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THE USE OF INFORMATION SYSTEM IN THE MANAGEMENT OF BUSINESS RULES

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Summary

Clearly established business rules are essential in a successful performance of each employee and the business system as a whole.

Business rules determine the methods of realization and management of business processes, i.e. to the manner in which employees should behave within a business system.

Most of the business rules which are crucial for successful development of business processes need to be set out and they should be indifferent in relation to users of the rules, meaning that the system of business rules should be managed hierarchically, by applying the functions of the information system.

The question is how to develop and integrate a system of business rules into an information system through the business application project, which is the basis of the information system; next question is how to dynamically develop that system through the stages of the information system life cycle.

Practical experience in the management of business systems indicate that such management can no longer be optimal without integrated and automatized systems of business rules on the level of business application, which confirms the previous assumption.

In view of the above, this work is aimed at disclosing several selected original and successful models of business rules that have been developed within the framework of the VISTEL business application project.

Key words: business system, information system, business rules, business application

1. Introduction

The automatized business rules are built in the information system of the business system and they ensure safe and effective application of the strategy of business system (Figure 1). In addition, they enable the users of the business system to execute tasks in a simple and safe manner, free of risks and stress that may occur as a result of possible errors in the course of business processes.

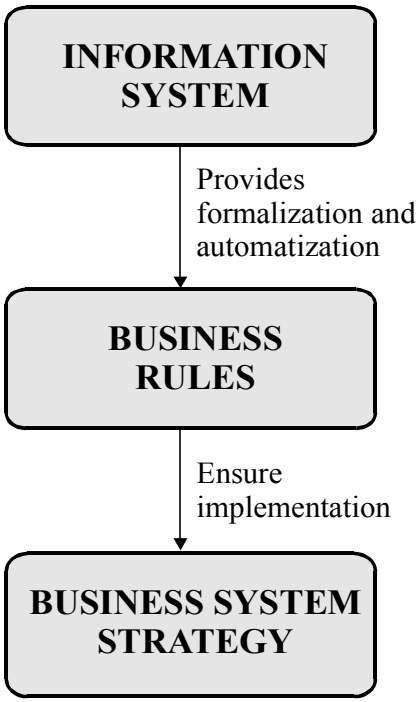

Figure 1. Link between the information system, business rules and business system strategy

It can be said that the strength of the organization of a business system lies in the subsystem of business rules. The business system whose information system does not provide support to the basic business rules, has a very scarce area of stability and is susceptible to numerous possibilities of arbitrary behaviour of the participants in the business processes, which may strongly affect the vital functions of the system.

2. The meaning and the application of business rules

Generally, the term 'business rules' implies predetermined patterns/procedures, which should be respected by all participants in the business processes, both formally and professionally. Introduction and formalization of business rules as the basis of the business intelligence [1] are intended to ensure unconditional respect of the pre-defined methods of the execution of all processes within the system, as well as their quality.

Hypothetically, more formalized business rules mean more stability in the functioning of the system and lesser entropy; also, they mean that employees will be exposed to a lesser risk of stress and fewer errors in their work.

On the other hand, a system without formalized business rules is likely to result in high entropy and a narrow area of stability.

The two hypotheses mentioned above can easily be proved by conducting an analysis of the concrete business systems.

However, it has been noticed that certain highly organized business systems have gone too far in their efforts to formalize and automatize the business rules in terms of trying to shift the full responsibility for the implementation of business rules to the business application and reduce the role of the realizer of the business processes to the role of an operator.

Such a tendency may create a deceptive impression – especially on the level of the system management – that practically everyone is apt to do any job within the system without necessarily having the professional expertise, since all required business rules have been formalized and established already in the business application.

As much as the above described processes may seem realistic and justified due to the informatics technology, such tendencies are likely to gradually lead to erosion of dignity of certain professions in the busines process, which will then be followed by other, secondary negative effects.

One of possible negative effects is frustration of employees as a result of the loss of feeling that their professional qualifications have been properly evaluated. In addition, it will leave the management with a false impression that complex business processes do not necessarily require professional staff but merely high-quality business applications.

3. The role of the information system in the management of business rules

From the point of view of the organization of a business system, all business rules may be set out in the business documents that have the executive power as regards employees; however, their consistent and practical implementation is questionable, because it depends on the individual approach of each particular employee.

Basically, all formalizable business rules can be integrated into and defined within the information system, which rules out the possibility of subjective interpretations by its users; however, certain negative effects are possible, such as those mentioned in Item 2).

In that respect, the implementation of business rules is ensured by the business application as the basis of the information system.

This allows unconditional implementation of the business system strategy on one hand, and the employees are partly cleared of the burden of responsibility on the other hand, as arbitrary application of business rules is rendered impossible.

4. Certain models of business rules in the business system of a trading company

As regards the business systems of trading companies, a whole range of business rules need to be applied. Here we distinguish primary and secondary business rules. The former group includes the rules that ensure viable functioning of a business system, and they directly affect the efficiency of business processes, while the latter group includes all other business rules.

The following chapter describes a selected group of primary business rules that are implemented through the models integrated within the VISTEL [3] business application.

The business rules are disclosed following the principle: rule definition – rule model.

4.1. Access to the data on conducting business by using business application

The business rule reads: «*Within the competence of his/her work post, the user of application may have access only to certain modules of the business application and/or update only certain groups of data from the data base.*»

Developed business systems with a hierarchic organizational structure must have control over the access of the users of application to the application modules and, consequently, to certain segment of the business related data base.

The above mentioned problem can not be solved on the level of administering the rights to access within the framework of the data base system, but on the level of the application.

This business rule is based on the modular structuring of the business application system, in which one module covers one sector – organizational entity within the business system (Figure 2).

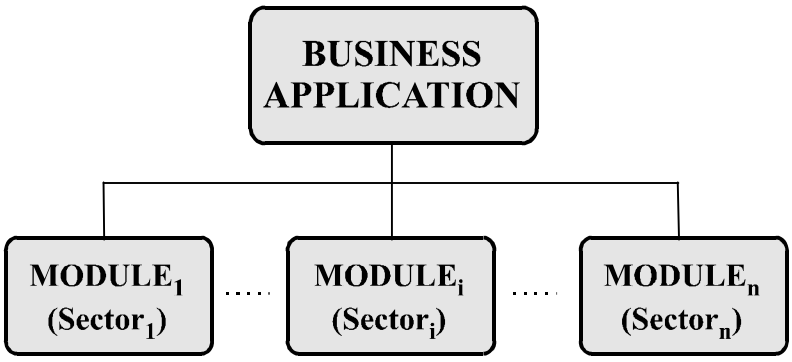

Figure 2. Modular structure of the business application

This means that the user may have access to one or more modules of the business application (Figure 3) with the right to enter and update certain group of data, including the option to browse through certain data that are being updated in some other application modules.

Figure 3. ERA user model– application module

In terms of administration on the level of business application, the implementation of this business rule is not a problem, and it can have multiple positive effects within the

information system of a business system, which strongly influence the effectiveness of the work process.

4.2. Commercial communication with buyers

The business rule reads: «*Communication with a buyer is possible only if the rules set out by the business system are followed*».

The above cited rule refers primarily to the sale/delivery of goods to the buyer by the commercial sector.

The KRIT_KUP criterion for the i^{th} among N-number of buyers, and this criterion is fundamental for the rule, can be formalized by the following expression:

$KRIT\_KUP_{i\ (i=1,\ ...,N)}$ = {LIM_D, BR_D_VP. RAB}, where

LIM_D - the amount of permitted debt limit, kn
BR_D_V_P - the number of currency days – grace period,
RAB - general rebate (in %) to all or selected items

Theoretically, this means that each i^{th} buyer may be offered different commercial conditions for the purchase of certain items.

The above business rule is extremely important in the realization of commercial function in the real time, especially in the developed systems of trading companies with a large number of permanent buyers. This rule, applied via the information system, enables implementation of commercial strategy of the business system, while sales officers protect themselves from possible arbitrary decisions that are based on personal gain.

4.3. Management of stock

The business rule reads: «*The ordered quantity of goods must meet the criteria of the stock management system*».

This is one of the extremely important business rules which implies engagement of financial means for the procurement of new goods on one side, and ensuring the stock that will allow a successful realization of the commercial function in the shortest time period – on the other side.

The implementation of the above mentioned business rule is based on the group ofa large number of limitations and a complex analytical procedure, which – based on the business data on the turnover of the goods in the preceding period – generates a proposition on the optimal quantity that needs to be ordered in the future.

There are several theoretical stock management models [2], and the following among them have proved to be exceptionally successful [4]:

SignKolic = P * V + Zkoef* sqrt(v * stdP**2 + P**2* stdV**2);

GenKolic = SignKolic* NarKoef
NarKolic = GenKolic – Zaliha

where

SignKolic	- signaled quantity to be ordered,
GenKolic	- increased signaled quantity,
NarKolic	- quantity to be ordered,
NarKoef	- multiplicator of the signaled quantity,
Zaliha	- quantity on stock,
P	- average daily sale
stdP	- standard sale deviation,
V	- average time required for delivery by the supplier,
stdV	- standard deviation of the delivery time
Zkoef	- probability coefficient of sufficiency of the stock until the next delivery

4.4. Management of the rebate system

The business rule reads: «*The rebate percentage on the sale price is not an arbitrary, accross-the-board category, but a complex business function that depends on a number of parameters*».

As a commercial category, the rebate is nowadays one of the most relevant foundations of the market competition, because the buyer most often tends to purchase goods from the seller who offers the highest rebate percentage for the same item.

This particularly refers to wholesale buyers/legal entities, who purchase wholesale and then resale, or who purchase material as part of internal contracting projects.

The rebate (RAB) may be the function of a number of parameters $par_{i(i=1,N)}$, such as quantity, financial amount of the bill, value of purchased goods in an earlier time period and the like:

$$RAB(\%) = \mathbf{f}(par_1, ..., par_i, ..., par_N)$$

and it can apply to a buyer in general for all items, or it can be worked out per specific items.

The sensitivity of the implementation of this business rule is obvious from the fact that the rebate on the sale price as an attribute to a particular item, directly affects the amount of the discrepancy in price (RUC), which is the basic financial category that the profit of the entire trade company business system depends on.

RUC = **f** (NBVC, RAB, PRDC), where

NBVC - purchase price
PRDC - sale price.

In view of the fact that the discrepancy in price can be completely annulled if the rebate is approved without control, the proper information is the maximum allowed rebate which, in percentage, can only be a part of the real discrepancy in price.

The realization of this business rule through the information system of the business system implies a hierarchic management of the rebate system on the level of business application, without the possibility of subjective improvisations of sales officers, who may fail to achieve the optimal discrepancy in price, which is the basic purpose of the trade as a process.

4.5. Preparations for issuance of goods from the warehouse

The business rule reads: «*The criteria for optimal performance of the warehouse operator who prepares the goods for delivery to the customer are as follows: the shortest way and minimum time required to collect the goods in the warehouse*».

To ensure the implementation of this rule, the warehouse subsystem must be organized and set in order in the best possible way. In other words, an orderly set up system of warehouse locations, supported by business application, must be established.

In this instance, the business rule can formally be expressed by the following relation:

$$OTN = \mathbf{f}\ (R_1, ..., R_i, ..., R_N), \text{ where}$$

OTN - document about the delivery order as part of preparation for issuance of goods to a buyer

R_i - the i^{th} item on the OTN , distinguishing R_i sorts of items per locations at the warehouse.

The implementation of this business rule ensures optimal circulation of goods through the warehouse with the minimum staff and their optimal performance.

4.6. Methods of taking inventory

The business rule reads: «*The inventory is taken systematically, by applying the PDA device with a barcode scanner, without any paperwork required*».

Taking inventory is a procedure prescribed by the law, by which a business system establishes the current state of the stock through physical examination and detects possible surplus or loss.

The realization of this process is primarily an organizational problem, the solution of which directly affects the successfulness and accuracy of the registered supplies.

Considering that it is the legal obligation of each business system to take inventory of the stock once in a business year, the main goal is to reduce to a minimum possible loss that results from the interruption of the business process. This can be achieved by applying the PDA device (portable computer with a barcode scanner).

In view of the above, the business rule relating to the inventory taking can include the following activities:

1) Preparation of N-number of PDA devices and, in communication with the business application, entering of the complete assortment of the goods at the warehouse. The minimum data that needs to be entered must include: the code, the barcode and the name of items.
2) Forming M-number of groups assigned to the taking of inventory, where M = N, and assign each group to one particular section of the warehouse.
3) Opening N+1 inventory work documents (DOK) in the business application, where
   DOK_{N+1} - principal synthetic inventory document, with registered surpluses and losses,
   $DOK_{i(i=1,N)}$ - operational auxiliary inventory documents in which the registered data are imported from the PDA devices.
4) Upon completion of «i» group, import the data on the status of goods registered in DOK_i during the inventory taking.
5) Once the data are imported in DOK_i, the synthetic inventory document DOK_{N+1} should be updated by document DOK_i.
6) Continue with the analysis of the synthetic document DOK_{N+1} and upon completion – close the document, thus obtaining balance between the state of the stock and the state found upon the inventory taking.

5. Conclusion

When developing business application, particular attention should be paid to the formalization and automatization of critical business rules of the business system.

Since business systems have a permanent tendency to grow with and adjust to frequent changes of market conditions, they must constantly modify their business rules accordingly.

Business application as the basis of the information system, must have a well developed and built-in system of business rules capable of modifying the business system independently from the manufacturer of the business application.

Obviously, it is an illusion to expect that all business rules relating to the management of business processes can and should be formalized through the business application and that they can fully ensure implementation of the business system strategy, disregarding the human factor.

It is also an illusion to expect that the implementation of automatized business rules can and should annul the professional knowlwdge of employees in the business process, that they can turn into classic operators of the business application and that they do not necessarily need to have specific professional knowledge about the processes that they operate.

The author of this study is experienced in defining, formalizing and installing business rules into business applications. This study covers only selected business rules integrated into the VISTEL business application, which has so far shown good results in practice.

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