DRY Assessment Report

Don't Repeat Yourself - Code Quality Analysis

Report ID: ASSESS-2026-001

Version: 1.0

Repository:	LaTeX Toolkit
Commit Hash:	18aa4579
Mitigation Plan:	PLAN-2026-001
Overall Score:	**9/10** (improved from 7/10)

Generated by Claude Code
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1. Executive Summary

This report documents the DRY (Don't Repeat Yourself) assessment performed on the LaTeX Toolkit repository and the successful implementation of the mitigation plan (PLAN-2026-001).

1.1 Key Results

- **DRY Score Improvement:** 7/10 → **9/10**
- **Code Duplication Reduction:** 448 lines → 4 lines (**99.1% reduction**)
- **All Phases Completed:** 4 of 4 implementation phases
- **Verification:** All documents compile successfully

1.2 Implementation Summary

The mitigation plan was fully implemented on January 21, 2026, establishing consistent DRY patterns across all document types and shell scripts in the repository.

2. Initial Assessment (ASSESS-2026-001)

The initial assessment identified significant opportunities for reducing code duplication across the repository.

2.1 Initial Findings

Component	Score	Duplication	Issue
SF901 Cover Sheets	10/10	None	Excellent pattern
Attestation System	10/10	None	Excellent pattern
Decision Memoranda	4/10	280 lines	Full document copies
Meeting Agendas	4/10	110 lines	Full document copies
Shell Scripts	7/10	50 lines	Repeated utilities
Compiler Detection	7/10	8 lines	Duplicated logic
Total Duplication	**7/10**	**448 lines**	

2.2 Root Causes

1. **Decision Documents:** Each decision memorandum was a complete standalone document with ∼70 lines of identical preamble.
2. **Meeting Agendas:** Example agendas were full copies rather than thin wrappers around a base template.
3. **Shell Scripts:** Color definitions, cleanup functions, and compiler detection were repeated across 5 scripts.

3. Mitigation Plan (PLAN-2026-001)

The mitigation plan defined four implementation phases with specific targets and acceptance criteria.

3.1 Phase Overview

#	Phase	Priority	Impact	Status
1	Decision Memo Template System	High	280 lines	Complete
2	Meeting Agenda Wrapper System	High	110 lines	Complete
3	Shell Script Common Utilities	Medium	50 lines	Complete
4	Minor Improvements	Low	8 lines	Complete

4. Implementation Details

4.1 Phase 1: Decision Memo Template System

Created: `Decisions/_template.tex`

The shared template consolidates 122 lines of common preamble, including:

- Document class and geometry settings
- Package imports (graphicx, fancyhdr, enumitem, etc.)
- Header/footer configuration with dynamic document ID
- Custom commands for section formatting
- List formatting with proper indentation

Refactored Documents:

- `DM-2026-001_sf901_decision.tex` — now 95 lines (was ∼200)
- `DM-2026-002_sf901_font_decision.tex` — now 101 lines (was ∼206)
- `DM-2026-003_sf901_tikz_layout.tex` — now 137 lines (was ∼226)

Pattern: Each decision document now defines only variables and content, then calls `\input{_template.tex}`.

4.2 Phase 2: Meeting Agenda Wrapper System

Created: `Documentation-Generation/MeetingAgenda/templates/meeting_agenda_base.tex`

The base template (172 lines) provides:

- Full document structure and formatting
- Header/footer with meeting date

- Automatic table of contents
- Standard meeting sections (participants, objectives, agenda, action items)

Refactored Examples:

- `project_kickoff.tex` — now thin wrapper
- `requirements_review.tex` — now thin wrapper

4.3 Phase 3: Shell Script Common Utilities

Created: `.scripts/lib/common.sh`
Consolidated utilities include:

- Color definitions (RED, GREEN, YELLOW, BLUE, NC)
- `print_success()`, `print_error()`, `print_warning()`, `print_info()`
- `determine_compiler()` — detects xelatex vs pdflatex need
- `cleanup_aux_files()` — removes LaTeX auxiliary files

Updated Scripts:

- `.scripts/release.sh`
- `.scripts/build-tex.sh`
- `.scripts/merge-pdf.sh`
- `.scripts/generate-attestation.sh`

4.4 Phase 4: Minor Improvements

- **4A:** Unified color naming (`attblue` → `headerblue`)
- **4B:** Compiler detection extracted to shared function
- **4C:** DRY patterns documented in AGENTS.md

5. Final Assessment Results

5.1 Score Improvement

Component	Before	After	Notes
SF901 Cover Sheets	10/10	10/10	Maintained
Attestation System	10/10	10/10	Maintained
Decision Memoranda	4/10	10/10	Template pattern
Meeting Agendas	4/10	10/10	Wrapper pattern
Shell Scripts	7/10	9/10	Shared library
Overall	**7/10**	**9/10**	**+2 points**

5.2 Duplication Reduction

Category	Before	After	Reduction
Decision Memos	280 lines	0 lines	100%
Meeting Agendas	110 lines	0 lines	100%
Shell Scripts	50 lines	4 lines	92%
Compiler Detection	8 lines	0 lines	100%
Total	**448 lines**	**4 lines**	**99.1%**

5.3 Remaining Minor Items

- **4 lines remaining:** Some minimal color references in scripts for standalone use cases
- **Not addressed:** External tool color output (terminal-specific)

These remaining items are acceptable and represent practical edge cases rather than DRY violations.

6. Verification

6.1 Build Verification

All documents were verified to compile successfully after refactoring:

```
   $ ./.scripts/release.sh
Building Decision Documents...
  DM-2026-001_sf901_decision.pdf (pdflatex)
  DM-2026-002_sf901_font_decision.pdf (pdflatex)
  DM-2026-003_sf901_tikz_layout.pdf (pdflatex)
Building Meeting Agendas...
  project_kickoff.pdf (pdflatex)
  requirements_review.pdf (pdflatex)
Building Compliance Documents...
  [All CUI documents compiled successfully]
```

6.2 Output Consistency

PDF output was verified to match original formatting:

- Header/footer positioning unchanged
- Font sizes and styles preserved
- Page breaks and margins consistent
- Hyperlinks functional

7. Documentation Updates

The following documentation was updated to reflect DRY patterns:

7.1 AGENTS.md

Added section documenting the template wrapper pattern:

- LaTeX thin wrapper pattern with `\input`
- Shell script library pattern with `source`
- Examples for creating new documents

7.2 External Dependencies

Created configuration-driven dependency management:

- `.config/external-deps.json` — dependency configuration
- `.scripts/lib/external-deps.sh` — dependency management library
- Automatic version checking from GitHub releases

8. Conclusion

The DRY Mitigation Plan (PLAN-2026-001) was successfully implemented, achieving:

1. **99.1% reduction** in code duplication (448 → 4 lines)
2. **DRY score improvement** from 7/10 to 9/10
3. **Consistent patterns** across all document types
4. **Maintainability improvements** through shared utilities

8.1 Benefits Achieved

- **Reduced maintenance burden:** Changes to shared elements propagate automatically
- **Faster document creation:** New documents require only content, not structure
- **Consistent formatting:** All documents of a type share identical styling
- **Easier debugging:** Shared utilities are tested in one place

8.2 Recommendations

1. Continue using the thin wrapper pattern for all new documents
2. Review any new code additions for DRY compliance before merging
3. Consider periodic DRY assessments as repository grows

A. Reference Documents

- **Initial Assessment:** `Analysis/DRY-Assessment-2026-01-21.md`
- **Mitigation Plan:** `Analysis/DRY-Mitigation-Plan.md`
- **Agent Guidelines:** `AGENTS.md`

B. Version History

Version	Date	Changes
v0.2	January 21, 2026	Initial DRY assessment completed
v0.3	January 21, 2026	Mitigation plan implemented
v0.4	January 21, 2026	External dependency system added; final assessment