



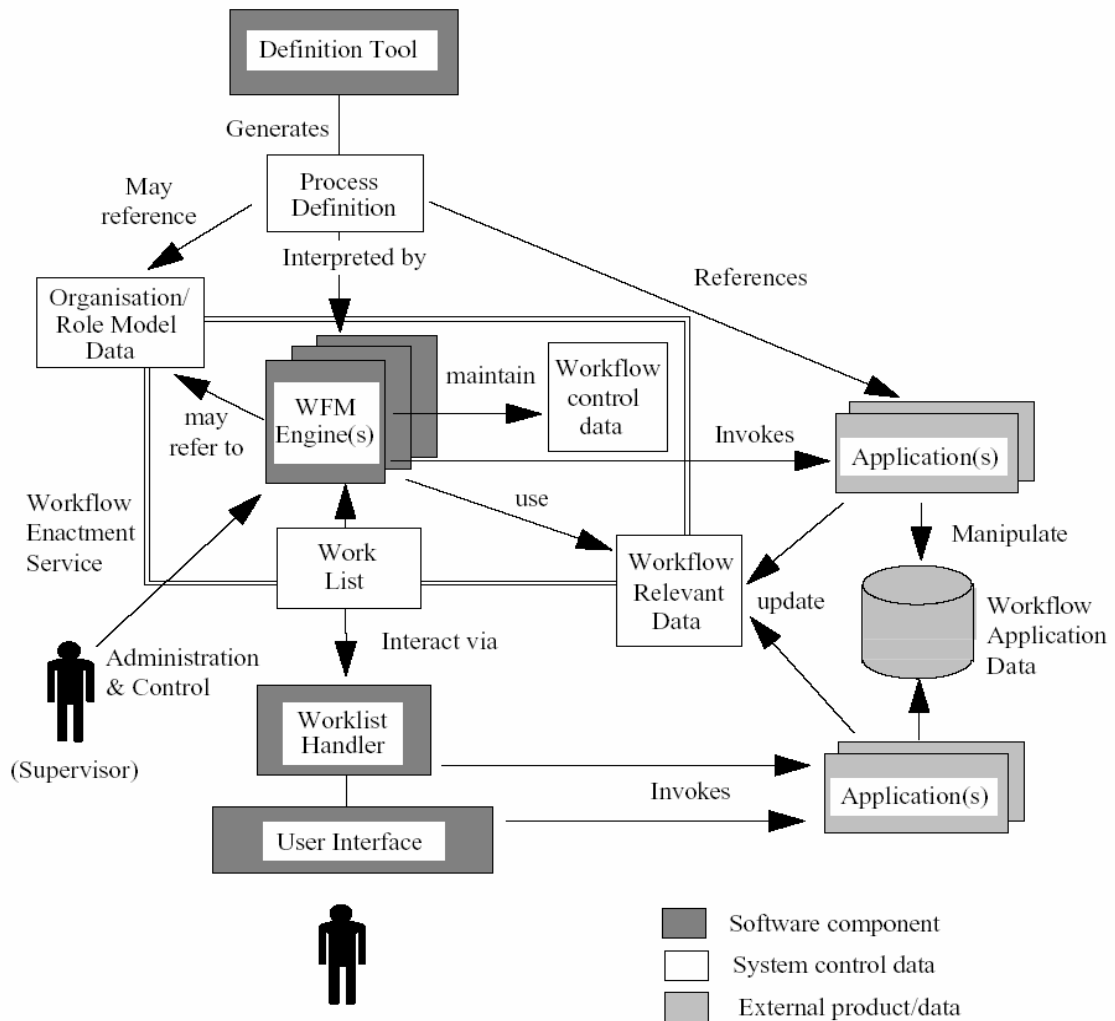
## **Ronin Workflow Management System Standards & Patterns**

### **1- Introduction**

Within the present instrument, Ronin Workflow Management System, hereinafter referred to as Ronin.WfMS is surveyed from comparative and contrastive viewpoint with the existing standards in workflow management. In general, it can be said that every and each workflow management system is envisioned from two aspects. On one hand, its structure and architecture must be considered and on the other hand, it must be careful that to how extent the envisioned system could support the several processes of an organization. Whereas, Ronin Workflow Management System would be beyond a mere support of a standard, therefore, in each part of this survey, Ronin.WfMS will be tested with the most completed existing standard in that field. It is obvious that in the field of structure and architecture of workflow management systems, the most completed existing source is **WfMC**. The best source for surveying capabilities of a workflow management system in modeling of the organization processes is also **Workflow Patterns**.

### **2- Comparison of Ronin. WfMS with WfMC from architectural Viewpoint**

Architecture of Ronin.WfMS completely and precisely corresponds to the proposed architecture of WfMC. The following figure which has been exactly produced an adaptation of documents of WfMC, shows the proposed structure of WfMC for a workflow management system. It shall be noted that some of the workflow management systems who pretend being correspondence with WfMC, may not support the general architecture of WfMC standard; on the contrary, development of Ronin.WfMS has been completely performed on this architecture basis. Therefore, Ronin.WfMS not only completely corresponds to this architecture, but also, they can be even compared part to part.



Architectural Standard Structure of a Workflow Management System in WfMC



The following table asserts that each how each part of this standard has been implemented in Ronin.WfMS.

<b>WfMC Standard Component</b>	<b>Ronin.WfMS Corresponding Components</b>
Definition Tool	Ronin.WfMS Organization Modeler Ronin.WfMS <u>Application Modeler</u> Ronin.WfMS Process Designer
Process Definition	Ronin.WfMS Process Designer Ronin.WfMS <u>Application Modeler</u>
Organization/Role Model Data	Ronin.WfMS Organization Model
WFM Engine	Ronin.WfMS Engine
Workflow Control Data Work List Workflow Relevant Data	Ronin.WfMS Workflow Database Tables
Work List Handler	Ronin.WfMS Service
User Interface	Ronin.WfMS Portal

Architecture of Ronin.WfMS completely corresponds to WfMC standard.

It shall be noted that application modeler is a part of workflow management system which has been considered less by WfMC and Ronin.WfMS may produce more capabilities about them.

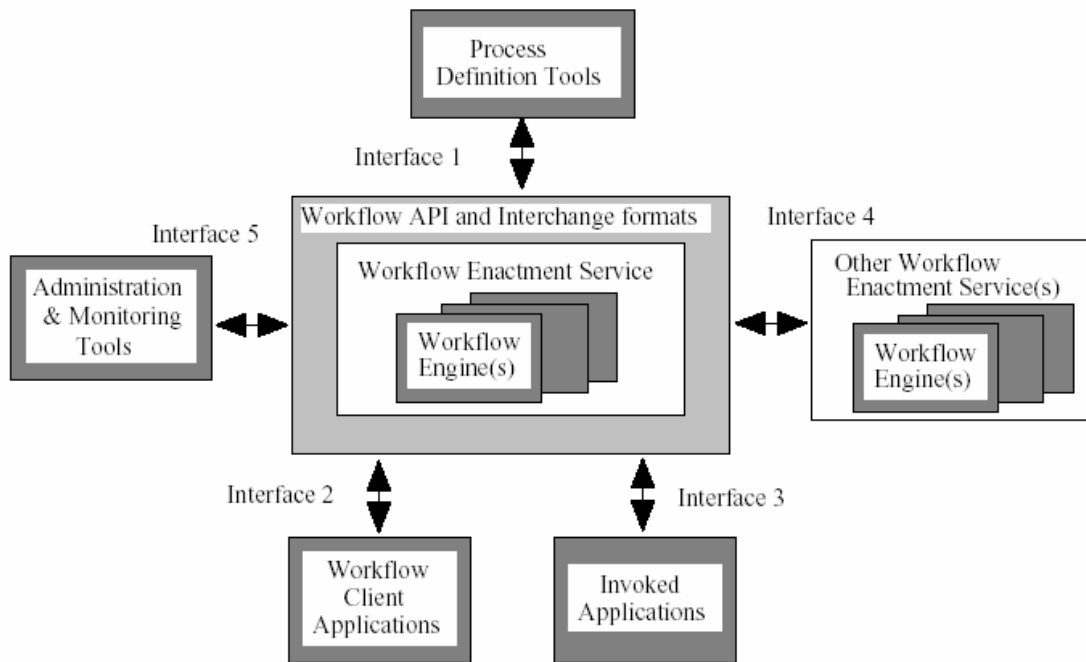
### 3- Comparison From Connective Interfaces Viewpoint

The following figure presents connective interfaces, determined through WfMC for the workflow management system. Ronin.WfMS, however, may support most of these interfaces completely and/or more powerful than WfMC standard. But, at the time for surveying of these interfaces, paying attention to the following points is required.

- Ronin.WfMS is a software product and its user expects to use just one product and essentially, modality of internal communications of a system is not so important for the user; but its accurate operation would be important.
- WfMC standard has been produced independently from every technology of software production and for the purpose of being admissible through all technologies; whereas, Ronin. WfMS, as a product, could develop its own possibilities whether from quantitative or from qualitative viewpoints, utilizing existing possibilities in existing modern technologies.



- WfMC standard has been produced through OMG and the most important issue on the standards, produced through OMG, such as CORBA, is focused on that de to being independent from specific technologies and replying on theoretical viewpoint (instead of practical one), almost no one of these standards have been completely implemented so far or they have been somehow changed.



Interfaces, Presented in WfMC for Workflow Management System

The following table asserts that the interfaces, presented through WfMC standard have been covered through what parts of Ronin.WfMS and how to the extent it is covered. In continuation, producing comments for each one of these interfaces, we may proceed to present Ronin viewpoint regarding those interfaces.

WfMC Interface	Ronin.WfMS Interface	Coverage
Interface 1: Process Definition	Organization Model Interfaces Application Model Interfaces Process Model Interfaces	<b>More Than 100%</b>
Interface 2: Client Functions	Service Interfaces	100%
Interface 3: Invoked Application Functions	Agent Interfaces	<b>More Than 100%</b>
Interface 4: Workflow Interoperability	Proxy Interfaces	70%
Interface 5: System Administration	Administration Interface	100%



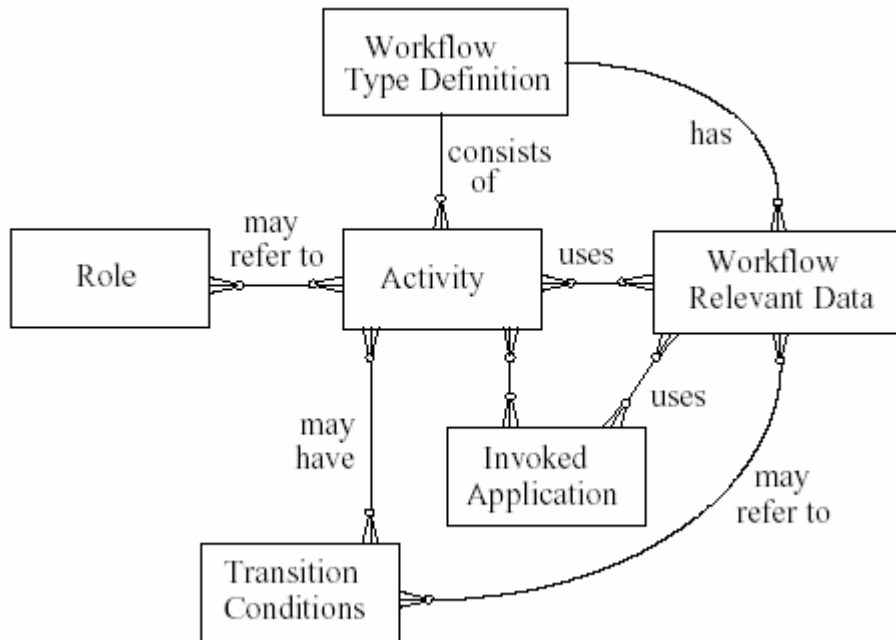
	Monitoring Interfaces	
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Supporting Rate of Ronin. WfMS from WfMC Standard Interfaces

Important: **More than 100%** in the above-mentioned tables means having more possibilities and more features.

**3-1 Process Definition Interface**

This interface has been defined in WfMC for the purpose of establishing a connection between workflow management system and systems. The following figure shows generally the proposed Meta-Model by WfMC for this interface.



Met al-Model, Proposed by WfMC for Process Definition Model

For the purpose of covering specific modes and local points regarding workflow management system as good as possible, it has been taken step to develop Ronin.WfMS, remaining faithful to this Meta-Model. Therefore, Ronin.WfMS fully covers this Meta-Model and has completed it. It shall be noted that development and completion of this model has been also carried out on the strength of other existing standards. In accordance with WfMC in Ronin.WfMS, in addition to modeler tools which are kept at a modeler disposal,



there are other required interfaces to write other modeler tools and import/export for other models too.

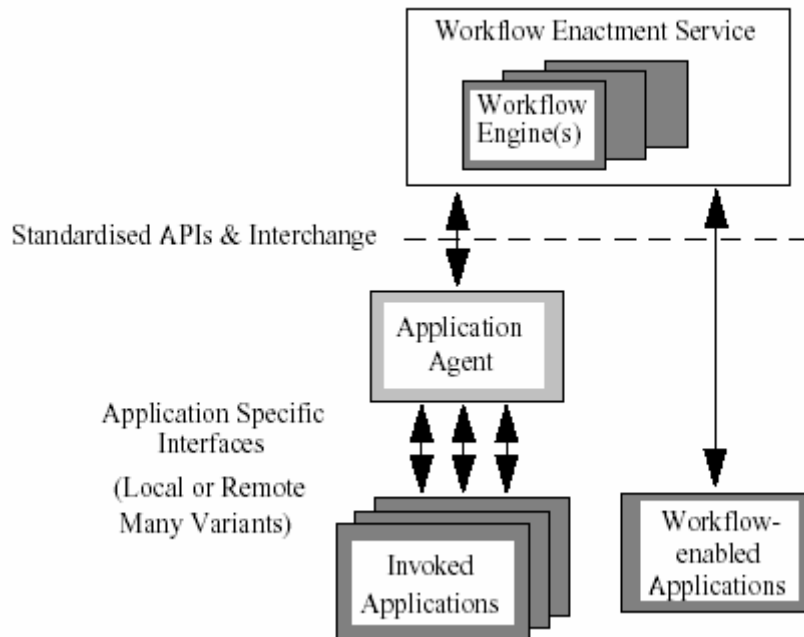
### 3-2 **Client Function Interface**

By virtue of WfMC, to connect between the users and workflow management system, two capabilities must be presented. First a tool shall exist that the users, using it, would be able to keep in workflow process and second, some possibilities shall be provided that it would be possible to write such a tool, specifically, for others.

The portal of Ronin Workflow Management System is precisely developed for the purpose of supplying the first capability. On the other hand, the only connective route of this portal with other components of workflow management system is possible through Ronin.WfMS Service. The Ronin. WfMS Service interface may offer the required services for development of any type of new desirable portal, as same as exactly expected by WfMC. To develop the current portal for Ronin.WfMS, this principle is relied on that all requirements of the user would be executed merely and exclusively referring to Ronin.WfMS Service. In the meantime, the services, offered through Ronin.WfMS Service must not be prepared in a specific shape and only for its main portal of Ronin product. Therefore, every new portal will also be fully capable to replace with the major portal. For the same reason, Ronin.WfMS meets all requirements, planned in Work List Handler interface from WfMC standard.

### 3-3 **Invoked Application Functions Interface**

The following figure shows a general idea of WfMC on activating applications.



### General Idea of WfMC on Modality of Applications

In Ronin.WfMS, the WfMC standard has been precisely considered about applications. It means that in Ronin.WfMS, an interface has been accurately defined named IApplicationAgent through its implementation, every applications would be capable to connect with the workflow management system. The following table presents possible technologies for interconnecting the applications and Ronin.WfMS.

Invocation Technology
Microsoft COM+
.Net Cross Domain Invocation
.Net Remote Invocation
WEB Service Invocation
Advanced URL Invocation

### Technologies, Supported by Ronin.WfMS for Activation of Applications

In WfMC, connection between applications and workflow management system has been established on two fundamentals. One, possibility to activate the applications and another one is data transmission between the workflow management system and applications. In Ronin.WfMS, while fully supporting these two fundamentals, planning the concepts such as



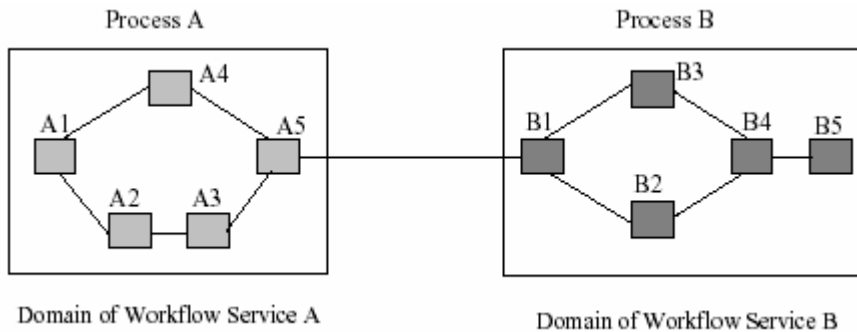
independent operation of applications and workflow management control via advanced workflow management tools, have provided more new possibilities for its users.

- Independent Operation of Applications: In Ronin. WfMS, the applications are able to reply to the users' requests, independently from portal of performed workflow management system; while, the workflow management system may achieve the organization processes following to their measures taken and may be keep in touch of events.
- Advanced Workflow Management Tools: Ronin. WfMS has produced different tools like Portal Bar and/or Work List to the applications developers in order through workflow management concepts, spending the least cost, they may enter into applications. Therefore, the final users are exempted from repeatedly coming and going between the workflow management system portal and applications to use possibilities workflow management system, besides their envisioned applications.

### **3-4 Workflow Interoperability Interface**

The aim of presenting such an interface in WfMC, is to provide some possibility for cooperation of different workflow management systems. In WfMC, there are four scenarios to interconnect between the workflow management systems. One of these four scenarios is being the sameness of executive extent of two workflow management systems and other three scenarios shall be also available without being sameness of executive sameness of these systems.

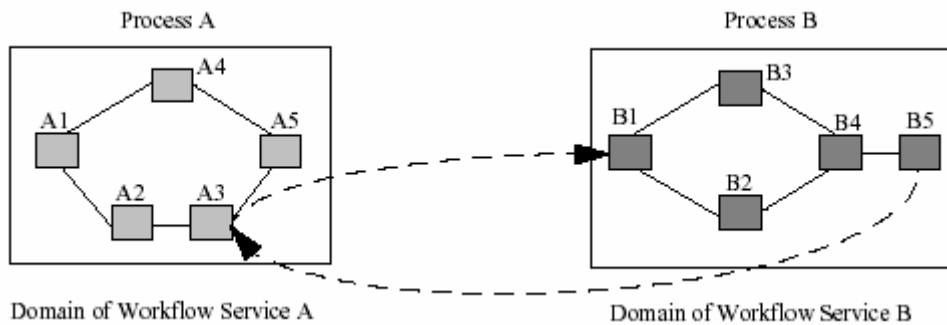
The first scenario which has been illustrated in the following figure, shows the chained services model in which there is no need to being the sameness of extent of two workflow management systems.



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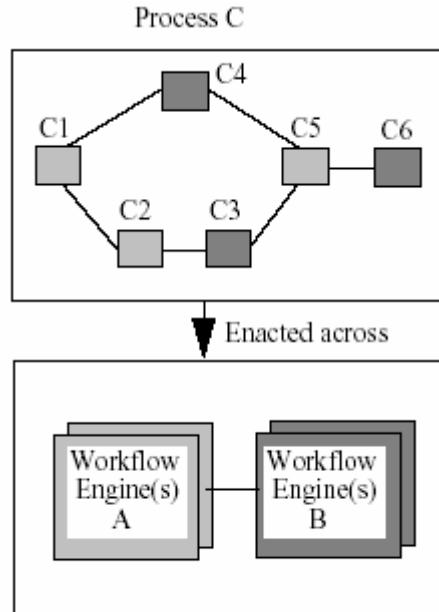
### ned Services Model

The following figure shows the second scenario of collaboration between workflow management systems which is called nested sub-processes model and there is no need to being the sameness of extent of workflow management system.



### Nested Sub-Processes Model

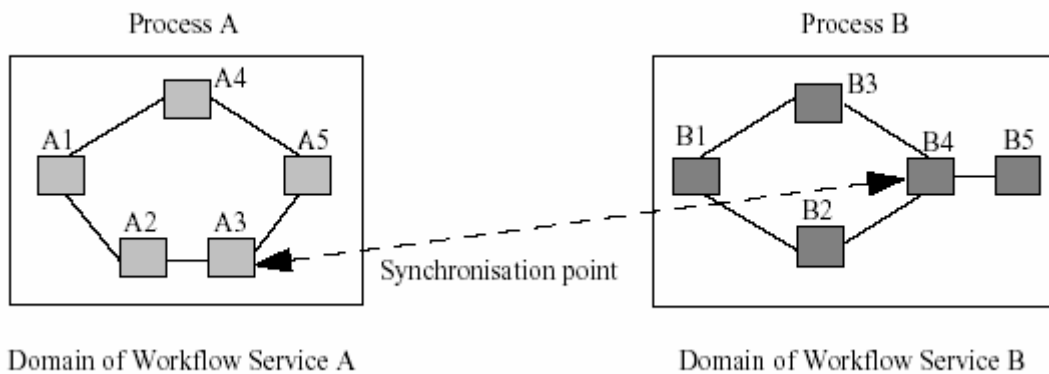
The third scenario, i.e. collaboration between workflow management systems, is called peer to peer model which needs to the workflow management systems together with joint extents and is illustrated in the following figure. As you can see, in this model, just one process is practically implemented.



Shared Domain of Workflow Services A & B

### Peer to Peer Model

The latest scenario which is called parallel synchronized model, has been illustrated in the following figure. Implementation of this scenario also needs no workflow management systems together with joint extent.



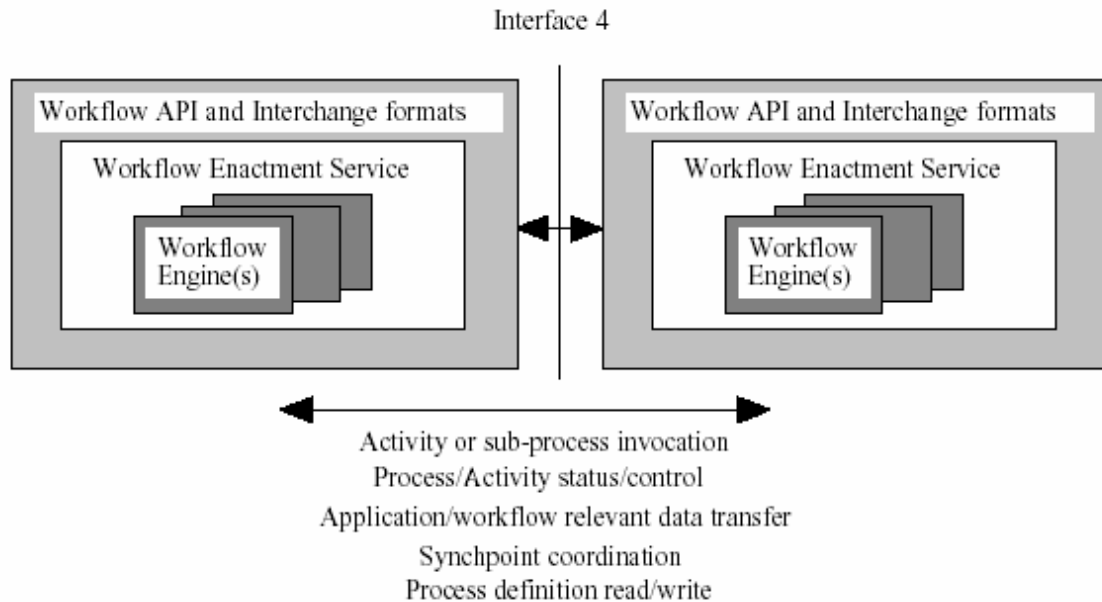
### Parallel Synchronized Model

From WfMC viewpoint, interconnection between the workflow management systems shall be applicable in two ways which each type shall be subject to accept specific conditions and rules on these systems behalf.

- Two workflow management systems use similar processes model and/or they are able to extract the information regarding interrelated processes model, directly. In this case, these two systems

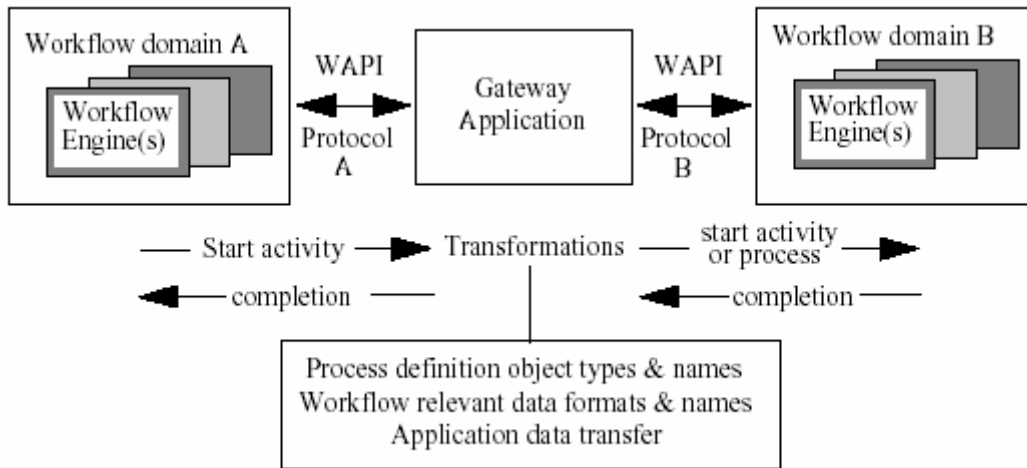


can interconnect with each other completely and according to WfMC Interface IV, which this interrelation has been illustrated in the following figure. Naturally, such an interrelation may provide possibility to implement all four synchronized scenarios.



### WfMC Standard in Interrelation Amongst Workflow Management Systems Together With High Affiliation

- Should two workflow management systems could not essentially use their information of processes model, directly, it is possible to create a connection between them via a new interface. In this case, on the strength of WfMC, modality of interconnection will be as follows. This type of interconnection makes possible to implement the scenarios which need no workflow management systems together with joint extents; but about the scenarios that need joint extents, it is not so flexible and some specific points must be observed on both behalf.



Using Gateway to Connect Between Two Workflow Management System in WfMC

### 3-5 System Administration Interface

For the purpose of providing possibility to supervisory and directorate of workflow management System, in Ronin, WfMS, also according to WfMC, whether a required user interface has been presented for supervisory or an appropriate programming interface is possible in order to enjoy such services through other systems. Therefore, this interface is completely supported.

### 4- Coverage Rate of Workflow Management Patterns

One of the most important questions which are posed on workflow management system is that to what extent these systems can model and implement the organization processes and is it possible to find out a process in an organization which could not be modeled in a workflow management system. Of course, in organizations which are ready to reengineer their own processes, this issue is not as important as sensitivity of organizations which their objective is focused on making operation of such a system before reengineering of organization and achieving mechanized affairs besides their reengineering. In organizations which the reengineering of processes has not been carried out yet, you can find out some processes which are not able to be modeled together with most of workflow management standards i.e. WfMC. .

One of the matters which has not been directly considered by WfMC standard, is workflow patterns. The aim of collection and



standardization of these patterns is to create a series of modes which would a workflow management system could support them; its modeling capability will be to the extent that model different types of processes in an organization.

The processes model of WfMC is only envisioned as a sub-process of processes model, supported by Ronin.WfMS. The following figure shows a list of workflow patterns which specifies that Ronin.WfMS supports which one of them. It can be said that power and flexibility of Ronin.WfMS in the field of interrelation of process model on one hand and models of an organization and applications, on the other hand are beyond the existing standards and daring, it can be said that it is of the few workflow management systems, having such an extent of supporting the patterns. In the following, there are the patterns which are beyond the WfMC standards.

(The best source to survey capabilities of a workflow management system in an organization modeling is workflow patterns.)

The list of supported workflow patterns in Ronin Workflow Management system, has been spelled out as below:

Workflow Pattern		Ronin.WfMS
WP1	Sequence	Supported
WP2	Parallel Split	Supported
WP3	Synchronization	Supported
WP4	Exclusive Choice	Supported
WP5	Simple Merge	Supported
WP6	Multi-Choice	Supported
WP7	Synchronizing Merge	Not Available now
WP8	Multi-Merge	Supported
WP9	Discriminator	Supported
WP10	Arbitrary Cycle	Supported
WP11	Implicit Termination	Supported
WP12	Multiple Instances without Synchronization	Supported
WP13	Multiple Instances with Synchronization (at design time)	Supported
WP14	Multiple Instances with Synchronization (at run time, before the starting point)	Supported
WP15	Multiple Instances with Synchronization (dynamically creation)	Supported
WP16	Deferred Choice	Not Available now
WP17	Interleaved Parallel Routing	Supported
WP18	Milestone	Not Available now
WP19	Cancel	Supported