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Workflow Flexibility: The Forlorn Promise

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Abstract

It is argued in this position paper that a workflow management system is potentially a powerful solution to bring more flexibility to the management of business processes. At the same time, the technical difficulties of integrating such systems in a business environment prevent this advantage to materialize up to this day.

1. Workflow: Success or Failure?

Process-awareness in information systems manifests itself in various forms, with similar concepts appearing under different names, in different combinations, and with varying levels of tool support [4]. In this paper, I will consider a subcategory that is more or less well-delineated within the domain, that of Workflow Management Systems (WfMSs). A WfMS is a software system that supports the specification, execution, and control of business processes on the basis of explicit process models [6][7]. Commercial WfMSs have been around since the early nineties, while their conceptual predecessors range back further, see e.g. [5].

I know of a quite some arguments that favor the picture of WfMSs as a successful technology. They have become "one of the most successful genres of systems supporting cooperative working" [3]. Furthermore, WfM functionality has been embedded by many other contemporary systems, such as ERP, CRM, and call-center software, and has influenced thinking in the web services community considerably. Also, from personal experience I know that in the Netherlands every single financial corporation and most ministries and municipalities apply workflow technology on a wide scale.

On the other hand, WfMSs have received an unmistakable share of criticism. Many observers have argued that the application of a WfMS makes business process execution too rigid, not allowing their users to react freely to the breakdowns occurring during their evolution [2]. Some seem to blame the rigidity on the use of formal workflow models; others on the strict coupling between modeling and execution. Especially the lack of flexibility to deal with unforeseen situations is a very widely felt shortcoming of many commercially available WfMSs, which has resulted in various research approaches to alleviate the problem. For an overview, see, for example, [9].

So, what is the truth? In the 6th century BC, Lao Tzu wrote in his book of the Way and its Virtue: "The truth often sounds paradoxical". And I think this is the case for workflow technology as well: WfMSs are successful, but not because of its intentional promise.

2. Flexibility

Then what is that promise? In their seminal book on WfM [1], the authors describe the introduction of workflow technology as a next step in an information systems development trend (see Figure 1).

Figure 1: The trend in IS development

Increasingly, generic tasks are being taken out of programs and put into decomposed management systems. In Figure 1, this evolution is described in four steps. From 1965-1975, operating systems (OSs) were introduced, freeing application programmers from addressing generic tasks such as memory allocation within single applications. During the period 1975-1985, database management systems (DBMSs) were widely introduced and from 1985-1995, the user interface was extracted from the application program with User Interface Management Systems (UIMS). In the subsequent period 1995-2005, WfMSs were widely introduced, eliminating the coordination of the business processes from the applications.
By eliminating process coordination logic from applications, it would become possible – in principle – to change the structure of a business process independently from the content of the various applications: the flexibility promise. In other words, changing a business process, e.g. the swapping of two tasks, would not require programmers to look throughout numerous line of (business) application code to find and adapt the involved dependencies. Instead, a simple update of the process model in the WfMS would do and the business logic in the applications would not be affected at all.

The question now is whether this promise has been fulfilled. My feeling is that it has not. In the context of a long-running investigation into the effectiveness of WfMSs that Eindhoven University of Technology is conducting, I have been involved in monitoring the implementation of more than a dozen of WfMS implementations since 2001 [8]. My impression is that none of the involved organizations dare to touch the WfMS configuration once it had been completely configured. So many technical difficulties had to be solved to integrate the WfMS with the various applications (e.g. the Document Management System, various registration systems, financial ledger, etc.) that changing the slightest thing would perhaps disturb the precious balance that had been accomplished - often at the cost of developing proprietary, ad-hoc integrations between the WfMS and the applications.

So, the involved organizations were surely disappointed about the merits of introducing such an expensive technology as a WfMS at the work floor when flexibility did not increase? On the contrary. In most cases – but not all – management and end users alike were very happy with the system. But the reasons for this were on a different level. Management was happy with decreasing flow times of individual cases that were being processed. Performers themselves were often relieved that they could spend less time on finding all the relevant information needed for executing a task, because the WfMS took care of finding this data from all the involved applications. Secondly, they would not need to "invent" the proper continuation of the process after they had done their part of the work, as the WfMS would take care of this.

3. Conclusion

WfMSs are widely applied and have become popular because of their positive effects on logistic parameters such as flow time, service time, and resource utilization. At the same time, the promise of bringing flexibility to the work floor has not yet been fulfilled. The main reason is, as of yet, the problematic integration of WfMSs with their environment in actual implementation sites. As a result, a WfMS is hardly touched after it has been installed, "If it ain't broke, don't fix it."

Despite the considerable attention for improving and extending WfM functionality itself, notably with respect to flexibility issues, it seems that the flexibility fruits can only be reaped when more down-to-earth, technical integration issues have been solved first.

4. References