Workflow Management Coalition defines Interface between Workflow Engines and Process Definition Information

Introduction
As part of its standards work, the Workflow Management Coalition has classified the functional interfaces to a workflow service. “Interface 1” comprises a common meta-model for describing the process definition, a textual grammar for the interchange of process definitions (Workflow Process Definition Language - WPDL), and APIs for the manipulation of process definition data.

Purpose
Process Definitions are central to the implementation of a workflow service. They provide a means of linking case tools for process analysis, modelling and definition with the workflow runtime software.

Business Process Review Tools make a huge contribution to the understanding of business processes. They help all levels of personnel gain an understanding of the current situation, to model it graphically and then to see how improvements could be made. It is right that intellectual effort should be concentrated into this activity rather than building workflow applications. WfMC I/F1 provides a quick-start to the implementation of workflow from a set of process definitions generated by such tools.

Whilst it is BPR tools that identify how improvements can be made, it is the use of workflow to automate suitable business processes which contributes to efficiency and real cost improvements. The rationale, which caused the WfMC team to expend so much effort on the development of a viable interface definition between workflow engines and business process visualisation tools, is very persuasive.

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<th>Business Rationale</th>
<th>Explanation</th>
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<td>Improved thinking about business processes</td>
<td>It is clear that BPR tools help people to visualise their business processes, aid the understanding, and improve the optimisation of the activities. The key to success is to get the process definitions optimised for performance. Then, when they are implemented, the process automation provided by the workflow engines will maximise the contribution to the organisation’s activities. Simulation and visualisation tools enable users to understand their processes and to optimise them. Process Definitions can be held in repositories for easy re-use or ongoing development. From the</td>
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<td>Process Definitions can be easily re-used</td>
<td>repository the process definition can be exported for modification by Business modelling tools and the workflow software for implementation. This saves time and money.</td>
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<td>Process definitions can be implemented faster</td>
<td>Once the decision has been made to implement workflow, the quicker this can be achieved the better. Some organisations report a return on investment of 100% in the first year. So, every month spent on implementation potentially wastes resources.</td>
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<td>WfMC I/F 1 enables process definitions to be passed to the workflow engine and implemented without delay.</td>
<td>Different workflow engines can be used with the same BPR tool. The use of a separate tool to define, model, analyse, simulate or document a business process prior to its enactment on a separate workflow execution service, enables the business to select independent workflow and process definition / modelling tools, and enables the business to choose the optimum product for each part of the overall system.</td>
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<td>Different BPR tools can be used with the same workflow engine</td>
<td>Users can choose the right tool for a specific business activity, knowing that the output can be transferred quickly and easily to the I/F 1 compliant workflow product of their choice.</td>
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<td>Leverages a variety of applications</td>
<td>WfMC I/F1 enables clients to use and integrate a variety of ERP, CTI, CCM, and BPR tools within their organisation on a departmental basis.</td>
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<td>Improved investment security</td>
<td>WfMC I/F 1 reduces the risk of investment in workflow technology. Process definitions can be created in a variety of BPR tools, and clients will always be able to select best of breed. The transfer and retrieval of a process definition to and from a common design repository, accessed by a number of different tools or run-time systems, provides a formal point of responsibility for control of process definitions.</td>
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<td>Support of continuous process automation improvements</td>
<td>The development of process definitions is an iterative process. The easy interface facilities defined in WfMC I/F 1 support the concept of continuous improvements.</td>
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There are many graphical tools used to model and describe business processes. Interface 1 defines a common interchange format, which supports the transfer of workflow process definitions between separate products. The interface also defines a formal separation between the development and run-time environments, enabling a process definition, generated by one modelling tool, to be used as input to a number of different workflow run-time products. This meets the need for the independence of modelling and workflow run-time products. Different workflow products will now interpret a workflow process definition, generated by a separate visualisation tool. Process definitions transferred between these products or stored in a separate repository are accessible via that common interchange format.

Independent of the transfer mechanism itself, which can be batch or API based, this interface definition describes a formal documentation of a workflow process, which identifies the information content of build-time definitions. To provide a common method to access and describe workflow definitions, a workflow process definition meta-data model has been established. This meta-data model identifies the commonly used entities within a process definition, together with their characteristics, defined as a set of attributes (or properties). Based on this model, vendor specific tools can transfer models via a common exchange format.

The principles of process definition interchange are illustrated in the diagram below:
The WPDL has been designed to handle information used by a variety of different tools. The WPDL may never be capable of supporting all additional information requirements in all tools, but will provide a standardised basis for the exchange of the majority of process definition data. One of the most important elements of the WPDL is a generic construct, the “extended attribute”, which supports the definition of vendor or user specific attributes for use within the common representation.

Behind the common meta-model definition, two styles of interface operation are supported.

The WPDL is a textual grammar that represents the objects and attributes within the process definition via a series of defined keywords, based upon the WfMC Glossary. Individual process definitions or groups of related process definitions may be transferred in this way, which is designed for primary operation using an ASCII text based file over a batch orientated interface. This approach is based upon two interfaces provided by vendors:

1. Import of a workflow definition from the common process definition language into the vendor’s internal representation and export of a workflow definition from the vendor’s internal representation to the common process definition language.

2. Process definition APIs are also defined to allow access to, and manipulation of, the individual attributes and entities (as defined within the meta-model) of a stored process definition. This enables access to process definitions by software processes within a workflow or business process modelling environment, typically to create or modify a process definition dynamically.

**Process Definition**

This is defined as the representation of a business process in a form which supports automated manipulation, such as modelling, or enactment by a workflow management system. The process definition consists of a network of activities and their relationships, criteria to indicate the start and termination of the process, and information about the individual activities, such as participants, associated IT applications and data, etc.

It is the process definition that is interpreted by the workflow engine, acting as a template for the creation and control of instances of that process during process enactment. Objects and attributes from the process definition will be inherited by each created instance of the process during process enactment. The process definition may contain references to sub-processes, separately defined, which make up part of the overall process definition.

A loose distinction is sometimes drawn between production workflow, in which most of the procedural rules (i.e. elements of the process definition)
are defined in advance, and ad-hoc workflow, in which the procedural rules may be created or modified during the operation of the process. An initial process definition will contain at least the minimal set of objects and attributes necessary to initiate and support process execution. The specifications developed by the WfMC are designed to support both styles of workflow operations since the ability to create, interchange and modify a process definition is central to the operation of all styles of workflow system. The WfMC Glossary also contains descriptions of, and common terminology for, the basic concepts embodied within a process definition such as activities, transitions, workflow relevant data and participants.

**Approaches to Process Definition Interchange**

A variety of different mechanisms may be required to transfer process definition data between systems according to the characteristics of the various business scenarios. In all cases the process definition must be expressed in a consistent form, which is derived from the common set of objects, relationships and attributes expressing its underlying concepts.

The WfMC process definition meta-model and process definition language can co-exist with a variety of modelling techniques used to visualise and describe the process dynamics (UML, IDEF, Petri-Nets, Role/Action diagrams, etc). As well as expressing the process dynamics WPDL also supports the definition of information describing the business aspects of the process - participants, applications and data relevant to the process. These are all expressed as entities and attributes within the top level process definition (the so-called "Minimum Meta Model") and as keyword constructs within the associated WPDL.

It is not the intent of the WfMC to place any arbitrary constraints on process definition expressions. The Interchange definition is intended for use principally within file based operations, enabling the transfer of a complete batch of process definition data, typically comprising one or more complete process definitions. When used in this way any appropriate file transfer service supporting ASCII level text interchange can be used to support transfer between products. The WPDL forms a common interchange standard that enables products to continue to support arbitrary internal representations of process definitions with an import/export function to map to/from the standard at the product boundary.

A specific set of APIs is provided within WAPI for the manipulation of process definition objects and their attributes (for example to allow an authorised user to retrieve or modify parts of a process definition). Programming bindings are defined for "C" and "IDL". A common underlying communications interface must be provided between the relevant products; typically based upon RPC and ORB mechanisms. Although it is possible to exchange complete process definitions by the repeated use of APIs between compatible products, it is expected that their primary use will be for the selective retrieval and manipulation of parts of a process definition during process build or enactment.
The transfer of complete or large components of process definitions may also be feasible using common object services such as relationship services and object repositories. Future work is likely in this area in conjunction with the OMG.

References
WfMC Glossary
WfMC Interface 1 Process Definition Interchange Process Model

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