Introduction

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Workflow Management Coalition

Welcome to the Workflow Handbook 2004. This edition offers you three sections:

- **SECTION 1: The World of Workflow** covers a wide spectrum of viewpoints and discussions by experts in their respective fields. Papers range from an examination of the Split Personality of BPM through to Web Services workflow architectures and Business Process Management Technology with special spotlight on IT in Asia and Pacific Rim.
- **SECTION 2**: **Workflow Standards** deals with the importance of standards, with a visionary look into the future of the Workflow Reference Model. The relationship between the BPMN specification and workflow patterns is examined in detail. The draft Wf-XML 2.0 specification, discussed in ASAP/Wf-XML 2.0 Cookbook has been published in full on the Coalition website.
- **SECTION 3: Directory and Appendices**—an explanation of the structure of the Workflow Management Coalition and references comprise the last section including a membership directory.

SECTION 1—THE WORLD OF WORKFLOW

The Split Personality of BPM
Derek Miers, Enix Consulting, United Kingdom

This paper explores the link between Business Strategy, BPM Technology and Process Architectures—specifically, highlighting the need for, and difficulty in achieving both procedural 'control' and business agility.

Part I outlines the need for 'Procedures' and evolving business 'Practices.' Part II explores the need to understand and model 'what' you are doing before detailing 'how' it is done. Part III discusses some of the challenges for Business Process Management Systems (BPMS)—how they can support revolutionary objectives, yet provide an evolutionary journey. It highlights some of the issues in BPMS selection and suggests an approach for designing flexible and adaptable process architectures—providing a balance between procedural control and business agility. A key objective of this paper is to outline effective approaches and techniques that support the design of process frameworks—especially where a BPMS implementation is the intended target.

Metrics Based Business Process Management
Tommy Hansen, Mike Marin and Khoi Dang, FileNet, United States

Traditionally, BPM systems have offered limited or no data analysis and reporting capabilities. Rather, the focus has been on efficient, reliable and extensible business processing systems with some basic built-in logging functionality. The workflow user community was thus left with the task of implementing ad-hoc reporting to verify that the BPM effort delivered enhanced process management and cost savings. Following a workflow implementation project, the reporting and analysis efforts were often given lower priority and in many cases were never fully realized.

Web Services Orchestration and Management Through Intelligent BPM
Setrag Khoshafian, Ph.D., Pegasystems Inc., USA

Increasingly, Web services are becoming the preferred solution for loosely coupled integration of applications or systems within an organization and between trading partners. The adoption of Web services in mainstream service-oriented computing involves service orchestration and service management. Most of the concentration in the industry has been on orchestration standards for BPM (business process man-

agement), such as BPML, BPEL, XPDL and others. These are important and necessary. But they are not sufficient. Also, recently there have been standardization efforts for Web Services Management (WSM). WSM involves monitoring the message exchange transactions between organizations and also within enterprises. Often WSM concentrates on lower level service invocation QoS (quality of service). Many frameworks have additional rules that need to be captured outside lower level message exchange reliabilities. The rules could be associated with orchestrated services, service types, or can model more sophisticated SLAs (service level agreements). This paper addresses intelligent BPM for Web services and shows how the integration of rules and processes can be used to support orchestration and management of Web services.

Workflow-based Business Monitoring

Stefan Junginger, BOC Information Technologies Consulting GmbH, Germany; Harald Kühn and Franz Bayer, BOC Information Systems GmbH, Austria; Dimitris Karagiannis, University of Vienna, Austria

In today's business operations speed gets more and more important in comparison to size. Workflow technology has proven to be an important aid in accelerating process-oriented application development and the execution of business processes. For successfully guiding a corporation in fast changing environments, the control and monitoring of running business processes and their interrelationship to a corporation's strategy and objectives is one of the crucial success factors.

This article describes a three-level framework for business monitoring and explains how the notion of workflow and workflow technology profitably contributes to monitoring, measurement and control on each level. The strategic level focuses on the general strategy, goals and key indicators of a corporation. In the tactical level probes and key performance indicators on the workflow type level are of interest, such as average cycle times, workloads etc. Finally, on the operational level monitoring workflow instances contribute to control daily business operations. A case study from the direct sales market explains the application of the framework. The article ends describing future developments in business monitoring and their possible impact on workflow technology.

Workflow Implementation of Change Lifecycle for Product Configuration Management

P Jiang, J Newman, Q Mair, E Valfre, J-F Calm, C Wiles, G Segarra, I Viglietti, F Feru, T Visnovec & K Causse

Product Configuration Management (PCM) is an important issue for complex products that present a long lifecycle. During this long product lifecycle, change requirements may arise from any stage for product evolution or problem correction. This paper introduces a change management process model developed in the DIECoM project for the aerospace and automotive industries. In terms of the gap between business process definition and IT workflow execution, this paper presents an integrated modelling methodology that uses widely accepted UML as business process modelling language and extends the semantics of UML to support XPDL workflow template of WfMC. As a result, workflow practice can be achieved by using a customized XSL stylesheet to transform an XMI file representing the UML model to a standard format accepted by a workflow engine. The modelling methodology is illustrated by a case study of the process model of Change Configuration Management, where the process model defined in Rational Rose is transformed into XPDL for workflow enactment in ENOVIA LCA.

Adaptive Process Management

Eric Y. Shan, University of California, Berkeley, California; Fabio Casati and Ming-Chien Shan, Hewlett-Packard Laboratories, Palo Alto, California

Workflow management systems today are inept at dealing with a constantly changing environment, for process execution is dictated by static definitions. This is a serious hindrance to businesses, which need to adapt their operations quickly to a dynamic

market that has expanded in complexity from advancing Internet technology. In this paper, we enhance the traditional process model and framework in order to enable greater flexibility and self-management to meet these needs.

Scorecard-based Process Controlling Linking Business Objectives to Workflow Execution

Joerg Becker, Tobias Rieke; University of Muenster, Germany

In a changing environment efficient Process Management is a crucial activity. Therefore, managerial instruments are needed which depict dependencies between process management goals. The Balanced Scorecard is a widely used instrument for strategic management. In addition, OLAP-Report Systems can be used to analyze data through the refinement of reference objects.

This chapter outlines a controlling system for process management, with the use of the Balanced Scorecard as an accepted strategic management instrument and an approach for deriving operative goals suitable for process parts and sub-processes according to reference objects. Starting from the Balanced Scorecard level, this approach also builds a basis for detailed OLAP-Reports. Workflow Management Systems are used to provide these concepts with necessary data from Audit Trails. Workflow Management Systems are crucial for this approach due to their integrative character.

Workflow and Business Process Outsourcing: Friend or Foe?

Narinder Singh, webMethods Workflow, United States

When learning to ride a bicycle, hit a golf ball or shoot a basketball, your body interprets the activity as a series of stimuli that are then reacted upon through predominantly conscious actions within your neuromuscular system. As these activities are learned through repetition, patterns are wired through the body's nerves and muscles that lead to reflex-based response. In essence, responses are now hard wired throughout your body. This leads to enhanced, more consistent performance that can be further measured and improved.

At some point, patterns of response are so tightly connected with the external activity that even improvements to the techniques of the activity (e.g. a more compact golf swing) cannot enhance, and will likely harm overall performance—because existing patterns have been so well entrenched into the neuromuscular system.

Workflow Management Middleware for Secure Distance-Spanning Collaborative Engineering

Tim Schattkowsky, Wolfgang Mueller, Adam Pawlak; C-LAB, Paderborn, Germany; Silesian University of Technology, Gliwice, Poland

This article presents the E-COLLEG Tool Registration and Management Services (TRMS) with open XML-based data exchange, tool integration and remote invocation capabilities. TRMS is a workflow management middleware tailored to distance spanning engineering collaboration and security enabled data exchange. The infrastructure is validated through two industrial Intranet-crossing case studies between Polish, French, and German chip manufacturing industries applying real-world development scenarios. In both application scenarios, common engineering practices have been identified and built into engineering workflows. Further, the current truly pan-European collaborative industrial scenarios show promising results with respect to the stability of the implemented software and easy application and flexibility of the provided interfaces.

Optimizing Rehabilitation Patient Scheduling Using Process-Simulation

Varun Panchapakesan, CACI, Inc., United States

This paper focuses on the use of process-simulation for optimizing rehabilitation patient scheduling. A proof of concept scheduling model for Eastern Health Systems, Inc is constructed using a simulation tool and process characteristics like patient throughput, staff productivity, labor costs, etc. are compared to assess the effectiveness of centralized versus decentralized rehabilitation patient scheduling.

Collaboration-enabled Process Management (CPM)

Martin Ader, W&GS, France

In 1993, a research prototype showed the feasibility of coupling a collaboration tool with a process engine. The collaboration tool was designed by Milano University to support group conversations. The process engine was developed by Bull to include explicit process and organizational representations. The integration intended to support conversations among users in order to handle exceptional situations during process execution. We will describe how the two tools were assembled, present the Bank process implemented in 1994, and review potential uses and corresponding benefits. We will show how the conditions for such hybrid systems are now met. We will present the potential consequences of collaboration-enabled process management (CPM) for users, process analysts, process designers, and training. Finally we will describe how collaboration-enabled process management (CPM) might be a major step toward an evolution of the various work management technologies into a comprehensive and pervasive work environment where process, collaboration, and knowledge management support together the activities of each of us.

SPOTLIGHT ON ASIA AND PACIFIC RIM

Asia-Pacific: The Next Frontier for BPM

Linus Chow, Regional Director, HandySoft Global Corp., Asia-Pacific; Ken Loke, Director, Bizmann Systems, SE Asia; Suraj Goyal, Deputy GM, Datamatics Technologies, India.

Despite the challenges of a year of conflict, disease, and economic shocks, BPM has seen 2003 as a pivotal year in providing value to enterprises and governments throughout Asia-Pacific. In fact Asia-Pacific has shown its resilience by expanding its adoption of BPM as way to become more competitive and to allow stable sustained growth. 2003 can only be called a challenging year for most business and particularly the Asia-Pacific region. Not only did the region have the pressure caused by the worldwide economic slowdown and the "War on Terror", but it also had to deal with SARS and regional pressures, such as the Bali bombing and tension between India and Pakistan. These events caused enormous pressure for changes in the way businesses operate in a much more competitive market. In a way this pressure was the catalyst for businesses to seek more efficient and effective ways of managing their business processes. While workflow and BPM has a history in Japan and Oceania; BPM in SE Asia, India, and Greater China is now being recognized as a key differentiator for those starting to adopt it..

Workflow in Japan: When Tradition Meets Technology

Dr. Geoffrey Long, KAISHA-Tec, Japan

Japan as a country is an interesting mix of the old and new. Latest technologies vie shoulder to shoulder with traditional methods. Workflow is no exception to this and this paper will describe what workflow is like in the normal business community in Japan. This is a useful introduction to Western readers interested in doing business in Japan using workflow.

Cooperative Fragment-driven Workflow Modeling Methodology and System

Kwang-Hoon Kim, Dong-Keun Oh, Jung-Hoon Lee, Jae-Kang Won, Hyong-Mok Kim; Kyonggi University, South Korea

This paper proposes an advanced workflow modeling methodology, called a fragment-driven workflow modeling methodology that enables several real actors/workers to cooperatively define a workflow model. Because a workflow procedure has recently become more complicated and large-scaled, it might be hard to say that the approach is applicable for them without any further modification. Furthermore, it might be difficult to be applied for modeling a cross-organizational (or global) workflow procedure, because the involved organizations are not willing to open their own information to the others.

In this ground-breaking approach, the actors, each associated with their own organizations, need to define only their own activities, not the whole one, then the system gathers these partial sub-models (workflow fragments), and generates a global workflow procedure. The authors strongly believe that the methodology and the system should be very applicable and valuable for cooperatively modeling not only intra-organizational workflow procedures but also cross-organizational e-business processes and services such as SCM, e-Commerce, e-Logistics, and so on.

An Intelligent and Personalized Enterprise Process Portal

Chi-Tsai Yang and Bin-Shiang Liang: Flowring Technology, Taiwan; Shung-Bin Yan and Feng-Jian Wang: Computer Science and Information Engineering National Chiaotung University, Taiwan

Workflow-based application systems are prevailing in the enterprise information environment. The scenarios of workflow application are no longer limited to small user group operating the document management or data processing applications. Nowadays the deployment of workflow applications into the Enterprise Process Portal is emerging in enterprises, and this makes them employee's assistants in daily business activities as well as manager's advisor in executive decision. Meanwhile, the degree of business process automation and integration is getting more and more sophisticated. This chapter addresses five specific issues.

SECTION 2—WORKFLOW STANDARDS

ASAP/Wf-XML 2.0 Cookbook

Keith D Swenson, Fujitsu Software Corporation, United States

Wf-XML is a protocol for process engines that makes it easy to link engines together for interoperability. Wf-XML 2.0 is an updated version of this protocol, built on top of the Asynchronous Service Access Protocol (ASAP), which is in turn built on Simple Object Access Protocol (SOAP). This chapter is for those who have a process engine of some sort, and wish to implement a Wf-XML interface. At first, this may seem like a daunting task because the specifications are thick and formal. But, as you will see, the basic capability can be implemented quickly and easily. This article will take you through the basics of what you need to know in order to quickly set up a foundation and demonstrate the most essential functions. The rest of the functionality can rest on this foundation. The approach is to do a small part of the implementation in order to understand how your particular process engine will fit with the protocol.

Creating Process Efficiencies by Combining BPM and BPO

Bob Puccinelli, DST Technologies, Inc., United States

There is a growing trend in organizations to merge and combine both business process management (BPM) and business process outsourcing (BPO) strategies. This trend can be tied to five key business drivers thast include a renewed focus on core competencies and process improvement strategies such as Six Sigma, Balanced Scorecard, and Lean Manufacturing are continuing to expand throughout companies. Given the market size estimates for both of these markets, there is a high expectation that in the coming years, companies are going to employ more and more strategies that incorporate both BPM and BPO.

Workflow Service Provider with XPDL

Arnaud Bezancon, ADVANTYS, France

Process definition frequently requires input and expertise from consultants. Providing a description and a graphic view of a process is typically the first step in implementing a workflow engine. IT companies and consultants often provide this kind of service via dedicated quality standards software. The Client (or consultant) then has to translate the model into an operational definition of the process prior to implementation in the workflow engine. The XPDL (XML Process Definition Language) standard enables both parties to go further, by allowing an IT company to provide both the

process model and the ready-to-implement XPDL definition. The XPDL file can also be used directly by an ASP (Application Service Provider) workflow engine. This means the client can benefit from instant, on-demand usage of the process, avoiding typical infrastructure costs (software, hardware and service charges).

Process Modeling Notations and Workflow Patterns
Dr. Stephen White, IBM Corp., United States

The research work of Wil van der Aalst, Arthur ter Hofstede, Bartek Kiepuszewski, and Alistair Barros has resulted in the identification of 21 patterns that describe the behavior of business processes. This paper reviews how two graphical process modeling notations, the BPMN Business Process Diagram from the Business Process Management Initiative (BPMI), and the UML 2.0 Activity Diagram from the Object Management Group (OMG), can represent the workflow patterns. The solutions of the two notations are compared for technical ability to represent the patterns as well as their readability.

The Workflow Reference Model—10 Years On
David Hollingsworth

Last year saw the 10th anniversary of the Workflow Reference Model. This paper reassesses the relevance of the Model in the current context of Business Process Management. It discusses the principles behind the Model, its strengths and weakness and examines how it remains relevant to the industry today. It concludes by introducing a number of considerations required to establish a "BPM Reference Model" and discusses how the various overlapping standards in this space may be categorised.

SECTION 3—DIRECTORY AND APPENDICES

- The ***Authors' Appendix*** provides the contact details and biographies of the valuable contributors to this book. Each is a recognized expert in his or her respective field. You may contact them if you wish to pursue a discussion on their particular topics.
- The chapters on the ***WfMC Structure and Membership*** describe the Coalition's background, achievements and membership structure and sets out the contractual rights and obligations between members and the Coalition
- ***WfMC Membership Directory****:* WfMC members in good standing as of December 2003 are listed here. Full Members have the membership benefit of optionally including details on their products or services.

The WfMC invites you to delve into the information presented in whatever manner suits your reading or research style and knowledge level.

Our thanks and acknowledgements extend to not only the authors whose works are published in this Handbook, but also to the many more that could not be published due to lack of space.

Selected papers and case studies are available for free download from our sister website www.e-workflow.org if you wish to continue your reading and research on the topic of workflow.

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