Workflow flexibility: the forlorn promise

Citation for published version (APA):

Reijers, H. A. (2006). Workflow flexibility: the forlorn promise. In S. Mitra Reddy (Ed.), *Proceedings of the 15th IEEE International Workshops on Enabling Technologies : Infrastructure for Collaborative Enterprises (WETICE 2006)*, 26-28 June 2006, Manchester, United Kingdom (pp. 271-271). Institute of Electrical and Electronics Engineers. <https://doi.org/10.1109/WETICE.2006.80>

DOI:

[10.1109/WETICE.2006.80](https://doi.org/10.1109/WETICE.2006.80)

Document status and date:

Published: 01/01/2006

Document Version:

Publisher's PDF, also known as Version of Record (includes final page, issue and volume numbers)

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.tue.nl/taverne

Take down policy

If you believe that this document breaches copyright please contact us at:

openaccess@tue.nl

providing details and we will investigate your claim.

Workflow Flexibility: The Forlorn Promise

Hajo A. Reijers

Eindhoven University of Technology, Department of Technology Management, PO Box 513,
5600 MB, Eindhoven, The Netherlands
h.a.reijers@tm.tue.nl

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

- [1] W.M.P. van der Aalst and K.M. van Hee, *Workflow Management: Models, Methods, and Systems*, MIT Press, Cambridge, 2002.
- [2] J. Bowers, G. Button, and W. Sharrock. Workflow From Within and Without: Technology and Cooperative Work on the Print Industry Shopfloor. In *Proceedings of the Fourth European Conference on CSCW*, pp. 51-66. Kluwer, Dordrecht, 1995.
- [3] P. Dourish, Process descriptions as organizational accounting devices: the dual use of workflow technologies. In *Proceedings of the ACM 2001 International Conference on Supporting Group Work*, pp. 52-60. New York, ACM Press, 2001.
- [4] M. Dumas, W.M.P. van der Aalst, and H.M. ter Hofstede, *Process-Aware Information Systems*, Wiley, New Jersey, 2005.
- [5] C.A. Ellis (1979). Information control nets: a mathematical model of office information flow. In *Proceedings of the ACM Conference on Simulation, Measurement and Modeling of Computer Systems*, pp. 225-240. New York, ACM Press, 1979.
- [6] D. Georgakopoulos, M. Hornick, and A. Sheth, "An Overview of Workflow Management: From Process Modeling to Workflow Automation Infrastructure", *Dist and Par Databases*, 3, 1995, pp. 119-153.
- [7] S. Jablonski and C. Bussler, *Workflow Management: Modeling Concepts, Architecture, and Implementation*, International Thomson Computer Press, London, 1996.
- [8] H.A. Reijers and W.M.P. van der Aalst, The Effectiveness of Workflow Management Systems: Predictions and Lessons Learned, *I J of Inf Management*, 56(5), 2005, pp. 457-471.
- [9] H.A. Reijers, J.H.M. Rigter, and W.M.P. van der Aalst. The Case Handling Case, *I J of Coop Inf Systems*, 12(3), 2003, pp. 365-391.