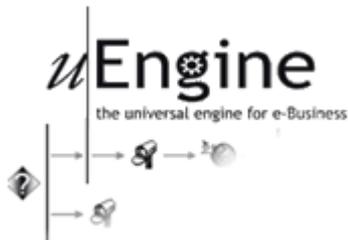




Work Flow Engine

Related MIS Term project,
Based on <http://www.uengine.org>,
'The Workflow Management Coalition Specifiacation(wfMC)'

with



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Digital Interactions Lab. (<http://di.snu.ac.kr>)

Dept. of IE, SNU



What is Workflow?

Definition –Workflow

The computerised facilitation or automation of a business process , in whole or part.

Concretely, workflow is concerned with the automation of procedures where documents, information or tasks are passed between participants according to a defined set of rules to achieve, or contribute to, an overall business goal.

Definition –Workflow Management System

A system that completely defines, manages and executes “workflows” through the execution of software whose order of execution is driven by a computer representation of the workflow logic.

Concretely, WMS is one which provides procedural automation of a business process by management of the sequence of work activities and the invocation of appropriate human and/or IT resources associated with the various activity steps.

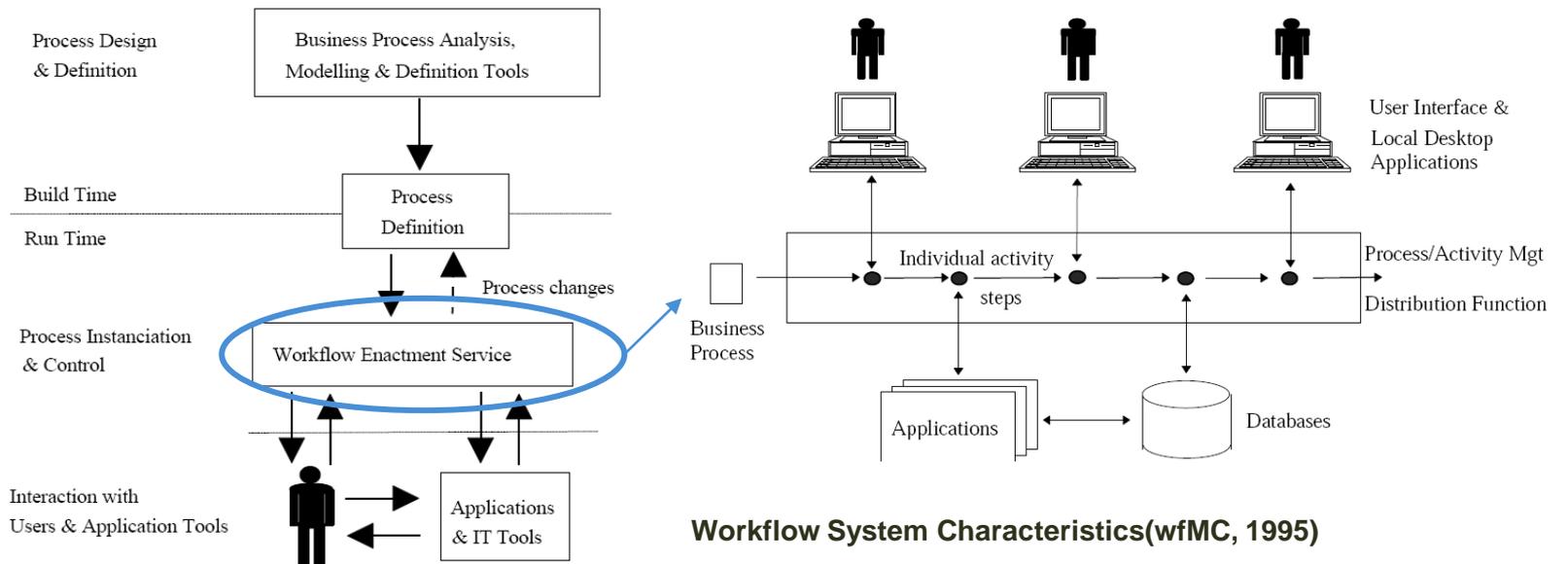
Definition –Process Definition

The computerised representation of a process that includes the manual definition and workflow definition

What is Workflow?

At the highest level, all WFM systems may be characterised as providing support in three functional areas

1. **The Build-time functions**, concerned with defining and possibly modelling the workflow process.
2. **The Run-time control functions**, concerned with managing the workflow processes in an operational environment.
3. **The Run-time interactions** with human users and IT application tools for processing the various activity steps

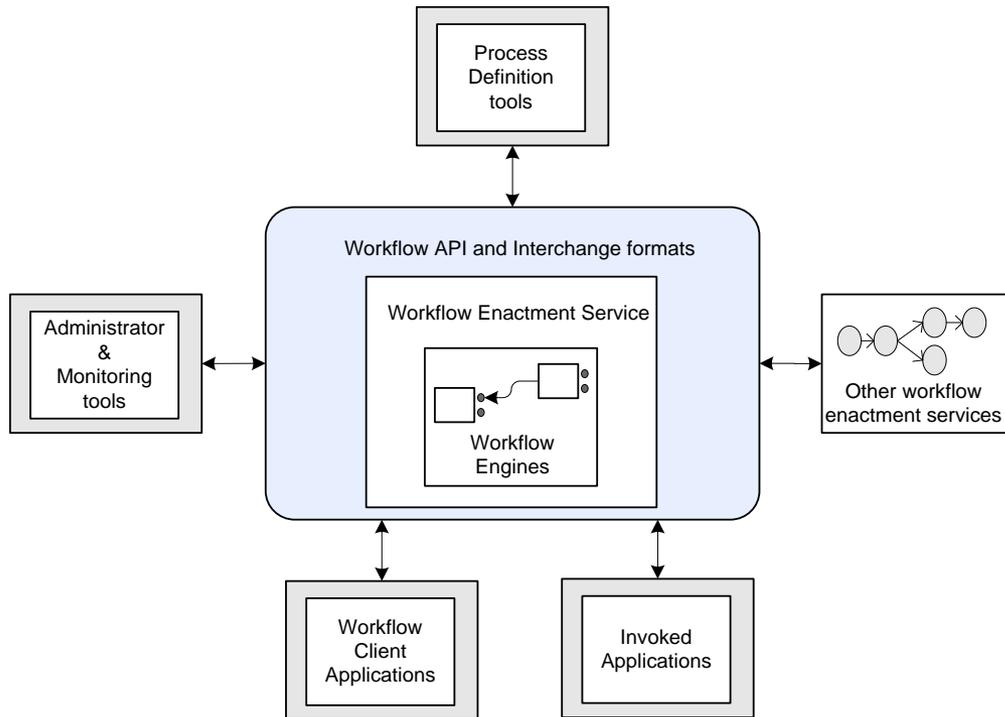


Workflow System Characteristics(wfMC, 1995)

Distribution within the workflow enactment service (wfMC, 1995)

What is Workflow?

Components of workflow engine are illustrated in figure below.



- **Process Definition tools**
- **Administrator & Monitoring tools**
- **Workflow Enactment Server**
- **Workflow Client Applications(or Worklist Handler)**
- **Invoked Applications**



What is Workflow?

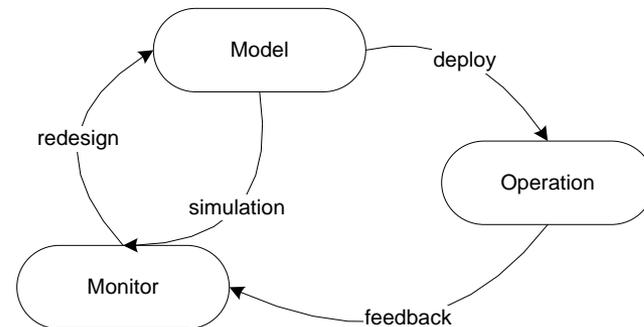
Difference, Normal developing tools VS Workflow Engines

Normal Developing Tools

- Developer** • Technical based, Process designer
- Goal** • Focused implementation..
- Workunit** • Command(for SQL query, invoke function..)
- Datum** • Data structure(e.g. int, String, record..)
- Operation** • Step by Step, reengineering

Workflow Engines

- Process designer
- More Focused Workflow or Processflow
- Activity(in process level)
- Document(e.g. word, XML..)
- respond immediately and give feedback.

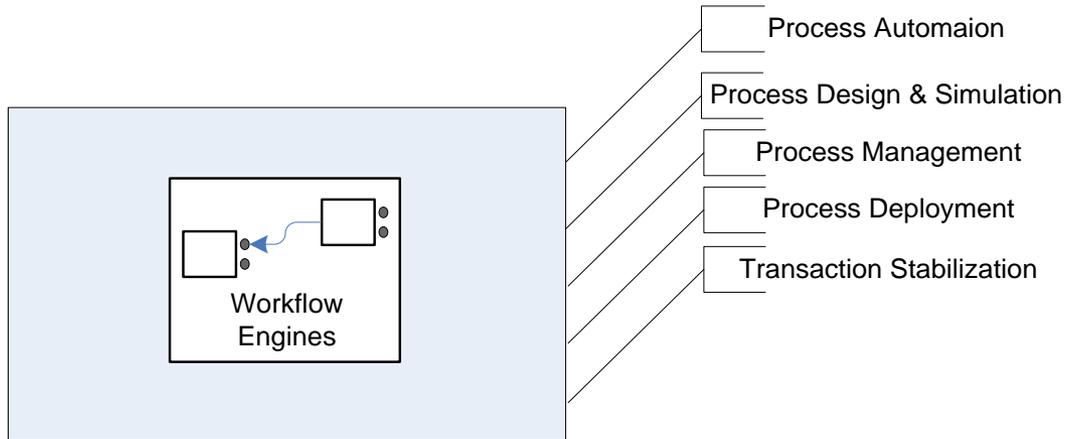




What is Workflow?

That is, Workflow..

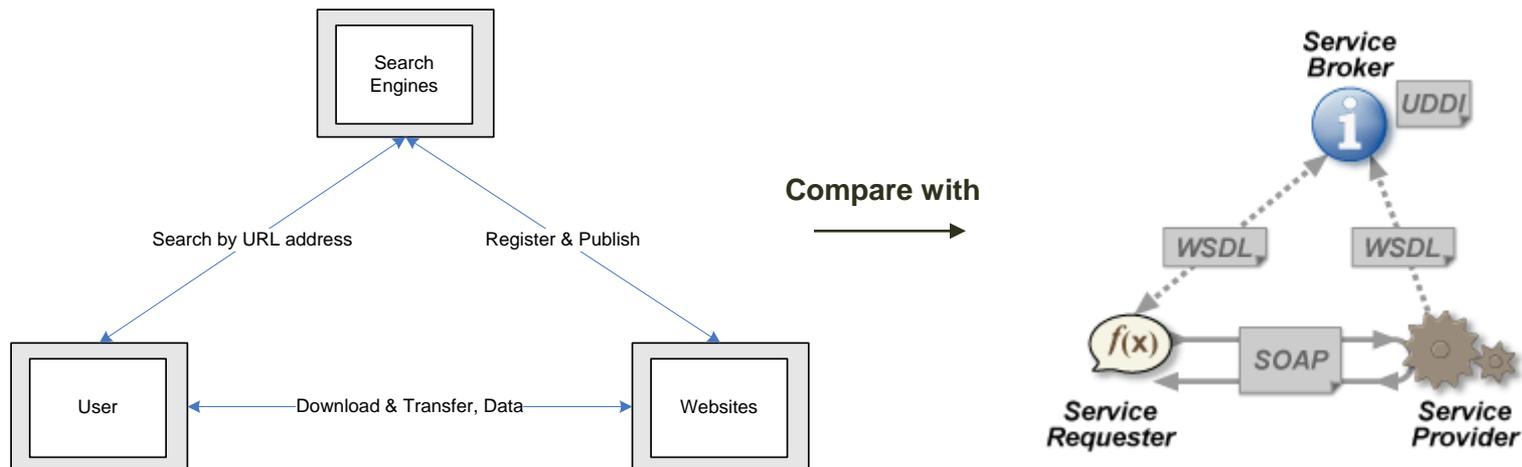
Support 'Environments for System Implementation and Operation' through many applications and development tools.



What is Workflow?

Web Service Definition

Web service is a software system designed to support interoperable Machine to Machine interaction over a network. (Defined by W3C)



- **SOAP** : An XML-based, extensible message envelop format, with “binding” to HTTP, HTTPS, SMTP(simple mail trasfer protocol), XMPP(extensible messaging and presence protocol) protocols.
- **UDDI** : A protocol for publishing and discovering metadata about Web services, to enable applications to find Web services, eigher at design time or runtime.
- **WSDL** : An XML format that allows service interfaces to be described, along with the details of their bindings to specific protocols. Typically used to generate server and client code, and for configuration.



What is Workflow?

The example of SOAP(Service Oriented Architecture Protocol)

```
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
  <soap:Body>
    <getProductDetails xmlns="http://warehouse.example.com/ws">
      <productID>827635</productID>
    </getProductDetails>
  </soap:Body>
</soap:Envelope>
```

The example of WSDL(Web Service Definition Language)

```
<?xml version="1.0" encoding="utf-8" ?>
<description
  xmlns="http://www.w3.org/ns/wsd1"
  targetNamespace= "http://greath.example.com/2004/wsd1/resSvc"
  xmlns:tns= "http://greath.example.com/2004/wsd1/resSvc"
  . . . >

. . .
</description>
```

[Note]

Most of these core specifications have come from W3C, including XML, SOAP and WSDL, UDDI comes from OASIS.



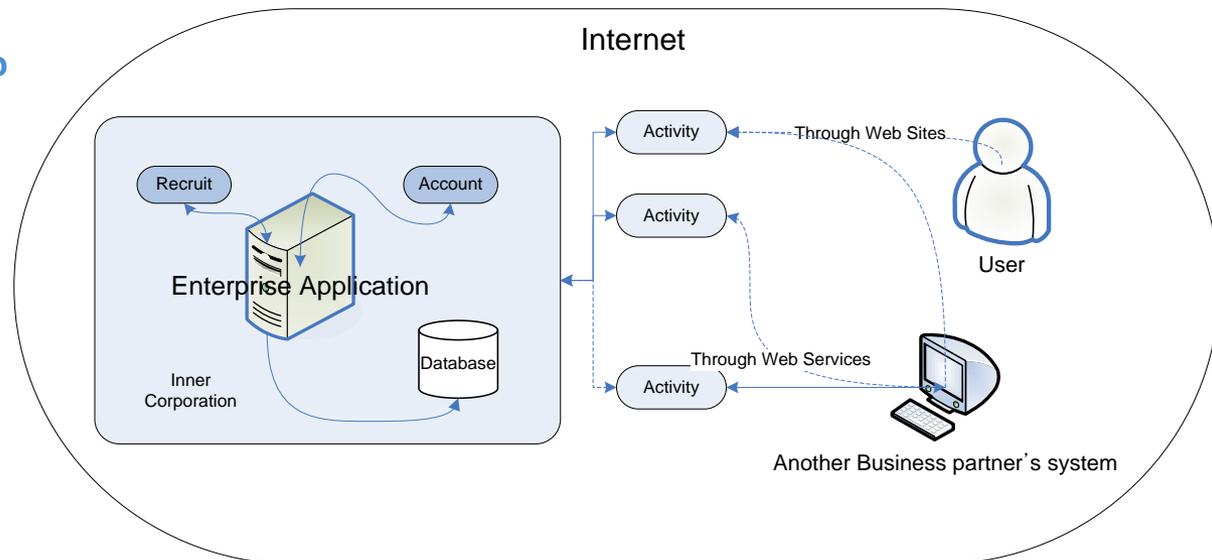
What is Workflow?

The Characters of Web Service

- Information Exchange in the interoperable way
- Dynamic Service Binding & Advertisement

The Strategies and Characters of Web Service Business

- Single product(contains Single Service) and Variety of suppliers
- Globalized Outsourcing
- Short-Term Partnership
- Business Wrapper





What is Workflow?

The List of Web service FrameWorks from wikipedia.org

Name	Platform	Destination	Specifications	Protocols
Apache Axis	Java	Client/Server	WS-ReliableMessaging, WS-Coordination, WS-Security, WS-AtomicTransaction, WS-Addressing	SOAP , WSDL
JSON-RPC-Java	Java	Server	???	JSON-RPC
Java Web Services Development Pack	Java	Client/Server	WS-Addressing, ???	SOAP , WSDL , ???
Web Services Invocation Framework	Java	Client	???	SOAP , WSDL
Windows Communication Foundation	.Net	Client/Server ?	WS-Addressing, WS-ReliableMessaging, WS-Security	SOAP , WSDL
XFire	Java	Client/Server	WS-Addressing, WS-Security	SOAP , WSDL
XML Interface for Network Services	Java	Server ?	??	SOAP , XML-RPC
gSOAP 	C++	Client/Server	WS-Addressing, WS-Discovery, WS-Enumeration, WS-Security	SOAP , XML-RPC , WSDL



What is Workflow?

Next..

Let's talk about the WFE(workflow engine) and operate it.



Search 'workflow engine' (open source)

reference address: <http://SourceForge.net>

Here are results

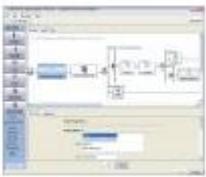
Name	Activity	Rank	Registered	Latest File	Downloads (count)
uEngine BPM	 99.85%	280	2003-12-18	2007-03-13	12,692
JTrac	 99.76%	447	2006-03-17	2006-12-12	14,754
YAWL	 99.70%	544	2004-07-15	2007-03-16	39,920
OpenWFE	 99.70%	557	2002-05-29	2007-02-07	93,274



Search 'workflow engine' (open source)

workflow engine's characteristic feature(1)

uEngine BPM



A BPM (Business Process Management) / Workflow Solution based on Web Services and CBD-concept, which provides most features of commercial one - Process Designer, EIP, Web service tools and OLAP based Process Analyzer.

JTrac



JTrac is a generic issue-tracking web-application that can be easily customized by adding custom fields and drop-downs. Features include customizable workflow, field level permissions, e-mail integration, file attachments and a detailed history view.



Search 'workflow engine' (open source)

workflow engine's characteristic feature(2)

YAWL



YAWL is a Workflow/BPM system. Based on a concise and powerful modeling language; YAWL handles complex data, transformations & Web Service integration. Built in Java, it uses XML Schema, X Path/Query, & X Forms natively. It is compatible with SOAP & WSDL.

OpenWFE



OpenWFE is an open source java workflow engine / environment. It is a complete Business Process Management suite, with 4 components : an engine, a work list, a web client and an 'APRE' (Automatic Participant Runtime Environment).



Installation Uengine

.....
Step 1 Download uEngine and extract it.

 [Download](#)

.....
Step 2 Launch the run.bat script in 'was/bin'

.....
That's all about installing and running uEngine.

[Note]

uEngine was tested in JDK v1.4.(not JRE) so if your server does not start up property, insert following command into the start of the Run.bat

SET, JAVA_HOME=<directory for JDK>



How to Run U-engine

Just connect to <http://localhost:8080> , that's all.

[Note]

uEngine has java container(Jboss), already. so you need not download 'Jboss_java'



Start up, Uengine

First,

Login, ID: test@liferay.com | PassWord: test

Then,

You will see below feature.

The screenshot displays the Uengine web application interface. At the top, there is a navigation bar with tabs for Home, Process, To Do, Manager, and Analyzer. The main content area is divided into several sections:

- Analog Clock:** A circular clock showing the time.
- Workload - Configuration - Class:** A vertical bar chart showing the workload for Joe Bloggs.
- Admin:** A section for server and user management, including options for Auto Deploy and Enterprise.
- Enterprise Admin:** A section for managing users, organizations, locations, user groups, and roles. It includes search fields for First Name, Middle Name, Last Name, and Email Address, along with an Active status dropdown and a Search button.
- Gantt Chart:** A Gantt chart showing task progress over time. The chart is titled "2007, 4, > click to filter" and "By Resource". It displays a task "Trouble ticket process483 (483)" with sub-tasks: Report trouble, Set the right person, Write resolution, and Approve it. The chart shows the progress of these tasks over a period of 30 days, with a legend indicating "Now Working", "Work Done", "Delayed/Still Working", and "Time left to due date".
- Calendar:** A calendar view for April 12, 2007, showing a grid of days and a table for events. The table has columns for Time, Title, and Type. The message "There are no events on this day." is displayed.



Regist and Management(Admin)(1)

First,

Click 'Home' at initial administrator page.

Second,

To Set 'Admin category', See below chart.

Category	Specification
Company	Register Company name , info, logo
Portlets	Manage Portlets, Modify, Set roles..
Server	Read & Modify Server infomation
User	Register & Modify User infomation
Groups	Register & Modify the Groups of User infomation
Roles	Set Roles..

Regist and Management(Admin)(2)

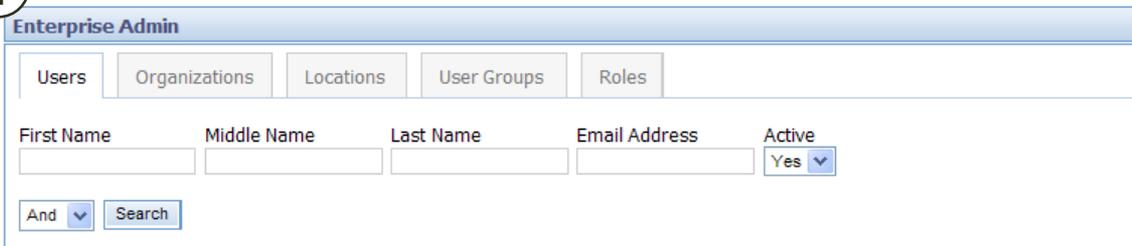
Regist User..

Click 'Search' and fill out below form.

Then,

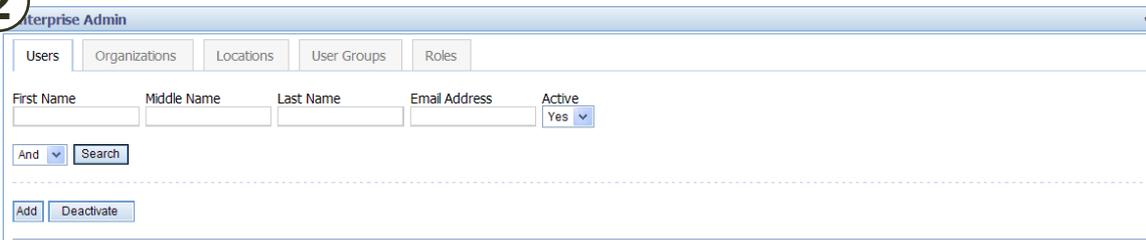
Click 'Add' and Set role of users..

1



The screenshot shows the 'Enterprise Admin' interface. At the top, there are tabs for 'Users', 'Organizations', 'Locations', 'User Groups', and 'Roles'. Below the tabs, there are input fields for 'First Name', 'Middle Name', 'Last Name', and 'Email Address'. To the right of these fields is an 'Active' dropdown menu with 'Yes' selected. Below the input fields, there is an 'And' dropdown menu and a 'Search' button.

2

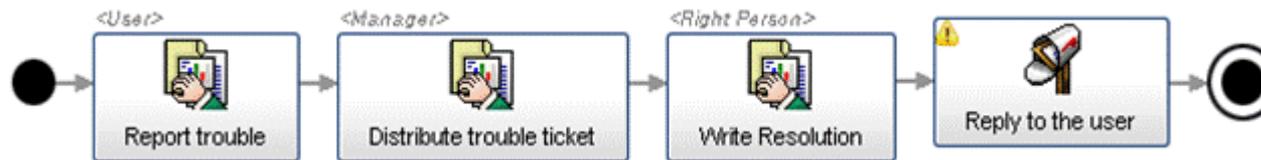


The screenshot shows the 'Enterprise Admin' interface, similar to the first one. It has the same tabs and input fields. However, the 'Add' button is now visible at the bottom left, and the 'Deactivate' button is visible at the bottom right. The 'Search' button is still present.

Start-up, Process Design

Simple process, Example

Trouble-Ticket Process diagram



Trouble Ticket is a process that handles trouble tickets by distributing them to the right person who is responsible for the maintenance of the system and gives feed back of the result to the user by e-mail notification.

Process steps

Report trouble → **Distribute trouble ticket** → **Write resolution** → **Reply to the user**

Process Design(cont'd)

How to create process and use it(1)

The screenshot shows the uEngine process management portal. The top navigation bar includes links for Work List, Workspace, Dashboard, and Process manager. The current user is logged in as Joe Bloggs, with options to Sign-out or Change Password. The main interface is divided into two sections: Process Definitions and Process Instances.

Process Definitions: A tree view shows a workflow named 'testprocess' with several actions: add definition, add child folder, rename, remove, and move.

Search Instances: A search form with a 'Search' button and a 'reset' button. It includes fields for Status (set to 'All'), Name, Started (From/To), and Ended (From/To).

Process Instances Table:

Status	Instance ID	Definition	Info	Started Time	Finished Time
Running	Trouble ticket process41	Trouble ticket process		2007-01-17 06:58:54.085	
Running	Trouble ticket process40	Trouble ticket process		2007-01-17 06:58:47.736	
Running	Trouble ticket process37	Trouble ticket process		2007-01-17 06:54:07.113	
Running	Trouble ticket process34	Trouble ticket process		2007-01-17 06:36:32.266	
Running	Trouble ticket process33	Trouble ticket process		2007-01-17 06:36:22.682	
Completed	Trouble ticket process31	Trouble ticket process		2007-01-06 10:22:24.387	2007-01-06 10:23:53.665
Running	Trouble ticket process24	Trouble ticket process		2007-01-06 02:51:52.331	
Running	test	Trouble-Ticket		2007-01-06 01:49:58.03	
Running	이름없음21	이름없음		2006-12-27 16:34:22.354	
Running	이름없음8	이름없음		2006-12-27 15:51:47.199	

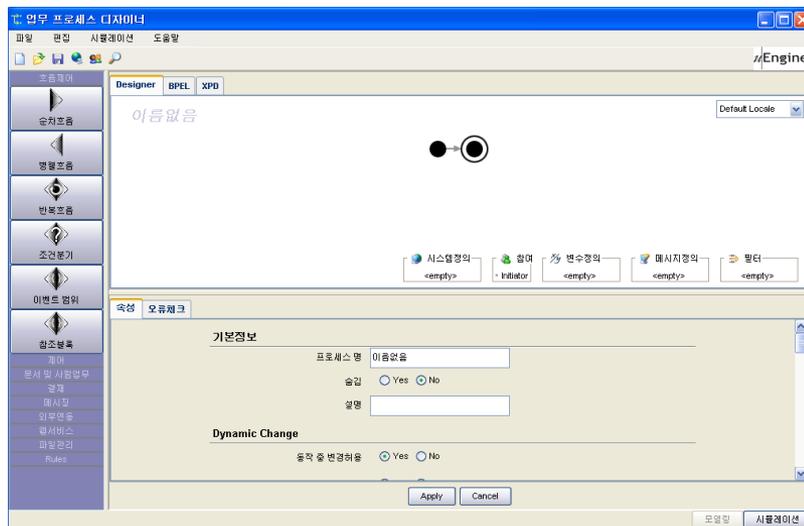
At the bottom of the table, there are pagination controls: Newest, 1, 2, Oldest.

Step 1 Go <http://localhost:8080/uengine-web>, and login.

Step 2 Click process management, and add your own process folder

Process Design(cont'd)

How to create process and use it(2)



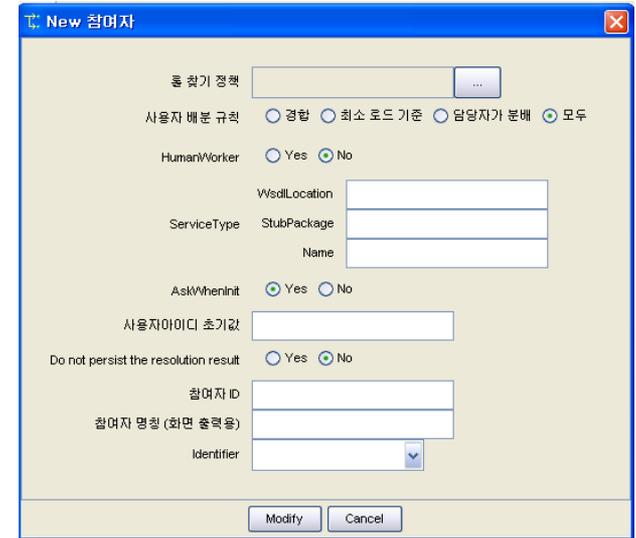
←..... Process design tool(uengine)

Step 3 And click 'add process definition'(and then auto downloading, process design tool'

Step 4 And then draw process diagram.

Process Design(cont'd)

How to create process and use it(3)

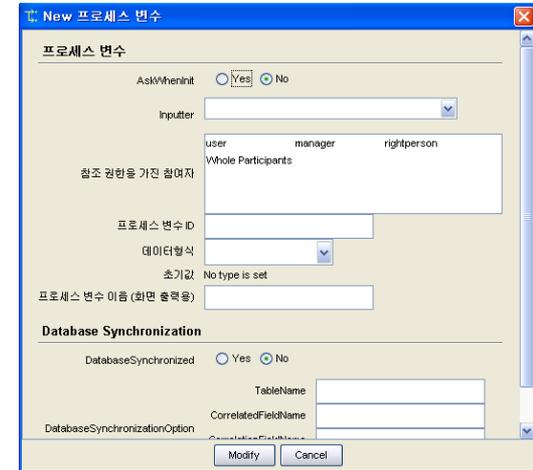
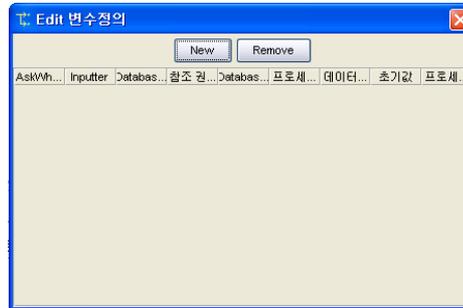
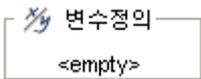


Step 5 And then you must define 'attending user', so click 'user define'

Step 6 And then fill out the 'attending user form'

Process Design(cont'd)

How to create process and use it(4)



* The Kinds of variable form

- Select box
- Radio button
- TextArea

Step 7 And then click the 'variable define'

Step 8 And then fill out the 'variable form'

Process Design(cont'd)

How to create process and use it(5)



Step 9 Click '문서 및 사람업무', and then click '일반사람업무'

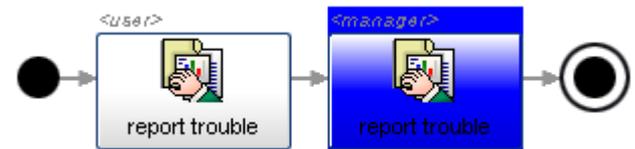
Step 10 And then fill out the 'form', click 'apply'

Process Design(cont'd)

How to create process and use it(6)



Drag and drop



Step 11 Next replicate step 9, and create manage box

Step 12 Click role picker, and select manager, drag and drop in manager box.

Process Design(cont'd)

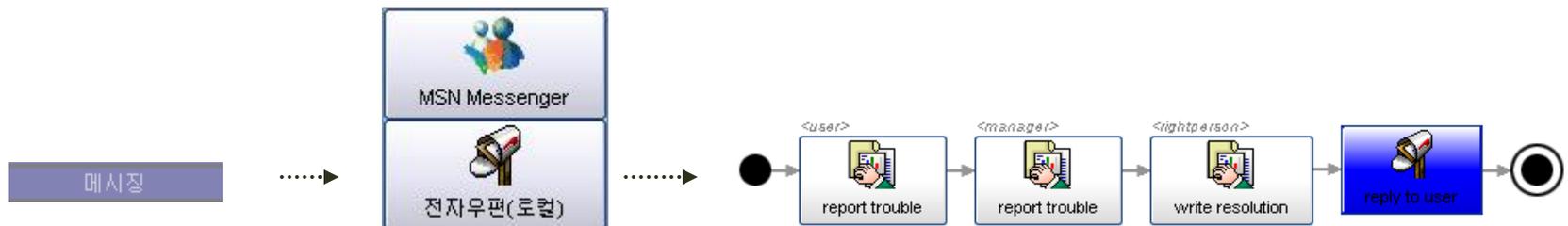
How to create process and use it(7)



Step 13 Next iterate step 9~10, and you will see above diagram.

Process Design(cont'd)

How to create process and use it(8)

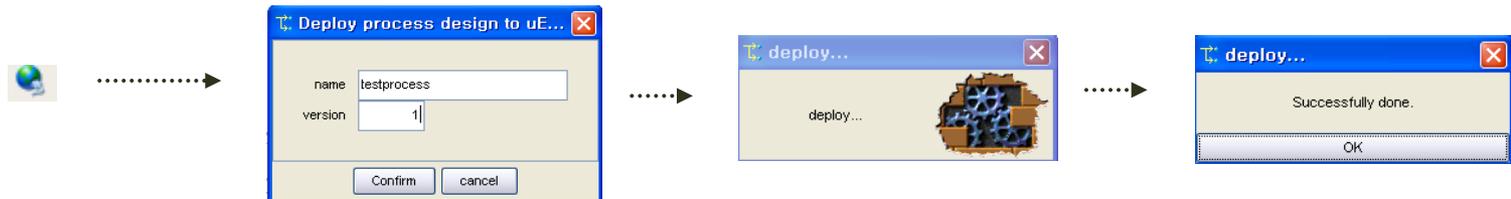


Step 14 Now for messeging you must create messeging box, so click the '메시징'

Step 15 Click '전자우편(로컬)' and fill out the form

Publishing..

How to Deploy this process model

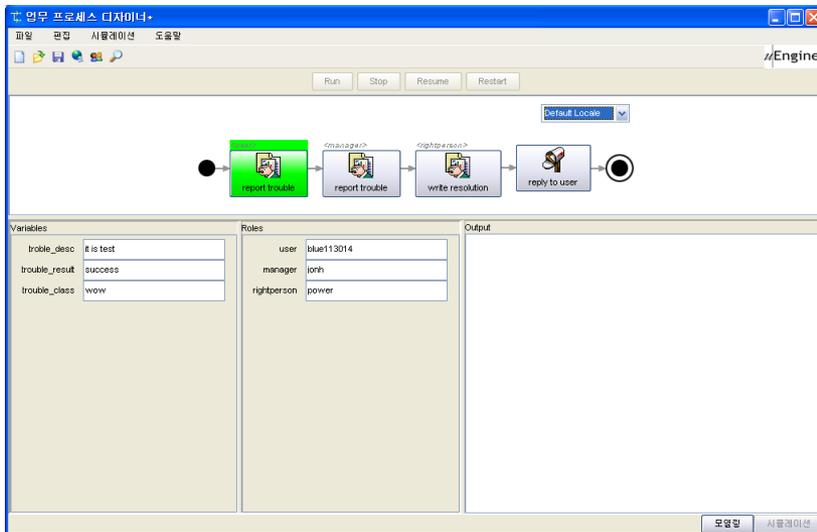


Step 16 Now deploy this model, click the button(above) and fill out the box, click 'confirm'

.....

How to Simulation on Modeling Tool

To Simulation this process model



Step 17 Click the 'simulation' and then you will see this screen.

Step 18 Each step, you fill out the input box and then 'run'

Deploying the Model

Deploy this process model(1) on Local Server..

The screenshot shows the i/Engine Process Portal interface. The user is logged in as 'Joe Bloggs'. The navigation menu includes 'Home', 'Process', 'To Do', 'Manager', and 'Analyzer'. The 'Process Participant' section is active, displaying a list of process models:

- Workflow
- B2BI
- BRE
- Pageflow
- EAI
- Trouble-Ticket
- Trouble-Ticket - Scope
- Trouble-Ticket - URL application
- Sub processes
- Trouble-Ticket - Sub Process
- Trouble-Ticket - Approval Line
- Trouble Ticket process_by_yong

The screenshot shows the i/Engine Process Portal interface with the 'Process Participant' section expanded to show the 'Trouble Ticket process_by_yong' process. The process flow is as follows:

```
graph LR; Start(( )) --> R1[Report trouble]; R1 --> R2[Report trouble]; R2 --> W[Write Resolution]; W --> R[Reply to the user]; R --> End(( ))
```

Below the process flow, there is an 'Instance List' table with the following columns: Instance Name, Definition Name, Started Date, Due Date, Finished Date, and Information. An 'Initiate this process...' button is located to the right of the process flow.

Click the 'process tab' then, you will see featurer 2,

Next, click 'initiate the process'

Deploying the Model

Deploy this process model(2)

The screenshot displays the jEngine Process Portal interface. At the top left, the logo "jEngine" is visible. The top right corner shows a welcome message "Welcome Joe Bloggs!" and navigation links: "Home - My Account - Sign Out [Add Content] [Page Settings]" and "My Places » Joe Bloggs (Private)". Below this is a navigation bar with tabs: "Home", "Process", "To Do", "Manager", and "Analyzer". A search bar is located on the right side of the navigation bar.

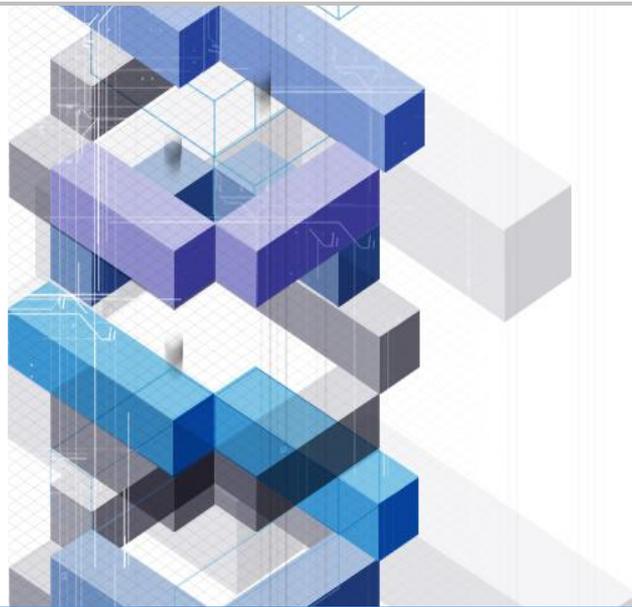
The main content area is titled "Process Participant" and shows a process flow for "Trouble Ticket process_by_yong > Report trouble". The process flow consists of five steps: "Report trouble" (with a person icon), "Report trouble" (with a person icon), "Write Resolution" (with a person icon), "Reply to the user" (with a person icon), and a final step with a person icon. A "Process Edit" button is located to the left of the first step.

Below the process flow, there are several form fields:

- Role Binding:** Fields for "User" and "RightPerson", each with a dropdown arrow.
- To-Do:** A "Class of Problem" dropdown menu set to "Systemic". Below it is a "Problem Description" text area and an "[Instance.Name]" text field.

At the bottom right of the form, there is a "Complete" button. A "Customize..." link is located at the bottom left of the form area.

Fill out the form.. And click complete.



Thank You !