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Regulations and Methodological Support of Electronic Catalog SYSTEM in Scientific Library of Moscow Technological University.

Alexey N. Schennikov[1]*, Tatyana G. Tsunikova[1] and Dmitry Y. Stepanov[1]

[1]Federal State Budget educational Institution of Higher Education "Moscow Technological University" (Moscow, Russia)

ABSTRACT

The recommended standard-regulating maintenance of a system for conducting the Scientific and technical library catalogs provided an opportunity to make the information system order more refinement. In the paper have been addressed issues of regulations and methodologies of electronic catalog system change considered. The analysis of the current state of the data processing and catalogs using of the Scientific and technical library was held. The task of expanding STL product rubricator was carried out under the proposed rules of the system modification. Expansion of the classifier required the updates of architecture objects and data system; as a result of the use of the developed adjusting tables and their relationship it has been able to realize the original task with minimal system changes. So, to increase a number of product classification levels a set of custom tables, their relationships and program amendments were proposed, as well, as organization, correction and harmonization of system catalog lingware accompanied. Work and document flows defined for support and change production usage of electronic catalog system in Moscow technological university.

Keywords: Automated system, information system, enterprise architecture, industrial production catalog, lingware, scientific library, Moscow Technological University.

*Corresponding author

INTRODUCTION

Information systems for management of electronic catalogs and processing data files (hereinafter – IS) are becoming more and more popular due to the increasing flow of information to be processed, structuring, storage and analysis [1]. IS, developed and implemented in the Scientific and technical library (hereinafter – STL) of Moscow technological university MIREA (hereinafter – MIREA) on the basis of the automated system of the Federal information fund of domestic and foreign catalogs of industrial products [2], also refers to the system of processing and cataloging.

During the life cycle of IS STL, it arises the modification needs of its standard functionality associated with the legislative, technological and other changes in the environment. Such changes should be clearly monitored, evaluated and regulated in order to prevent a steady stream of improvements of the system. Regulatory and methodological of IS allows to eliminate this situation by establishing, documenting and harmonization of rules for users to interact with the system [3].

Initially, it is assumed that each processing system and maintain electronic catalogs tailored to the needs of the enterprise. Properly built architecture software solution gives IS generalizing ability that allows interacting with the directory of external organizations to supplement, expand and unify catalogs. This is only possible through the use of linguistic software (hereinafter – LS) of IS, which determines the rules of conduct, adjustment and harmonization of the data [1].

OBJECTIVE AND TASKS

The aim of the work is to design regulatory and methodological support of the system of electronic catalogs MIREA STL to effectively solve practical problems by modifying the system. To achieve this goal, the following tasks are to provide:

- definition of regulatory guidance documents IS for STL;
- expansion of electronic catalogs heading IS for STL;
- maintaining, updating and harmonization LS of IS for STL.

REGULATORY AND METHODOLOGICAL DOCUMENTS

Fundamental of any IS design documents are solution designs and specifications for the development. Depending on the stage of the solution life cycle contain a description of a given process models «As-Is» and «To-Be», technical settings, as well as a list of improvements of the system for the implementation of business processes. The specifications for the development, the list of which is mentioned in the solution designs, describe the necessary program changes ISs that perform the usual tailor the system is impossible [4].

All subsequent documents allow log the modifications made and train users to work with the modified system. Documenting conducted by training the system setup protocols and technical specifications for development. Protocols allow fixing the system configuration and specification – code. Functional modular and system testing implemented extensions preceded by step documentation [5].

Training of end users is based on the instructions and accompanying test scripts. Instructions are usually subdivided into training and user (fig.1). The first contains descriptions of the implementation given step or operation of the business process, the second – characterize the process «from start to finish». From the point of view of users, the second type of instructions is preferable, while the first involves lower costs for training and subsequent document updates.
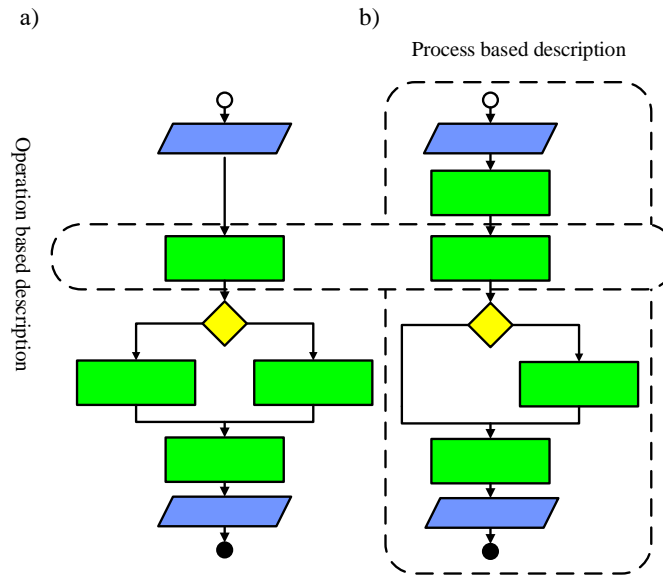
Figure 1: Training materials preparation approaches: a) operation based; b) process based

During the productive operation of the system the document flow does not lose relevance. The only difference is that each need to modify the functionality of the system registers a request for the change. The request contains a description and justification of the need for change in the IS, as well as prioritizing. Each change request is complemented by the proposed assessment effort to perform system modifications. After confirmation, a note is entered in the printed document, then the technical implementation phase starts, beginning with the preparation of solution designs and specifications previously described.

The above document flow is very similar to the draft version when IS is still in generation stage, the design and implementation [6, 7]. Any change in the system must be originally designed, further implemented and only then brought to the users. That is why this standard-regulating model is offered to the organization of the work and support IS STL. The final list of documents is shown in fig.2.
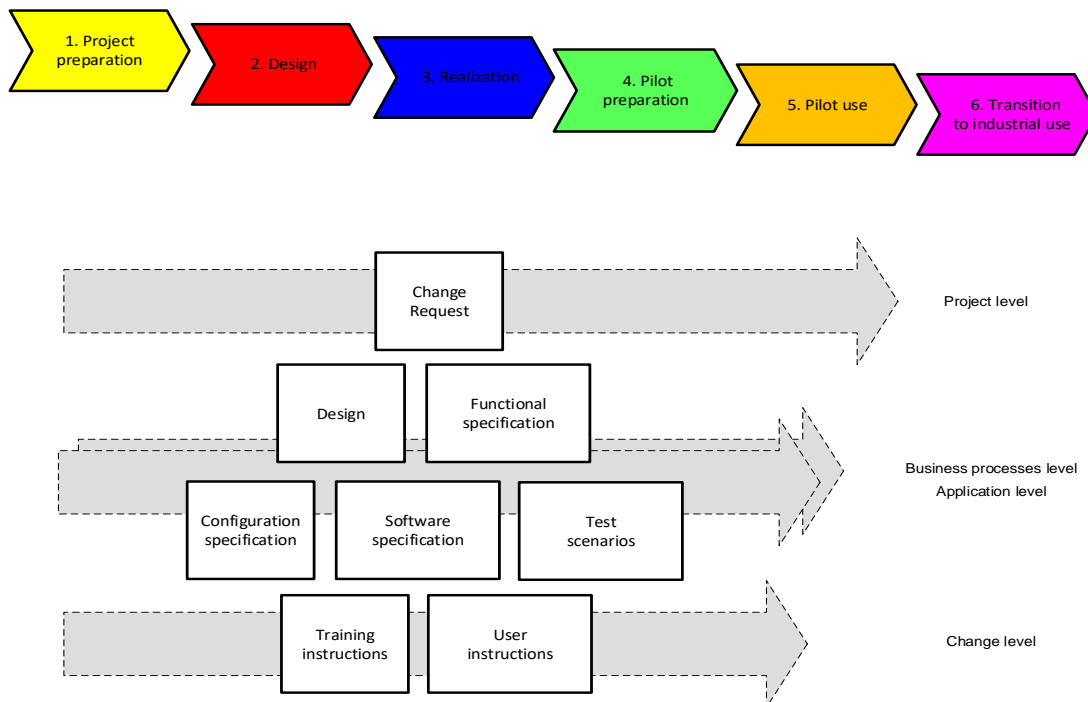

Figure 2: System change document flow

RESULTS

Product classifier reinforcement

The standard functionality of the system, implemented in STL MIREA contained a three-tier classification of products. After the completion of phase «business stabilization» of the system and its subsequent transition to full commercial operation became necessary to expand the number of product classification levels. In connection with what has been registered and approved by the appropriate change request.

The current implementation of the system involves the categorization of products on such grounds as lot and heading, as well as SCSTI (State categories scientific and technical information) and UDC (universal decimal classification). Implementing change request indication requires upgrading the system architecture of data. Reinforcement of classification characteristics possible via approach proposed on fig.3.

It should be noted that the business objects, which interact with end-users – an organization that catalogs and products. The relationship of these objects, «1: M», as one organization can have multiple catalogs, each of which includes details of many products (fig.3a). If users are responsible for the maintaining business objects in the system, the technicians must take care of pre-configure them.

The system defines the adjusting tables for the directory types, fields, groups, fields and their reference values. Setting up the relationship tables is conducted according to the principle of nesting. Options available for input fields originally defined (name, type and length), which can be assigned to reference values. Reference limits values entered in the data field to only those that originally instituted in the database table.

For each field it is defined a certain processing rule. The rule is a code that is used to check the data at the time of entry, change or migration. Examples of rules may serve as mandatory and optional filling the input fields, input limitation based on the values contained in other fields and other. If necessary, the processing rules can be extended any user logic.

Fields and their processing rules are combined into groups. This allows you to set the field data entry to maintain the product catalog. It is on the basis of the functional groups are expanding fields classifiers lot and headings, SCSTI and UDC. As a result, the group set attributes and products, and classification (fig.3b). Assigning field groups to defined catalog type determines the final set of fields and rules for cataloging.

At the initial creation of the business object the user must specify the type of catalog. Depending on the type of field is determined by a list of rules and their reference when creating entries in the product directory. Thus, the expansion of the electronic catalog rubricator is performed based on the settings catalogs types, defining new input fields and corresponding values of the reference books. This delivers the flexibility of customization, community, and the transparency of the proposed solutions.

Maintaining, updating and harmonization of LS

The need to ensure linguistic product catalog has served the second request to change the IS STL. The implementation of this request involves an adjustment of items. Changing names is carried out according to the rules set forth tab.1, which ensures uniformity of product descriptions. If necessary, rename columns or change levels of classification are conducted exclusively in database tables. Update directories of values leads to the automatic display changes in the interface reference product catalog. This is possible since the program directory laid dynamic selection and display logic (breeding values is done not by name, but the internal identifier tag).
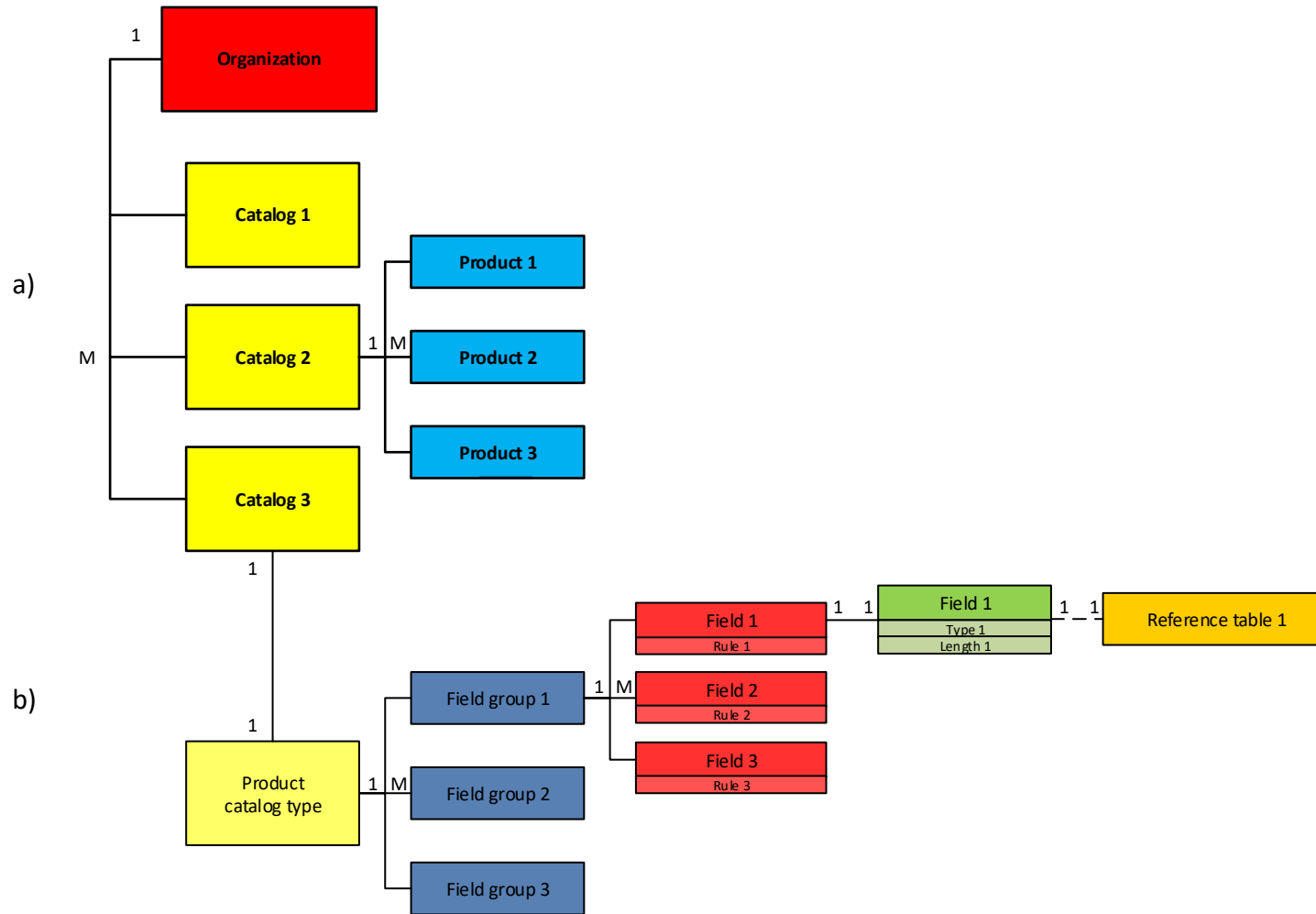
Figure 3: Data architecture: a) business objects; b) custom tables for classification

Table 1: Product naming convention

Rule	Description	Example
sequence parts of speech	first nouns, adjectives then specifications	machine hydraulic DS-185B (not hydraulic machine DS-185B)
using the singular	use singular of product	autotransformer laboratory (not autotransformers laboratory)
using punctuation, uppercase and lowercase letters, gaps	capital letters of first noun and technical characteristics, no gaps while using hyphen, no quotes	machine search and rescue PSM-8, AK-17 (not Machine search and rescue, «psm-8» Ak - 17)

If necessary to specify a new feature in index values for the subsequent updating of the entire product catalog it is required to proceed as follows. Update reference values of the new feature. If the number of catalog items for which you want to set the new value is small, the change operation is carried out manually. Otherwise, the directory is downloaded into a spreadsheet treated by technician and re-loaded into the system, but to a new directory.

Harmonization LS while there is a migration of external product catalogs it requires additional system improvements. In particular, for each classifier it must enter a correspondence table of indication out of IS STL and external systems, further more broaden the processing rules to the automatic replacement features. Migration algorithm is as follows. Preparing the directory structure of the external organization of production is done, and then correspondence table, processing rules and a new catalog type are achieved. Next, the system registers the organization and creates a new catalog with the previously set type. Customization of the system is over then.

The next step – an outside organization generates a catalog of its products in a predetermined format and sends it as a table at STL. IS technical specialist having obtained an electronic catalog file carries his load with reference to the earlier establishments in system of organization and catalog. This completes the migration of an external directory.

CONCLUSION AND RECOMMENDATIONS

The recommended standard-regulating maintenance of a system for conducting STL catalogs provided an opportunity to set the order IS refinement. In the list of regulatory documents and regulatory change requests they included solution designs and functional specifications for the development. As a result of completion of the system offers to update configuration protocols, technical specifications, as well as training and user instructions.

The expansion the classifier of products led to rethink the approach to data conducting systems. It has been proposed the rules for processing data and STL product catalogs, set the LS system. Introduction of data matching rules from different sources allows performing the harmonization of catalogs that are integrated into the system from an external company.

REFERENCES

[1]   Kudzh S.A. Russian technological journal 2015; 9(4): 1-6.
[2]   Federal information fund of domestic and foreign catalog of industrial products official website. URL: промкаталог.рф (request date: 01.11.2016).
[3]   Kudzh S.A. Information technologies in management. Moskow: MIREA 2014.
[4]   Stepanov D.Y. Economy science questions 2014; 70(6): 54-62.
[5]   Gvozdeva T.V., Ballod B.A. Information system designing. Rostov-on-Don: Fenix 2009.
[6]   Stepanov D.Y. Russian technological journal 2015; 8(3): 227-238.
[7]   Nedelkin A.A., Titov V.A., Tikhomirova E. I., Romanova Y.D. ARPN Journal of Engineering and Applied Sciences 2016; 11(7): 4681-4684.