

Business rules specification and business processes modelling

Specifikace podnikových pravidel a modelování podnikových procesů

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Abstract: Up to date business is managed by large-scale different rules that regulate how the business acts and how it is structured. We find the rules in law, regulation, business policy document, procedures manual, system documentation, memoranda etc. These reference resources may provide the specific basis for a rule or offer a background, context or explanation of the business rule. In the recent years, it has been discovered that business rules constitute an entire body of knowledge that has not been adequately addressed in either the analysis or design phases of the information system development. Typically, business rules have been buried in the program code or in the database structures. The article deals with the business rules approach and rule technology and helps to identify the business and technical opportunities they afford to the company. It offers the business process model and its integration with business rules. This approach could provide business analysts with an essential approach to understanding, redesigning and communicating what really happens in the business processes (in agricultural area). It serves to understand the business impact of any change in small and medium-sized organizations. We use the UML notation and its business model extension.

Key words: business rules, business architecture, business process, UML, business concepts, knowledge management, information system, business goal

Abstrakt: Současné podniky jsou řízeny řadou podnikových pravidel, která ovládají jejich vykonávání i strukturu. Nachází se v zákonech, směrnících, průvodcích, manuálech, dokumentech i nařízeních. Tyto zdroje poskytují základ pro pravidlo, nabízí kontext, pozadí nebo jeho vysvětlení. Pravidla jsou obsažena i v informačních systémech. V poslední době bylo zjištěno, že pravidla tvoří základ podnikových znalostí a uvádějí se v souvislosti s analytickou nebo návrhovou fází vývoje informačního systému. Článek se zabývá přístupem podnikových pravidel a technologiemi pro identifikaci podnikových možností a potřeb. V souvislosti s grafickou formalizací je představen procesní model jako ukázka metodiky vhodné pro podnikové analytiky pro získávání a ukládání pravidel, pro jejich pochopení, komunikaci a jejich následnou správu. Používáme notaci UML a její rozšíření na podnikové modelování.

Klíčová slova: podnikové pravidlo, podniková architektura, podnikový proces, UML, podniková znalost, znalostní management, informační systém, cíl podniku

Under the pressures of the day-to-day business, only those with optimal structured and trustworthy end-to-end processes will have the versatility to adapt quickly to change. Rapid changes, principally in the external environment, require the business management to select new approaches and methods of decision-making and to have a well conceived algorithm enabling a flexible response to customers' wishes using findings of knowledge management (Svoboda 2007). Complete

processes that directly affect and involve customers and other stakeholders must always perform as effectively as possible. Business rules control and regulate business processes. When we address business rules, we can be far more flexible and adapt much more rapidly both to changes in customer requirements and expectations, and to competitor actions.

However, human resources of any organization should be able to define, understand, analyze, im-

prove, and communicate knowledge about business processes (that is business rule) at multiple levels of abstraction for multiple audiences in a repeatable and shareable way.

Business processes are the most important part of business architecture. Today, many of the company's business architecture concepts and particularly business knowledge are 'lost' for all practical purposes. Either they are embedded in the programming code and dispersed across an unending array of legacy applications or they are implicit in mindless habits and procedures or processes. The business architecture not only offers the opportunity to retain this knowledge, but also provides an innovative and practical approach to engineering effective business solutions.

We could ask some of following questions: What is the best way to express business rules using a textual language? What is the best way to express business rules using a graphical language and which notation to choose? What is the best way to express business rules using a mathematical formalization or a predicate logic? How business rules are best discovered? What is a good meta model for information models, including business rules? I and my colleagues try to answer these questions in our research and some of out issues I will present in this article.

In connection with the graphical formalization for business rules expression, I will show the business process model and explain its using in the procedure of harvesting and collecting the precise business rule. In my other works and articles, I have used the UML for business rule modelling. I created models of them in the context of the whole business processes also in relation to business resources as is business worker, money, material, product, goal (Ericsson 2000). It turned out that the UML is a good language and a good way for visualization of business architecture including business rules. I can recommend the UML also for business knowledge presentation. I do not see a wide difference between the rule and knowledge models.

We develop and explore the modern approach to the process (logistics process) reengineering by the help of the business modelling. This approach describes how to take advantage of business architecture and business rules documents. This article could provide business analysts and business managers and executive with an essential approach to understanding, redesigning and communicating what really happens in their business. However, it describes only one of the many ways of the business rule documentation with using object technology that includes models and diagrams that are similar to human behaviour and are available to all the participants and users.

MATERIAL AND METHODS

As it was written above, the rules govern policies, terms, pricing, definitions and configurations and affect the business processes, organizational structures and the behaviour of the business. They can be defined on a high strategic level or they can be formulated to specify the detailed requirements on an information system. We can speak about three kinds of business rules – governing, operating or automated rule. All these kinds have their own characteristics.

The governing rule is a legal statement (e.g., law, act, statute, etc.), a formal regulation, a mandatory agreement (e.g., contractual obligation), a higher-level business policy or directive, etc. it is often aimed at guiding or constraining the business, regulating its interactions with external parties. It often must be interpreted into one or more operating rules to be applied in an actual business process or used for information system design.

The operating rule is a declarative statement interpreted in a well-structured business language, suitable for a direct application to a business process and for consideration in an information system design. It should be unambiguous and stated in a manner directly relevant to the internal workings of the business.

The automated rule is a specific rule of the business, stated in a form recognizable by a programming language, an application generator, or a similar technology. It is very helpful to provide business analysts with a pragmatic approach to understanding and communicating what really happens in today's business processes and activities (BRGroup 2005).

Guidelines, directions and instructions are provided for selecting a modelling toolkit that best suits some project and business needs. This contribution provides an ample opportunity to think over the real-life process problems in companies and to receive practical advice about how to resolve them. The process of identifying business rules is often iterative and heuristic, where rules begin as general statements of policy. Even if the policy is formal and specific, it is typically described in a general and informal fashion, and it often remains for the employees to translate it into meaningful specific statements of what to do.

These sentences are sometimes clear, sometimes (perhaps deliberately) ambiguous, and most of the time, they contain more than one idea. And when the business people can explain rules to informatics or to analytics, they must express them in clear and well-structured language that improves communication between the managers and people from business side and between managers and IT people.

Some resources differentiate governing, operating and automated rules. But the important think is also that this definition expresses two fundamental ideas, both central to business rules, as follows (Rábová 2005):

- *At the operational level*, an enterprise is a collection of rules, not merely a collection of processes or procedures to execute. This revised view will require a new design for information systems—ones that are called such as *designs rule-based*.
- *At the data level*, we speak about *data-based rules*. Wide enterprises are characterized at the operational level by multitudes of users with diverse responsibilities and with specific objectives that are often conflicting. In such an environment, attempting to enforce rules within processes or procedures ultimately is useless. What all these workers have in common is their data basis and the need to record and share the persistent results (of processes and procedures) in a standard form. So we prefer that the expression of business rules should be based on “data” and their specification should be declarative, not procedural (Ross 2006).

Modelling of business concepts is one of the possibilities of expressing business rules simply and comprehensible either at the operational or data level and it helps the enterprise professionals to manage their business effectively.

Our business rules approach is constituted at the principles of The Business Rules Manifesto (BRGroup 2005), the important document about business rules managing. It is composed of the harvesting, mining, documentation and managing of business rules in small, middle and large enterprises. The aim of my article is presentation of the method or technique for expressing the business rules via the model of business architecture. I think this is the most important part of business rules approach. As I have presented in my previous articles and works, there are several solutions in the business rule classification (Rábová 2006, 2007). In our approach, we prefer the following, structural and operative rule:

- *The structural business rules* enable the business to create (i.e., to structure) its own private world of the encoded knowledge. They give shape to the core notions of the business by precisely establishing clear lines of demarcation for each. During business activity, structural business rules are used to evaluate ‘where you are’ (current state) as the need arises. For example, is this customer a gold customer or not? Do we owe this customer a discount on this order? Does this bird have an actual test of healthy OK? The conclusion reached

in each case is only as good as the logic within the rules. A poor or misapplied logic yields poor or inconsistent results.

- *Operative business rules* enable the business to run (i.e., operate) its activities in a manner suitable, optimal, and/or best aligned with its goals. Operative rules deliberately preclude specific possibilities (of operation) that are deemed undesirable or less effective. Breaking an operative rule will not ‘break’ the knowledge, but the threat of sanction is often quite real. Break an operative rule and a clear-cut violation occurs. Operative business rules are always preventive. Here are some examples of structural rules:

Any aspect of business guidance or know-how that might change should be treated as rules. In forming definitions, therefore, the practitioner should always focus what is unlikely to ever change – that is, on the fundamental essence of the business concepts. We call such a business architecture statements the *essence definitions*. For example, consider the definition of ‘customer’ proposed by a practitioner in a real-life project, or the definition of the customer category or of the number of *business workers, cowmen, for certain number of livestock* in agricultural business.

RESULTS AND DISCUSSION

Presented business rules approach, is available for two different sides of stakeholders (any person or representative of an organization who has an interest in the outcome of a project). They are IT people and the business people (executive, management, workers) with other accomplishment and skills. As a consequence, I see the big problem (I am an IT professional). First, we all have to express rules in a clear, unambiguous, well-structured business language. This is the way to improve communication about business rules and connecting concepts in the enterprise between the business side and the IT practitioners. We have to find a middle ground between the high-level policy directives and the technical specification of rules at an implementation level. Only thus we make a bridge between the thinking of analytics, designers and business people.

We suggest the procedure as follows will describe it only in a brief. Essential is to present here our model for obtaining the rules from business workers and managers in this article.

We design the model of business architecture (Figure 1). This common company model consists of the four basic concepts (goal, resource, process and rule). We target the business processes or business

activities and their goals, resources, input, output and support concepts.

There are definition and structure of these concepts in the business guideline, laws, direction but also only in mindless habits or heads of the business people. Key users or members of our team from business connect their work or activity knowledge with the component of our submitted diagrams and pictures. I think this is the proper way to get their knowledge. And this is the ground we would like to make.

Then we can specify, classify, support or manage the business rules. But this is the subject of many other groups and communities from all over the world. Our patterns help only with communication by harvesting and collecting rules in at beginning of the whole process.

CONCLUSION

In conclusion of my contribution, I must present some aspects of the business rules quality, because

it refers to the fitness of business rules. The business rules are the essential parts of the knowledge management process and they influenced also the strategic management. Knowledge has become a resource of key importance with regard to the competitive advantage of a business. We can say that every business rule present some business knowledge. There are two general areas of evaluating rule, or perhaps knowledge - validation and verification as discussed below. Actually some new opportunities are emerging in this area, especially using automated tools or application systems.

Validation means assessing fitness with respect to *business purpose*. The goal is not only to ensure the correctness of the rules from the perspective of business people, but also to ensure that when applied, the results will be appropriate in all relevant circumstances. Validation is largely a matter of the diligent analysis, but automated analysis tools can help in many ways.

When we use a textual language for the business rule expression, the following criteria are essential:

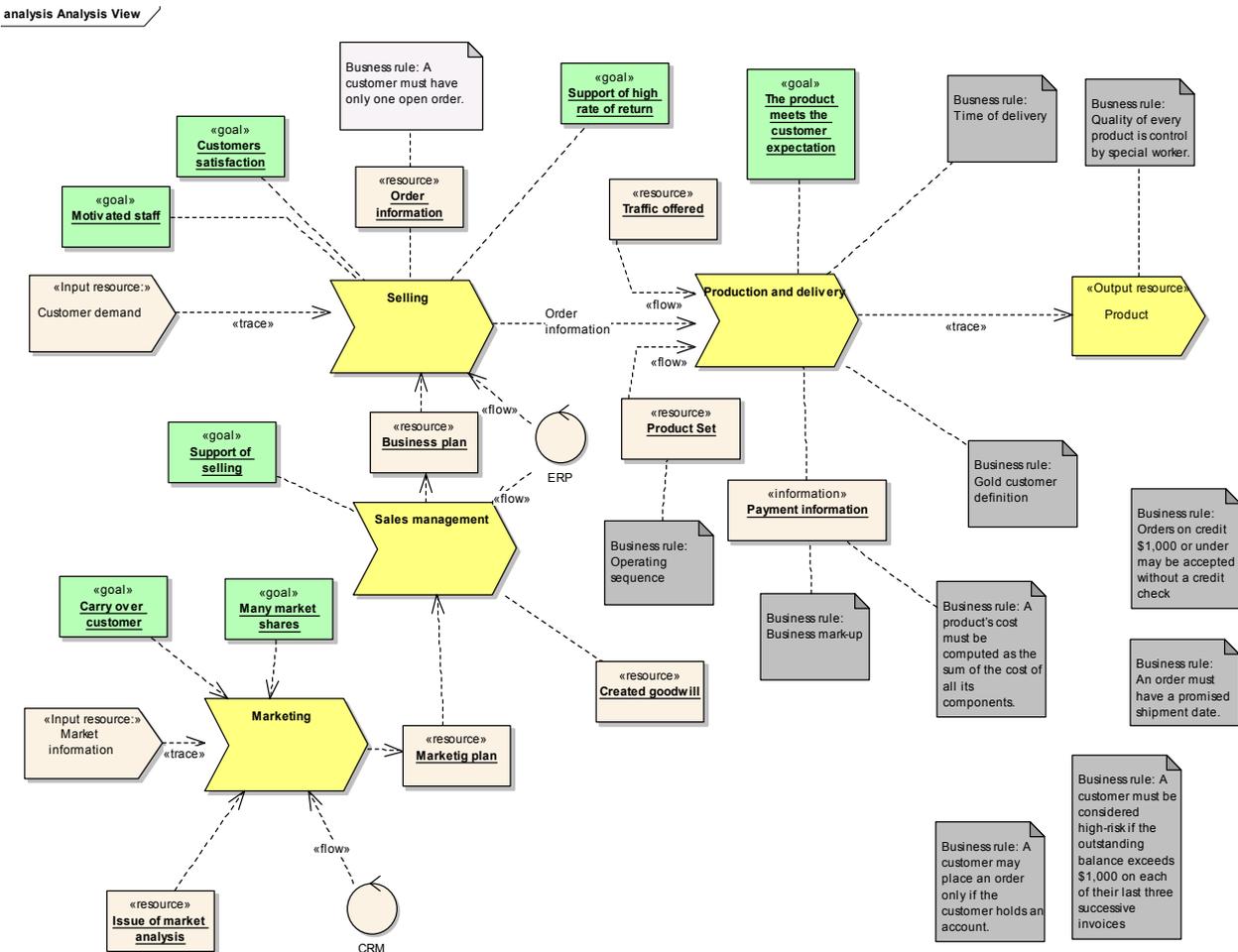


Figure 1. The business process model and the business rules

- *Expressibility* – the language must be capable of expressing a wide range of business rules.
- *Clarity* – rules in the language must be understandable also by non-technical domain experts
- *Formality* – rules in the language must be unambiguous.

The interest in the business rules and their managing and supporting is steadily growing, due in a large part to the recognition of the impact of business rules on customer service and corporate agility. There are numerous applications areas/needs for business rules, so there are many ways to introduce the business rules approach into an organization. Never before has the business been in a position to shape and refine its own guidance and know-how so directly and proactively. One of the problems in this approach is also who owns the business rules and whether to attack the problem at a departmental or a corporate level because the first step to solve the problem is recognizing it (Ross 2006).

Enterprise Architecture is an important strategic planning technique that can be used by the organization to communicate and interpret the objectives of the business, and to align the IT services with these aims. It also offers a powerful framework within which organizations can address their statutory and corporate governance requirements. The technique enables a better planning, an ability to prove compliance, and provides a better awareness of the value of technology investments, as well as helping to provide understanding of the complexity found in many IT environments.

The process of identifying business rules is often iterative and heuristic, where rules begin as general statements of policy. Even if the policy is formal and specific, it is typically described in a general and informal fashion, and it often remains for the employees to translate it into meaningful specific statements of what to do. The presented technique enables that the rules are written and made explicit, are expressed in a plain language, that they are specified directly by those people who have the relevant knowledge (e.g. the active stakeholder participation) and that they are managed.

A key challenge facing every company at present is how to be more adaptive to change. Modern business systems must be capable of responding to change as and when it occurs.

It is actually a rule that the business follows. It could be a government-imposed law, a customer requirement, or internal limitations. We think the pragmatic business rules approach is necessary to support business rules harvesting and administration and to support conducting the accomplished business analysis. We believe that the time has come for all enterprises to put in place business processes and business rules that will enable us to answer the most fundamental of all business questions, including 'How are we doing, which elements of the business are performing well, and which are holding us back?'

REFERENCES

- BRGroup. Available at <http://www.businessrules-group.org> [Quoted 08/2005].
- Eriksson H., Penker M. (2000): *Business Modelling with UML*. John Wiley & sons, Inc.; ISBN 0-471-29551-5.
- Rábová I. (2005): The Formalization of Knowledge in Agricultural Industry Business Process. *Agricultural Economics – Czech*, 51 (7): 53–58.
- Rábová I. (2006): Business Rules in the agricultural area. *Agricultural Economics – Czech*, 52 (6): 335–340.
- Rábová I. (2007): Podniková pravidla v podnikových procesech (The business rules in the business processes). In: *Firm and competition environment*. MZLU Brno, pp. 63–68; ISBN 978-80-8663-88-6.
- Ross D. (2006): *Business Rule Solutions*. Available at <http://www.brcommunity.com/index.php> [Quoted 20.10.2005]
- Svoboda E. (2007): Knowledge management in managerial work of business management. *Agricultural Economics – Czech*, 53 (7): 298–303.

Arrived on 16th May 2008

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