

The DOCX Reader

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DISCUSSION

Mapping, omissions, and round-trip expectations for the DOCX reader

LABELS

formats, docx, reader

Status of This Memo

This document is an internal Zen discussion record authored in Typst and tracked in git. It intentionally follows RFC-style structure so the design scope, rationale, trade-offs, and operational constraints remain explicit. Documents that still use the placeholder number XXXXX are provisional drafts. Numbered ZDS documents are part of the project record.

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40. Abstract

The format record for `zenfmt_docx` (`ai.insan.zenfmt.docx`), the WordprocessingML reader delivered in phase 4 of ZDS 0002. That record carries the architectural mapping table; this one is the plugin’s own ledger — the obligations ZDS 0001 places on every format record: the mapping as implemented, the deliberate omissions with their reasons, and what a round trip may and may not expect.

41. Scope

The reader consumes `.docx` packages through the shared `zenfmt_ooxml` ZIP layer and `zenfmt_xml` pull parser, under every limit in ZDS 0002’s archive table. The main part is resolved

through the package relationships, never guessed. `styles.xml`, `numbering.xml`, `word/_rels/document.xml.rels`, and `word/footnotes.xml` are read when present; a document missing any optional part still converts.

42. Mapping

As implemented; the rationale is in ZDS 0002, *Reading the Office Formats*.

Source	Tree result	Facets
<code>w:p</code>	paragraph; plain inside synthesized list items.	StyleFacet when a non-heading <code>w:pStyle</code> names it: the style id.
<code>w:p</code> with heading <code>w:pStyle</code>	heading. Built-in <code>Heading1..Heading9</code> and any style whose <code>w:basedOn</code> chain reaches one; levels above six clamp with <code>docx.heading-level-clamped</code> .	none.
<code>w:p</code> with <code>w:numPr</code>	<code>list_item</code> in a synthesized list: the inference machine from ZDS 0002, with ordered-versus-bullet and start from <code>numbering.xml</code> , bullets when the pointer dangles.	none.
<code>w:r</code> with <code>w:rPr</code> flags	Nested strong, emphasis, strikethrough, superscript, subscript, <code>small_caps</code> , underline in the canonical order; the common prefix of consecutive runs is shared. Toggles with <code>w:val="0"/"false"/"none"</code> clear.	none.
<code>w:rFonts</code> naming a monospace family	code, degraded: a font became a role.	none.
<code>w:t</code> , <code>w:delText</code>	Text; only <code>w:t</code> content is significant, never inter-element whitespace.	none.
<code>w:br</code>	<code>hard_break</code> ; <code>w:type="page"</code> counts	none.

Source	Tree result	Facets
	toward docx.page-breaks-dropped.	
w:tab	A space.	none.
w:hyperlink	link, target through the relationships or #anchor.	none.
HYPERLINK fields	link around the cached result runs; other fields keep their cached result and drop the instruction.	none.
w:tbl / w:tr / w:tc	table with columns from w:tblGrid; leading w:tblHeader rows in table_head; w:gridSpan becomes col_span; w:vMerge continuations fold into the origin with docx.merged-cells-degraded.	none.
w:drawing, w:pict	image with the relationship target as source and descr as alt text; sourceless, description-less shapes emit nothing.	The image part's bytes register with the resource store under the same source name, digested at registration; extraction past the limits degrades to docx.media-limit.
w:footnoteReference	note; the body parses from word/footnotes.xml after the document body.	none.
w:sdt	container (block) or span (inline) with the control's tag as its class.	none.
w:ins, w:moveTo	Content kept: insertions accepted.	RevisionFacet on the containing paragraph: kind insertion, the w:author and w:date attributes. An insertion wrapping whole paragraphs binds to the first paragraph it opens.
w:del, w:moveFrom	Content dropped and counted, as before.	RevisionFacet on the containing paragraph:

Source	Tree result	Facets
		kind deletion with author and date, so the fact of the deletion survives the drop.
w:sectPr with w:pgSz	Counted toward docx.section-properties-dropped, as before.	One page LayoutFacet on the first body block: width and height in EMU, converted from twips at 635 EMU per twip.

43. Deliberate omissions

Recognized and dropped, each with the named report; the counts aggregate.

Report code	What is recognized and dropped
docx.comments-dropped	Comments and comment ranges.
docx.tracked-deletions-dropped	w:del and w:moveFrom content.
docx.page-breaks-dropped	Explicit page breaks.
docx.bookmarks-dropped	Bookmarks and cross-reference anchors.
docx.section-properties-dropped	Page size, margins, columns.
docx.text-boxes-dropped	Text boxes and shapes with text.
docx.embedded-objects-dropped	OLE objects: charts, spreadsheets.
docx.unhandled-construct	Any other WordprocessingML element: children processed, construct reported — the runtime twin of this table.

Deferred rather than dropped: OMML mathematics (the math node exists; the mapping does not yet). Image byte extraction, deferred in the first draft of this record, now lands in the resource store as the mapping table shows.

44. Round-trip expectations

DOCX to Markdown is a one-way projection in the first release. What survives a later DOCX → Markdown → DOCX trip is bounded by Markdown’s vocabulary plus the preservation namespace: the reader records the distinct non-heading paragraph style ids it saw under ai.insan.zenfmt.docx (version 1, paragraph_style_ids) in the artifact manifest, digest-bound to the output. A future DOCX writer may consult it; nothing may require it. The facet rows in the mapping table widen that channel (ZDS 0013): style names, tracked changes, and page geometry now travel typed in the shared IR, and the manifest summarizes them per kind, with full rows under --preserve-facets.

45. Security

Everything from ZDS 0002 applies: central-directory-only ZIP reading, the no-override name rules, refusal of encrypted entries and unknown compression, no DTD processing

(docx.doctype-refused), and the XML depth limit (docx.xml-too-deep). The adversarial corpus in tests/docx.zig asserts each refusal by report code.

46. References

- ZDS 0002, *Reading the Office Formats* — the architectural mapping this record instantiates.
- ECMA-376 Part 1 (WordprocessingML), Part 2 (Open Packaging Conventions).