Introduction

Layna Fischer, General Manager
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Welcome to the Workflow Handbook 2005. 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 workflow in the world of BPM to Web Services workflow architectures and Business Process Management Technology and Business Rules.

- **SECTION 2: Process Standards** deals with a comparative analysis of XML standards, with a visionary look into the future of the service-oriented architecture. Several examples detail important step-by-step instructions of generating processes, such as using the BPMN specification to model a BPEL process. The ASAP/Wf-XML 2.0 Cookbook has been updated following several successful live demonstrations of the protocol.

- **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

**WORKFLOW IN THE WORLD OF BPM: ARE THEY THE SAME?** 17

*Charlie Plesums, WfMC Fellow, United States*

This introductory chapter describes how workflow management systems are no longer just a simple inventory of work to be processed, or a simple routing system, but have become sophisticated process management tools. System tools have emerged to help analyze and design complex new business processes. Other tools, the invocation engines, run the process as defined. Specifically these engines invoke transactions on systems both internally and across many organizations—suppliers, partners, and customers. Business Process Management—BPM—is born.

**BPM—TOO MUCH BP, NOT ENOUGH OF THE M** 23

*Derek Miers, Enix Consulting, United Kingdom*

The problem with many BPM deployments is that they often overlook the reason why this technology is needed in the first place—to support the achievement of business objectives. The re-emergence of business processes as a core discipline in modern business management is fairly clear. But in order to really derive the maximum benefit from BPM initiatives, firms need to manage the people interface more carefully.

**INTEGRATED FUNCTION AND WORKFLOW** 31

*Chris Lawrence, Old Mutual, South Africa*

Mr. Lawrence discusses designing and building computer systems based on the process modeling methodology called ‘integrated function and workflow’ (IFW) systems. A key claim of the approach presented in this chapter is that it keeps the business model and the solution model aligned because they are
one and the same model. The subprocess concept and construct is an important factor in that alignment—which is effectively the alignment between what and how.

**BUSINESS ACTIVITY MONITORING AND SIMULATION**  
*Joseph M. DeFee, CACI and Paul Harmon, Business Process Trends, United States*

Gartner suggests that BAM will become a major corporate concern in the next few years. Most large organizations will at least explore the possibility of improving business process management by creating systems that provide a broad overview of a process that can provide near-real-time information and advice to process managers. A variety of techniques will be used. The authors believe that simulation-based BAM will prove to be the most powerful and flexible approach to BAM and will increasingly be relied on by those with the more complex processes.

**BUSINESS PROCESS IMPROVEMENT THROUGH OPTIMIZATION OF ITS STRUCTURAL PROPERTIES**  
*Vladimír Modrák, Technical University of Košice, Slovakia*

With the growing requirements for the improvement of business activities within organizations, aspects of changes and new concepts of process structures are becoming a topical problem. These aspects are evenly important from standpoint objectives of the first out of two phases of workflow management (WfM). The processes of change have been addressed mostly at the level of administrative business processes (BP). Apart from main intention to present a practicable approach to the measurement of the structural complexity of business processes, the chapter also outlines some conceptual aspects of the effectiveness of the creation of practical tools for business processes redesign consisting of modeling and subsequent analyzing of processes structural attributes.

**ENHANCING AND EXTENDING ERP PERFORMANCE WITH AN AUTOMATED WORKFLOW SYSTEM**  
*Robert J. Kearney, Image Integration Systems, Inc., USA*

ERP systems are most commonly and correctly perceived and utilized as transaction processing machines. In that role they excel. Workflow systems, integrated with the ERP system, can function as the data delivery mechanism for ERP transactional processing. Conversely, ERP transactional processing is but one of the many activities in the workflow. The integrated result provides capabilities that have been missing with ERP alone: standardization and automation of entire business processes, effective involvement and interaction with the business experts, and, the creation and capture of all relevant business process information. The improved business processes enable the promised economies of scale from centralized ERP processing.

**NARROWING THE SEMANTIC GAP BETWEEN BUSINESS PROCESS ANALYSIS AND BUSINESS PROCESS EXECUTION**  
*Dr. Setrag Khoshafian, Pegasystems Inc., USA*

The business process management (BPM) industry is growing rapidly, surpassing the expectations of even its most ardent supporters. Like most new technologies, BPM is enduring its own growing pains thanks to convergence, consolidation, and accelerated adoption. One of the critical areas of convergence that has not received sufficient attention is the semantic gap and interoperability challenges between business process analysis (BPA) tools and
intelligent BPM engines. This interoperability challenge is further aggravated by the lack of robust business rules modeling tools. Business rules are now regarded as essential components of a next generation BPM (intelligent or smart BPM). Even though there are various BPM standardization efforts, the semantic gaps between BPA and run-time intelligent BPM engines are considerable. This paper will address these semantic gaps and identify solutions for continuous and iterative development of complex intelligent BPM applications.

**USING SOA AND WEB SERVICES TO IMPROVE BUSINESS PROCESS FLOW**

Zachay B. Wheeler, Roberta Bortolotti, SDDM Technology, United States

Case Study: District of Columbia’s Oracle Database, Presentation Layer, SOAP/XML. Tasked with the analysis of improving and automating the current business process of license issuance for the Department of Consumer and Regulatory Affairs (DCRA) of the District Columbia, the SDDM Technology team developed Business Logic and Data Access Tiers. The solution to the District of Columbia business license problem was resolved using Service-Oriented Architecture and Web Services, taking advantage of a wide variety of available technologies. WS SOA allows business people in the DC government to consider using an existing application in a new way or offering it to a partner in a new way, thus potentially increasing the transactions between agencies.

**WORKFLOW AND BUSINESS RULES—A COMMON APPROACH**

Heinz Lienhard and Urs-Martin Küni, ivyTeam-SORECO Group, Switzerland

A BPM approach is proposed for addressing processes, Web Services and the use of business rules by the processes, starting from graphical models. Transparent, easy to manage and mathematically sound solutions are obtained in a coherent way. The authors show that practical experience with Business Rule Management within BPM will have a beneficial influence on the further development of BPM technology. What is already possible to do now will become very easy to do in the future, e.g. totally integrated calls to rule management from process elements (like “event starts,” “process triggers,” “decisions (gateways in BPMN)” etc). As well, rule inference may become a natural part of these systems.

**STATE OF BPM ADOPTION IN ASIA**

Ken Loke, Bizmann System (S) Pte Ltd., and Dr. Pallab Saha, Institute of Systems Science, National University of Singapore

There will be an exponential growth in the adoption of BPM technologies within ASEAN companies, say the authors. The way businesses and the marketplace are evolving will fuel this adoption. Academicians, consultants and solutions vendors are working together to bridge viable deliverables in various forms for ASEAN companies to adopt BPM. Companies have recognized the need to equip their workforce on process excellence. The intense competition and time to market factors further put pressure for companies to optimize their current processes. The authors show how observing corporate governance in different degrees is something that most enterprises are taking seriously.
Section 2—Workflow Standards

BUSINESS PROCESS METAMODELS AND SERVICES 159

Jean-Jacques Dubray, Attachmate, United States

The software industry has long searched for a computing model where business or work processes would be explicit and where customers could change the business processes without significant coding projects. Programming languages like WS-BPEL, Service orientation and web service technologies represent a major architectural advance to create a new generation of business process engines that can integrate with a wide variety of business functions and across business boundaries going far beyond the original concepts of business process orchestration that were defined in the late nineties and have hardly evolved since then. Dubray contends that this new generation of process engines is expected to manage end-to-end business processes while being far more flexible, far more business savvy and far more integrated with all aspects of IT as was laid out the business vision in the past twenty years. These concepts are poised to revolutionize software engineering and the way we build business applications.

WORKFLOW AND SERVICE-ORIENTED ARCHITECTURE (SOA) 179

Arnaud Bezancon, Advantys, France

Service-Oriented Architecture is clearly the solution for organising information systems, responding on various levels to new development and communication challenges in applications. The work involved in system migration and choosing the appropriate moment to effect this migration are the main obstacles to rapid implementation in companies. Bezancon maintains that workflow, BPM and SOA are therefore not competitors but the proliferation of marketing and techniques surrounding automation of processes are such that solutions are particularly difficult to understand from the client company’s point of view. He predicts that in this particular context, those solutions presenting tools which are easiest to implement and use will almost certainly have the highest rate of success.

A COMPARISON OF XML INTERCHANGE FORMATS FOR BUSINESS PROCESS MODELLING 185

Jan Mendling and Gustaf Neumann, Vienna University of Economics and Business Administration; and Markus Nüttgens, Hamburg University of Economics and Politics

This paper addresses heterogeneity of business process metamodels and related interchange formats. We present different approaches towards interchange format design and effects of interchange format specification first. The authors derive the superset of metamodel concepts from 15 currently available XML-based specifications for business process modeling. These concepts are used as a framework for comparing the 15 specifications. The authors aim to contribute to a better comparison of heterogeneous approaches towards BPM. This may finally result in a BPM reference metamodel and a related general interchange format for BPM.

HOW TO MEASURE THE CONTROL-FLOW COMPLEXITY OF WEB PROCESSES & WORKFLOWS 199

Jorge Cardoso, Department of Mathematics and Engineering, University of Madeira, Portugal

The major goal of this chapter is to describe a measurement to analyze the control-flow complexity of Web processes and workflows. The measurement is to be used at design-time to evaluate the complexity of a process design
before implementation. In a competitive e-commerce and e-business market, organizations want Web processes and workflows to be simple, modular, easy to understand, easy to maintain and easy to re-engineer. To achieve these objectives, one can calculate the complexity of processes. The complexity of processes is intuitively connected to effects such as readability, understandability, effort, testability, reliability and maintainability. While these characteristics are fundamental in the context of processes, no methods exist that quantitatively evaluate the complexity of processes.

AN EXAMPLE OF USING BPMN TO MODEL A BPEL PROCESS 213

Dr. Stephen A. White, IBM Corp., United States

The Business Process Modeling Notation (BPMN) has been developed to enable business user to develop readily understandable graphical representations of business processes. BPMN is also supported with appropriate graphical object properties that will enable the generation of executable BPEL. Thus, BPMN creates a standardized bridge for the gap between the business process design and process implementation. This paper presents a simple, yet instructive example of how a BPMN diagram can be used to generate a BPEL process.

A SIMPLE AND EFFICIENT ALGORITHM FOR VERIFYING WORKFLOW GRAPHS 233

Sinnakkirshnan Perumal and Ambuj Mahanti, Indian Institute of Management Calcutta, India

The main contribution of this chapter is that a new workflow verification algorithm has been proposed to verify structural conflict errors in workflow graphs. This algorithm is presented along with visual step-by-step trace of the algorithm, correctness and completeness proofs and complexity proofs. Workflow verification issues have been solved in a simple and elegant manner by the proposed algorithm. The authors show how this algorithm is much easier to understand, as it uses search based techniques like Depth-First Search and has significant advantages in terms of time complexity when compared to other workflow verification algorithms available in the literature.

ASAP/WF-XML 2.0 COOKBOOK—UPDATED 257

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.
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 February 2005 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.

*Layna Fischer, Editor and Publisher*  
*General Manager, WfMC*