Advanced Markdown Showcase

[Organization Name]

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Table of Contents

Advanced Markdown Showcase

A comprehensive demonstration of markdown capabilities

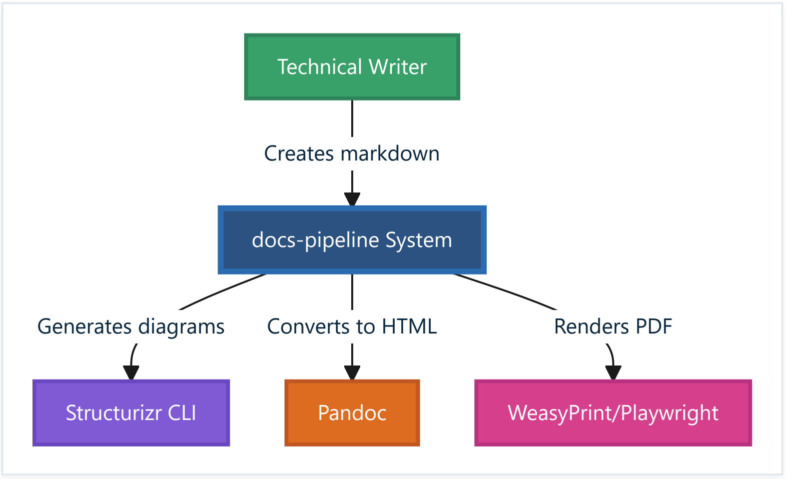
Introduction

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

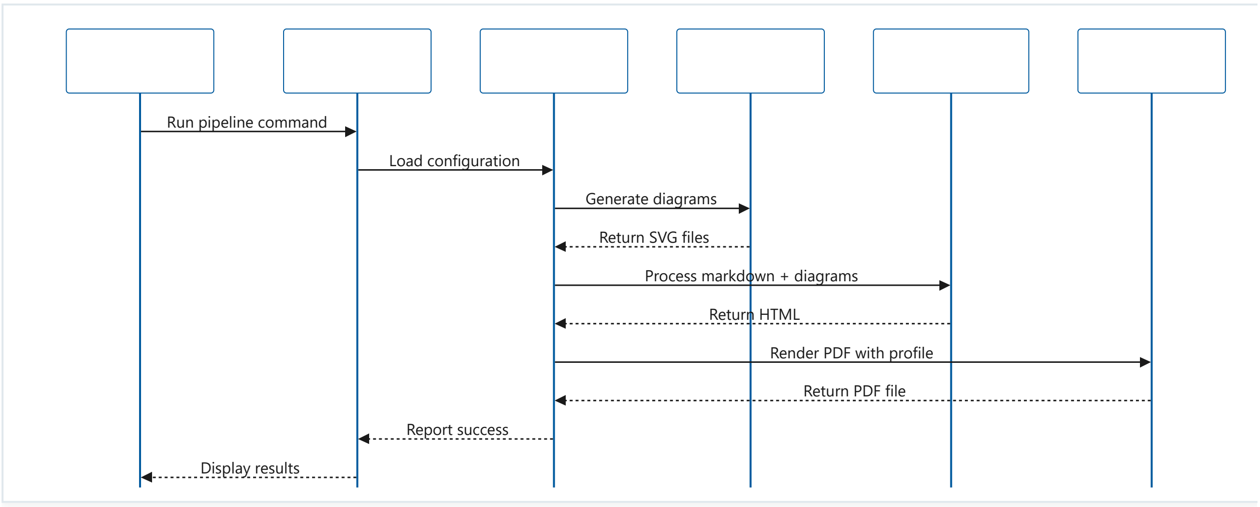
The following C4 context diagram shows the high-level system architecture:



Diagram

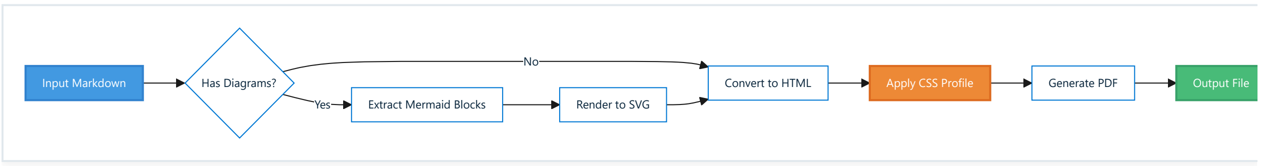
Sequence Diagram

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

FEATURE	TECH WHITEPAPER	DARK PRO	MINIMALIST	ENTERPRISE BLUE
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

COMPONENT	TECHNOLOGY	VERSION	PURPOSE
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) doc
```

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 $^{\text{superscript}}$ and $_{\text{subscript}}$.

Links and References

For more information, see: - Pandoc Documentation - Mermaid Syntax - Structurizr DSL - WeasyPrint Documentation

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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

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