

Collaborative Works on Adaptation of EVM for NICA

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Realization of the NICA project at JINR required a system, which would provide sufficient reports over the project's progress, as well as better understanding of the distribution of both financial and human resources. Taking into account past experience of CERN when the LHC was built, a choice of porting existing EVM system from CERN to JINR was made. The EVM system at CERN is a part of a big software complex named APT. It has strong links to the other CERN systems, such as accounting system, employees' information, authentication system, etc. Therefore some works were required to adapt it to JINR needs.

In collaborative works on this adaptation were involved both CERN and JINR sides. The Laboratory of Information Technologies (LIT) of JINR was responsible for the implementation of the additional modules to replace missing connections between planning, authentication and accounting systems of JINR. At the same time CERN side represented by GS-AIS-PM section of responsible for the database schema cleaning and removal of the modules involved in the communication between external CERN systems (accounting, authentication, etc.) The final goal was to have the system deployed at CERN but providing remote access for users from JINR.

At the first step the system was detached from the internal CERN infrastructure. It gave an impression of what has to be done for the successful functioning as a standalone application for JINR. As the result several steps were defined to be done by JINR side. They include an additional module to modify the WBS and OrgBs tree structures, interact with the JINR accounting system and an interface to register users from JINR with corresponding access rights, which will allow to use the system as desired. This report will highlight all of these points.

In Earned Value Management (EVM) theory a work breakdown structure (WBS) is the main informational source of the project structure which it is applied to. The WBS consists of works, required for the successful completion of the project, starting from the higher levels and going deeper into details. Every level or specific work has its own responsible and belongs to a specific organic unit. As well as any WBS element, every responsible person also

belongs to a specific organic unit, which is either a group, or a department, or a laboratory in the organization where the project is developing. The structure of the organic units is called organic breakdown structure (OrgBS). Both WBS and OrgBS are tree structures, which explains why one of the EVM extensions for JINR is the module to operate with tree structures.

While at CERN the OrgBS is coming from the separate internal human resources system, the one used at JINR was not suitable for the integration. The described module is providing such functionality as addition, deletion and re-arranging of the organic units. This allowed the re-create the structure, which represents the one existing at JINR.

Original version of the EVM system is providing an interface to modify the WBS structure it via excel files. This is convenient if the project is already planned and only minor changes are applied to its structure. In case of the NICA project, it was still at the stage of planning, so the WBS was not finally defined and was changing significantly from time to time. For this the interactive interface representing the tree structure was more convenient. It was providing as well an ability to add, remove and reorganize the WBS units. Still to modify the lowest level of the WBS – Workunits, the integrated in the EVM system interface had to be used as this part is tightly interacting with the internal system logic and could not be easily separated without any loss of the functionality.

To cover the gap between CERN and JINR authentication systems and allow users from JINR to have access to the system, an additional module was developed. It provides an interface, where administrators of the system (from both JINR and CERN sides) are able to create user accounts for persons from outside CERN, assign them to the corresponding organic units (see OrgBS) and grant rights to the specific levels of WBS which the user is responsible for. The whole process involves 3 steps. At the first step information about a new user, such as name and surname, date of birth, copy of his passport or any other valid ID, is added to the CERN central DB. The second step is to associate a newly created account using the described module with the DB record. And the last step is to grant a role in the system and specify the WBS units which he is

responsible for. User can be either a system administrators or project leaders. These roles are giving full access to the system reports and stored data, with the only difference that administrator role allows a creation of new user accounts. Other roles are related to the progress reporting, either at the level of a WBS or organic unit (as each WBS unit is associated with an organic unit).

The last step was to provide an integration between JINR accounting system and the EVM application. As the EVM theory is based on the planned costs and actual costs, it has to have information about all the budget spending entered in the system. This was not a trivial task because of the huge difference between the accounting at JINR and CERN. Also such information is usually confidential, so providing an access from CERN facility where the EVM system is deployed to JINR facility was not the best option as it required strong security model behind. As the solution was decided to implement an additional module, which could transfer information extracted from JINR accounting system to the model used at CERN. As the communication mechanism Excel file format was chosen and JINR accounting system was extended to extract required information into a template, which was then processed by the EVM module and the information from the file was filled into the objects named "Budget Codes" that represent budget model at CERN. To solve the security problem, only administrators and project managers have right to upload and extract financial data.

The implementation of all the described modules was done using the Grails framework on the server side as the communicational level between the database and the client interface. For the client interface GWT along with its 3rd party extension GXT was used. Both are using JAVA as the coding language and allow to create flexible user interfaces. When the application is deployed, the code is compiled to JavaScript and therefore makes the application accessible through world wide web. All these technologies are open source which is important for non-profit scientific organizations such as JINR and CERN. They also have support of internalization mechanism. It was important to have both English and Russian languages support in the application. As the database storage Oracle 11g is used.

Therefore the whole model can be represented as is shown on fig. 1.

The business proses is organized in the following way [1]: every WBS responsible reports progress to the EVM system via ADB2 system, while all the financial costs (including the bills and payment facts) are coming directly from ADB2 to the EVM system. This gives access to all kind of reports provided by

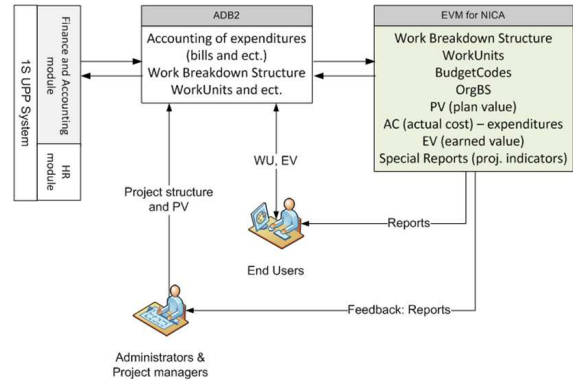


Figure 1: Architecture of the integration between the accounting system of JINR and the EVM system deployed at CERN site

the EVM system, while still keeping track of the budget and contracts' payments using existing accounting system at JINR.

At the moment NICA project is represented in the system as

- 292 WBS units
- 1424 WorkUnits
- 331 Budget code to operate with the financial information coming from JINR

In total 45 users were registered at CERN and added to the system as WBS responsables with corresponding roles.

During the collaboration 3 schools organized by JINR and CERN were held in Dubna. The progress of the works was reported [1, 2] and the EVM basics were presented [3, 4].

References

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