

Gap Analysis of ODF v1.0 Accessibility

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Introduction – Raising the Bar with ODF

- ODF is the first truly open document format to raise the level of accessibility
 - Regardless of ODF's future – Raising the level will drive all document access to improve
 - This is an end user effort as much as it is a technical effort – Use Cases are Critical
 - We must consider total solutions (Applications, AT interoperability, Author assistance)
 - We must execute in a timely fashion

- Objectives
 - Support DAISY standards for talking books (allow for XSLT transformation)
 - Fill basic gaps between existing Office formats and ODF
 - Follow existing W3C accessibility standards and support markup features (WCAG, XForms, etc.)
 - Enhance Braille support where possible
 - Improve access to presentations
 - Improve keyboard navigation (Can we benefit from declarative markup for keyboard navigation?)
 - Facilitate platform API interoperability (support emerging Dynamic Web Access Standards)
 - Solutions should be usable!

- Expected community involvement
 - Use Cases, Use Cases, Use Cases – You don't need to be a techy—all user input is crucial
 - Feedback
 - Technical expertise in DAISY or W3C specifications is welcome



Basics of ODF Documents

- XML files and additional resources are zipped in a file
- Core XML files (cited from “OASIS OpenDocument Essentials” <http://books.evc-cit.info/>)
 - content.xml
 - The actual content of the document.
 - meta.xml
 - Meta-information about the content of the document (such things as author, last revision date, etc.) This is different from the META-INF directory.
 - settings.xml
 - This file contains information that is specific to the application. Some of this information, such as window size/position and printer settings is common to most documents. A text document would have information such as the zoom factor, whether headers and footers are visible, etc. A spreadsheet would contain information about whether column headers are visible, whether cells with a value of zero should show the zero or be empty, etc.
 - styles.xml
 - This file contains information about the styles used in the content. The content and style information is deliberately stored in different files. Separating content from presentation provides more flexibility.
- “content.xml” is the target file, which should be fixed.
 - We will only discuss “content.xml” in the following presentation.



Comparison between MS Office and ODF (per WCAG 1.0)

The significant disadvantages are the **lack of alternative texts**, the **lack of native tables for presentation documents**, and the **lack of descriptions for links**.

WCAG 1.0	Microsoft Office	ODF v1.0
1.1 Alt Text for non-text elements	Yes	Insufficient
1.2 Alt Text for Image Map	Not Supported	Yes
3.4 Relative font size	No	Yes
3.5 Heading	Yes	Yes
3.6 List structure	Yes	Yes
4.1 Changes in natural language	Yes	Yes
5. Use Table tags for data tables	Yes	Insufficient (Presentation, Drawings)
5.1 Table header	No	Yes
9.4 Logical tab order	No	Yes (Forms) Yes (Drawings)
12.3 Divide large blocks into groups	Yes	Yes
12.4 Label Association for Form inputs	No	Yes
13.1 Link identification	Yes	No



Comparison of Alternative Text between MS Office and ODF

	MS Office (Word, PowerPoint, Excel)	ODF v1.0 (Text, Presentation, Spreadsheet, Drawing)	ODF Element Names
Image	Yes	Yes	draw:image
Line and Arrow	Yes	No	draw:line, draw:connector, draw:polyline, draw:path
Auto Shape	Yes	No	draw:rect, draw:circle, draw:polygone, draw:regular-polygon, draw:ellipse, draw:custom-shape
3D Shape	Not Supported	No	dr3d:scene
Grouped Object	Yes	No	draw:g
Sound and Video	Yes	Yes	draw:plugin
Chart	Yes	Yes	draw:object
Image Map	Not Supported	Yes	draw:area-rectangle, draw:area-circle, draw:area-polygon
Text Box, Title, Caption	Yes	Yes	draw:text-box, draw:caption

Reference: OpenDocument format Specification v1.0 Chapter 9, 9.3.9 "Alternative Text"



Example: Alternative Texts for Images

ODF v1.0 already supports alternative texts for images

	MS Office (Word, PowerPoint, Excel)	ODF v1.0 (Text, Presentation, Spreadsheet, Drawing)	ODF Element Names
Image	Yes	Yes	draw:image

MS Office (Office 2002 HTML/XML export function)

```
<v:shape id="_x0000_s2052" type="#_x0000_t75" alt="Puzzle"
style='position:absolute;left:180pt;top:18pt;width:5in;height:7in'>
  <v:imagedata src="slide0001_image001.jpg"
o:title="MPj03853440000[1]"/>
</v:shape>
```



Screen capture of tested slide

ODF v1.0

```
<draw:frame draw:style-name="gr1" draw:text-style-name="P1"
draw:layer="layout" svg:width="12.7cm" svg:height="17.78cm"
svg:x="6.35cm" svg:y="0.635cm">
  <draw:image
xlink:href="Pictures/10000000000002EE0000041A8C367975.jpg"
xlink:type="simple" xlink:show="embed" xlink:actuate="onLoad">
    <text:p text:style-name="P2" />
  </draw:image>
  <svg:desc>Puzzle</svg:desc>
</draw:frame>
```

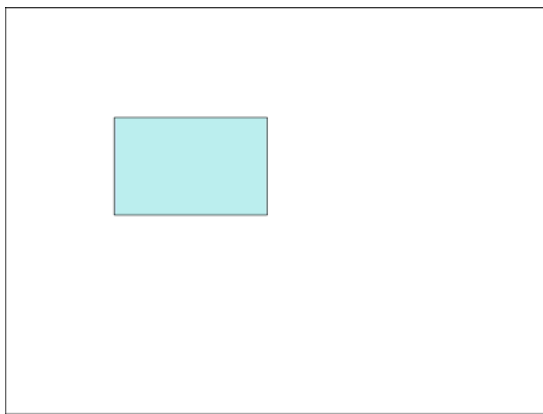
Example: Alternative Texts for Auto Shapes

ODF v1.0 **does not** support alternative texts for auto shapes.

	MS Office (Word, PowerPoint, Excel)	ODF v1.0 (Text, Presentation, Spreadsheet, Drawing)	ODF Element Names
Auto Shape	Yes	No	draw:rect, draw:circle, draw:polygone, draw:regular-polygon, draw:ellipse, draw:custom-shape

MS Office

```
<v:rect id="_x0000_s7172" alt="Rectangle"
style='position:absolute;left:144.5pt;top:145.25pt;width:204pt;height:130.5pt;
mso-wrap-style:none;v-text-anchor:middle' fillcolor="#bbe0e3 [4]"
strokecolor="black [1]">
    <v:fill color2="white [0]" />
    <v:shadow color="gray [2]" />
</v:rect>
```



Screen capture of tested slide

ODF v1.0

```
<draw:rect draw:style-name="gr11" draw:text-style-name="P7"
draw:layer="layout" svg:width="7.197cm" svg:height="4.605cm"
svg:x="5.098cm" svg:y="5.124cm"/>
```

Suggestion

```
<draw:rect draw:style-name="gr11" draw:text-style-name="P7"
draw:layer="layout" svg:width="7.197cm" svg:height="4.605cm"
svg:x="5.098cm" svg:y="5.124cm">
    <svg:desc>Rectangle</svg:desc>
</draw:rect>
```



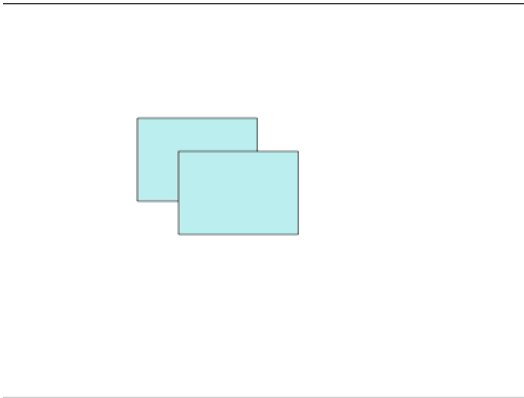
Example: Alternative Texts for Grouped Objects (1)

ODF v1.0 **does not** support alternative texts for grouped objects.

	MS Office (Word, PowerPoint, Excel)	ODF (Text, Presentation, Spreadsheet, Drawing)	ODF Element Names
Grouped Object	Yes	No	draw:g

MS Office

```
<v:group id="_x0000_s2054" alt="Grouped Rectangles"
style='position:absolute;left:184.25pt;top:156.625pt;width:221pt;height:158.75pt'coordorigin="1474,
1253" coordsize="1768,1270">
  <v:rect id="_x0000_s2052" alt="Rectangle 1"
style='position:absolute;left:1474;top:1253;width:1315;height:907;mso-wrap-style:none;v-text-
anchor:middle' fillcolor="#bbe0e3 [4]" strokecolor="black [1]">
    <v:fill color2="white [0]">
    <v:shadow color="gray [2]">
  </v:rect>
  <v:rect id="_x0000_s2053" alt="Rectangle 2"
style='position:absolute;left:1927;top:1616;width:1315;height:907;mso-wrap-style:none;v-text-
anchor:middle' fillcolor="#bbe0e3 [4]" strokecolor="black [1]">
    <v:fill color2="white [0]">
    <v:shadow color="gray [2]">
  </v:rect>
</v:group>
```



Screen capture of tested slide



Example: Alternative Texts for Grouped Objects (2)

ODF v1.0

```
<draw:g>
  <draw:rect draw:style-name="gr1" draw:text-style-name="P1" draw:layer="layout" svg:width="5.8cm" svg:height="4.001cm"
  svg:x="6.5cm" svg:y="5.525cm"/>
  <draw:rect draw:style-name="gr1" draw:text-style-name="P1" draw:layer="layout" svg:width="5.799cm" svg:height="4.001cm"
  svg:x="8.498cm" svg:y="7.126cm"/>
</draw:g>
```

Suggestion

```
<draw:g>
  <draw:rect draw:style-name="gr1" draw:text-style-name="P1" draw:layer="layout" svg:width="5.8cm" svg:height="4.001cm"
  svg:x="6.5cm" svg:y="5.525cm">
    <svg:desc>Rectangle 1</svg:desc>
  </draw:rect>
  <draw:rect draw:style-name="gr1" draw:text-style-name="P1" draw:layer="layout" svg:width="5.799cm" svg:height="4.001cm"
  svg:x="8.498cm" svg:y="7.126cm">
    <svg:desc>Rectangle 2</svg:desc>
  </draw:rect>
  <svg:desc>Grouped Rectangles</svg:desc>
</draw:g>
```



Summary of Alternative Text Issue

- We suggest allowing the use of the <svg:desc> element for the following ODF elements:

	MS Office (Word, PowerPoint, Excel)	ODF v1.0 (Text, Presentation, Spreadsheet, Drawing)	ODF Element Names
Line and Arrow	Yes	No	draw:line, draw:connector, draw:polyline, draw:path
Auto Shape	Yes	No	draw:rect, draw:circle, draw:polygone, draw:regular-polygon, draw:ellipse, draw:custom-shape
3D Shape	Not supported	No	dr3d:scene
Grouped Object	Yes	No	draw:g



Example of Schema Modification for Alternative Text Support

```
<define name="draw-rect">
  <element name="draw:rect">
    <ref name="draw-rect-attlist"/>
    <ref name="common-draw-position-attlist"/>
    <ref name="common-draw-size-attlist"/>
    <ref name="common-draw-shape-with-text-and-styles-attlist"/>
    <optional>
      <ref name="office-event-listeners"/>
    </optional>
    <zeroOrMore>
      <ref name="draw-glue-point"/>
    </zeroOrMore>
    <ref name="draw-text"/>
    <optional>
      <ref name="svg-desc"/>
    </optional>
  </element>
</define>
```

OpenDocument-schema-v1.0-os.rng
Line number: 5947

- Other drawing shapes should be modified in same way.
<draw:line>, <draw:polyline>, <draw:polygon>, <draw:regular-polygon>, <draw:path>, <draw:circle>, <draw:ellipse>, <draw:g>, <draw:page-thumbnail>, <draw:frame>, <draw:measure>, <draw:caption>, <draw:connector>, <draw:control>, <dr3d:scene>, <draw:custom-shape>



Comparison of Tables between MS Office and ODF v1.0

WCAG 1.0	Microsoft Office	ODF
5. Use Table tags for data tables	Yes (including PowerPoint)	Insufficient (Presentation, Drawings)
5.1 Table header	No	Insufficient (Presentation, Drawings)

Current spec: (ODF v1.0 Spec., Chapter 8 “Tables”)

“This chapter describes the table structure that is used for tables that are embedded within text documents and for spreadsheets.”

Suggestion

“This chapter describes the table structure that is used for tables that are embedded within text documents, spreadsheets, and for presentation documents.”



Example: Tables in Presentation (1)

There is no definition of native tables for Presentation documents in ODF v1.0, so PowerPoint tables are converted into a set of rectangles.

	June	July
Boston	120	170
New York	150	130

Screen capture of tested slide

ODF v1.0

```
<draw:g>
  <draw:custom-shape draw:style-name="gr1" draw:text-style-name="P2"
draw:layer="layout" svg:width="5.2cm" svg:height="1.933cm"
svg:x="15.498cm" svg:y="11.19cm">
  <text:p text:style-name="P1">
    <text:span text:style-name="T1">130</text:span>
  </text:p>
  <draw:enhanced-geometry svg:viewBox="0 0 21600 21600"
draw:type="rectangle"
draw:enhanced-path="M 0 0 L 21600 0 21600 21600 0 21600 0 0 Z N" />
</draw:custom-shape>
```

```
<draw:line draw:style-name="gr3" draw:text-style-name="P3"
draw:layer="layout" svg:x1="20.699cm" svg:y1="7.325cm"
svg:x2="20.699cm" svg:y2="13.123cm">
  <text:p />
</draw:line>
</draw:g>
```



Example: Tables in Presentation (2)

For Text documents, ODF v1.0 has elements for tables, such as cells, rows, and headers, so we suggest allowing table elements in Presentation documents. This improvement will allow screen readers to provide table navigation function in Presentation.

	June	July
Boston	120	170
New York	150	130

Screen capture of tested slide

Suggestion

```
<table:table table:name="Table1" table:style-name="Table1">
  <table:table-header-columns>
    <table:table-column table:style-name="Table1.A" />
  </table:table-columns>
  <table:table-header-rows>
    <table:table-row table:style-name="Table1.1">
      <table:table-cell table:style-name="Table1.A1"
office:value-type="string">
        <text:p text:style-name="P1" />
      </table:table-cell>
      <table:table-cell table:style-name="Table1.A1"
office:value-type="string">
        <text:p text:style-name="P1">June</text:p>
      </table:table-cell>
```

```
<table:table-cell table:style-name="Table1.C2" office:value-type="string">
  <text:p text:style-name="P1">130</text:p>
</table:table-cell>
</table:table-row>
</table:table>
```



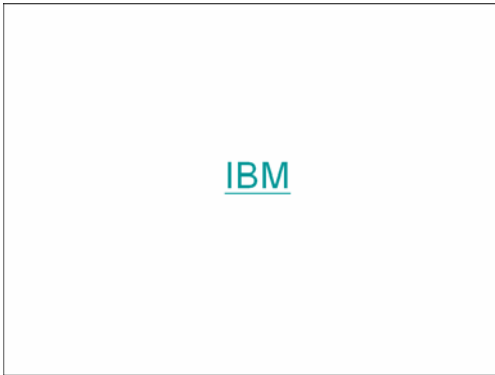
Link Identification (1)

ODF v1.0 **does not** support additional descriptions for links.

WCAG 1.0	Microsoft Office	ODF v1.0
13.1 Clearly identify the target of each link.	Yes	No

MS Office

```
<span lang=EN-US style='font-size:
300%;mso-fareast-language:JA'>
<p:onclick hyperlinktype="url"
href="http://www.ibm.com/" tips="Jump to IBM Home"/>
<a
title="Jump to IBM Home" href="http://www.ibm.com/" target="_blank"
onclick="window.event.cancelBubble=true;">IBM</a>
</span>
```



Screen capture of tested slide



Link Identification (2)

ODF v1.0

```
<draw:frame draw:style-name="gr1" draw:text-style-name="P2" draw:layer="layout" svg:width="5.804cm"
svg:height="2.541cm" svg:x="11.099cm" svg:y="7.523cm">
  <draw:text-box>
    <text:p text:style-name="P1">
      <text:span text:style-name="T1">
        <text:a xlink:href="http://www.ibm.com/">IBM</text:a>
      </text:span>
    </text:p>
  </draw:text-box>
</draw:frame>
```

Suggestion

```
<draw:frame draw:style-name="gr1" draw:text-style-name="P2" draw:layer="layout" svg:width="5.804cm"
svg:height="2.541cm" svg:x="11.099cm" svg:y="7.523cm">
  <draw:text-box>
    <text:p text:style-name="P1">
      <text:span text:style-name="T1">
        <text:a text:desc="Jump to IBM Home" xlink:href="http://www.ibm.com/">IBM</text:a>
      </text:span>
    </text:p>
  </draw:text-box>
</draw:frame>
```



Alternative text definition for Frame tags

➤ “A frame is a rectangular container that contains enhanced content like text boxes, images or objects.”

- Text boxes (<draw:text-box>)
- Objects
 - OLE objects (<draw:object-ole>)
 - OpenDocument format objects (<draw:object>)
- Images (<draw:image>)
- Applets (<draw:applet>)
- Plug-ins (<draw:plugin>)
- Floating frames (<draw:floating-frame>)

```
<define name="draw-frame">  
  <element name="draw:frame">  
    ....  
    <zeroOrMore>  
      <choice>  
        <ref name="draw-text-box"/>  
        <ref name="draw-image"/>  
        <ref name="draw-object"/>  
        <ref name="draw-object-ole"/>  
        <ref name="draw-applet"/>  
        <ref name="draw-floating-frame"/>  
        <ref name="draw-plugin"/>  
      </choice>  
    </zeroOrMore>  
    ...  
    <optional>  
      <ref name="svg-desc"/>  
    </optional>  
    ...  
  </element>  
</define>
```

ODF Schema
OpenDocument-schema-v1.0-os.rng
(line number 6612)



OLE Objects vs. ODF Objects (1)

- ODF already supports alternative text for OLE objects and ODF objects
- ODF objects are saved as XML format, while OLE objects are saved as binary files.
- Since the OLE objects are binary, XML-based assistive technologies cannot read the content of OLE objects.
- **Therefore, for accessibility it is recommended that ODF objects be used instead of MS Office OLE objects.**

List of files in a ODF file with an OLE Object

- **content.xml**
- **meta.xml**
- **styles.xml**
- **settings.xml**
- **mimetype**
- **Object1** (Binary data for OLE objects)
- **META-INF/manifest.xml**
- **Thumbnails/thumbnail.png**
- **ObjectReplacements/Object1**

List of files in a ODF file with an ODF Object

- **content.xml**
- **meta.xml**
- **styles.xml**
- **settings.xml**
- **mimetype**
- **Object1/content.xml** (“embedded” ODF XML)
- **Object1/styles.xml**
- **Object1/settings.xml**
- **META-INF/manifest.xml**
- **Thumbnails/thumbnail.png**
- **ObjectReplacements/Object1**



OLE Objects vs. ODF Objects (2)

Example of OLE Object (embedded Excel worksheet)

```
<draw:frame draw:style-name="gr1" draw:layer="layout" svg:width="10.548cm"
svg:height="0.896cm" svg:x="7.298cm" svg:y="9.723cm">
  <draw:object-ole draw:class-id="00020820-0000-0000-c000-000000000046"
xlink:href="/Object 1" xlink:type="simple" xlink:show="embed" xlink:actuate="onLoad" />
  <draw:image xlink:href="/ObjectReplacements/Object 1" xlink:type="simple"
xlink:show="embed" xlink:actuate="onLoad" />
  <svg:desc>Excel Spreadsheet OLE object</svg:desc>
</draw:frame>
```

	A	B	C
1	1	2	
2	50	60	

- "00020820-0000-0000-c000-000000000046" is class id (CLSID) for Excel Work Sheet Object

Example of ODF Object (embedded ODF spreadsheet)

```
<draw:frame draw:style-name="standard" draw:layer="layout" svg:width="12.859cm"
svg:height="6.423cm" svg:x="6.641cm" svg:y="8.5cm">
  <draw:object xlink:href="/Object 1" xlink:type="simple" xlink:show="embed"
xlink:actuate="onLoad" />
  <draw:image xlink:href="/ObjectReplacements/Object 1" xlink:type="simple"
xlink:show="embed" xlink:actuate="onLoad" />
  <svg:desc>ODF spreadsheet object</svg:desc>
</draw:frame>
```

	A	B	C
1	1	2	
2	70	80	1
3			

- "/Object 1" is directory for embedded ODF XML files



References

- OASIS Open Document Format for Office Applications (OpenDocument) v1.0
- OASIS OpenDocument v1.0 Relax-NG Schema

- OASIS OpenDocument Essentials
 - <http://books.evc-cit.info/>
- OpenDocument fellowship
 - <http://opendocumentfellowship.org/Main/HomePage>

- Microsoft Office Assistance: About creating accessible Office documents
 - <http://office.microsoft.com/en-us/assistance/HP030734311033.aspx>
- Office XP: Microsoft Desktop Accessibility
 - <http://www.microsoft.com/office/previous/xp/accessibility.asp>

- Office Open XML Specification – submitted to ECMA by Microsoft
 - <http://www.ecma-international.org/activities/Office%20Open%20XML%20Formats/>