

Technical Specification

CONFIDENTIAL – INTERNAL USE ONLY

Author: Matt Jeffcoat

Organization: [Organization Name]

Date: November 2025

Version: 1.0

This document is confidential and intended solely for authorized personnel and approved contractors. Unauthorized distribution is prohibited.

Advanced Markdown Showcase

Introduction

Architecture Diagrams

System Context Diagram

Sequence Diagram

Data Flow Diagram

Complex Tables

Feature Comparison Matrix

Performance Benchmarks

Technology Stack

Code Examples

Python API Implementation

JavaScript Event Handler

YAML Configuration

Bash Deployment Script

Mathematical Expressions

Inline Math

Display Math

Lists and Hierarchies

Feature Roadmap

Technical Requirements

Callouts and Quotes

Special Elements

Horizontal Rules

Inline Formatting

Links and References

Conclusion

Key Takeaways

ADVANCED MARKDOWN SHOWCASE

A comprehensive demonstration of markdown capabilities

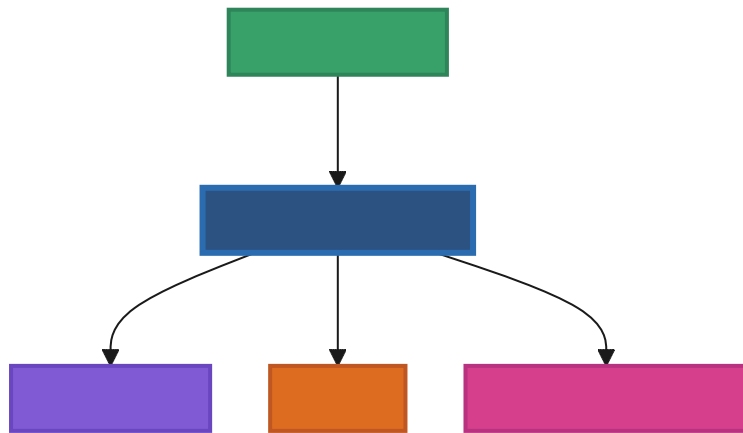
Introduction

This document showcases the full range of markdown features supported by the docs-pipeline system, including advanced diagrams, tables, code blocks, and typographic elements. Each section demonstrates a different capability that renders beautifully across all four visual profiles.

Architecture Diagrams

System Context Diagram

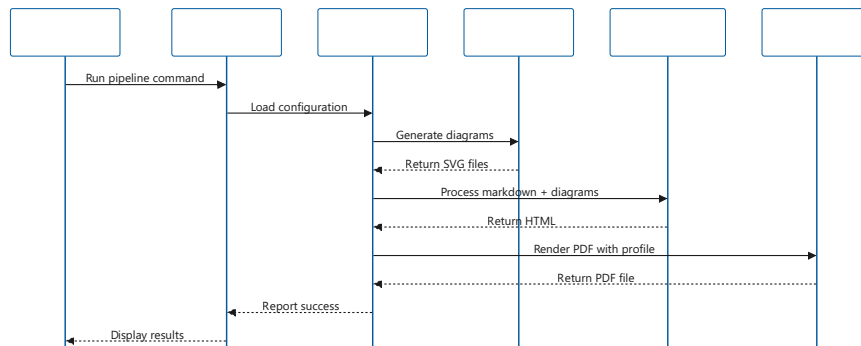
The following C4 context diagram shows the high-level system architecture:



Diagram

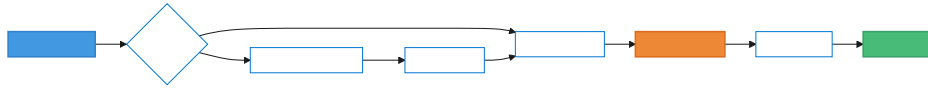
Sequence Diagram

Here's how the PDF generation process flows:



Diagram

Data Flow Diagram



Diagram

Complex Tables

Feature Comparison Matrix

FEATURE	TECH WHITEPAPER	DARK PRO	MINIMALIST	ENTERPRISE BLUE
Background	White	Dark Navy	Off-White	White
Primary Color	Blue (#1976d2)	Cyan (#93c5fd)	Gray (#2c3e50)	Corporate Blue (#003d7a)
Typography	Serif + Sans	Modern Sans	Ultra-light	Corporate Sans
Code Blocks	Light gray bg	Dark bg + border	Minimal bg	Blue-tinted bg
Tables	Standard borders	Subtle borders	Borderless	Strong borders
Use Case	Print docs	Screen viewing	Architecture docs	Business reports
Page Margins	Standard	Compact	Generous	Standard
Heading Style	Bold + underline	Uppercase + glow	Thin + minimal	Corporate gradient

Performance Benchmarks

DOCUMENT SIZE	PROCESSING TIME	MEMORY USAGE	OUTPUT SIZE
Small (1-5 pages)	1.2s	45 MB	250 KB
Medium (10-20 pages)	3.5s	78 MB	890 KB
Large (50-100 pages)	12.8s	156 MB	3.2 MB
Enterprise (200+ pages)	45.2s	312 MB	8.7 MB

Technology Stack

COMPONENT	TECHNOLOGY	VERSION	PURPOSE
Parser	Pandoc	3.1+	Markdown → HTML conversion
Diagrams	Mermaid CLI	10.6+	Diagram rendering
Architecture	Structurizr CLI	Latest	C4 model diagrams
PDF Renderer	WeasyPrint	60.0+	HTML → PDF (default)
PDF Renderer (Alt)	Playwright	1.40+	HTML → PDF (enhanced SVG)
Orchestration	Python	3.10+	Pipeline coordination

Code Examples

Python API Implementation

```

from pathlib import Path

from typing import Optional

import asyncio


class DocumentPipeline:
    """
    Production-grade document generation pipeline.

    Coordinates diagram generation, markdown
    processing,

    and PDF rendering with configurable profiles.
    """

    def __init__(self, config_path: Path, profile:
        str = "tech-whitepaper"):

        self.config = self._load_config(config_path)

        self.profile = profile

        self.cache_enabled = True

    async def process(self, input_file: Path,
        output_file: Path) -> bool:
        """
        Process a single document through the
        pipeline.

        Args:

            input_file: Source markdown file

            output_file: Target PDF file path

        Returns:

```

```

        True if successful, False otherwise
        """
    try:
        # Step 1: Generate diagrams
        diagrams = await
        self._render_diagrams(input_file)

        # Step 2: Process markdown with diagrams
        html = await
        self._markdown_to_html(input_file, diagrams)

        # Step 3: Render PDF with selected profile
        success = await self._render_pdf(html,
        output_file, self.profile)

        return success
    except Exception as e:
        self._log_error(f"Pipeline failed: {e}")
        return False

def _load_config(self, path: Path) -> dict:
    """Load and validate YAML configuration."""
    import yaml
    with open(path) as f:
        return yaml.safe_load(f)

```

JavaScript Event Handler

```
// Real-time document preview system

class DocumentPreview {

  constructor(container, apiEndpoint) {

    this.container = container;

    this.api = apiEndpoint;

    this.debounceTimer = null;

    this.currentRequest = null;

  }

  async updatePreview(markdown) {

    // Debounce rapid changes

    clearTimeout(this.debounceTimer);

    this.debounceTimer = setTimeout(async () => {

      try {

        // Cancel previous request if still pending

        if (this.currentRequest) {

          this.currentRequest.abort();

        }

        // Create new request with AbortController

        const controller = new AbortController();

        this.currentRequest = controller;

        const response = await fetch(this.api, {

          method: 'POST',

          headers: { 'Content-Type': 'application/

            json' },


```

```

    body: JSON.stringify({
      markdown,
      profile: 'tech-whitepaper'
    }),
    signal: controller.signal
  });

  if (response.ok) {
    const { html } = await response.json();
    this.container.innerHTML = html;
    this._attachEventListeners();
  }
} catch (err) {
  if (err.name !== 'AbortError') {
    console.error('Preview update failed:',
      err);
  }
}
}, 300);
}

_attachEventListeners() {
  // Handle internal navigation
  const links =
    this.container.querySelectorAll('a[href^="#"]');
  links.forEach(link => {
    link.addEventListener('click', e => {
      e.preventDefault();
      const target =
        document.querySelector(link.hash);

```

```
target?.scrollIntoView({ behavior:
  'smooth' });
});
});
}
}
```


YAML Configuration

docs-pipeline.yaml - Production configuration

workspaces:

production:

Structurizr diagram generation

diagrams:

workspace: architecture/system.dsl

workspace_dir: architecture/

formats: ["svg", "png", "mermaid"]

output_dir: docs/diagrams/

resources:

- architecture/styles/
- architecture/icons/

Document generation with multiple profiles

documents:

Technical specification - all profiles

- input: docs/specs/system-architecture.md
output: output/specs/architecture-tech.pdf
format: pdf
profile: tech-whitepaper
renderer: playwright
- input: docs/specs/system-architecture.md
output: output/specs/architecture-dark.pdf
format: pdf
profile: dark-pro
renderer: playwright

API reference - enterprise profile

- **input:** docs/api/reference.md

output: output/api/reference.pdf

format: pdf

profile: enterprise-blue

renderer: weasyprint

Bash Deployment Script

```

#!/bin/bash

set -euo pipefail

# docs-pipeline deployment script
REPO_ROOT="$(cd "$(dirname "${BASH_SOURCE[0]}")/.."
&& pwd)"

OUTPUT_DIR="${REPO_ROOT}/output"
DOCS_DIR="${REPO_ROOT}/docs"

echo "🚀 Starting document pipeline..."

# Step 1: Clean previous output
if [[ -d "$OUTPUT_DIR" ]]; then
    echo "🧹 Cleaning output directory..."
    rm -rf "$OUTPUT_DIR"/*
fi

# Step 2: Generate architecture diagrams
echo "📐 Generating Structurizr diagrams..."
python -m tools.structurizr.cli \
    --workspace architecture/system.dsl \
    --format svg,png,mermaid \
    --output "$DOCS_DIR/diagrams/"

# Step 3: Process all documents
echo "📄 Processing markdown documents..."
python -m tools.docs_pipeline.cli \
    --config docs-pipeline.yaml \

```

```

--parallel \

--verbose

# Step 4: Verify outputs
echo "✅ Verifying generated files..."

required_files=(
    "output/specs/architecture-tech.pdf"
    "output/specs/architecture-dark.pdf"
    "output/api/reference.pdf"
)

for file in "${required_files[@]}; do
    if [[ ! -f "$REPO_ROOT/$file" ]]; then
        echo "❌ Missing required file: $file"
        exit 1
    fi
done

echo "🎉 Pipeline complete! Generated $(find
"$OUTPUT_DIR" -name '*.pdf' | wc -l)
documents."

```

Mathematical Expressions

Inline Math

The quadratic formula is $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$ and the exponential function is $(e^{i\pi} + 1 = 0)$.

Display Math

$$\begin{aligned} \nabla \times \vec{E} &= -\frac{\partial \vec{B}}{\partial t} \\ \nabla \times \vec{B} &= \mu_0 \vec{J} + \mu_0 \epsilon_0 \frac{\partial \vec{E}}{\partial t} \\ \nabla \cdot \vec{E} &= \frac{\rho}{\epsilon_0} \\ \nabla \cdot \vec{B} &= 0 \end{aligned}$$

Performance scaling follows:

$$T(n) = O(n \log n) \text{ where } n = \text{document size}$$

Lists and Hierarchies

Feature Roadmap

1. **Phase 1: Core Pipeline** (Q4 2024)

- Markdown to PDF conversion
- Basic Mermaid diagram support
- Single profile system
- CLI interface

2. **Phase 2: Multi-Profile System** (Q1 2025)

- Four distinct visual profiles
- Profile-specific CSS
- Configurable renderer selection
- Web demo interface

3. **Phase 3: Advanced Features** (Q2 2025)

- Structurizr C4 integration
- Multi-workspace orchestration
- Parallel document processing
- Diagram caching system

4. **Phase 4: Enterprise Features** (Q3 2025)

- Custom branding support
- Template library
- API access
- Cloud deployment options

Technical Requirements

◦ **System Requirements**

- Python 3.10 or higher
- Node.js 18+ (for Mermaid CLI)
- Docker (optional, for Structurizr)
- 2GB RAM minimum (4GB recommended)

◦ **Development Tools**

- Git for version control
- VS Code or similar editor

- pytest for testing

- ruff for linting

- **Optional Dependencies**

- Playwright (for enhanced PDF rendering)

- SVGO (for SVG optimization)

- KaTeX CLI (for math rendering)

- PlantUML (for UML diagrams)

Callouts and Quotes

Important Note

This document demonstrates production-ready markdown processing capabilities. All features shown here are fully functional and render consistently across all four visual profiles.

Performance Tip

Enable diagram caching with `use_cache: true` in your configuration to significantly reduce processing time for repeated builds. Cached diagrams are stored in `tools/pdf/output/pdf-diagrams/` by default.

Special Elements

Horizontal Rules

Sections can be separated with horizontal rules for visual clarity:

Inline Formatting

Text can be **bold**, *italic*, ***bold and italic***, ~~strikethrough~~, `inline code`, or even ^{superscript} and _{subscript}.

Links and References

For more information, see: - [Pandoc Documentation](#) - [Mermaid Syntax](#) - [Structurizr DSL](#) - [WeasyPrint Documentation](#)

Conclusion

This showcase demonstrates the comprehensive markdown capabilities of the docs-pipeline system. From simple formatting to complex diagrams, tables, and code blocks, every element renders beautifully across all visual profiles.

Key Takeaways

- ✓ **Multi-format support** - PDF, DOCX, and HTML outputs
- ✓ **Four visual profiles** - Choose the right look for your audience
- ✓ **Production-ready** - Handles enterprise-scale documentation
- ✓ **Extensible** - Add custom profiles and renderers
- ✓ **Fast** - Parallel processing and intelligent caching

