SpeakUp

A Systems-Engineering Demonstration

Bruce Dombrowski

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Repository: `https://github.com/brucedombrowski/SpeakUp`

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About This Document

Purpose: This briefing is designed for asynchronous review by managers and customers. It can be read independently without a presenter.

What SpeakUp Is:

- A response to organizational calls for constructive feedback
- A response to customer requests for process improvement ideas
- A demonstration of systems-engineering discipline applied to knowledge work
- Vendor-neutral at the requirements level—no specific tool is proposed

Repository: All artifacts, verification evidence, and this briefing are available at:

`https://github.com/brucedombrowski/SpeakUp`

Problem Statement

The current operating environment has systemic constraints that limit effectiveness:

Constraint	**Impact**
Fragmented workflows	Disconnected mobile, desktop, execution
Limited AI in trusted boundaries	Workflow degradation to stay compliant
Broadcast email as work proxy	Reduced signal-to-noise; interrupts focus
Untracked coordination	Limited traceability and auditability
Knowledge attrition risk	Personnel transition loses institutional knowledge

Governing Principle

Core Principle

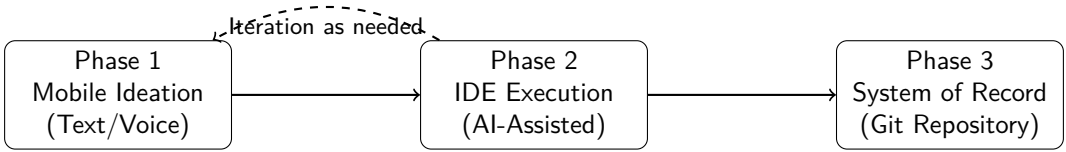
Thinking is necessary and expected.
Accountable work begins when thinking is captured.

This principle guides the proposed workflow. Work performed in structured, tracked systems maximizes:

Principle	Benefit
Work in structured systems	Enables automation support and reduces manual overhead
Capture in tracked systems	Provides traceability for audits and reviews
Git as system of record	Creates authoritative, version-controlled history
Email for notification only	Preserves email for time-critical coordination, not as work artifact

Proposed Workflow Model

The workflow has three phases that can iterate:



Phase 1: Ideation

- Smartphone-based reasoning
- Text input always available
- Voice input when possible
- No controlled data required

Phase 2: Execution

- Modern IDE environment
- AI assistance (modular)
- Within trust boundaries
- Produces artifacts

Phase 3: Record

- Git version control
- Captures history
- Captures rationale
- Lifecycle management

Functional Requirements (Solution-Agnostic)

These requirements define *what* is needed, not *how* to implement it:

ID	Type	Requirement
FR-1	Mandatory	Mobile ideation capability (smartphone, text/voice input)
FR-2	Mandatory	IDE-centric execution with integrated, replaceable AI assistance
FR-3	Mandatory	Git-based system of record capturing artifacts, history, and rationale
FR-4	Mandatory	Identity and trust boundary alignment (security at identity and device)
FR-5	Recommended	High-signal communication model (email for notification only)

Security and Compliance

SpeakUp maintains existing security posture—no rules are relaxed:

Trust Boundary Alignment

- Security enforced at authenticated identity
- Security enforced at managed device
- AI operates in-boundary as assistive tool
- Classification and handling rules unchanged

Information Handling (This Project)

- No sensitive PII included
- No CUI included
- No proprietary information included
- No classified information included
- Verified by inspection (see repository)

Verification evidence: `verification/Compliance-Statement.md`

Value Proposition

The Core Point

With the right environment, one person can do the work of an entire team.

Example: This briefing—IDE, AI agent, LaTeX documents, professional PDFs, version control—all produced by one person. The constraint is not capability. It is environment.

Capability	**Current State**	**Proposed State**
Work capture	Fragmented, untracked	Structured, version-controlled
AI assistance	Outside boundary or unavailable	In-boundary, modular
Knowledge preservation	At-risk	Durable artifacts
Automation readiness	Limited	Maximized
Auditability	Manual effort	Built-in traceability

Implementation Approach

This project demonstrates the pattern by being the pattern:

- **Concrete enough to execute**
  - Working repository with all artifacts
  - Defined outputs and verification evidence
  - Reproducible workflow documented in `artifacts/Workflow-Log.md`
- **Abstract enough to remain vendor and environment neutral**
  - Requirements specify *what*, not *how*
  - Implementation choices documented separately
  - Alternative tools and environments can satisfy same requirements
- **Self-demonstrating**
  - This briefing was created using the proposed workflow
  - Ideation on mobile, execution in IDE, artifacts in Git

Example project using this workflow:

`https://github.com/brucedombrowski/OpenSourceHouseProject`

Repository Contents

All project artifacts are available for review:

File	Purpose
`README.md`	Authoritative requirements and project specification
`briefing/SpeakUp-Briefing.pdf`	This document
`verification/Compliance-Statement.md`	Information handling verification evidence
`verification/Requirements-Traceability.md`	Requirements to evidence mapping
`verification/PII-Scan-Results.md`	Automated PII scan test results
`verification/scripts/check-pii.sh`	Automated verification script
`artifacts/Workflow-Log.md`	Execution workflow documentation

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Handling Constraints and Blockers

When a constraint is encountered, the workflow captures it explicitly:

Example: Export Control Constraint

During BPv7 implementation, NASA TReK was identified as ideal tooling—but is export-controlled (EAR ECCN 9D515.B.5). Rather than stop, the constraint was documented and alternatives evaluated.

Option	Trade-off	Decision
NASA TReK	Export controlled (EAR)	Future path
NASA JPL ION-DTN	Open source	Selected default
Clean-room Python	Full control	Learning/customization

Key Principle: Constraints become traceable decisions, not invisible blockers.

Artifact: `artifacts/Decision-Log.md`, `src/bpv7/simulation/EXPORT_CONTROL.md`

Requirements Anti-Patterns

Bad specifications cost billions and cause project failures:

Failure	Cost	Root Cause
Mars Climate Orbiter	$320M	Metric/imperial unit mismatch
FBI Virtual Case File	$170M	Vague requirements, scope creep
Ariane 5 Rocket	$370M	Reused incompatible code

Anti-Pattern (FAR 11.104: "least acceptable")	Better: Performance Spec
"Shall use Microsoft Word"	"Shall produce PDF/A archival format"
"Shall be written in Java"	"Shall execute on target platform"
"Shall use Oracle database"	"Shall persist data with ACID guarantees"

SpeakUp approach: LaTeX source (diffable, traceable) → PDF output (portable, archival)

Verification Summary

This project produces verification evidence as first-class artifacts:

Method	Application	NIST Control
Manual Inspection	Document review	—
PII Pattern Scan	Phone, SSN, IP detection	SI-12
Malware Scan	ClamAV detection	SI-3
Secrets Scan	API keys, credentials	SA-11
MAC Address Scan	Hardware identifiers	SC-8
Host Security	OS configuration	CM-6
File Integrity	SHA-256 hashes	SI-7

Security Attestation: All automated scans **PASS**
Policy: Only passing results are published. Vulnerability details are never exposed.

Recommendation

Adopt the SpeakUp workflow model as a pattern for:

- Converting thinking into durable, reviewable artifacts
- Preserving institutional knowledge as personnel transition
- Enabling automation and reducing manual audit effort
- Maintaining security and trust boundaries while using AI assistance
- Improving signal-to-noise in organizational communication

This pattern is applicable to:

- Engineering work
- Analytical work
- Knowledge work generally

Commit History (Evidence of Work)

30 commits in 8 person-hours — demonstrating AI-assisted productivity:

Hash	Commit Message
9e5aca8	Update documentation and scan handling
f1f386e	Add master build script
8855611	Add long-duration DTN test with LOS/AOS
4090a0a	Add BPv7 tests and Wireshark demo
f5d1959	Update TCPCL to RFC 9174 wire format
1f3cb42	Add constraints slide
cd86850	Add decision log
6015094	Add Docker DTN simulation
0aecf3c	Add TCPCL v4 (RFC 9174)
318800a	Add BPv7 core (RFC 9171)
acc6be5	Add security verification suite
2b27e68	Strengthen value proposition
35a13c7	Add lifecycle management
79ac56e	Add LaTeX briefing deck
76bd5bc	Initial commit

Next Steps

1. **Review this briefing** and the repository contents
2. **Identify a pilot application area** where the workflow could be applied
3. **Establish repository and workflow** for the pilot
4. **Iterate** between ideation and execution phases
5. **Measure and refine** based on results

This briefing was produced using the SpeakUp workflow model it describes.

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Contact: Bruce Dombrowski (Creator)