NRS Business Process Standards and Guidelines using BPMN
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<th>Date</th>
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1. Introduction

1.1 Purpose
This document identifies the elements and terms to use in creating process models using Business Process Model and Notation release 2.0 standard (BPMN 2.0).

It should be noted that the process models created are not for executable code.

1.2 Audience
This document is directed at vendors and ministry staff who will be creating or maintaining Business Process Models.

1.3 Scope/Exclusions
The scope of this document covers all process models delivered to or maintained by the Sector.
Where conflicts, if any, are perceived between this document and other standards, the Business Portfolio Manager must be consulted.

1.4 Assumptions
It is assumed that the audience has working knowledge of the Sector’s SDLC process and standards around the content of those documents.
2. Basic Rules of BPMN

Sequence Flows
- Are used to show the order that Activities will be performed in a Process
- They cannot cross Sub-Process boundaries
- They cannot cross Pool boundaries

Message Flows
- They cannot connect objects that are within the same Pool

Boundary (Edge-mounted) Events
- Must have at most one outgoing Sequence Flow
- Must not have any incoming Sequence Flow

Sub-Process
- A Start Event in a Sub-Process must be of type None
3. Process Modeling Best Practices

Start and End Events
- Always use Start and End Events
- Distinguish alternative instantiation of the process as separate Start Events
- Distinguish various end states as separate End Events
- Flows that end in the same end state should be merged to the same End Event

Gateways
- Always use Gateways to depict split or merge of flows
- Always place an Activity that will determine the diverging condition(s) just before a diverging Gateway of type Exclusive, Inclusive and Complex
  - A benefit of this best practice is that this decision Activity can now be interrupted if need be
4. BPMN Process Modeling Standards

Business Process Diagrams must use those Elements and Attributes selected from the Descriptive and Analytic sub-classes for Process Modeling.

Object Management Group’s standards for Business Process and Model Notation (BPMN), Version 2.0, defines three conformance sub-classes for Process Modeling: Descriptive, Analytic, and Common Executable. Both Descriptive and Analytic focus on visible (graphical) elements and a minimal subset of supporting attributes/elements. Common Executable focuses on what is needed for executable process models.

All of the Descriptive and a subset of Analytic sub-class Elements and Attributes were selected for use. (Refer to Tables 2.1 and 2.2 of OMG’s specifications document for BPMN 2.0)

Acceptable Elements and Attributes to use on BPMN 2.0 Business Process Diagrams include the following:

- Pool
- Lane (Role)
- Sequence Flow (unconditional) – must not use default or conditional flows
- Message Flow – must not use, attach, Message icon (element)

**Activity Types:**
- Task (atomic)
- Collapsed Sub-Process (compound)

**Task Types and Graphical Markers:**

<table>
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<tr>
<th>Abstract (None)</th>
<th>A Task which is not further specified.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Avoid use of this, unless absolutely necessary</strong></td>
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</table>

<table>
<thead>
<tr>
<th>User</th>
</tr>
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<tbody>
<tr>
<td>A human involvement Task executed by, or managed by, a business process runtime</td>
</tr>
<tr>
<td>“Workflow” Task where a human performer performs the Task with the assistance of a system/software app, and is scheduled through a task list manager of some sort</td>
</tr>
<tr>
<td>Activity carried out with the help of a system</td>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>An automatic Task carried out by the system, without human intervention</td>
</tr>
<tr>
<td>A Task that uses some sort of service, which could be a web service or an automated application</td>
</tr>
</tbody>
</table>
**Sub-Process Types:**

1) **Sub-Process** (aka embedded Sub-Process)
   a) Has unique empty Start Event
   b) For collapsed Sub-Processes, preferred use of Start and End Events
   c) For expanded Sub-Processes used to depict parallel path activities, the Sub-Process Activity is unlabeled and there are no Start and End Events

2) **Call Activity** (aka reusable Sub-Process)
   Exception to Sub-Process Rules:
   a) May also have non-empty Start Events
   b) Can have multiple pools

**Collapsed Sub-Process Internal Markers:**
- **Ad-Hoc** – limit use of this internal activity marker for those instances where all activities may not be activated, otherwise, use expanded Sub-Process to model this behaviour
- Must not use internal markers: Standard Loop, Multi-Instance Loop, Compensation

**Gateways:**
- Exclusive – For consistency, NO symbol in diamond shape to represent this gateway
- Parallel
- Inclusive
- Event-based

**EVENTS** of Types: Start, Intermediate, End:

**Start Events:**
- None (no trigger)
- Message
- Signal
- Timer
End Events:
- None (no trigger)
- Message
- Signal
- Terminate

Intermediate Events (standalone):
- Link (catch / throw)
- Message (catch / throw)
- Signal (catch / throw)
- Timer (catch)

Boundary (Edge-mounted) Interrupting Intermediate Events:
- Message
- Timer
- Signal
- Error
- Must not use Non-Interrupting

Artifacts:
- Group
- Text Annotation

Data Artifacts:
- Data Object (None)
- Data Store

Artifact Connectors:
- Association
- Data Association

<<DO NOT USE>> Business Process, BPEL (Business Process Execution Language), and Message graphical flow elements:

<<DO NOT USE>> Conversation Link connector:

<<DO NOT USE>> BPMN 2.0 Type toolbox page:

<<DO NOT USE>> Documentation (not a visible element, an attribute of most elements)
**Sending and Receiving Messages**

- Use a **Message Event** if the sending or receiving of the message is considered instantaneous
- **Message Task** if the sending or receiving of the message can be interrupted
- From a temporal perspective; an **Event** maps to a time point on a time line and a **Task** maps to a time interval

**Intermediate Events – Catch & Throw Scenarios**

**Link Intermediate Event:**

![Link Intermediate Event Diagram]

**Message Intermediate Event:**

![Message Intermediate Event Diagram]

**Signal Intermediate Event:**

![Signal Intermediate Event Diagram]
5. Verbs to Use in Process Names

As a convention, processes are named using verbs and nouns. For example, “Apply for License” or “Identify the Client”.

Verbs generally correspond to actions or events in a business context. A list of common verbs to use in naming processes is provided in table below. The modeler is asked to use those verbs when it makes sense, and to add to the list as needed.

Nouns are used to refer to people, places, events or other things for which business would want to keep records.

Use precise verbs. Verbs such as manage, administer, process, etc. do not convey the precision required for process names. However, they can be used at the function, business domain, level (L1 Business Level).

<table>
<thead>
<tr>
<th>Accept</th>
<th>Control</th>
<th>Gather</th>
<th>Obtain</th>
<th>Resolve</th>
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<tbody>
<tr>
<td>Adapt</td>
<td>Convert</td>
<td>Generate</td>
<td>Offer</td>
<td>Respond</td>
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<tr>
<td>Adopt</td>
<td>Coordinate</td>
<td>Group</td>
<td>Open</td>
<td>Return</td>
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<tr>
<td>Align</td>
<td>Decide</td>
<td>Guide</td>
<td>Operate</td>
<td>Review</td>
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<tr>
<td>Allocate</td>
<td>Define</td>
<td>Identify</td>
<td>Optimize</td>
<td>Scan</td>
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<tr>
<td>Apply</td>
<td>Deliver</td>
<td>Implement</td>
<td>Order</td>
<td>Schedule</td>
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<tr>
<td>Approve</td>
<td>Deploy</td>
<td>Improve</td>
<td>Organize</td>
<td>Screen</td>
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<tr>
<td>Arrange</td>
<td>Describe</td>
<td>Include</td>
<td>Perform</td>
<td>Search</td>
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<td>Design</td>
<td>Increase</td>
<td>Plan</td>
<td>Secure</td>
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<td>Assign</td>
<td>Determine</td>
<td>Initiate</td>
<td>Prepare</td>
<td>Select</td>
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<tr>
<td>Authorize</td>
<td>Develop</td>
<td>Integrate</td>
<td>Present</td>
<td>Serve</td>
</tr>
<tr>
<td>Begin</td>
<td>Discuss</td>
<td>Interview</td>
<td>Prioritize</td>
<td>Settle</td>
</tr>
<tr>
<td>Build</td>
<td>Distribute</td>
<td>Involve</td>
<td>Process</td>
<td>Share</td>
</tr>
<tr>
<td>Calculate</td>
<td>Divide</td>
<td>Issue</td>
<td>Produce</td>
<td>Show</td>
</tr>
<tr>
<td>Capture</td>
<td>Enable</td>
<td>Launch</td>
<td>Propose</td>
<td>Simplify</td>
</tr>
<tr>
<td>Categorize</td>
<td>Enter</td>
<td>Leverage</td>
<td>Provide</td>
<td>Sort</td>
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<tr>
<td>Change</td>
<td>Establish</td>
<td>License</td>
<td>Purchase</td>
<td>Specify</td>
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<tr>
<td>Choose</td>
<td>Estimate</td>
<td>Link</td>
<td>Qualify</td>
<td>Staff</td>
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<tr>
<td>Circulate</td>
<td>Evaluate</td>
<td>Load</td>
<td>Quantify</td>
<td>Start</td>
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<tr>
<td>Clarify</td>
<td>Examine</td>
<td>Locate</td>
<td>Query</td>
<td>Structure</td>
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<tr>
<td>Classify</td>
<td>Execute</td>
<td>Maintain *</td>
<td>Receive</td>
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<td>Close</td>
<td>Expedite</td>
<td>Manage *</td>
<td>Record</td>
<td>Suggest</td>
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<td>Explore</td>
<td>Maximize</td>
<td>Refer</td>
<td>Supply</td>
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<tr>
<td>Compare</td>
<td>Facilitate</td>
<td>Measure</td>
<td>Register</td>
<td>Support</td>
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<tr>
<td>Compile</td>
<td>Finish</td>
<td>Minimize</td>
<td>Release</td>
<td>Survey</td>
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<tr>
<td>Complete</td>
<td>Focus</td>
<td>Modify</td>
<td>Replace</td>
<td>Test</td>
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<td>Conduct</td>
<td>Forecast</td>
<td>Monitor</td>
<td>Reply</td>
<td>Translate</td>
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<tr>
<td>Confirm</td>
<td>Form</td>
<td>Move</td>
<td>Report</td>
<td>Transmit</td>
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<tr>
<td>Construct</td>
<td>Forward</td>
<td>Name</td>
<td>Request</td>
<td>Update</td>
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<tr>
<td></td>
<td></td>
<td>Navigate</td>
<td></td>
<td>Validate</td>
</tr>
<tr>
<td>Continue</td>
<td>Foster</td>
<td>Notify</td>
<td>Reserve</td>
<td>Verify</td>
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</tbody>
</table>

* Avoid use of the verbs **Manage**, **Monitor**, or **Maintain**, as these may suggest an action, however, typically mean things performed *continuously* rather than *repeatedly*.
6. Naming Convention Best Practices

General:
- Always use keywords that are meaningful to the business
- Do not use uncommon abbreviations
- Do not use the element type in its name (i.e. Activity1)

Activities
- All Activities should be named (except for expanded Sub-Process)
- Name Activities using a Verb-Noun phrase
  - Use the present tense of an active verb of meaning to the business
  - Use a qualified noun of meaning to the business
- Do not name multiple Activities with the same name (except for Call Activities)

Gateways
- Gateways do not perform any work or make decisions; it is simply a visualization of divergence or convergence of flow
- Do not name converging Gateways
  - Associate a Text Annotation when convergence logic is not obvious
- Name diverging Exclusive Gateways with an interrogative phrase (except where gateway used for directing the flow)

Sequence Flows
- Name Sequence flows coming out of diverging Gateways of type Exclusive, Inclusive and Complex using their associated conditions stated as outcomes

Message Flows
- Label Message Flows directly with the name of the message
- The label should be the name of the message, for example, Rejection notice, and not the name of the state (i.e. Rejected) or the action of sending or receiving (i.e. Send rejection)

Pools
- The name of the Pool should be the name of the organization, department, branch, external Participant, etc. or the Process Name
- If you use a Pool on a child level (sub-process) diagram (Call Activity ONLY), label it with the same name of the upper-level process not the Sub-Process Activity name

Lanes
- Name Lanes using the Category’s name
  - Lanes are often used to categorize elements by Roles
  - Name Roles using a qualified noun or noun phrase

Data Objects
- All Data Objects should be named
- Name Data Objects using a qualified noun that is the name of a business object or information object of meaning to the business
Events

- All “triggered” Events should be named
- Name Message, Signal, Escalation, and Error Events with a past participle using an active verb
- Name Link Event with a noun
- Name paired Message, Link, Signal, Escalation, and Error Events using a matching name
- Name Timer Events using their schedule
- Name End Events using the name of the end state
7. Resources

- Object Management Group, Inc. (OMG) specifications document for BPMN 2.0: Business Process Model and Notation (BPMN), Version 2.0
  http://www.omg.org/spec/BPMN/2.0/