Chapter 2
A Framework for the Use of Business Activity Monitoring in Process Improvement

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ABSTRACT
Process performance improvement initiatives can be significantly enhanced in terms of performance measurement and diagnosis by real-time performance, quality and traceability information. Currently available Business Intelligence (BI) and Business Process Management (BPM) systems struggle to provide sufficiently lightweight or flexible solutions for the needs of process improvement projects. In addition, current process modelling languages such as XPDL and BPEL provide little or no support for the inclusion of detailed process performance metrics. This paper describes a generic framework using event-based process modelling to support the definition and inclusion of performance metrics and targets within process models, and the calculation of process performance metrics at user-defined intervals. The iWise implementation of this framework is an XML and Web services-based infrastructure that uses this event-based model for enhancing process visibility using real-time process metrics. Users can adjust alert thresholds on key process metrics in real-time. iWise also evaluates events for outlier or out-of-bounds events as they are processed. It uses an integrated rules engine, leveraging semantic technologies to write rules which are tested as process-related events occur in real-time.

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INTRODUCTION
Process Improvement has been around as long as there have been processes. Since mankind has first repeated an action in order to reproduce a certain result you could argue that we have been engaged in processes. Naturally the complexity of these processes will vary – for example there is quite a difference in complexity between boiling an egg and delivering a 5-course banquet to a packed dining hall with military precision. On the other hand there is clearly a process which can be followed in both cases, with the aim of producing a result of predictable high quality, at
the time required, and with minimum use or waste of resources. What is also clear is that if you can’t deliver to customers’ expectations, they won’t be coming back to you with repeat orders.

The current economic climate also highlights any internal inefficiency that a company may be carrying. With competition willing to cut costs to win orders it is vital that we are able to deliver as efficiently as possible if we are to retain a profit margin. For many companies their actual survival may depend on finding and eliminating inefficiencies in their operations. This overall goal of delivering better, faster and cheaper goods and services, that the customer actually wants, is what we are striving for when we undertake Process Improvement. The difficulty with current Business Intelligence (BI) and Business Performance Management (BPM) systems in a Process Improvement context is that they are complex, expensive and require considerable resources and time to implement. This is counter to the need in process improvement for an agile way to model, measure and analyse processes as per the requirements of individual improvement projects. While there is currently a great deal of interest in BPEL, it is normally used to automate processes within a single company or division. If we wish to monitor and measure a typical supply chain process we come up against the problems of heterogeneous systems and standards for process execution, for example across HR, CRM, ERP, Finance. Business Intelligence (BI) systems are available to pull information from such disparate systems into a coherent view of business performance, but a significant cost in terms of time and resources. In addition, BI systems are not typically process-aware, lightweight and agile enough to be useful in most process improvement projects. In this paper we set out the context for process improvement initiatives, before presenting a solution to the problems just outlined.

**BUSINESS PROCESSES**

Before looking in depth at the methods and tools of process improvement it is important to establish a clear understanding of what business processes are about. At the highest level of abstraction we can consider a process as a collection of related tasks which are initiated in response to a particular event, which achieves a specific result for the customer of that process, to paraphrase the definition of Sharpe & McDermott (2001).

Possibly the simplest model of a process is shown in Figure 1. In this transformational model of a process we see that our process must deal with certain inputs (e.g. raw material, information) and produce outputs such as goods or services. The actual transformation itself could be a physical transformation in that the output is created from the combination of the input; it could be a transactional transformation such as the generation of airline tickets or the processing of an insurance claim; it could be locational, such as the transportation of goods from one location to another. Other examples include informational, involving the generation of useful information (such as a weather forecast) from raw data (such as meteorological data). In all businesses people are now beginning to think of what they do as processes. We will see later that this process thinking is vital to beginning on the path to process improvement. What is fundamental to our understanding of a process we wish to improve is that we can clearly identify the boundaries (start, end events) and scope of that process.

As we can see from Figure 2, processes will typically cross functional boundaries within and between organizations. This simple fact often proves the most revealing when working with com-