

# CURRENT TRENDS OF CORPORATE PERFORMANCE REPORTING TOOLS AND METHODOLOGY DESIGN OF MULTIFACTOR MEASUREMENT OF COMPANY OVERALL PERFORMANCE

M. Hodinka, M. Štencl, J. Hřebíček, O. Trenz

**Received: November 30, 2011**

## Abstract

HODINKA, M., ŠTENCL, M., HŘEBÍČEK, J., TRENZ, O.: *Current trends of corporate performance reporting tools and methodology design of multifactor measurement of company overall performance*. Acta univ. agric. et silvic. Mendel. Brun., 2012, LX, No. 2, pp. 85–90

Enterprises normally have a different approach to performance reporting. Performance reporting, and unfortunately reporting globally, at small and middle enterprises are not widely supported or popular. It perceived as something what enterprises must do, not what they like to do. The reason could be because its time consuming for them or it gives not a good (or none) feedback to the enterprises. But there are also some of the enterprises, that have their performance reporting as normal part of the corporate culture and want to have reporting as part of their information system (ideally automated). The first step of successful implementation of the automated performance reporting into the information system is to formalize the business rule from natural language expression. Current trends of corporate performance reporting and performance evaluation, i.e., the measurement of environmental, social, economic and governance performance of a company, and corporate sustainable reporting, are discussed in the paper. The relationship between corporate performance and reporting is an important issue; and the design of modern and advanced methods to identify key performance indicators is discussed here along with the possibility of the utilization of XBRL taxonomy or/and Complex event processing (CEP) techniques and methods.

performance evaluation, corporate performance, ESG performance, key performance indicators, corporate reporting, XBRL, complex event processing

Enterprises normally have a different approach to performance reporting. Performance reporting, and unfortunately reporting globally, at small and middle enterprises are not widely supported or popular. It perceived as something what enterprises must do, not what they like to do. The reason could be because its time consuming for them or it gives not a good (or none) feedback to the enterprises. But there are also some of the enterprises, that have their performance reporting as normal part of the corporate culture and want to have reporting as part of their information system (ideally automated).

The first step of successful implementation of the automated performance reporting into the information system is to formalize the business rule from natural language expression. Current trends of corporate performance reporting and performance evaluation, i.e., the measurement of environmental, social, economic and governance performance of a company, and corporate sustainable reporting, are discussed in the paper. The relationship between corporate performance and reporting is an important issue; and the design of modern and advanced methods to identify key performance indicators is discussed here along with

the possibility of the utilization of XBRL taxonomy or/and Complex event processing (CEP) techniques and methods. The practical survey of the extensible business reporting language (XBRL) as technology standard for the transparent interchange of financial and business reporting data is described by Bergeron (2003). This book provides an objective, vendor-independent assessment of XBRL, highlighting the positive and negative aspects of the standard.

The aim of this paper is to explain the CEP and it's relevant to the some of the other areas such as XBRL (extensible business reporting language) reporting, web services, business rules, autonomic computing as well as to tradition data management areas. It is true that parts of complex event processing are business rules and decision in processes (possibly automated). For the wider definition of business rules, defining business rules as constraints against the business and documented as a business asset there are additional steps, usually via some controlled business ontology or vocabulary. Identify declarative business rule statements that associate entities with each other and map business rule statements to associated entity / state / event occurrences to enforce the business rules in particular processes.

## METHODS AND RESOURCES

*Complex event processing* (CEP) is a set of techniques and tools to help us understand and control event-driven information systems (LUCKHAM, 2001). In the years it has evolved into the paradigm of choice for the development of monitoring and reactive applications. Gartner has determined that CEP is one of the emerging areas on the rise in the *hype cycle* and become dominant in the area of Business Process Integration and Management (BPIM) as well as other areas (i.e. command and control). According to Gartner's prediction, within 5–10 years this area will get to maturity.

Important is to introduce two main providers of methodologies. Barbara von Halle (2001) in *Business Rules Applied* predates the concept of CEP and indeed TIBCO<sup>1</sup> as the ~3rd largest rule engine vendor. And Ron Ross (1998) *business rule documentation focus* – the main book is *Business Rule Concepts* which is up-to-date and covers mostly the wider definition of business rules, but does relate how these map to automatable rules (and events).

Three factors are preconditions for effective utilization of the CEP. First, appropriate metadata representation of business rules on the Web is required that could improve the accuracy of searches (the resource discovery problem). Second, business rules points within web pages should be able to be reliably parsed (the attribute recognition

problem). Third, standard mechanisms are required that will encourage or require corporations to report in a consistent fashion. The reality of the Web is that it falls far short of a reliable communication medium all three of these factors. The eXtensible Markup Language (XML) provides a method to tag financial information to greatly improve the automation of information location and retrieval, and provides technical solutions to the resource discovery and attribute recognition problems. However, if every company were free to develop its own labels for its XML tags, then the searching for financial information would be only marginally improved. The recent development by a consortium lead by the American Institute of CPAs (AICPA) of the so-called *eXtensible Business Reporting Language* (XBRL) is an initiative to develop an XML-based Web-based business reporting specification. The widespread adoption of XBRL would mean that both humans and intelligent software agents could operate on financial information disseminated on the Web with a high degree of accuracy and reliability. XBRL provides rich research opportunities, including new taxonomies, database accounting, financial statement assurance, intelligent agents, human/computer interfaces, standard development process, adoption incentives, global adoption, and formal ontologies (GRAY *et al.*, 2001).

We can use developed XBRL tools to facilitate the calculations and the visualizations of above chosen economic performance indicators as defined in (HŘEBÍČEK *et al.*, 2011). XBRL allow us to prepare report to place electronic tags on specific content (graphs, numbers, text, etc.) of indicators in their reports by using an existing *XBRL taxonomy*. It enables users those are interested in finding some business rules, they could immediately find this rules – select it, analyse it, store it and exchange it with other computers and automatically present it in different ways. Users are able to apply this to multiple reports and compare information across different reports.

## RESULTS

Going back to the basics of business rules, rules can be restrictions, guidelines, computations, inferences, timings and triggers; the last two are where events start to come into play. Rules are defined through terms and facts; some facts may be events, and rules enforced as events occur. The most general and also easiest definition of business rule could be comparison to business restrictions. In a view of the processes in the company, which should effectively support software application, it could be said that business processes transform inputs into outputs on the basis of directives, regulations, techniques, methods, standards

1 TIBCO is the undisputed leader in complex event processing (CEP) software with over 40 percent market share, according to a recent IDC Study

and rules (RÁBOVÁ, 2007). Business rules drive process definitions and the decisions made within business processes, and mapping between rules, processes and decisions is easiest done from an event perspective, where the logic is defined in a ruleset as opposed to a process. Events are key to business rule evaluation and enforcement, where events are triggers for both processes and the rules that determine the decisions within those processes: an event triggers a process, which in turn calls a decision service. Changes to relevant data cause one or more rules from the ruleset to execute. In fact, there's a fine line between business processes and event processing if you consider how an event might impact an in-flight event-triggered process (KEMSLEY, 2009).

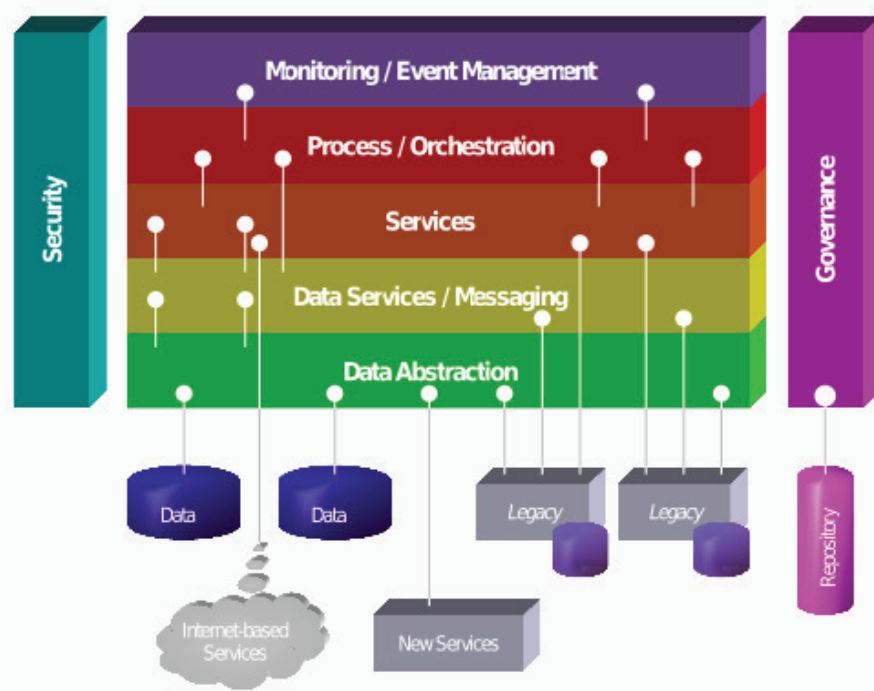
When it comes to modelling your SOA application's business logic, you could just code it all up and keep stateful information in an RDBMS. However, if your business logic has a considerable amount of complexity to it, is frequently changing, or is defined/maintained in large part by functional/business analysts, you might consider modelling parts or all of it with a BPMS/Process Engine, Business Rules, or even CEP. Today's SOA application is developed as a set of event-driven processes. Two types of events drive a process: an **event starts** when creates a new instance of the process; an **intermediate event** wakes up a pending instance as shown on Fig. 1.

BPM is good for fairly predictable processes, CEP for responding to events – while SOA is an approach, which can underpin and improve CEP and BPM as well as offering other benefits. The combined SOA/CEP offering is encouraging, because CEP's

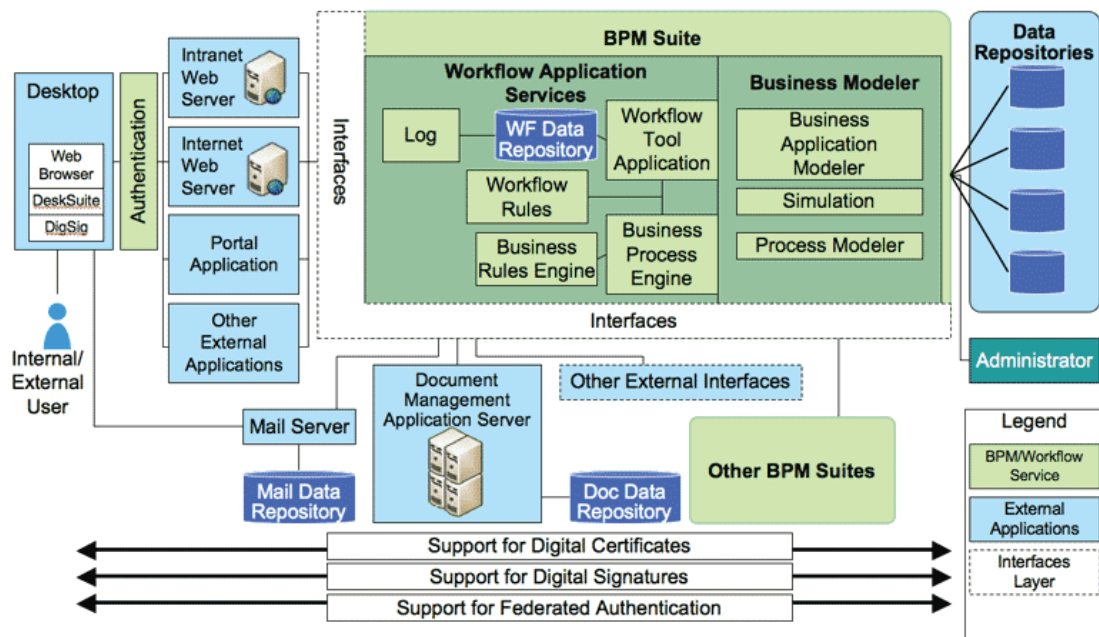
value comes not from its intrinsic value but from its contribution to an overall solution. SOA vendors, in a sense, have been in the *overall solution* business for years. They promote the idea that business architecture should be built on services, and they provide a platform on which to build those services. But what's always been missing was a tool to watch the services, to make sense of what's happening operationally.

What CEP and SOA have in common are events. Both technologies use events, but for different purposes. SOA processes use events to drive control flow. An SOA process is started by an event, and during the course of its execution waits for further events to propel it forward. Events in SOA, in effect, force process transitions. Most SOA processes not only receive events but also send events. When a process sends an event, another process receives it. CEP, by contrast, is a rules engine that uses events to trigger rule evaluations. CEP is constantly listening on the SOA bus for events. By using event pattern matching rules, CEP is able to infer causal connections between seemingly disparate events.

We started this paper with brief description of current situation in most of the European countries. Corporate Performance Evaluation and Reporting is one of the most important issues for successful management of corporation and enterprises especially in present – crisis time. In this article we provided solution of automated reporting with respect to the tradition BPM approach. The BPM is good for fairly predictable processes, CEP for responding to events. We see the right connection point between processes and events the SOA. SOA is an approach, which can underpin and improve



1: The SOA Architecture scheme



2: BPM Work Flow

CEP and BPM. If we focus more on the technology level, then an ultimate solution is also provided by XBRL. Most of current information systems are based or integrates support of XML. If we use complex reporting language, such as XBRL, we will get outstanding benefit from that solution. More further, we can apply specific evaluation methods on the data provided from the CEP system combined with all previously mentioned features to prepare complex reports uncovering correlated information hidden in provided data. The additional value, which contains this solution, brings the high level

of automation and reusability of already collected/ reported information or indicators.

The future research must be then focused on definition/design of the correct evaluation methods to effectively deliver the right information to the right users, having on mind the goal of high level automation of the whole indicators mining process. We try to initialise discussion about the whole integration of all elements (SOA, BPM, CEP, XBRL), which provides the hidden information and the correct integration and prioritization.

## SUMMARY

As we provided in the text of this paper, the first step of successful implementation of the automated performance reporting into the information system is to formalize the business rule from natural language expression. Our research is mainly focused on the methods of measurement and evaluation of environmental, social, economic and governance performance of a company (ESG), and corporate sustainable reporting. The relationship between corporate performance and reporting is an important issue; and the design of modern and advanced methods to identify key performance indicators is discussed here along with the possibility of the utilization of XBRL taxonomy or/and Complex event processing (CEP) techniques integrated in the right way and combined with the right evaluation methods are discussed in this paper.

## Acknowledgements

The Czech Science Foundation supported this paper as part of the project: Construction of Methods for Multifactor Assessment of Company Complex Performance in Selected Sectors. Registration No. P403/11/2085.

## REFERENCES

- BERGERON, B., 2003: *Essentials of XBRL: Financial Reporting in the 21st Century*. Wiley, 2003, ISBN: 0471220779.
- GRAY, L. G., DEBRECENY, R., 2001: *The production and use of semantically rich accounting reports on the Internet: XML and XBRL*. International Journal of Accounting Information Systems Vol. 2 Issue 1, pp. 47–74.
- HALLE, B., 2001: *Business Rules Applied: Building Better Systems Using the Business Rules Approach*. Wiley, pp 464. ISBN 0471412937.
- HŘEBÍČEK, J., SOUKUPOVÁ, J., ŠTENCL, M., TRENZ, O., 2011: *Integration of Economic, Environmental, Social and Corporate Governance Performance and Reporting in Enterprises*. Acta Universitatis agriculturae et silviculturae Mendelianae Brunensis: Acta of Mendel University of agriculture and forestry Brno. 2011. ISSN 1211-8516.
- KEMSLEY, S., 2009: *Business Rules and Business Events: Where CEP Helps Decisions*. BusinessRulesForum. [cit. 2011-11-10] Cited from <<http://www.column2.com/2009/11/business-rules-and-business-events-where-cep-helps-decisions-brf/>>.
- LUCKHAM, D. C., 2001: *The Power of Events: An Introduction to Complex Event Processing in Distributed Enterprise Systems*. Addison-Wesley Longman Publishing Co., p. 376. ISBN 0201727897.
- RÁBOVÁ, I., 2007: *Podniková pravidla v podnikových procesech*. In: Firma a konkurenční prostředí. ISBN 978-80-86633-88-6.
- ROSS, R. G., 1998: *Business Rule Concepts: Getting to the Point of Knowledge*. Business Rule Solutions Inc. ISBN 0-941049-04-3.

## Address

Ing. Michal Hodinka, Ing. Michael Štencl, Ph.D., prof. RNDr. Jiří Hřebíček, CSc., Ing. Oldřich Trenz, Ph.D., Ústav informatiky, Mendelova univerzita v Brně, Zemědělská 1, 613 00 Brno, Česká republika, e-mail: michal.hodinka@mendelu.cz, michael.stencl@mendelu.cz, jiri.hrebicek@mendelu.cz, oldrich.trenz@mendelu.cz

