

Registration number: 25-0005/182 from 28.08.2019

RECOMMENDATION

Mr. Radu Gagea, IT Director of National Bank of Moldova, hereby confirms that he has benefited from the services provided by Crystal System SRL and its below consultants within the project "Credit Risk Management System (CRMS) - Extension" for National Bank of Moldova, during the period 11.2017 – 06.2018.

The subject of the contract included:

- Business System Analysis/Design/DWH Development/Testing and technical assistance services for the CRMS Oracle Data Warehouse and Business Intelligence services.
- Integration services of the system with other external components.
- Database, ETL and Reporting design, modeling, implementation, testing and support.
- Technologies used in the project: Oracle DB, Oracle Weblogic, Oracle Data Integrator, ODI Agents, Oracle SQL & PL/SQL, OBIEE Reporting, Oracle Essbase, Java applications & Java web microservices.

The activities from this project were performed by the following profiles: Project Manager, Business System Analyst, Data Warehouse Developer and Testing Analyst.

The activities performed by the Business System Analysts within this project:

- Communicate and clarify business specifications with business users
- Analyze impact on the existing CRMS solution and assess benefits and feasibility, of the business requirements
- Elaborate business requirements into functional and technical specifications
- Provide solutions to business issues and requirements, and adapt them to the existing CRMS system
- Provide estimations of the planned activities
- Coordinate the design and participate in the development and testing activities
- Document and update the functional and technical specifications through the entire project
- Provide post-implementation and maintenance support of the implemented new enhancements and the entire CRMS Data Warehouse
- Provide users training

The resources involved as Business System Analysts:

- Mihai Zainescu
- Oana Tanasie
- Paul Panaitache
- Florin Agache

The activities performed by the Data Warehouse Developers within this project:

- Analysis of technical and functional specifications generated by Business System Analysts to understand, document and design of ETL processes
- Implementation and optimization of ETL processes (source to target data flows, data transformation, data loading, data validation) using ODI, PL/SQL procedures
- Design and implement data models for the Data Warehouse and Reporting Data Marts of the CRMS
- Design and implement business and technical validation rules with ODI, XSD schemas
- Plan and execute development ETL testing, unit test and integration test

- Provide support in testing phases and post-go live phase
- Find solutions for identified issues of execution, data manipulation or performance
- Assistance and support for testing new functionalities/implemented changes
- Follow the overall project development standards in the implementation process
- Update and enrich the implementation documents

The resources involved as Data Warehouse Developers:

- Flavius Razvan Schiopu
- Mariana Cana
- Cristiana Nicoleta Cirlig
- Andreea Aura Seinu
- Ervis Elezi
- Petre Manda

The activities performed by the Testing Analysts within this project:

- Data testing activities using specific tools
- Running source to target data testing scripts
- Data Warehouse Dimensions manipulation testing from CDR/DIPP web interface or through xls file import
- OBIEE Reporting data verification and validation
- ETL Oracle SQL & PL/SQL queries verifications
- ODI Validation Rules verification during data loading
- Monitor the ODI Agents and ODI Data flows in the data loading processes
- XML/XSD validation scheme and business rules verification.
- Perform testing activities: test design, execution, results analysis and documentation
- Manage testing and planning activities using tools like: Mantis & JIRA
- Acceptance and regression testing
- Apply an Agile product lifecycle approach to gain more flexibility in the testing phase

The resources involved as Testing Analysts:

- Alexandru Curcubat
- Laurentiu Robert Balamus
- Mihai-Andrei Gavrilă
- Emil Taralunga
- Bledar Berisha
- Fabricio Lahe

The implementation of the CRMS Extension project was a great success and this allow us to recommend Crystal System SRL and all the above involved resources with the rating „Very Good”.

Date

28.08.2019

Signature

Director of IT Department
of National Bank of Moldova
Radu Gagea

Stamp

