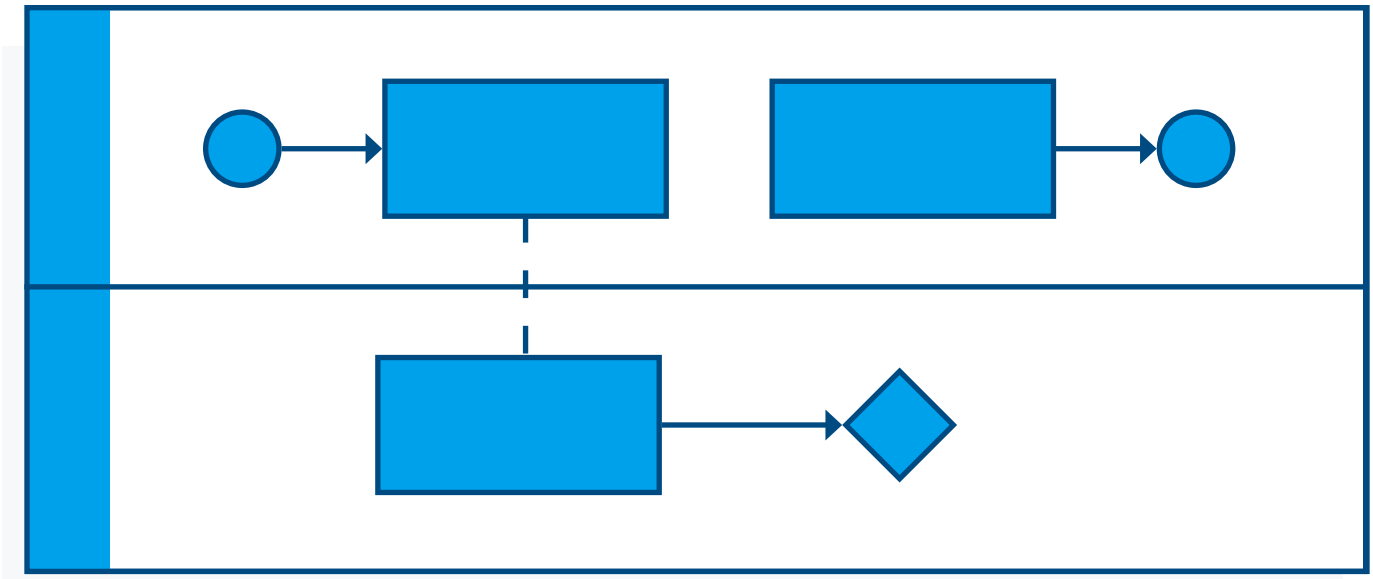

WHITEPAPER

BPMN 2.0 for Beginners

processmaker

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Table of **Contents**

Introduction

BPMN stands for Business Process Modeling Notation. BPMN is very similar to the concept of flowcharting, which has been around since the 1980s. Like flowcharting, BPMN modeling has the aim of allowing a person to map a workflow in such a way that it can be understood easily by other interested parties. BPMN is a language, and like any language, the purpose is to facilitate communication. BPMN facilitates communication and understanding of business processes.

The “N” part of BPMN stands for “notation.” The graphical notation comprises designated symbols representing actions, flows, or process behaviors. Visual symbols have been a part of the standard since the OMG released the first version of the BPMN specification in May 2004. BPMN is not software, and it’s not “owned” by a business but the OMG (Object Management Group) developed it as a notation standard that business analysts, technical developers, and project managers can understand. We’ve outlined seven steps to ensure you’re selecting the right enterprise BPM solution for your organization. These steps will allow you to determine which software system is right for you.

Not just a pretty picture

The historical problem with flowcharting was that each process modeler could make up their own meanings and interpretations for the diagrams they produced. Consequently, everyone interpreted the processes in different ways. In other words, process communication was highly imperfect. BPMN and, more specifically, BPMN 2.0 solved this ambiguity problem by introducing a semantic layer in XML, which transforms BPMN from just another pretty picture into something much more functional. By adding an XML definition to each BPMN object, the BPMN specification assures that each visual process model and all objects in the process model can only mean one thing.

```
<xsd:schema ...>
    ...
  <xsd:element name="task" type="tTask"/>
  <xsd:complexType name="tTask">
    <xsd:complexContent>
      <xsd:extension base="tActivity"/>
    </xsd:complexContent>
  </xsd:complexType>
    ...
</xsd:schema>
```

Image 1.1: Example Core XML schema.

Note: All BPMN images and code samples taken from the OMG Specification (http://www.omg.org/spec/BPMN/2.0.2/PDF)

Process model exchange & BPM software

Many workflow modeling tools and process engines support BPMN thanks to a common syntax. As a result, many different software suites can share and edit processes designed with BPMN. Many business professionals are comfortable with using BPMN to visualize workflows. Still, one of the most significant advantages of BPMN 2.0 is that the people who write code to automate processes understand BPMN 2.0, too, which is a great way to bridge the gap between business professionals and technical professionals. BPMN 2.0 makes it much easier for modeling tools, process engines, Business Activity Monitoring (BAM) tools, and others to exchange processes regardless of the implementation of the specific vendor tool.

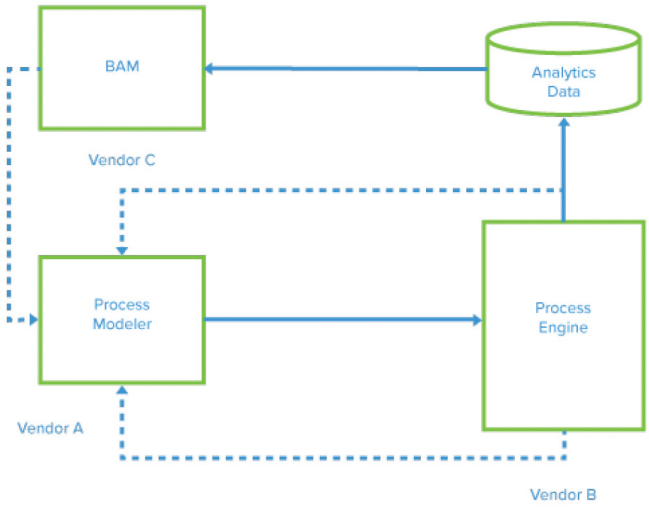


Image 1.2: Example Core XML schema.

BPMN 2.0 tries to solve the "round-tripping" problem of allowing process models to be exchanged seamlessly back and forth between process tools from different vendors.

Modeling workflows

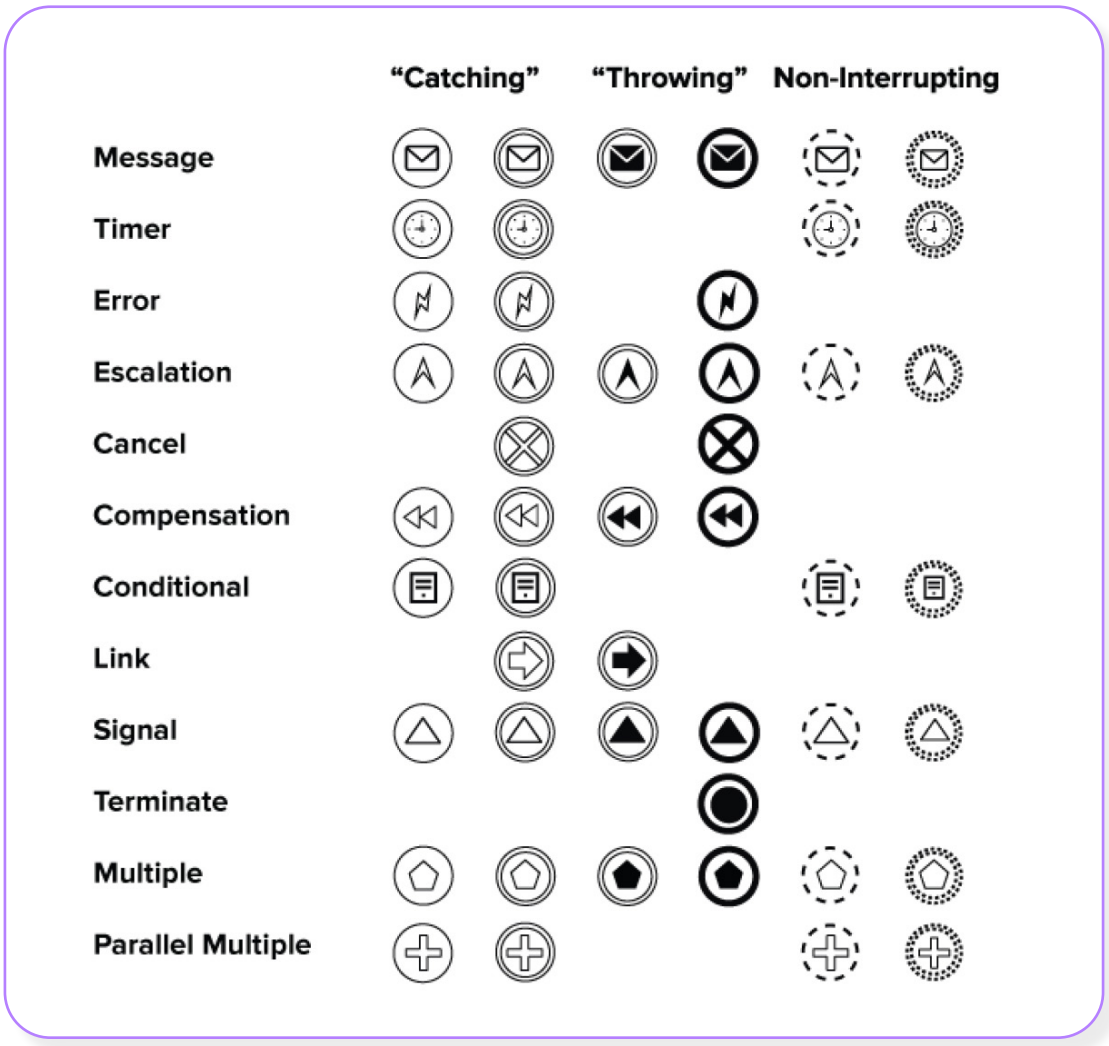
Workflows are essentially the flow of tasks within an organization. Workflows may be completely manual (like the process of making a sandwich), they may be automated entirely (like the process of inputting data into equations and making calculations), or they may be a combination of both (like the process of creating, reviewing, and approving a purchase request). Developing workflows captures all relevant information that goes into the process: who is involved, what they're responsible for, how tasks are handed off, and which tasks are manual and automated. Typically, the first stage in business process modeling of workflows is gathering relevant information. Next, the process and workflow are modeled. Finally, the new workflow is tested, implemented, monitored, and modified as necessary.

Image 1.3: Stakeholders need to be interviewed to understand the true nature of a particular workflow.

> **Developing workflows is a process of capturing all relevant information that goes into the process: who is involved, what they're responsible for, how tasks are handed off, which tasks are manual and which are automated.**

BPMN 2.0 is too complex

Many critics of BPMN 2.0 complain that BPMN is too complicated to learn. Even if the language is designed to be unambiguous by including a singular semantic layer, there are simply too many objects in BPMN for the standard to be helpful. These critics often point to images from the BPMN 2.0 OMG specification, such as this matrix of events, to emphasize their point. These critics often favor other types of modeling tools and methodologies.



The 3 basic modeling elements

The critics fail to mention that most processes do not require the modeler to know the entire specification. Most models don't use more than a handful of the most common process elements.

BPMN consists of only four main elements:

1. Events
2. Activities
3. Gateways
4. Sequence Flow

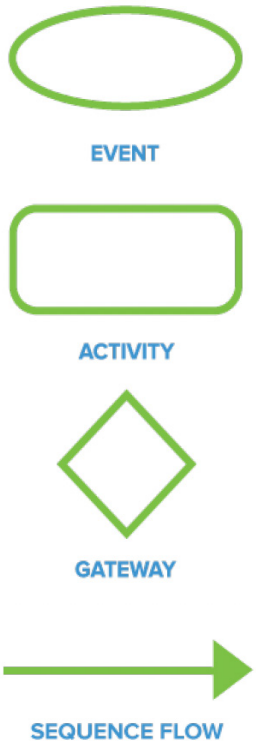


Image 1.5: The 3 Main Modeling Elements in BPMN 2.0 and the fourth element, the Sequece Flow.

The descriptive modeling subclass

The Descriptive Modeling Subclass is a bit of a mouthful. Some people call these the Level I elements. These are all the elements you probably need to learn to become relatively proficient in BPMN. At the very least, if your job involves working with processes, then you should know these elements:

- Pool and lane
- Sequence flow and message flow
- 3 types of activity: user task, service task, and task (none)
- Sub Process(expanded and collapsed)
- Call Activity
- 2 types of gateway: XOR gateway and parallel gateway
- 3 start events: Message, Timer, and None start
- 2 end events: Message and None
- Data object and data store
- Text annotation and regular data association

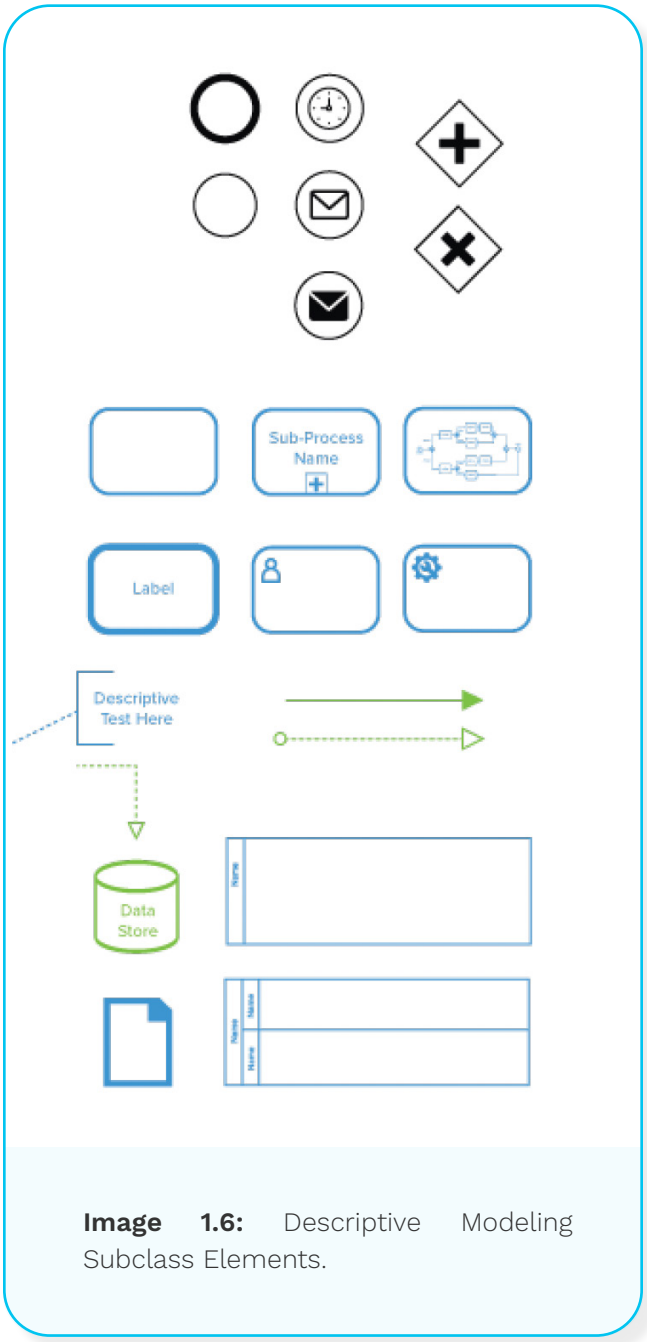


Image 1.6: Descriptive Modeling Subclass Elements.

Events

Let's take a quick look at the three main types of events:

1. Start – indicates where a particular Process will start.

2. Intermediate – occur between the start and end events and affect the flow of the process.

3. End – indicates where the process ends.

The important thing to remember is that there are variants. For example, if you add the picture of an envelope to any of these three events, you would have a message event. You could start a process by the arrival of a message, send a message (or catch a message) with an intermediate event somewhere in the middle of the process, or send a message at the end.

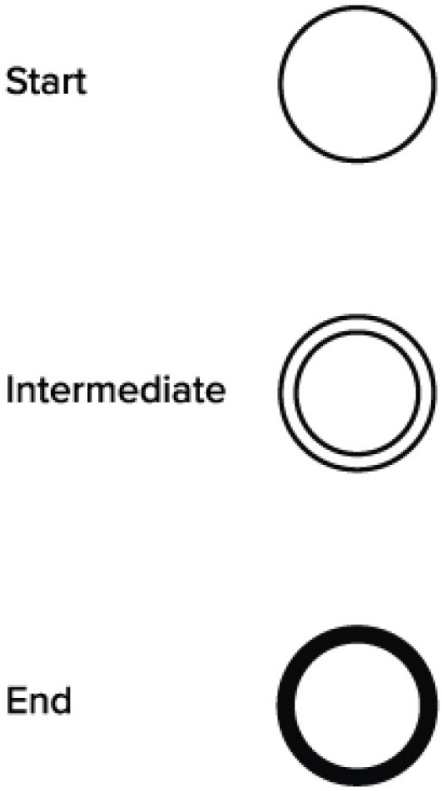


Image 1.7: Events are simple but there can be lots of variants.

Activities

An activity is a generic term for work that an actor performs in a process. Many people do not realize that an activity can be atomic or non-atomic (compound). In other words, an activity can be a task or a sub-process (a process within the primary process). The fun part of activities is that you can specify various activities. For example, tasks can be manual tasks, human tasks, message tasks (have the same function as a message event), script tasks, or service tasks (indicating, perhaps, that a web service performs work is performed by a web service

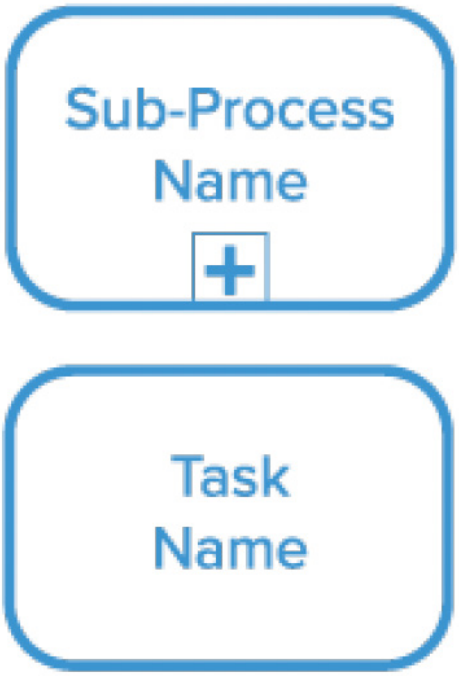


Image 1.8: Activities can be atomic (Task) or non- atomic (Sub-Process).

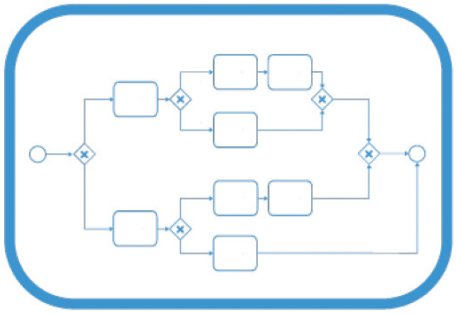


Image 1.9: Expanded Sub-Process.

Making decisions with gateways

Events and Activities are pretty easy to understand. The real magic in a process, though, happens at the gateways. Gateways can tell a process to continue exclusively down one path vs. another or instruct participants in the process to begin working in parallel. In some scenarios, there could be multiple pathways where that only become active under certain circumstances. There are some pretty funky gateways out there. My favorite is the event-based gateway (also known as a race gateway), which creates a race between two alternative paths. For example, a company might have a cancelation policy where a customer can cancel an emitted insurance policy within one week; otherwise, it will print and mail it. In this case, we either get the cancelation within a week or go down the path of emitting the policy. Wow – that is elegant.

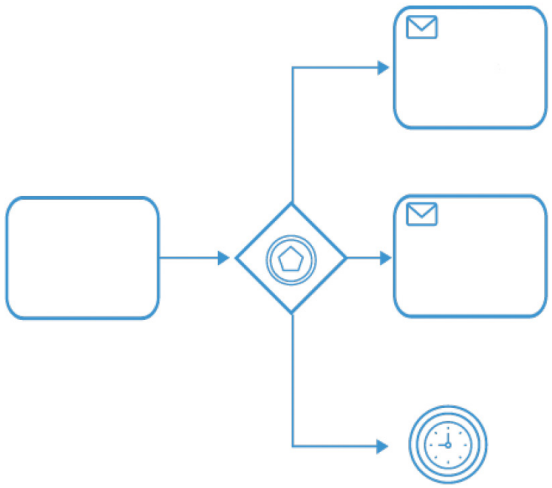


Image 1.10: Event-based Gateways are a difficult to master but elegant feature of BPMN 2.0.

The Big 3 Gateways

Don't worry if you think the event-based gateway is complex; it is. It is also not so common.

Here are the three you should know:

- **Exclusive:** This Decision represents a branching point where alternatives are conditional expressions within the outgoing sequence flows. Only one of the alternatives is chosen.
- **Parallel (Fork):** BPMN uses the term "fork" to refer to dividing a path into two or more parallel paths. It is a place in the process where activities can be performed concurrently rather than sequentially.
- **Inclusive:** This decision represents a branching point where alternatives are conditional expressions within the outgoing sequence flows. In some sense, it is a grouping of related independent binary (yes/no) decisions. Since each path is independent, all combinations of the paths may be taken from zero to all. However, it should be designed to take at least one path. A default condition could ensure that at least one path is taken.

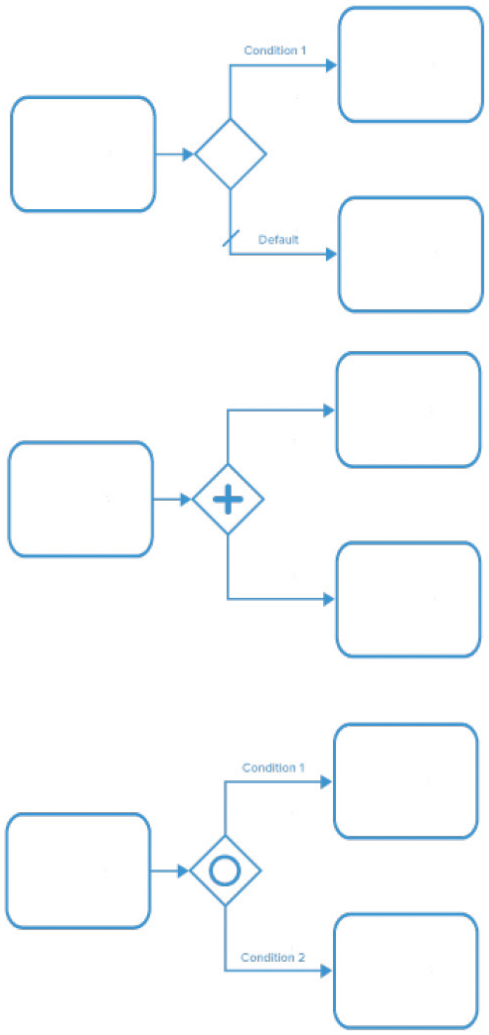


Image 1.11: The 3 Most Common Gateway Types.

Let's Go Swimming

It is worth spending another few minutes on another essential element in the descriptive subclass – swimlanes, pools, and my favorite, the black box pool. A pool is the graphical representation of a participant in a collaboration. It also acts as a "swimlane" and a graphical container for partitioning a set of activities from other pools, usually in the context of B2B situations. A pool *may* execute internal details in the process. Or a pool *may* have no internal information, i.e., it can be a "black box." A Lane is a sub-partition within a process, sometimes within a pool, and will extend the entire process, either vertically or horizontally. Lanes organize and categorize activities.

Image 1.12: Pool with 2 lanes.

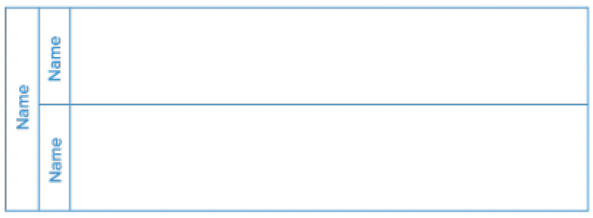


Image 1.13: Empty Pool.

Exception handling

If you get through the descriptive element subclass and are still hungry for more BPMN, some other elements are fun to learn and immensely useful. We will just show you one more in this eBook. For others, head to the OMG specification and read on. One of the most valuable things about BPMN is the exception handling. The simple fact is that most business processes don't follow their "happy path." The happy path is how the process flows when there is no exception. However, when there is an exception to the workflow, it helps to know how to deal with it. One way to handle exceptions is with an exception flow. An exception flow occurs outside the normal flow of the process. It is based upon an Intermediate event attached to the boundary of an activity that occurs during the performance of the process. The exception flow could be based on a timer (timer boundary event), the arrival of a message, or an error. When one of these events happens during the execution of the activity, the activity "throws off" a new path. Pretty cool, right?

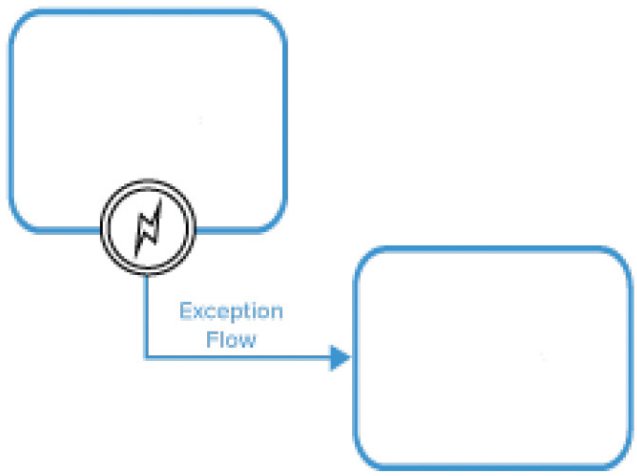


Image 1.4: Exception Handling is elegant in BPMN.

How BPMN 2.0 is different from earlier versions

The diagrams rendered under BPMN 2.0 are similar to those created under older versions, but BPMN 2.0 offers several new elements as well, including:

- Multiple parallel events
- Escalation events
- Different task types (service, send, receive, etc.)
- Global activities
- Sequential multiple instances of tasks and associated subtasks
- Event-based instantiating gateways
- Event-based sub-processes
- New types of data objects (data input, output, message, collection, etc.)

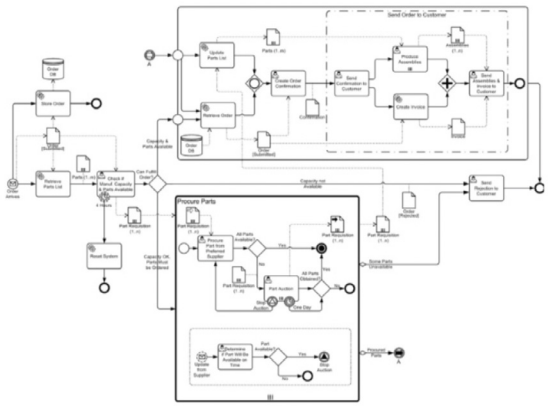


Image 1.15: Various New Object Types in BPMN 2.0.

Shapes and symbols used in earlier versions of BPMN are still used in BPMN 2.0. One significant change is that BPMN 2.0 adopts the XML interchange format, which makes it easier to turn a model and its notation into an automated, executable process. That means that workflow software vendors using BPMN can more easily take BPMN 2.0 input and automate it.

7 Rules for BPMN modeling

You should follow a few best practices when modeling in BPMN 2.0:

1. Make the BPMN diagram accurately reflect process logic, complete with labels on activities, sub-processes, intermediate events, and gateways
2. Show how exceptions are handled explicitly
3. Make models hierarchical (and hence easier to view as a whole) with processes and sub-processes expanding from a top-level diagram
4. Label task types such as “user” (a task a human accomplishes) or “service” (an automated task)
5. Represent actions in a verb-noun format (validate order, verify credit, etc.)
6. Consistently use message flows to indicate the business context of activities and events in a workflow
7. Use Black Box Pools to show external participants and their relation to the process

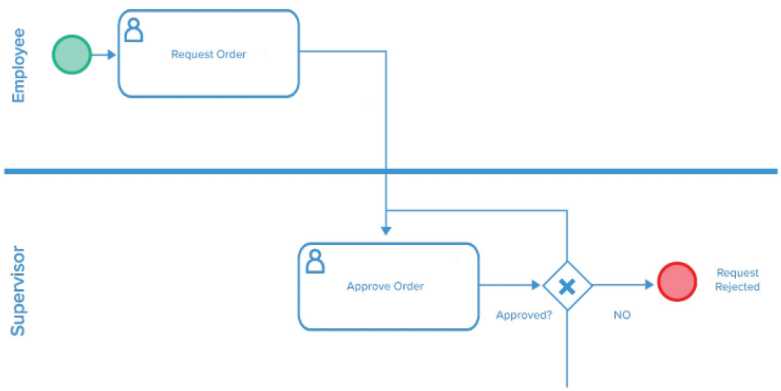


Image 1.16: Modeling Rules to Follow.

A common language for business and technical workers

In short, the best thing about BPMN 2.0 is that it provides a common language for technical and non-technical users, allowing both types of personnel to have the precision, flexibility, and understanding they need to build processes correctly. Because BPMN 2.0 offers this shared language, facilitates collaboration, and more new and flexible applications are possible. The system of shared standards makes communication and understanding both within and from one organization to another clearer and more manageable.

Perhaps your organization is reluctant to try BPMN, let alone BPMN 2.0. But there's no reason to put it off. You don't have to be an expert to use BPMN well. Learning the reasoning behind BPMN may require climbing a learning curve, but once you do, a whole new world of workflow automation possibilities opens up. Moreover, your technical people will easily translate them into automated processes.

> **“ Developing workflows is a process of capturing all relevant information that goes into the process: who is involved, what they're responsible for, how tasks are handed off, which tasks are manual and which are automated.**

Text-to-process

If you're not a BPMN 2.0 expert aand don't want to learn all the ins and outs, there are more accessible alternatives available to your organization. ProcessMaker's text-to-process feature eliminates the learning curve, empowering anyone to design processes despite having basic-level technical knowledge. Anyone in your organization can design a process using generative AI and natural language processing. All you need to do is simply provide a natural language description regarding the process you desire. Then, text-to-process will design your process for you within seconds. Generative AI-based features like these are both faster and easier than learning BPMN 2.0.

Making decisions with gateways

The ProcessMaker Designer allows you to build BPMN 2.0-compliant processes, giving you a standard notation all your business stakeholders within and outside of your organization will understand. With the ProcessMaker Designer, your business managers, business analysts, and technical developers will all speak the same language, and the “tech gap” between non-technical and technical users will narrow considerably. ProcessMaker is open-source and cloud business process management and automation software that offers users power and flexibility. You can use any number of pre-built templates as a starting point, or you can develop workflows from the ground up. Give it a try today.

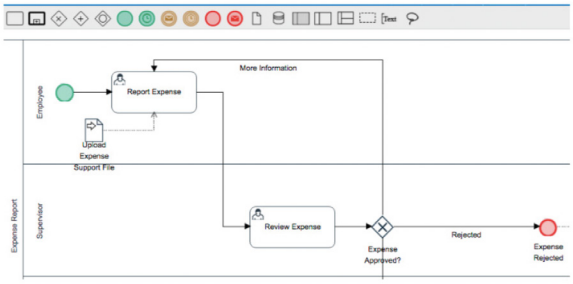


Image 1.17: With ProcessMaker Designer you can build BPMN 2.0 compliant processes.

About ProcessMaker

ProcessMaker is a low-code intelligent process automation platform. Headquartered in Durham, North Carolina in the United States, ProcessMaker has a partner network spread across 35 countries on five continents. Hundreds of commercial customers, including many Fortune 100 companies, rely on ProcessMaker to digitally transform their core business processes enabling faster decision making, improved compliance, and better performance.

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