

BPMN in COLOR

Introduction

The Business Process Model and Notation (BPMN) is a standard for business process modeling maintained by the Object Management Group (OMG). The primary goal of BPMN is to provide a notation that is understood by both business and technical users. It aims at bridging the gap between the business and IT professionals by providing the breath required to depict business processes logic in a user friendly manner while at the same time providing the depth to execute them.

BPMN 1.0 was originally released in May 2004 by the Business Process Management Initiative (BPMI). OMG then took over after an organization merger with BPMI and published a 1.1 version in January 2008 and then a 1.2 version the following year. BPMN 2.0 was released in January 2011.

BPMN 2.0 improved over the original BPMN specification by introducing choreography and conversation concepts but more notably by defining a metamodel. The specification also defines two serializations of this metamodel: XML Metadata Interchange (XMI) and XML Schema Definition (XSD).

The BPMN specification is widely adopted. By the end of 2013, there were already over 70 different tools that supported the notation and the adoption is growing every year. In February 2013, the BPMN Model Interchange Working Group (BPMN MIWG) was created by OMG to support, facilitate, and promote the interchange of BPMN Models. Two public demonstrations already took place at OMG technical meetings demonstrating an increasingly high number of vendors interchanging BPMN models.

The effort of the BPMN MIWG group led to the identification of several interchange issues with the BPMN metamodel and also some missing features that could improve the interchange quality between tools. One of the more visually apparent issue is the lack of support for interchanging shape, edge and label colors. The BPMN 2.0 specification allows for the use of colors in the notation and gives some guidelines about their usage in Section 2.1.3 but does not standardize its interchange.

BPMN modelers often use colors in their diagrams to express a specific semantic in their modeling methodology.

This white paper describes an extension to the BPMN 2.0 XML serialization to interchange color information between BPMN tool vendors. The goal of this extension is to provide a better interchange and transfer user semantic associated with colors. This white paper does not take a position on the best practices of using colors in BPMN diagrams nor does it propose a semantic for these colors.

BPMN in Color Schema Extension

The BPMN in Color extension schema is defined in the <http://www.omg.org/spec/BPMN/non-normative/color/1.0> namespace.

This proposed extension is based on the *anyAttribute* extension mechanism of the BPMN Diagram Interchange (BPMN DI) schema definition. The preferred extension would have used *any* elements instead of *anyAttribute* but the DI schema (from which the BPMN DI extends) does not defines its *processContents* as *lax* which would require to provide a schema location for validation of BPMN in Color with all BPMN xml.

HexColor type

The HexColor type defines the color representation in this extension. It is defined to follow the hex triplet format used in CSS, SVG, and many more standards. The

```
<xs:simpleType name="HexColor">
  <xs:restriction base="xs:string">
    <xs:pattern value="#[0-9a-fA-F]{6}" />
  </xs:restriction>
</xs:simpleType>
```

The value always starts with a hashtag (#) character and is then comprised of three pair of hexadecimal characters. The first pair represents the Red value (0-255), the second the Green value (0-255) and the last pair the Blue value (0-255) expressed in hexadecimal format.

Example: #FFFFFF (white), #0000ff (blue), #000000 (black), #ffa500 (orange)

Note here that unlike in CSS, the shortened form #000 is not a valid HexColor.

Extension Attributes

BPMN in Color defines three extension attributes to the BPMN DI schema:

Attribute Name	Description/Usage
background-color: HexColor	The background color defines the fill color of BPMNShape .
border-color: HexColor	The border color defines the color of the contour line of BPMNShape and the line color of BPMNEdge .
color: HexColor	The color attribute defines the color of the text depicted by a BPMNLabel .

Attributes Applicability Matrix

Each attributes must be used only as extension of the BPMN elements marked with an X:

Attribute Name	BPMNShape	BPMNEdge	BPMNLabel
background-color	X		
border-color	X	X	
color			X

Example usage

Here is a simple example serialization of an orange task with black border and white text.

```
<bpmndi:BPMNShape bpmnElement="task1" id="diagram1-task1"
    color:background-color="#ffa500" color:border-color="#000000">
    <dc:Bounds x="0" y="0" width="100" height="100"/>
    <bpmndi:BPMNLabel labelStyle="normal-text" color:color="#ffffff"/>
</bpmndi:BPMNShape>
```

Gradient, Shadow and Transparency

Advanced coloring concepts like gradients, shadows and transparency are left out of scope of BPMN in Color. This extensions goal is not to produce a picture perfect diagram from one tool vendor to another but to carry the user associated semantic behind colors in BPMN diagrams.

References

BPMN 2.0 Specification, <http://www.omg.org/spec/BPMN/2.0/>

BPMN MIWG, <http://www.omgwiki.org/bpmn-miwg/doku.php?id=start>

MIWG Berlin Interchange Demo, <http://www.youtube.com/watch?v=3RauYmE2fJ4>

MIWG Reston Interchange Demo, <https://www.youtube.com/watch?v=Tf7ktnV3OQ>