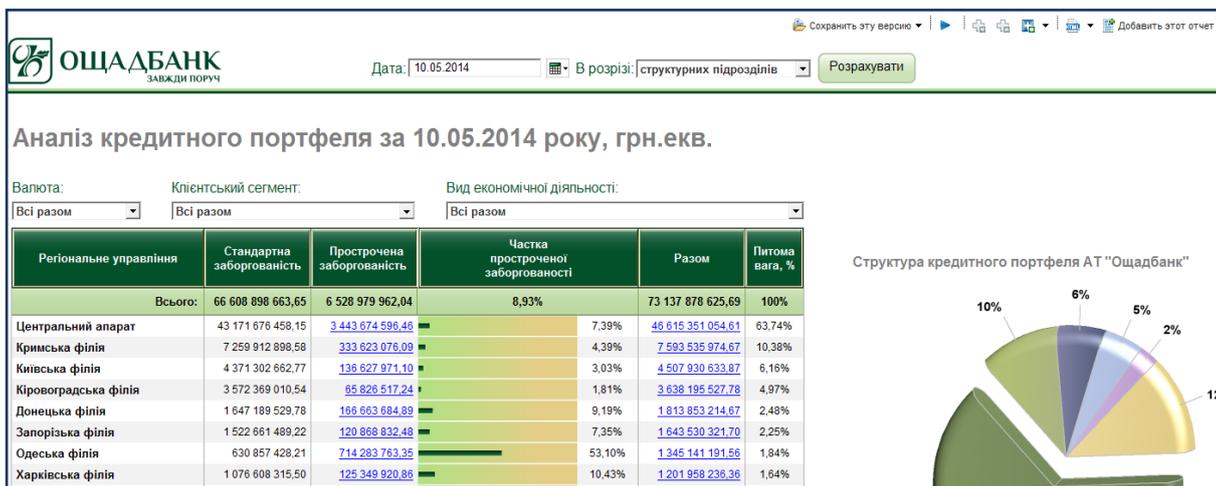


Figure 39: Screenshot of Credit Portfolio Analysis Report

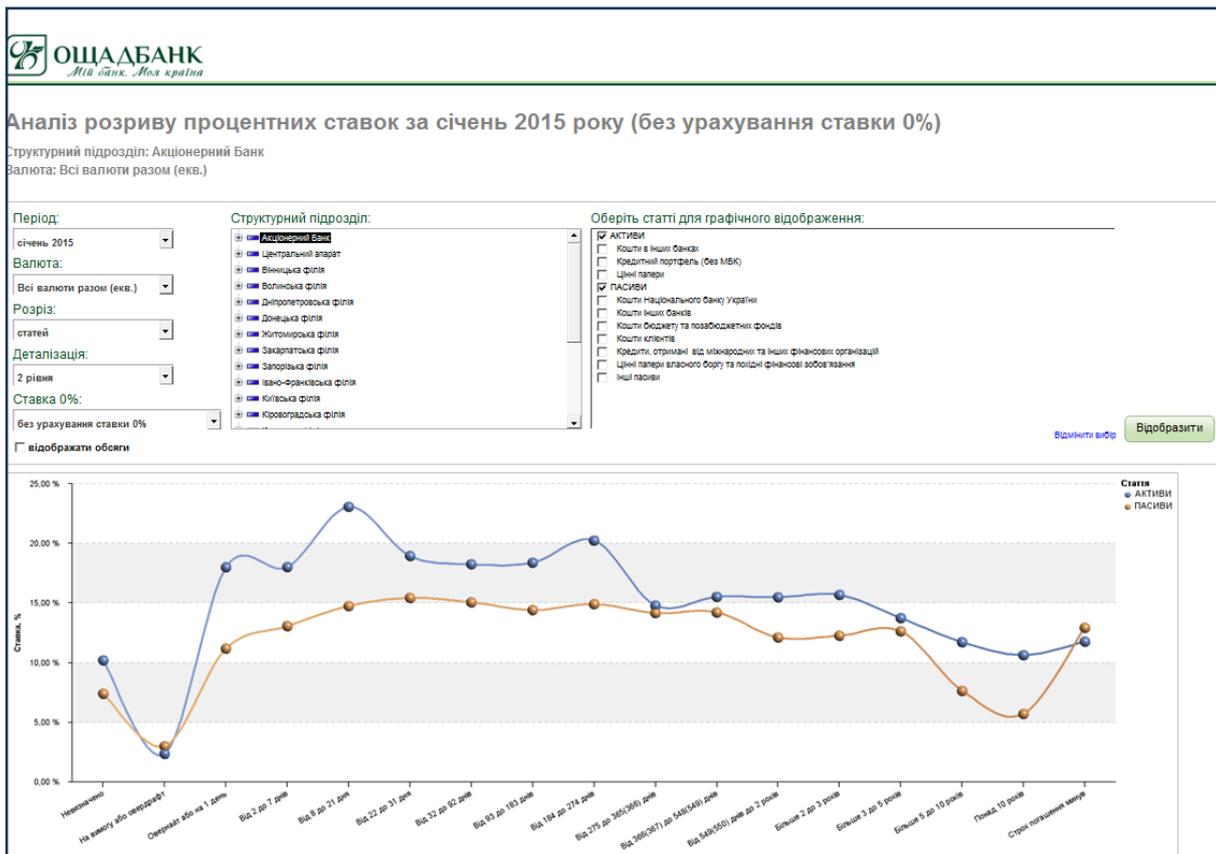


Figure 40: Screenshot of Interest Rate Curves Report

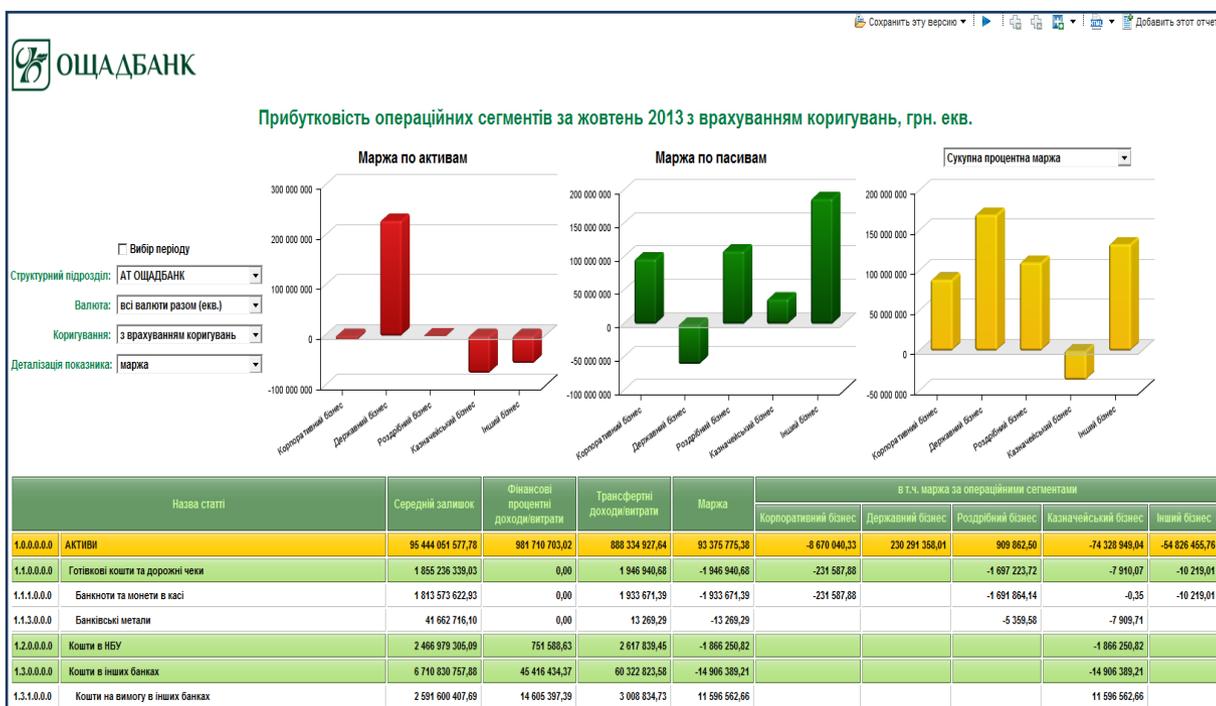


Figure 41: Screenshot of IFRS 8 Segment Reporting

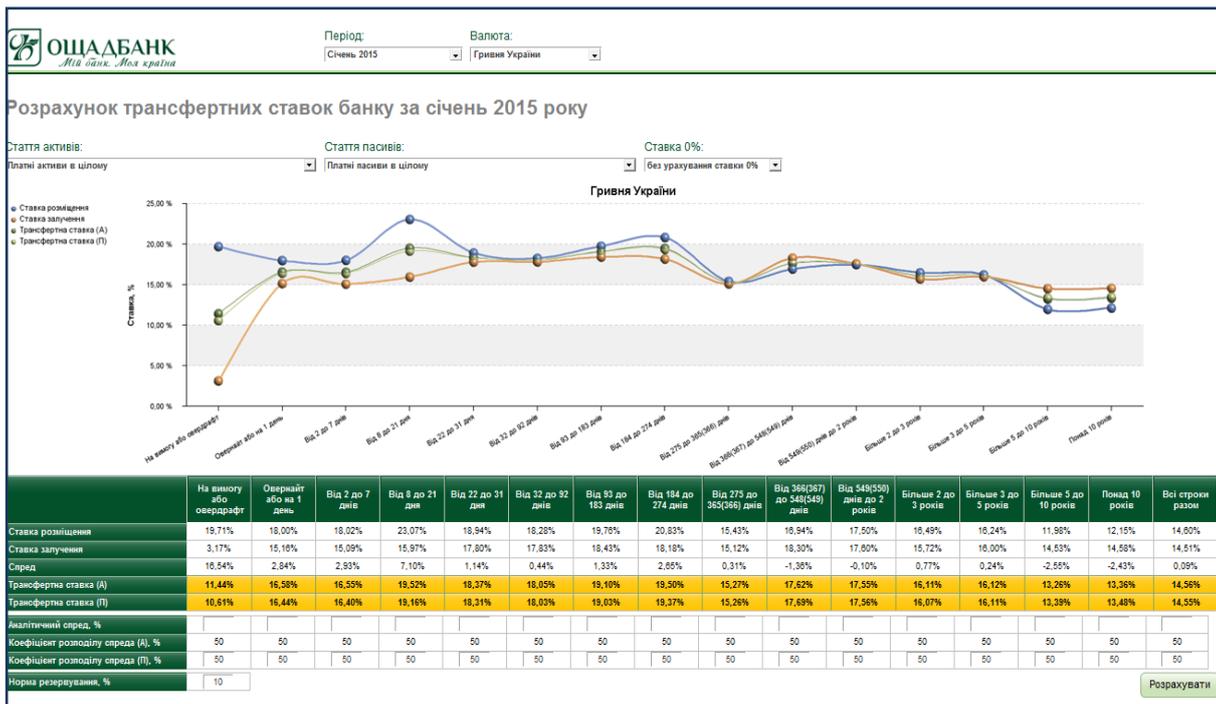


Figure 42: Screenshot of Transfer Pricing Report

## 9.4 IBM BDW Implementation Team at the State Savings Bank of Ukraine

Tab.5. Implementation Team

<b>IT and Management Consulting</b>	
Management Consulting	Quality assurance and sponsorship and Leadership creation. Control over Data Modelling and Source consultants. Project Management quality and project top level support
Data Modelling Consultants	Data modelers must have in-depth knowledge of the IBM BDW to find information quickly that matches the business area representatives' data requirements. If possible, one consultant should be experienced in banking, and be able to converse with the business personnel in their terminology
Source structure DB consultants	Knowledge of the structure and content of the tables and fields of sources' databases. Participation in gap analysis during the source to target sessions and during the data mapping at the development stage
<b>Sponsorship and Leadership function at the top level of the bank</b>	
Project Sponsor	Top level sponsorship is the key function for a successful modeling project. There should be an executive sponsor (Chairman or Deputy Chairman) to ensure availability and active participation in the project by people from across the breadth of the financial institution. This person should be available during the creation of the implementation plan and during the kick-off of validation and customization sessions to emphasize the importance of the project to the participants
Project Manager	Project management from the bank: selection and appointment of MIS staff, the development of a MIS project plan, monitoring for compliance with the requirements of the business, contacts with the business users for methodological support of the development team
<b>MIS or Data Admin function in the bank</b>	
Data Warehouse Owners (could be combined with Data Modeler)	Participation in the architectural design of the repository at the design stage, knowledge of the logical and physical structure of IBM BDW, acceptance of IBM BDW model after the end of the project. In the future, modeling and building IBM BDW structure, owner of BDW in the bank during the operational phase

ETL Owners (Could be combined with ETL Architect)	Participation in the architectural design of ETL in the design phase, understanding how to download data, support ETL process after the project
BI Owners (Could be combined with BI Architect)	Participation in the modeling of a Data Mart at BI system. Maintaining the required reports after the end of the project
<b>Development team (could be external)</b>	
Project IT Lead (could be combined with Lead Architect)	Selection of a team of specialists, distribution of work between the members of his team, planning and control of time of work, monitoring for compliance with business and technical requirements, contacts and coordination with the project manager from the bank
Lead Architect	Designing architecture DWH: hardware - software architecture, requirements to communication channels, ETL and BI architecture solutions, architecture of analytical applications, update daily tasks for developers
Data Modeler	Understanding the business requirements for the system and its implementation in the language of the data model: the development of the model of DWH, measurement and dimensions, identification of gaps in data sources, logical data mappings, the creation of logical and physical model of DWH
Business analysis	Analysis of business requirements, translation them into IT language, setting up technical requirements for IT programmers, ETL, BI. Metadata description, a business glossary, business rules
ETL Architect	Formation of architecture of ETL solutions, understanding the data sources, the establishment of regulations for data loading, the management of ETL developers team
Data Analysts	Analysis of the data quality in sources, the study of the sources structures, analysis of data, planning and coordination of data profiling, improvement of data quality, consultation with other specialists for data quality.
ETL developers	Developing ETL-procedures to load data from database systems (sources) of different vendors

Data Mappers	Creating template to match data in sources to target at the DWH storage
BI Architect	Modeling BI architecture: clarify, prioritize and specify of business-requirements, business rules, terms, participation in data marts modeling and BI reports, management of changes of the requirements
BI developers	Development of BI reporting
Functional Testers	Functional testers by development team, data quality, data growth management,
Programmers (Java, PL/SQL, .net, asp.net)	Programming of financial and technical applications of DWH
UAT business users	Before production user acceptance tests conducted by end users
<b>IT Support at the bank</b>	
Lead of IT infrastructure support	Development of MIS infrastructure: the selection and appointment of people in the IT department to conduct DWH technical support, participation in the development of the implementation plan (together with the project manager from the business), control performance time, contacts with external developers, conducting tender for hardware and software purchase and organizational support of the development team
Hardware administration	Responsible for the creation of a hardware-software environment for the development platform and productive platform.
Data Base administration	Responsible for the operation of the system as a whole, maintain it up to date, responsible for data extraction from the operating source systems, conduct de-personification of private data, data base optimization, DBA routine and various engineering works
System Administration	Administration and maintenance of operating systems, UNIX / Linux, Data Warehousing system and specialized analytical data marts, administration and maintenance of Cognos BI and IBM DataStage.