

Unleashing Business Processes through the Semantic Web – a Fact or Myth?

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Business process modelling (BPM) is nowadays a common practice that is regarded to have tremendous value when businesses wish to analyse, design and redesign their operations in order to optimise their work performance. This concept of being able to capture business processes and describe them in a more formal and reusable format, however, was not initially recognised. Business processes are often thought of as informal. They typically vary in different organisations and may change in circumstances. They may also be carried out differently depending on the person who implements it. In addition, these processes are often renewable that they must evolve through time and response to changes within the environment that they operate. As a result, in the past there is often only limited amount of processes within an organisation that are more clearly described, typically they are those directly related to IT automations.

This view was largely altered when a MIT lead project conducted their research in search of generic and reusable business and process components across different business companies and sectors. This enables them to place these commonly shared components in structured hierarchies. This work involved over forty university and industrial partners. Their results are published in the MIP Process Handbook [6]. A related attempt was lead by NIST's PIF [9] and PSL [10] initiatives for manufacturing processes; some 250 industrial and university partners are involved to create a common ontology and interchange language to promote the sharing between process concepts and model primitives in different applications.

In addition to sharing business practice, process modelling technologies clearly provide great technical advantages towards implementing a correct and appropriate workflow system. For instance, they allow critical analysis and simulation of possible scenarios before one commits cost to build the actual system. However, according to Delphi's survey in 2002 that before the year of 2000 only very few workflow systems are built based on business process modelling methods. Instead, this approach was only recognised and taken up after the year of 2000. Since then, the concept of linking BPM to workflow systems has been adopted rapidly. Today, BPM plays a dominant role in Business Process Re-Engineering, Business Process Change, Business Analysis, and Workflow Management. More recently, it has been recognised to be a vital and integrated part within the field of Knowledge Management.

Through the popularity and strong recognition of the importance of Semantic Web (SW). BPM and process modelling communities have been trying to bridge themselves and ride the SW wave. They are interested in several fronts. They want to be able to describe their processes in a semantically meaningful way – and more importantly, consistently over the web. They also want to describe their processes in standardised fashion so that they facility communication between applications. Example previous efforts of these types are OASIS's standard work [7], BPML [2]

and later on OWL-S [8]. More over, these communities want not just to describe their processes - they want to enact them and particularly through web services. One very good example is BPEL4WS [1]. However, despite their best attempts none of them has provided sufficient support for enabling semantically rich services via the Web. As a result, a newer breed of the process language WSML and WSMO [11] together try to tackle this problem.

Although WSML and WSMO are too new to make a definite judgement, it is relatively clear to see that current other existing efforts are not proficient to provide support that will unleash the full potential of business processes through the Web. Upon translating and mapping a typical BPM language onto OWL-S, it was found that various typical business operations could not be expressed easily in OWL-S [4]. This is partly because OWL-S provides mainly high-level concepts that lack constructs to enable more sophisticated co-ordinations, such as temporal synchronisation, between processes. Similar attempts were also conducted to map to BPEL4WS and BPML [5]. The latter two methods, however, suffer from the inability of describing their data model independently when representing their process models. OWL-S has advantage regarding this issue, as it may be used in conjunction with OWL that is an ontological language and is native for describing data.

Ideally, to fully support and enact a business process system over the web, a few properties should be considered. For example:

- To truly integrate data and process models in their languages;
- To enable a direct link to organisational structure, function and rationale, so that business decisions may have a direct influence on web based business operations;
- To allow explicit use of existing and prominent standard ontologies, including data as well as business process ontologies;
- Provision for sophisticated agent coordination and temporal synchronisation between separately run processes;
- To facilitate explicit representation of process life cycle, i.e. to treat a process as an independent entity, so that it may be tracked, monitored, suspended and repaired according to business rationale; the same point is also applicable for representing data life cycle;
- To provide a framework for explicit representation of error and recovery mechanism, in particular for a distributed and peer to peer environment;
- Finally yet importantly is to simplify the too many layers of the “semantic-layered cake for web-based workflow systems” [3].

There is definitely a great deal of potential for enacting BPM based workflow systems over the Web and there are plenty of advantages to be gained. For instance, it provides for a much more open and interactive environment that allows the participation of any arbitrary or purposely-selected agents. Agents are also able to carry out more agile, speedy and autonomous decision-making and business operations based on (own) goals. Such tasks may be standardised; or can be dynamically adapted at run time. They may be related to business communication, deals making, contract negotiation and secure business transactions over the Web. When and if all of these facilities are realised, this new breed of web and knowledge

based autonomous business systems should revolutionise the conventional ways of carrying out business and thinking about doing business.

Reference:

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