Modelio
Practical Guides

Practical Business Process Guide

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Introduction to Practical Guides

This set of Practical Guides is the result of hands-on experience gained by Modeliosoft consultants. Each guide is designed to facilitate model construction and to help you get the most out of the Modelio tool in a given context. The practical guides are deliberately short, since the aim is to provide essential practical information in just a few pages. The Modeliosoft consulting team is at your service to help with enterprise architecture definition, business process and software architecture modeling, SOA, and to provide any other assistance you may need in your IT projects.

Modeliosoft is pleased to provide a consulting/tool package. Find out more at www.modeliosoft.com.

At www.modeliosoft.com, you can download the Modelio Free Edition tool, a user-friendly and unlimited tool for UML modeling and business modeling (Enterprise Architecture, BPM, SOA logical architecture and software architecture), completely free of charge.

At www.modeliosoft.com, you can also evaluate and purchase Modelio Enterprise Edition, and discover the full functional richness of this tool: teamwork support, goal analysis, dictionary definition, requirements analysis, code generation, documentation generation throughout the entire project lifecycle, and so on.
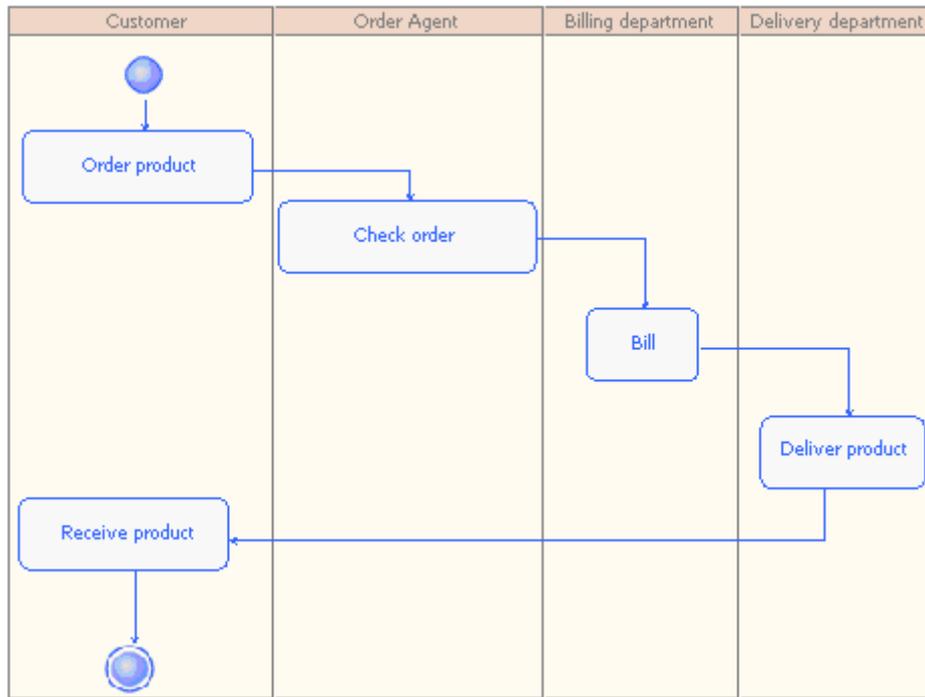
The Practical Guides currently available are as follows:

- Practical Use Case Guide

- Practical Business Process Guide

- Enterprise Architecture: Practical Guide to Logical Architecture

- Practical Company Organization Modeling Guide

Other practical guides will be available soon. Please check our website for details.

What are business processes?

A business process is a sequence of actions carried out by different actors working together to deliver a tangible result and bring added business value to the company.

The "Order product" business process (simplified)

For example, the aim of the "Order product" business process is to deliver the ordered product within the specified timeframe and bill the customer.

It should be noted that a business process model generally describes the business and not the IT system. Some described actions are carried out *manually*, with no interaction with a software component or application. For example, the "Deliver product" action can be carried out without using any software elements.

A business process is transversal, and is generally based on several structures and applications of one or several organizations. For example, the trip set-up process integrates the travel agency, the tour operator and the airline company.

In UML, business processes are represented using activity diagrams. However, users often prefer BPMN (Business Process Modeling Notation), which is seen as being easier to get to grips with.

When and why to use business processes

Business process descriptions bring real business vision, and constitute an excellent formalization and analysis tool when constructing systems. As such, they play a central role in today's company information systems (banking, insurance, telecoms, and so on).

In the context of a development project, they are above all used in business oriented activities (requirements expression, specifications or analysis, depending on the terminology used). Business process models are also an important part of companies' transversal activities (urbanization, cartography, BPM and SOA).

However, some domains are less concerned by business process models (embedded systems, for example, or office software packages).
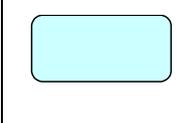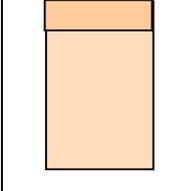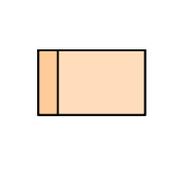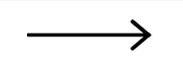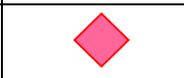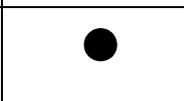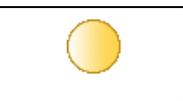
Best practices
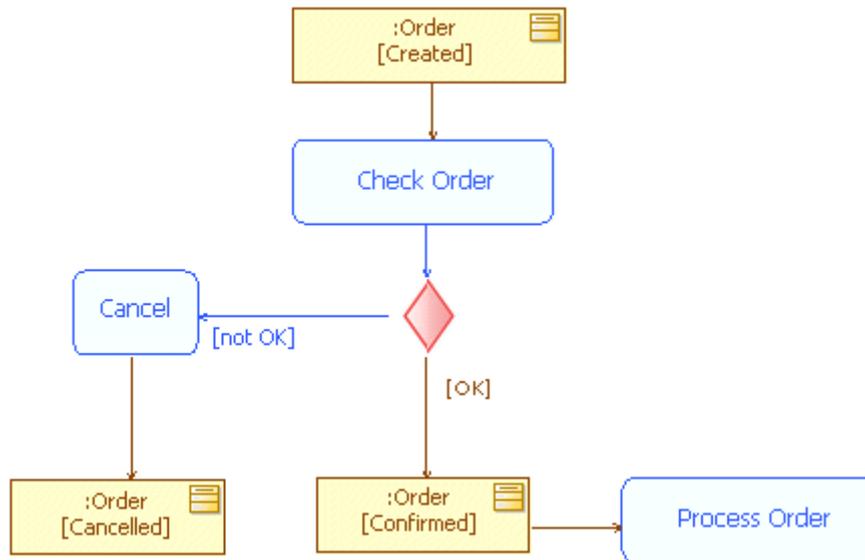
First and foremost, a business process must first be clearly defined, in order to position it in the overall business vision within the information system:

- The trigger event (for example: the customer places an order).

- The expected result(s) (for example: delivery and billing complete).

- The targeted objectives (for example: a reduction in delivery times).

Next, naming. A business process is named using a verb or a verbal phrase. For example, "Handle a claim" or "Prepare a loan application". Vague terms like "File management" or terms relating more to a function, like "Billing", are to be avoided.

The main elements that make up a process are as follows:

Term	UML activity	BPMN	Definition
Activity/ Process			Represents a process and contains process elements (actions, partitions …)
Action/Task			Execution unity or task undertaken by a partition
Partition/ Lane			Represents the entity in charge of realizing actions. This can be an actor or a company or organization structure.
Object node/ Data Object	Order [confirmed]	DataObject	Represents information exchanged between actions. An object's state can be indicated between square brackets.
Transition	⟶	⟶	Materializes the passage from one action to another.
Decision	◆	◈	Used to define a conditional branch.
Process start	●	◯	Defines the start of the process.
Process end	◉	◎	Defines the end of the process.
Branch end	⊗	◯	Terminates a branch of the process without stopping the overall process, some of whose branches can continue.

Extract of a process with decision, object flow with change in state

In the example shown above (see figure above - Activity diagram), the "Check Order" action handles an order that is in the "Created" state. If the check succeeds (OK), the order is then in a "Confirmed" state and we move on to the "Process order" action. If not, the order is cancelled.

Recommendation 1

One of the big risks of this type of modeling is the sheer number of elements, and the heterogeneity of representations and levels of detail.

To reduce this risk and better master the elaboration of business process models, the following rules are defined:

- Aim for a partition change for every action transition.
- Avoid trying to be exhaustive.
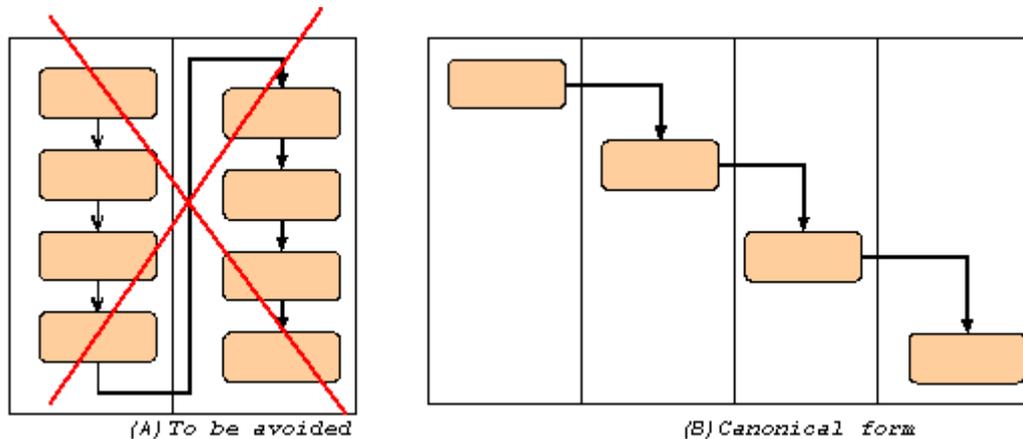
What should be described above all is the **collaboration** and **exchange** between different actors. To this end, partition changes for every transition constitute the **canonical form** to aim for (see right-hand figure below), without imposing this as an unbreakable rule. This rule, particularly in initial models, enables us to focus on the essentials and avoid getting bogged down in detail.

Conversely, a long sequence of actions in a single partition is to be avoided (see left-hand figure below). In general, the description of the work carried out by an actor (and not a company process) is represented by a use case scenario (please see the Practical Use Case Guide).

For example, the following sequence of actions run by the "Billing agent" actor:

1. Check order.
2. Look for price and applicable taxes.
3. Create bill.
4. Send bill to client.

This sequence will not be described by four different actions, but rather by one use scenario (in the context of the "Billing" use case).

(A) To be avoided   (B) Canonical form

Canonical form for business processes: partition change at every transition

It would not be a realistic objective to try to exhaustively describe the running of the process with all its possible cases and paths. Therefore, choices must be made, and partial representations accepted.

In general, we begin by describing the most frequent sequence, before progressively enriching it with more exceptional paths.

The content is also more precisely defined at each step. The first diagrams focus on actions and their sequence. Next, partitions are defined, incoming and outgoing objects added to each action, and possibly states associated with objects, and events.

The aim is to always produce legible diagrams, even if this means a diagram has to be cut down into several diagrams (for example, a diagram for the most frequent sequence, and other annex diagrams for other sequences).

Consistency rules

Business element processes are linked to other types of UML elements or to the Organization or Business views of Modelio SOA Solution. This enables the different viewpoints on the system being built to be validated and consolidated:
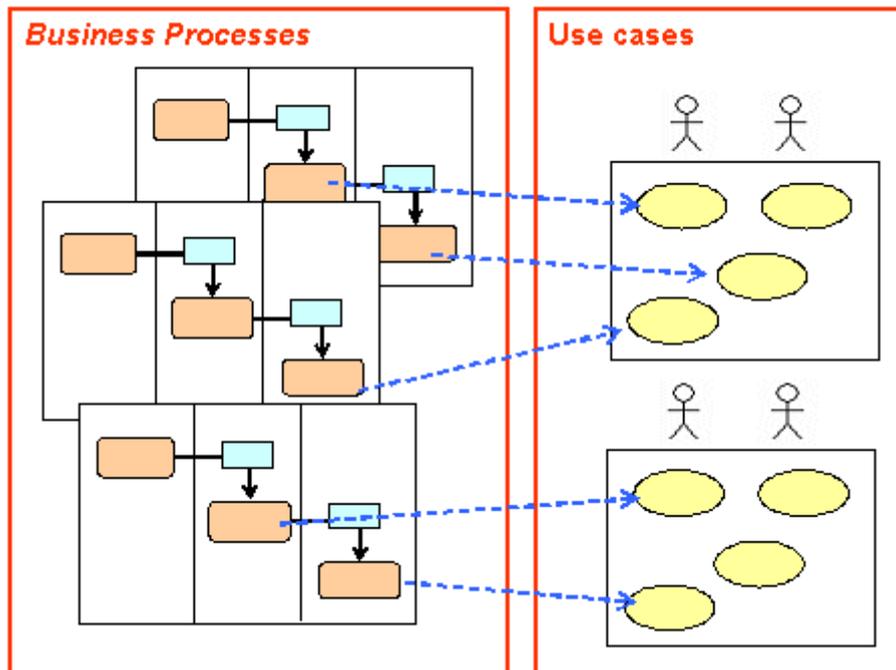
- Every object present in an activity diagram or a BPMN diagram must represent an instance of a static model element (class, component, …). This link can be edited in the object's properties (the "Type" field for a BPMN DataObject, the "Typed by" field for an activity diagram object node).

- If a state is defined in an object, it must correspond to a state featuring in the state machine of the object in question. This link can be edited in the object's properties (the "State" or "Current state" fields of the same elements).

- Every partition must be linked to a model element (actor, package, class). This link can be edited in the partition's properties (the "Model element represented" field on the two partitions).

Business processes and use cases

Business processes and use cases are of a different nature. Use cases focus on the particular and limited use of the system by an actor. Use case scenarios are short and are not interrupted. Conversely, business processes have a much wider scope, and are often interrupted when waiting for an event (for example, waiting several days for an order form to be signed).

Use case	Business process
A single beneficiary actor (focused on an actor)	Collaboration between several actors.
Reduced unicity of time	Can last several years.
Non-interruptible (a simple flow)	Generally interrupted, notion of state and event resumption.
Localized	Transversal. Across several structures or even several companies.

Relationships exist between business processes and use cases. Each non-manual business process action is based on interactions with elements of the information system, represented by use cases. For example, the "Check order" action is linked to the "Check order" use case, which describes in more detail how the "Order agent" proceeds to carry out this check.

The business process-use case relationship

However, strictly manual actions are not linked to use cases, as they do not require any interaction with the system.

In Modelio, these relationships are established through traceability links, for example through the traceability editor.

Characteristics of a business process

A set of characteristics associated with a process allow it to be better positioned and qualified:

- Duration (average): one day, several years.

- Frequency of execution: 1000 times a day or once a year.

- Number of users: (by type of user).

- Resource used (applications, repositories…).

These characteristics can be used to determine priorities. For large-scale organizations, it would not be realistic to produce a detailed model of all processes. Priority is given to the most critical processes for an organization.

Business process typology

There exist different categories of company business processes. Paul Allen(*) suggests the following classification:

- Customer processes, which provide customers with products or services. For example, the sale of a product.

- Sustaining processes, which are responsible for providing customers with added value, without directly exchanging with them. For example, the update of a product catalog.

- Enabling processes, which have no interaction with the customer, and which provide internal management services, such as staff pay or the recruitment process.

(*)Realizing e-Business with Components, Paul Allen, Addison Wesley 2001.
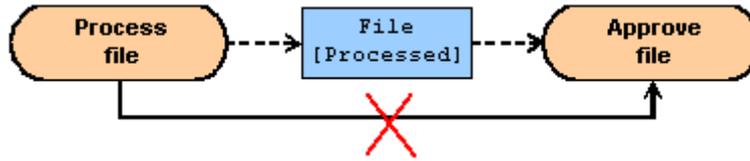
This classification is part of the business process hierarchical system. As the most important processes, customer processes take priority over other processes, since they are positioned at the heart of the company's business.

Metrics

If we consider only customer business processes, the number of business processes for the average company is in the region of a few dozen.

Recommendations

- Avoid doubling action flows with object flows, where this leads to superfluous information (where objects are also events that trigger actions).

Direct transition between actions and transition via object
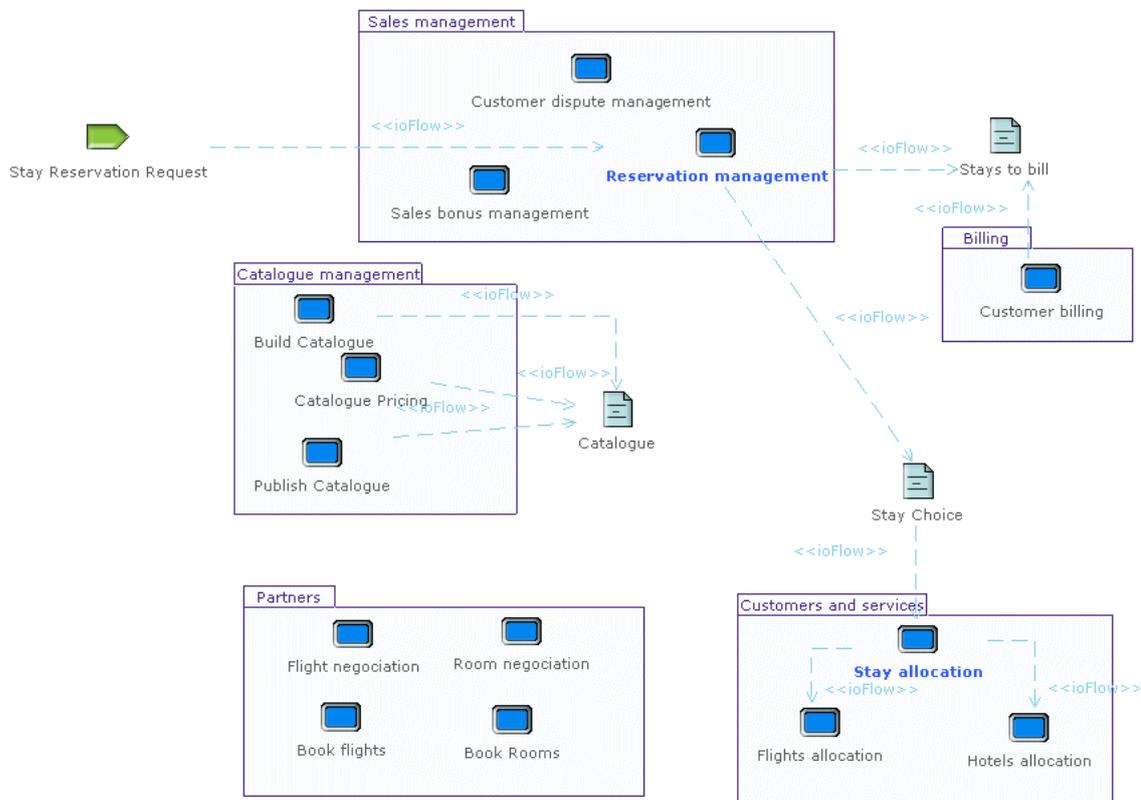
- Distinguish manual actions from other actions (by a particular color, naming rule or stereotype).

- Identify input and output for every action (in the form of objects or events).

Creating a business process in Modelio
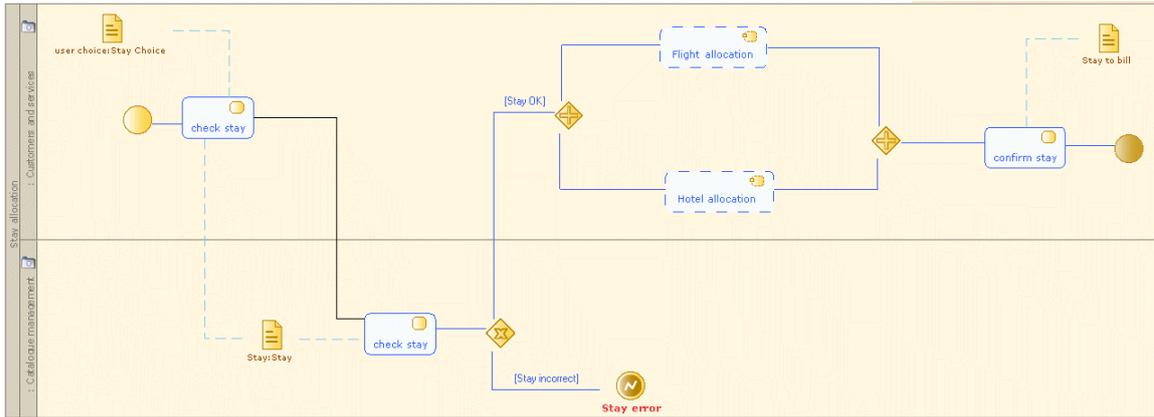
With Modelio, a process can be either (UML) an activity inside a package, or (Modelio SOA Solution) a (BPMN) process inside an organizational unit.

With Modelio SOA Solution, business processes can have an overview and a detailed view. Modelio enables the process model and its handled elements to be associated with the rest of the model (business, organization, …). We recommend therefore that:

- partitions, lanes or pools be associated with roles or organizational units

- tasks be associated inside a process with other triggered processes

- handled objects be associated with their type

Overview of an organization's processes

Detailed view of "Stay allocation" process