

Orchestration: Process and Task Management

Administration and Set-up Guide v1.0

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Revision History

Name	Date	Reason for Changes
BMKnez	Oct 17, 2014	First draft completed (see JIRA wor-7321)
Joel Basart	Nov 12, 2014	Updated draft to prepare for release.

About this Guide

Audience

System administrators who are responsible for configuring the system (customizing business processes in the system).

Scope

Three parts to this guide:

1) **Acceptable Methods of Customizing Business Processes (capabilities of JBPM)**
    - Modify an existing business process/ (e.g., default intake)
    - Create a new business process from existing orchestratable tasks
    - Conditionalize Orchestrations (create conditional orchestrations)

2) **How to Use JBPM6 Process Management Tool(s)**
    - Model,
    - Design, and
    - Deploy your custom business processes.

3) **How to Add New Business Processes to the Workflow Menu**
    - .xml file must be checked into the component registry to ensure security can be applied to the business process
    - modify (localize) the process name (xml code) in the property file (see "messages.en.properties")

CONTENTS

REVISION HISTORY 2

ABOUT THIS GUIDE 3

Audience 3

Scope 3

ACCEPTABLE METHODS OF CUSTOMIZING BUSINESS PROCESSES 5

Modifying an Existing Business Process 5

Creating a New Business Process 5

HOW TO USE JBPM6 PROCESS MANAGEMENT TOOL(S) 6

Model and Design your Business Processes (from jBOSS.org) 6

Process Designer 6

Data Modeler 7

ADDING NEW PROCESSES TO THE MENU* 8

APPENDIX A: WHAT IS ORCHESTRATION? 9

APPENDIX B: ORCHESTRATION IN WORKFLOWGLOBAL 15

Customization by Orchestration 16

Benefits of Orchestration 18

APPENDIX D: THE JBPM PROCESS MANAGEMENT TOOLBOX 19

APPENDIX D: GLOSSARY OF TERMS 22

Acceptable Methods of Customizing Business Processes

Modifying an Existing Business Process

Select an existing orchestration (business process), then duplicate/clone it.

Modification of COTs-defined processes (for example, admit; ~~facility count~~; release) can be accomplished through re-orchestration.

Re-orchestration can be accomplished in several ways:

- Removing one or more tasks from a pre-defined process
- Adding a task to a pre-defined process (note the task referred to here is not part of the COTs definition for the given pre-defined process)
- Rearranging tasks in a pre-defined process
- Changing gateway placement (to send more/fewer tasks to the Task Pool)

Creating a New Business Process

Creation of new custom processes can also be accomplished:

- Stringing together one or more existing tasks to create a new business process or workflow (Is this concept confined to a business area, or can the client feasibly string together random tasks to create a 'process'?

NEW processes can also be created/orchestrated using existing tasks.

- Define your process-- Link together two or more existing tasks to create a new business process or workflow.
- Select existing tasks that comprise this process – this is the task set (are there conditions or attributes that a task must have in order to be able to include it in a new process/new orchestration?)
- Assemble tasks in desired sequence
- Decide where to place the gateway – this determines which tasks are completed by a single user and which ones are spawned to the Task Pool

How to Use JBPM6 Process Management Tool(s)

Configuring orchestrations can be simplified into two steps:

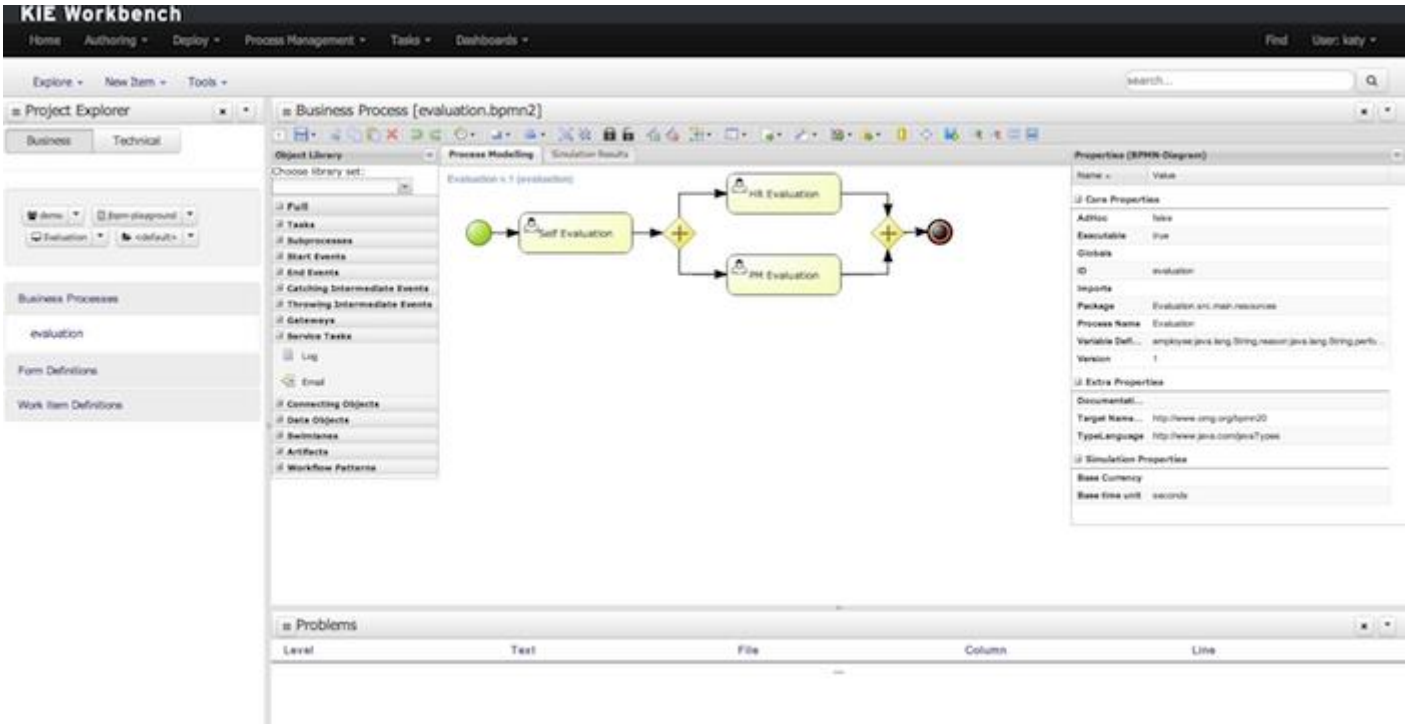
1. Model and Design (may be as simples as cloning an existing business process, making minor modifications (e.g., add a task and change gateway placement).

2. Deploy (build and deploy)

Model and Design your Business Processes (from jBOSS.org)

Process Designer

- Allows you to design and simulate business processes in a web-based environment.
- Allows you to model your business processes in a web-based environment.
- Use the graphical editor for viewing and editing your business processes (using drag and drop), similar to the Eclipse plugin. (It supports round-tripping between the Eclipse editor and the web-based designer. It also supports simulation of processes.)



Data Modeler

- Allows you to view, modify (edit) and create data models for use in your processes.
- Capture the requirements for a process or application and turn these into a formal set of interrelated data structures.
- Use the visual aid for building both logical and physical data models, without the need for advanced development skills or explicit coding. (The data modeler is integrated into the workbench. Its main goals are to make data models into first class citizens in the process improvement cycle and allow for full process automation through the integrated use of data structures (and the forms that will be used to interact with them)

Adding New Processes to the Menu*

- This is done using war/ear/ jar file packages
- See workflow.war > syscon.-menu.xml
- This xml file must be checked into the component registry (because this is where security layers are applied; it specifies user access for various business processes and tasks. New business processes must be validated against the security model)
- Once checked in, the process name displays in the menu – it will display with its xml name; you need to do yet another step – that is --modify (localize) the process name in the property file (see "messages.en.properties")*

Appendix A: What is Orchestration?

Process Orchestration is a method by which to manage business processes and their tasks.

Each WorkflowJAIL task is designed for reusability, which minimizes the effort to assemble tasks to create a business process.

Any set of tasks can be linked together to build a business process, in very much the same way jigsaw pieces can be connected to complete a picture.

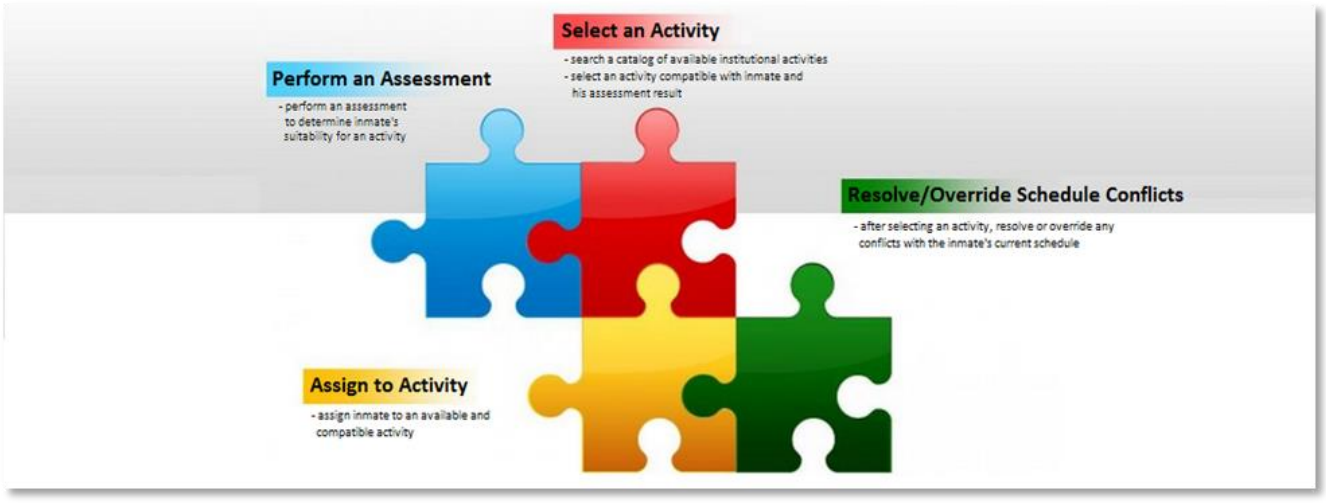
WorkflowJAIL has already done the lion's share of the work in defining a comprehensive set of default processes for your jail/prison. For example, processes such as Admit an Inmate and Release an Inmate are defined, orchestrated, and ready to use.

You can use the COTS-defined processes as they are, or you can orchestrate each pre-defined process to better align with your business needs. If, over time, your business needs change, you can modify an already-modified process.

Whether you are a small jail such as Xyz, or a mega jail such as LA County, the ability to customize each COTS-defined process can help ensure your mission-critical tasks are completed first, fast, and accurately.

Customization/orchestration of processes is easily accomplished by removing one or more tasks, or changing the sequence of those tasks, or adding another task. (Is it possible to add task that are not COTS-defined as part of that process?) (Tool: Eclipse-based and web-based editor to support the graphical creation of your business processes (drag + drop))

Let's look at WorkflowJAIL's default business process definition for ASSIGN INMATE TO A SCHEDULED ACTIVITY.



This business process is defined by the following task set:

1. Perform an Assessment. The Programs officer performs an assessment to determine his compatibility with an activity or set of activities.
2. Select an Activity. The Programs officer searches a catalog of available institutional activities and selects an activity that is compatible with the inmate and his assessment results.
3. Resolve or Override Schedule Conflicts. After selecting an activity, schedule conflict warnings may come up; the Programs officer can resolve or override any schedule conflicts before assigning the inmate to an activity's schedule.
4. Assign Inmate to Activity. Once all scheduling conflicts are cleared, the Programs officer can proceed to assign the inmate to the selected activity.

So, now that we have a business process definition to work with, its orchestration can be established.

A process orchestration can specify 4 things.

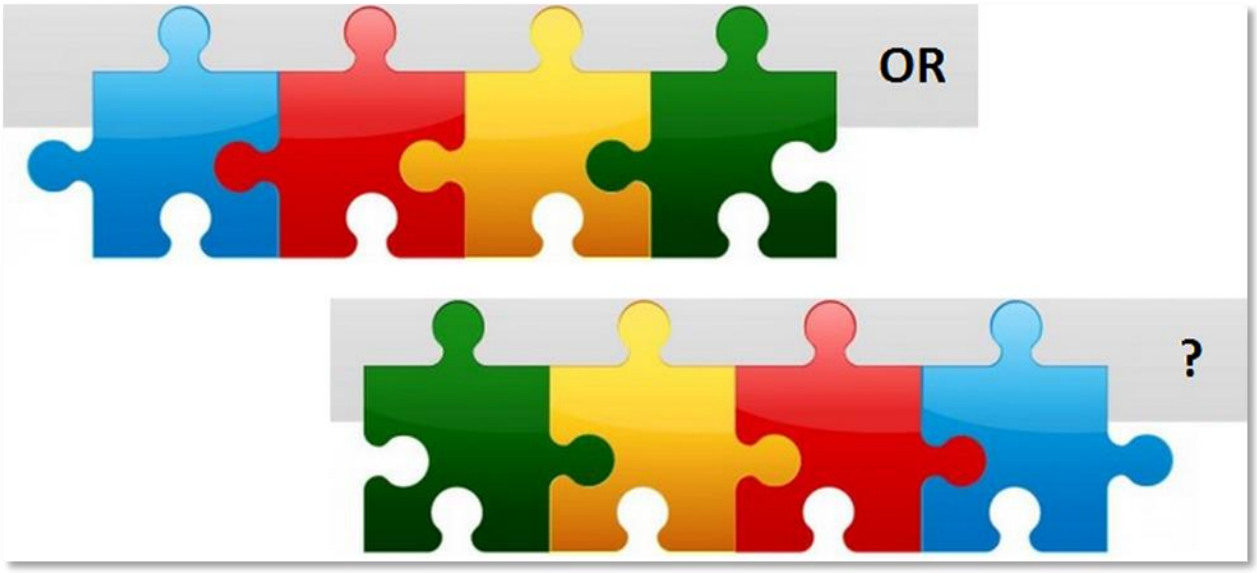
1. Process orchestration can specify which tasks are included in the business process.



- Tasks that are part of the original process definition may be removed. For example, in the ASSIGN INMATE TO ACTIVITY process definition we described earlier, a facility may decide that they no longer need to Perform an Assessment at the time an inmate is assigned to an activity, so this particular task is removed from the process.
- Conversely, tasks that are not part of the original process definition may be added.

  For example, using the ASSIGN INMATE TO ACTIVITY process definition we described earlier, a facility may decide that the assignment of activities should be subject to approval, so two reusable tasks—REQUEST APPROVAL and APPROVE/DENY REQUEST—are added to ensure the pending assignment is passed on to an Approving officer, prior to the assignment of the inmate to the activity.

2. Process orchestration can also specify how tasks are sequenced.



- A facility may decide to shuffle the order by which tasks are handled.

  For example, using the ASSIGN INMATE TO ACTIVITY process definition we described earlier, the tasks can be shuffled so that *selecting an activity* precedes *performing an assessment.*

So far, we discovered that process orchestration can determine which tasks are included in a process, by either removing or adding tasks to the process. And we also learned that the task sequence can be reshuffled.

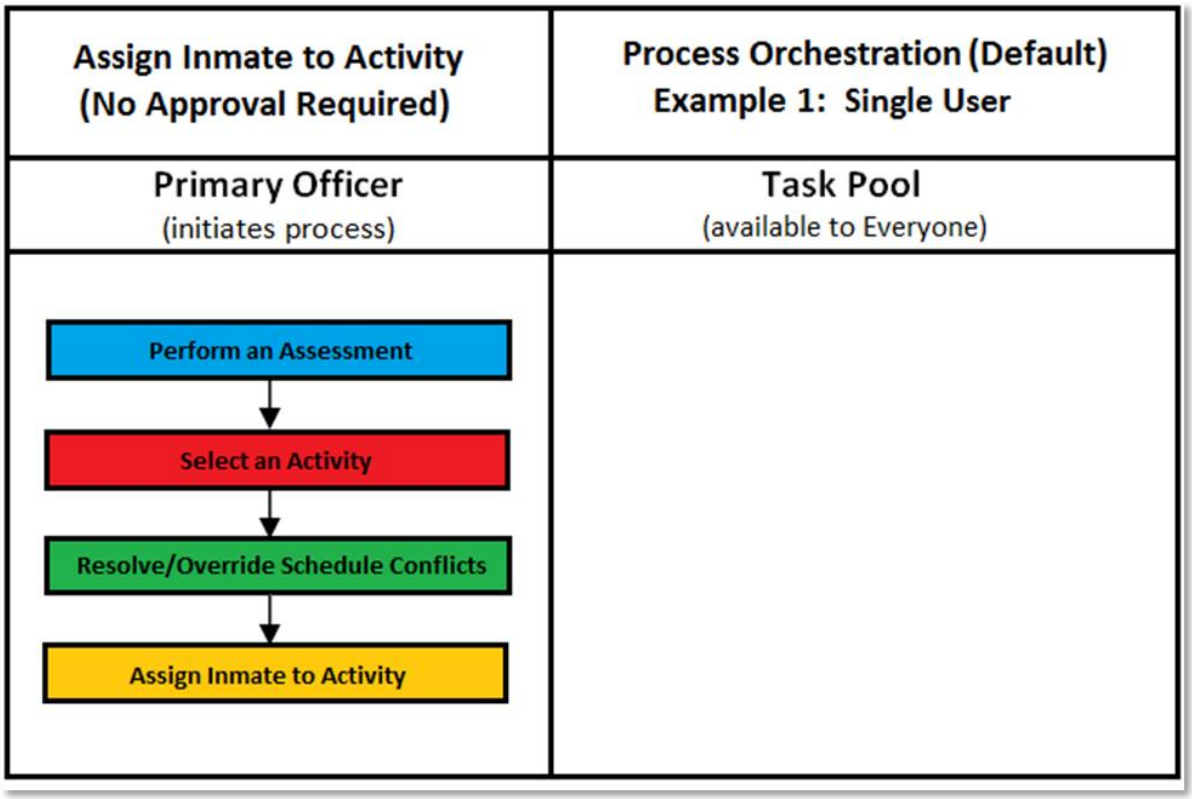
3. Process orchestration can also specify which tasks are to be completed by a single user – either in a single user session, or in more than one session.



- For example, using the ASSIGN INMATE TO ACTIVITY process definition we described earlier, a small facility may only have one Programs officer and typically dedicate him to this particular process.

This type of "single-user" orchestration may also be useful to a facility in a different way. A large facility may want to orchestrate a simple data-entry driven process in this way to minimize inconsistencies in how information is entered across all inmate records.

if a process is orchestrated for a single user, its task-flow may look something like this.



Example 1 illustrates a "single user" type of orchestration.

When the ASSIGN INMATE TO A SCHEDULED ACTIVITY process is initiated, this orchestration specifies:

- That all tasks be completed, in the sequence specified, by the person who initiated the process.
- Upon completion of the last task, there are no remaining tasks left in the process, therefore, no tasks are spawned and sent to the Task Pool and made available to other users.

This last point probably describes the most powerful and valuable aspect of orchestration.

4. Process orchestration can also specify which tasks are sent to the Task Pool and made available to other users.

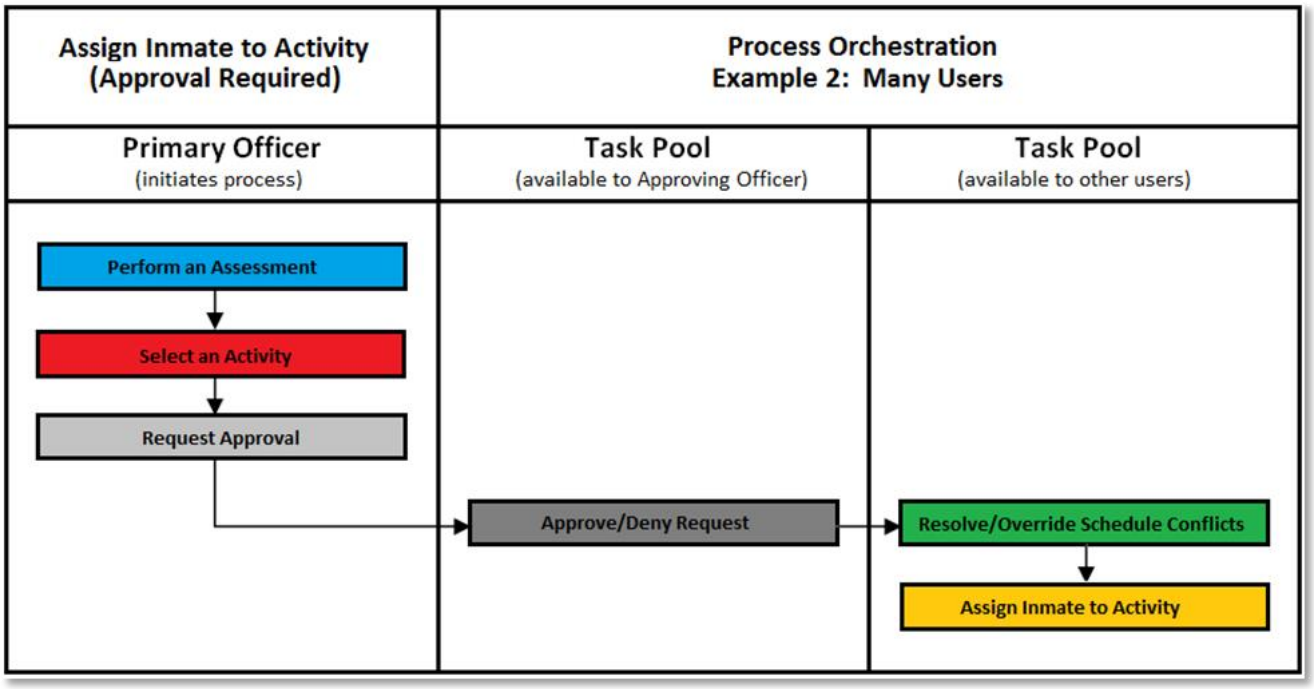


- For example, using the ASSIGN INMATE TO ACTIVITY process definition we described earlier, a facility may decide that the assignment of activities should be subject to approval, so two tasks—REQUEST APPROVAL and APPROVE or DENY REQUEST—are added to the process to ensure the pending assignment is passed on to an Approving officer, prior to the assignment of the inmate to the activity.

  The addition of approval-related tasks to this process now means that more than one user is involved in this process, as the approver cannot be the same person who initiated the process.

- This type of "many-users" orchestration may also be useful in a different way. A facility may want to orchestrate a lengthy process in this way to enable many users to work on a particular process concurrently. This approach has the potential to reduce the time it takes to complete a process. We will talk more about this aspect later in the presentation.

So…if a process is orchestrated for a many users, its task-flow may look something like this.



Example 2 illustrates a "many users" type of orchestration.

When the ASSIGN INMATE TO A SCHEDULED ACTIVITY process is initiated, this orchestration specifies:

- That the first three tasks be completed, in the sequence specified, by the person who initiated the process.
- Upon completion of the third task, the fourth task—Approve/Deny Request— is spawned and sent to the Task Pool and made available only to the Approving Officer*.
- Upon completion of the Approve Request (assuming approval is granted), the remaining tasks are spawned and sent to the Task Pool and made available to other non-specified users.

*Note: The WorkflowJAIL security model may specify which users or user roles are able to see and pick up tasks from the Task Pool.

Let's review what we just learned about process orchestration!

1. An orchestration can specify *whether tasks are removed or added* to the default process definition (task set)…
2. An orchestration can specify *how tasks are sequenced.*
3. An orchestration can specify *which tasks are completed by a single user*, either in a single user session or more than one session.
4. An orchestration can also specify *which tasks are sent to the Task Pool* to be picked up and completed by users working from other business areas.

Appendix B: Orchestration in WorkflowGLOBAL

Now that we have learned what orchestration is and what it does, let's take a peek at what orchestration looks like in the WorkflowJAIL web application. This time we will examine the *INTAKE* Process. And we will compare the default COTS orchestration with a customized 'short' re-orchestration. And we will also reveal the benefits of orchestration.

Default (COTS) Process Definition for *INTAKE*

In WorkflowJAIL, business processes such as INTAKE, have been defined, orchestrated, and are ready to use. The COTS process definition for INTAKE includes eight tasks:

- admit an inmate ; assign housing ; record demographics ; record cautions ;
- record education and employment ; create a case ; classify an inmate ; register property

Process Definition	Prerequisite Activity	Prerequisite Activity	Task A	Task B	Task C	Task D	Task E	Task F	Task G	Task H	*Minutes to Complete (Estimated)
ABCDEFGH	Search Person	Create Inmate	Admit Inmate	Assign Housing	Record Demographics (Basic)	Record Cautions	Record Education + Employment	Create a Case (Basic)	Classify (Perform Security Assessment)	Register Property	
	nominal	5 min.	5min.	5 min.	30 min.	5 min.	15 min.	5 min.	10 min.	10 min.	90 min.

Default (COTS) Orchestration for *INTAKE*

The COTS orchestration for *INTAKE* specifies that the first four mission-critical tasks be completed by the initiating user, at the time of intake, while the remaining tasks be sent to the Task Pool to be picked up and completed by other users at a later time.

- Orchestration specifies the following sequence and gateway placement: A B C D---gateway---E F G H
- Once tasks A B C D are completed, the gateway ensures that tasks E F G and H are sent to the Task Pool and made available to other users.

Although this COTS orchestration is practical, it can be customized through RE-ORCHESTRATION. You may use the COTS processes as they are, or you can re-orchestrate them to better align with the needs of your facility. For example, orchestrating fewer mission-critical tasks at the front end of the *INTAKE* process may enhance your ability to `check in` a high volume of incoming inmates on a daily basis, or at peak hours. The ability to re-orchestrate COTS processes makes WorkflowJAIL very versatile.

Customization by Orchestration

A Business Case for Customizing the Intake Process: Reduce Time Needed to Admit and House an Inmate [Re-orchestration Type 1: Send Select Task(s) to Task Pool]

In larger jails, there are significant safety-driven pressures to process high volumes of incoming inmates quickly. The *Intake* process in its entirety can be complex and time-consuming; however, Workflow allows you to re-orchestrate this process to ensure only mission-critical tasks are performed first. At the time of intake, it may not be realistic to record all pertinent inmate information, hence these tasks can be sent to the Task Pool—these tasks can be picked up by other users to complete when pertinent inmate information becomes available, or when time permits.

The following table illustrates the possible orchestrations/customizations for the *Intake* process across different-sized jails/facilities. Time estimates are provided to illustrate the potential time-savings realized when the *Intake* process is customized—that is--when the less critical data entry tasks are removed from the orchestrated Intake process.

Facility Type	Orchestration Pattern	Prerequisite Activity	Prerequisite Activity	Task A	Task B	Task C	Task D	Task E	Task F	Task G	Task H	*Minutes to Complete (Estimated)
		Search Person	Create Inmate	Admit Inmate	Assign Housing	Record Demographics (Basic)	Record Cautions	Record Education + Employment	Create Case (Basic)	Classify (Perform Security Assessment)	Register Property	
COTS Default Orchestration	ABCD---EFGH	nominal	5 min.	5min.	5 min.	30 min.	5 min.	Sent to TP	Sent to TP	Sent to TP	Sent to TP	50+40 (or 50+15)
Small Jail (100-500)	ABCDEFGH	nominal	5 min.	5 min.	5 min.	30 min.	5 min.	15 min.	5 min.	10 min.	10 min.	90+0
Medium Jail (500-750)	ABCDEF---GH	nominal	5 min.	5 min.	5 min.	30 min.	5 min.	15 min.	5 min.	Sent to TP	Sent to TP	70+20 (or 70+10)
Large Jail (750-1200)	ABC---DEFGH	nominal	5 min.	5 min.	5 min.	30 min.	Sent to TP	Sent to TP	Sent to TP	Sent to TP	Sent to TP	45+45 (or 45+15)
Very Large Jail (1200-2000)	ABC---DEFGH	nominal	5 min.	5 min.	5 min.	30 min.	Sent to TP	Sent to TP	Sent to TP	Sent to TP	Sent to TP	45+45 (or 45+15)

Mega Jail (2000+)	AB---CDEFGH	nominal	5 min.	5 min.	5 min.	Sent to TP	Sent to TP	Sent to TP	Sent to TP	Sent to TP	Sent to TP	15+75 (or 15+30)
Mega++ Jail (10,000+)	AB---CDEFGH	nominal	5 min.	5 min.	5 min.	Sent to TP	Sent to TP	Sent to TP	Sent to TP	Sent to TP	Sent to TP	15+75 (or 15+30)

The COTS INTAKE process is estimated to take a single user 90 minutes to complete in one session. Orchestration makes it possible for many users to handle the process-- either in a sequential fashion or concurrently. If many users can work on the same process concurrently, it can be completed far more quickly than if its tasks were handled sequentially. Process completion time can be significantly reduced if a process and its tasks are approached in the following way:

- The user who initiates the process completes their mandatory tasks in one session.
- Each task in the Task Pool is picked up by a different user.
- Each task in the Task Pool is started at the same time and worked on concurrently.

If the COTS-orchestrated INTAKE process (shown in orange) is approached this way, completion can be achieved in **65 minutes: that is -- 50 minutes,** the time it takes to complete the mandatory INTAKE tasks in one session, **plus 15 minutes,** the time it takes to complete the longest task in the Task Pool.

If the short-orchestrated INTAKE process (shown in dark pink) is approached this way, completion can be achieved in as little as **45 minutes: that is --15 minutes,** the time it takes to complete the mandatory INTAKE tasks in one session, **plus 30 minutes,** the time it takes to complete the longest task in the Task Pool.

Re-orchestration gives you the ability to reduce the time it takes to complete a process by 50%!

Benefits of Orchestration

Orchestration is a valuable configuration tool that gives you the power to *change your processes*, as well as *control how and when* they are completed. Let's review the benefits of orchestration.

1. **Flexibility**. Re-sequence or change COTS processes, or create new ones, as needed. (Ability to change processes as needed (remove or add new tasks to an existing process.)

2. Use the gateway feature to 'break up' a process (by inserting a gateway) and:
    - **Choose which tasks are completed immediately**.You can specify which tasks inside a process are completed immediately.
    - **Choose which tasks are deferred for completion at a later time**. You can specify which tasks inside a process are deferred for completion at a later time.
    - **Distribute tasks across different users**. You can distribute tasks across different users-or teams, via the Task Pool.
    - **Match and assign appropriate and available staff to a specific process, set of tasks, or individual tasks**. You can match the appropriate staff to a specific process, set of tasks or individual tasks –ensuring the right people are assigned to the appropriate task.
    - **Allow many users to work on a process concurrently**. Do you remember the INTAKE example? The short-orchestration offers the potential to complete the INTAKE process in half the time as the sequential (single-user) orchestration. Allow many users to work on a specific process concurrently offering the potential to complete a process significantly faster.

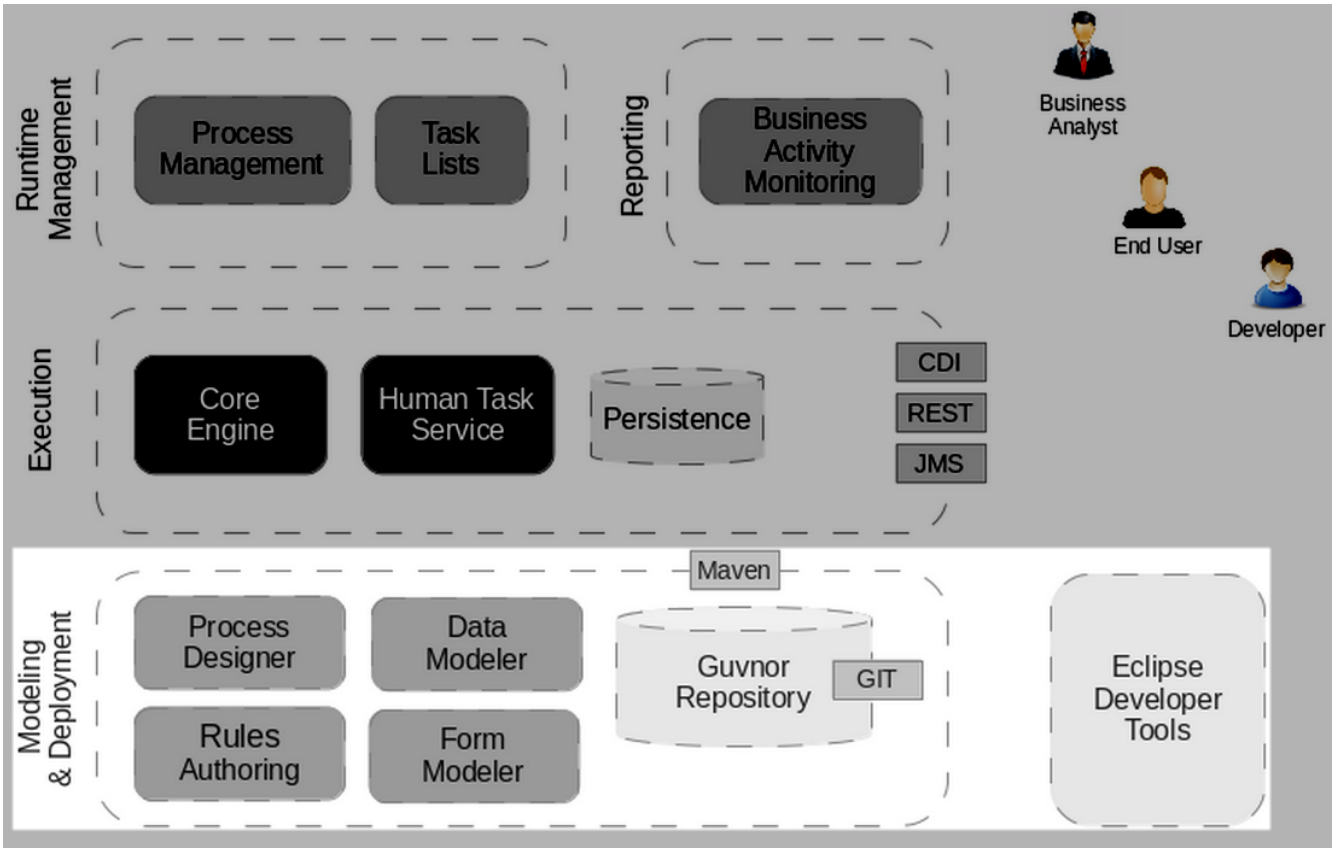
3. **Enhance predictability and consistency**. And lastly, from a usability standpoint, orchestrated processes offer users predictability and consistency, enabling them to perform their work efficiently. For example, the frontline Intake officer at the mega jail knows that he only needs to complete two intake tasks to process a new inmate; he also knows that the system reliably spawns the remaining Intake tasks, and sends them to the Task Pool where the appropriate users pick up the remaining tasks to complete the process before its due date.

** Note: The WorkflowJAIL Security Model plays an integral role in user permissions and user interactions with the Task Pool. It governs which users can see and access tasks in the Task Pool. For example, a medical staff member may be the only user able to access Record Cautions from the Task Pool. To find out more about this security model, see Administration and Set-up Guide: Security and Lightweight Directory Access Protocol (LDAP).*

Appendix D: The JBPM Process Management Toolbox

From JBoss Documentation (http://docs.jboss.org/jbpm/v6.1/userguide/jBPMOverview.html#d0e32)

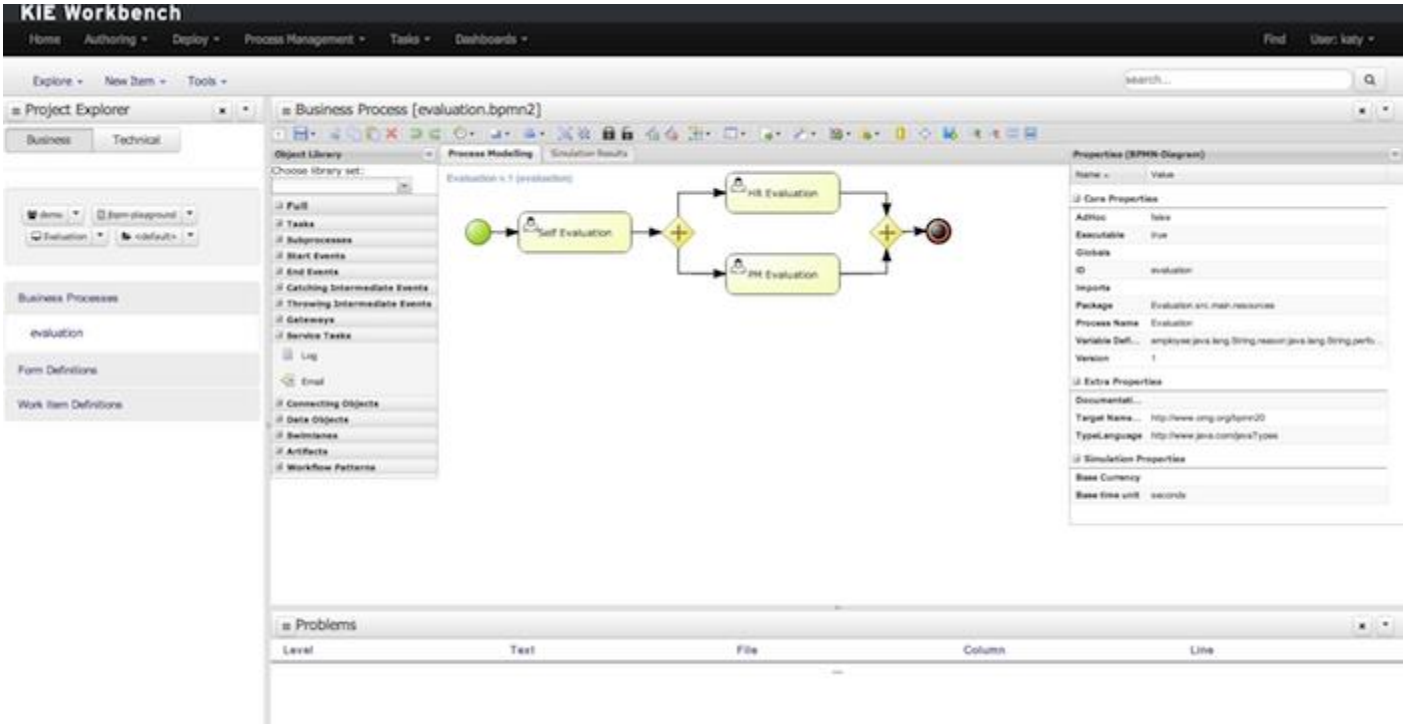
Web-based tools allows you to model, simulate and deploy your processes and other related artifacts (like data models, forms, rules, etc.):



Orchestration is accomplished using:

1. **The process designer** allows business users to design and simulate business processes in a web-based environment.

The web-based designer allows you to model your business processes in a web-based environment. It is targeted towards business users and offers a graphical editor for viewing and editing your business processes (using drag and drop), similar to the Eclipse plugin. It supports round-tripping between the Eclipse editor and the web-based designer. It also supports simulation of processes.



2. **The data modeler** allows non-technical users to view, modify and create data models for use in your processes.

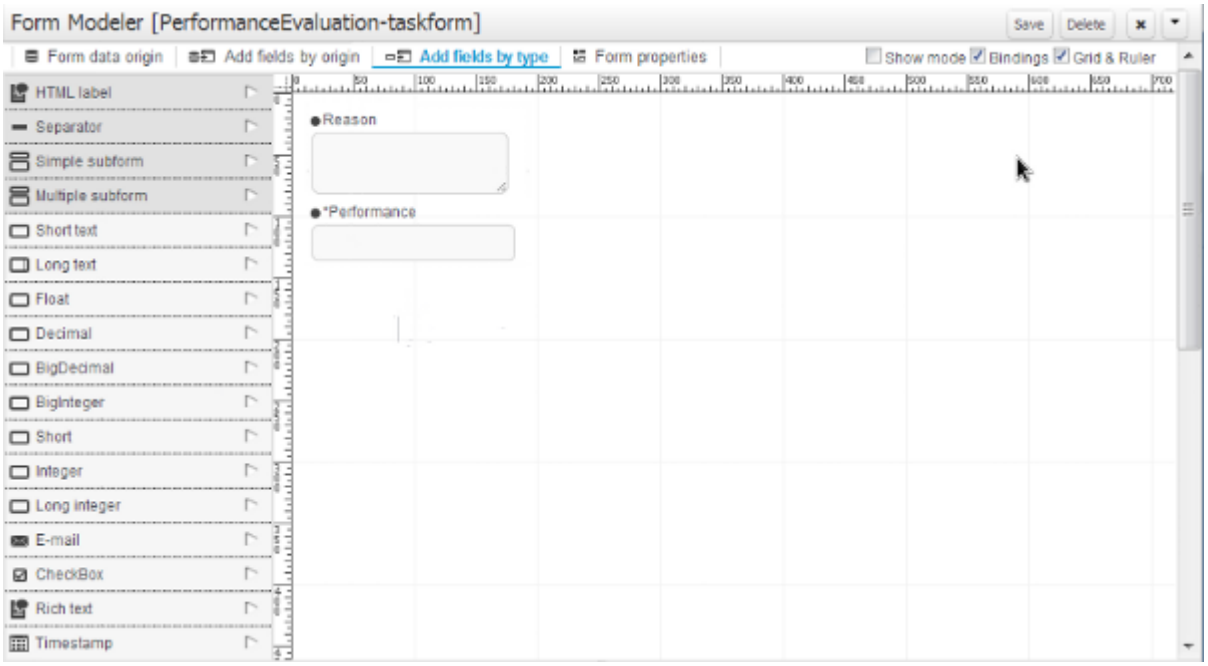
Processes almost always have some kind of data to work with. The data modeler allows non-technical users to view, edit or create these data models.

Typically, a business process analyst or data analyst will capture the requirements for a process or application and turn these into a formal set of interrelated data structures. The new Data Modeler tool provides an easy, straightforward and visual aid for building both logical and physical data models, without the need for advanced development skills or explicit coding. The data modelers is transparently integrate into the workbench. Its main goals are to make data models into first class citizens in the process improvement cycle and allow for full process automation through the integrated use of data structures (and the forms that will be used to interact with them).

3. **A web-based form modeler** also allows you to create, generate or edit forms related to your processes (to start the process or to complete one of the user tasks).

The jBPM Form Modeler is a form engine and editor that enables users to create forms to capture and display information during process or task execution, without needing any coding or template markup skills.

It provides a WYSIWYG environment to model forms that it's easy to use for less technical users.



Key features:

- Form Modeling WYSIWYG UI for forms
- Form autogeneration from data model / Java objects
- Data binding for Java objects
- Formula and expressions
- Customized forms layouts
- Forms embedding

The form modeler's user interfaces is aimed both at process analyst and developers for building and testing forms.

Developers or advanced used will also have some advanced features to customize form behavior and look&feel.

4. **Business Rules Engine.** Rule authoring allows you to specify different types of business rules (decision tables, guided rules, etc.) for combination with your processes. (see BRMS Guide)

5. **Guvnor Repository**. All assets are stored and managed on the Guvnor repository (exposed through Git) and can be managed (versioning), built and deployed.

Appendix D: Glossary of Terms

Term	Definition
task	A series of steps a user must execute to satisfy a business goal.
task set	A series of two or more tasks that can be used to build a business process.
task management	
process	
business process	
cancellable business process	May cancel once initiated–subsequent tasks in the process orchestration are cancelled .
non-cancellable business process	Cannot cancel once initiated–subsequent tasks in the process orchestration are sent to Task Pools (My Tasks;Task Pool)
business process definition	A series of two or more tasks that are required to satisfy a specific business goal.
process orchestration	A logical arrangement of a task set that satisfies a specific business goal
conditional orchestration	A type of process orchestration that is characterized by conditional branching/decision points (branching is dependent on outcome of one or more tasks within the process)
static orchestration	Non-modifiable? E.g., perform facility count?
jBPM	A suite of Business Process Management (BPM) tools created by jBOSS.org
JBPMN	Business Process Modeling Notation: a business modeling convention
Process Designer	Component of jBPM6 Process Management Tool: an open-source web process editor where you can customize processes, (e.g., remove, shuffle, add tasks to a business process.)
Data Modeler	Component of jBPM6 Process Management Tool: an open-source web process designer (integrated w Guvnor; ability to validate process definitions).
Form Modeler	Component of jBPM6 Process Management Tool: an open-source …
Drools	Component of jBPM6 Process Management Tool: an open-

	source Java business rules engine
Guvnor Repository	Component of jBPM6 Process Management Tool: an open-source ……