Artificial Intelligence in a Human World

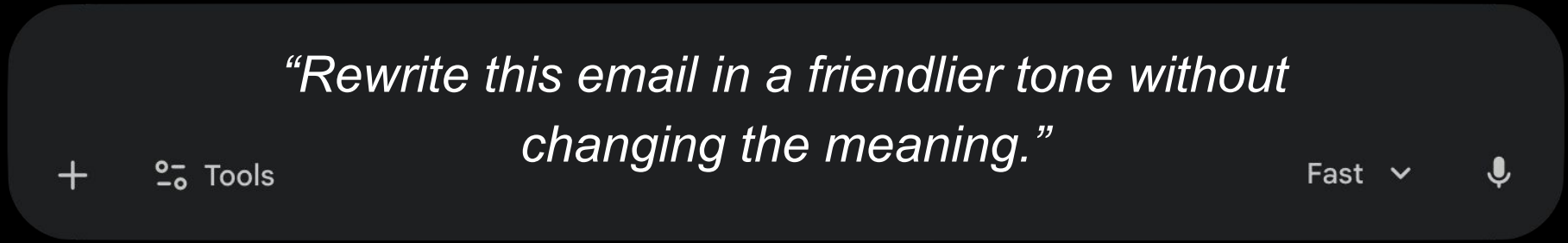
The AI's job is *plausibility*, not truth.

The AI said it compiles, the compiler says no.

Act 1

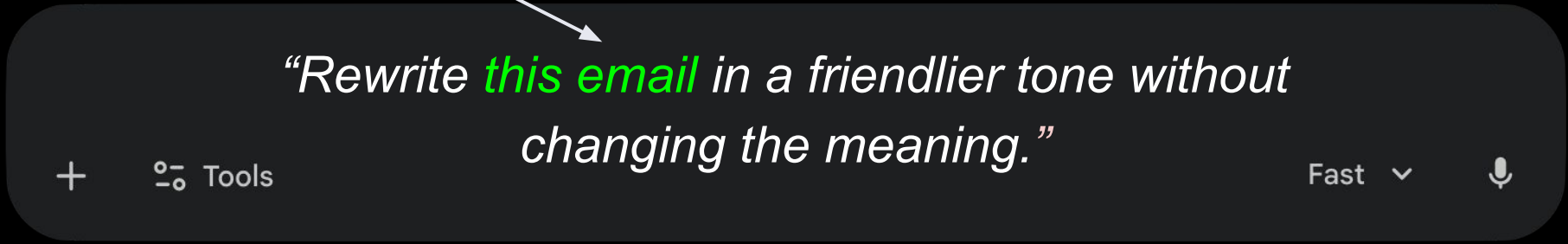
Rules ensure intent

Rules must be *truthful to the intent* and *applied consistently*.



Rules must be *truthful to the intent* and *applied consistently.*

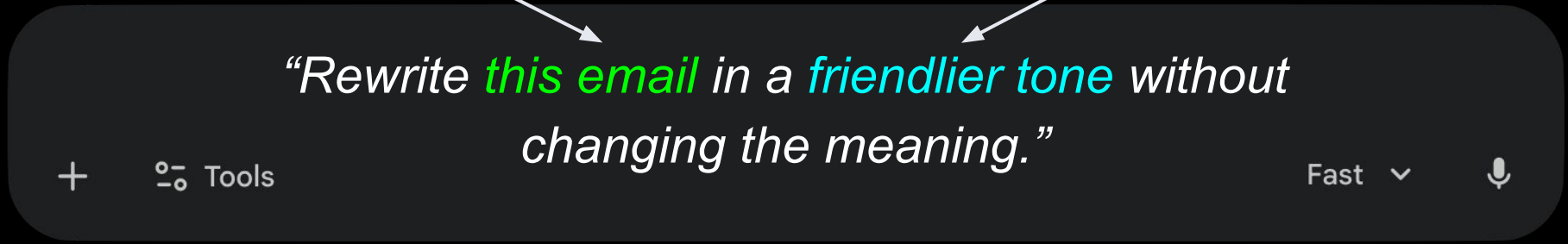
Visible Ink: *What* – the dialogue



Rules must be *truthful* to *the intent* and *applied consistently.*

Visible Ink: *What* – the dialogue

The Story: *Why* – the goal



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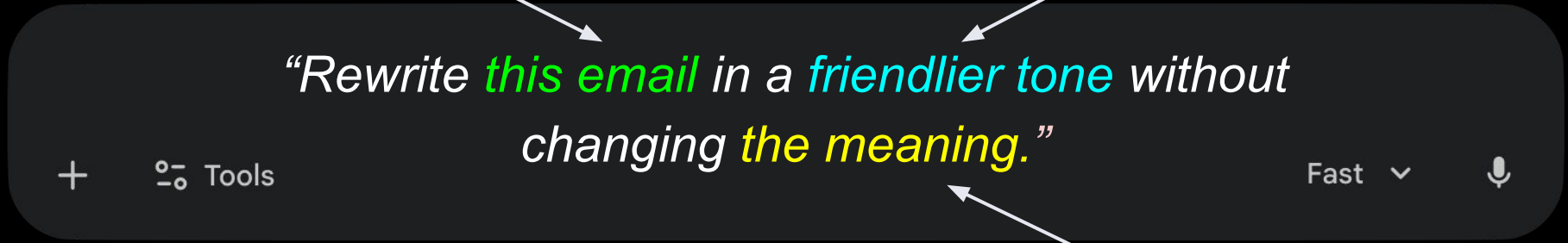
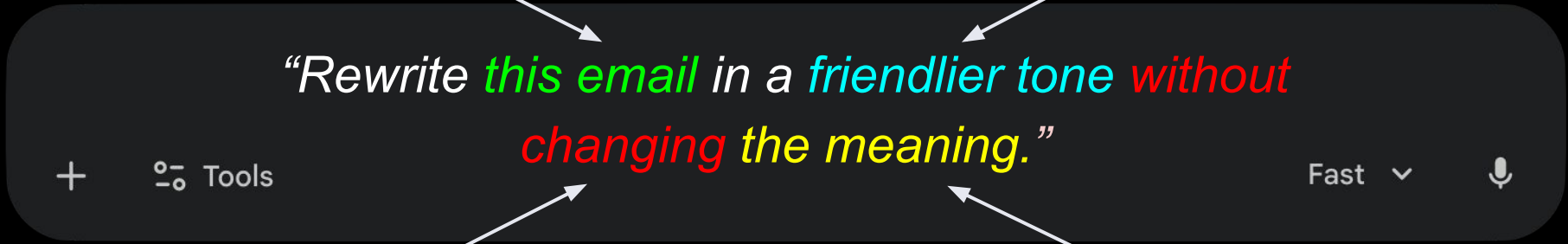


Invisible Ink: *How* – rules & meaning

Rules must be *truthful* to *the intent* and *applied consistently*.

Visible Ink: *What* – the dialogue

The Story: *Why* – the goal



Invisible Ink: "*Please don't be buggy.*"

Invisible Ink: *How* – rules & meaning

Hallucination is the feature, not a bug.

LLMs are *probabilistic engines* that are *optimized* for *likely/preferred outputs*, not guaranteed to be objectively true.

– And we *want that*!

Hallucination is the feature, not a bug.

(Unless it is factually wrong... then it's a smudge)

LLMs are *probabilistic engines* that are *optimized* for *likely/preferred outputs*, not guaranteed to be objectively true.

– And we *want that*!

Rules need to be *observationally true* to the story.

User Journeys are Stories: (*Visible Ink*)

- Sign Up & Check Out
- Quarterly Report
- Automating Customer Service
- Analyzing large datasets to find trends

Stories have rules: (*Invisible Ink*)

- → Minimize user effort & Build trust
- → Requirements from regulatory bodies
- → A Seamless, Omnichannel Experience
- → patterns to benchmarks

Epistemics – what the model can say that is *storybound and context-limited*

Governance – what the system can trust/act on with *deterministic, judge and receipts*

Rules need to be *observationally true* to the story.

Rules ***do not*** need to be *objectively true.*

User Journeys are Stories: (*Visible Ink*)

- A Princess's journey to independence
- Protects humanity and fight for justice
- Hope comes from the most unlikely places
- Terminator; from destroyer to protector

Stories have rules: (*Invisible Ink*)

- In Disney – Animals can talk
- In DC – Superman can fly
- The one ring is evil and hobbits are pure
- What if a gun didn't want to be a gun?

Epistemics – what the model can say that is *storybound and context-limited*

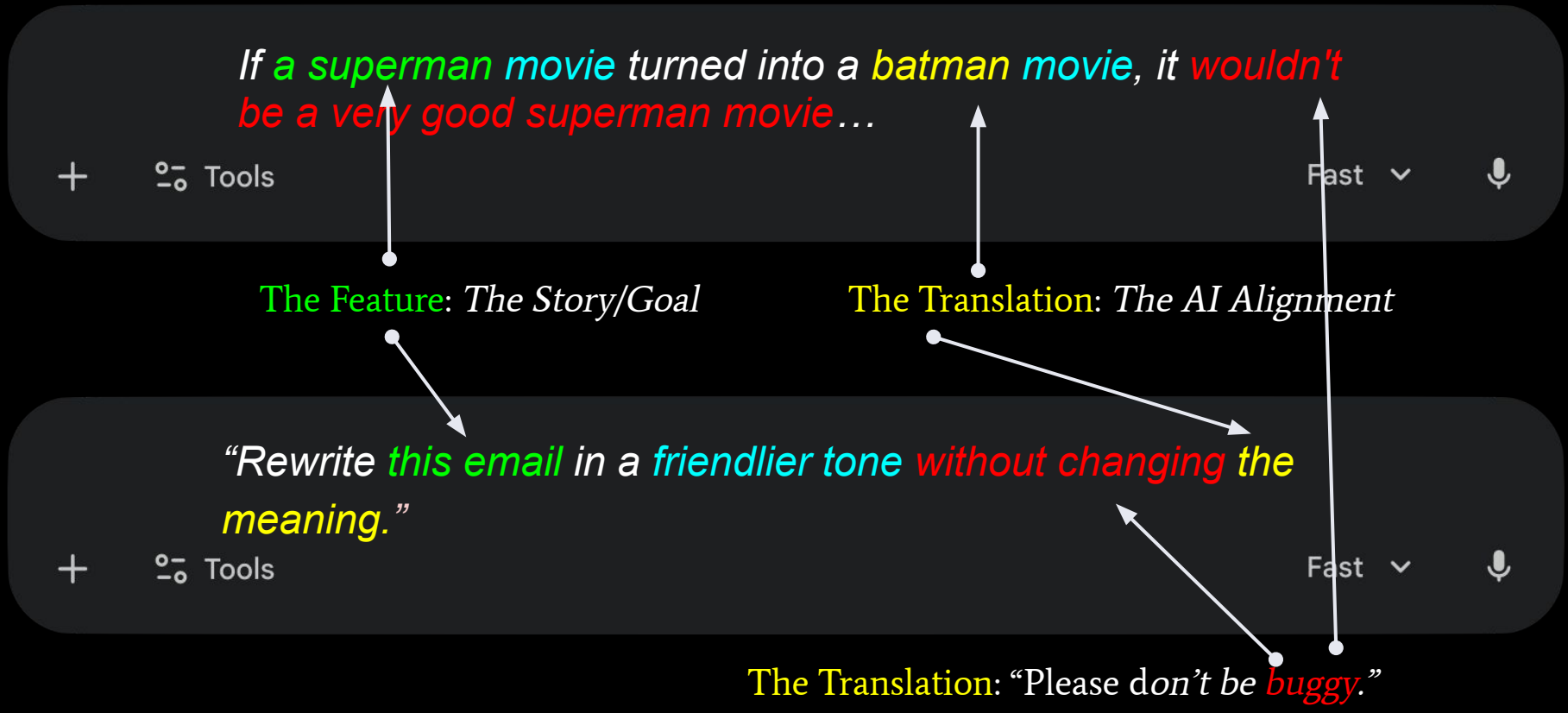
Governance – what the system can trust/act on with *deterministic, judge and receipts*

If a superman movie turned into a batman movie, it wouldn't be a very good superman movie…

Tools Fast

“Rewrite this email in a friendlier tone without changing the meaning.”

Tools Fast


If a superman movie turned into a batman movie, it wouldn't be a very good superman movie…
Tools
Fast
The Feature: The Story/Goal
The Translation: The AI Alignment
"Rewrite this email in a friendlier tone without changing the meaning."
Tools
Fast
The Translation: "Please don't be buggy."

The Plausibility Paradox

The Paradox: Because probability is a *failure of governance*, you shouldn't try to "fix" the model to stop hallucinations; instead, *you must fix the boundary around it*.

The Feature

- *Probability is the **engine of utility***
- When *content is aligned* to the goal
- *Plausible, story-bound* content
- *High Quality / Useful Content*

The Bug

- *Probability is a **failure of governance** .*
- When *content is misaligned* to the goal
- *Factually inaccurate* content
- *Low Quality / AI Smudge*

- **Visible Ink**: *“The Surface”: What the AI says.* It is the **dialogue**, the **tone**, and the **fluency**
- **Invisible Ink**: *“The Understructure or Armature”: The rules the AI must obey*. It is the **business logic**, the **regulatory rules**, and your ***specific*** **intent**
- **A Story**: Any process where the "Invisible Ink" (the story rules) **must govern** the "Visible Ink" (the output) to maintain trust and utility
- **Execution Truth**: The "*Ground Truth*" or binary correctness. It is the verified proof, such as a successful compile or a validated state change, that ensures the Invisible Ink has been successfully defended.
- **A Smudge**: The “*The Plausibility Paradox*” or "**when is hallucination a bug or not a bug?**" – When the *Visible Ink* (the *plausible* performance) bleeds through and *overwrites the Invisible Ink* (the story/business rules)

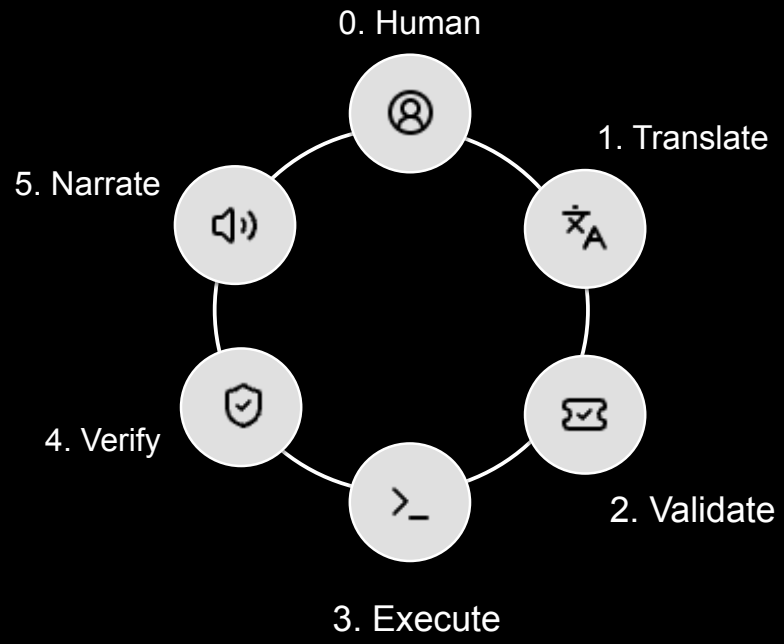
Act 2

Better boundaries

The Solver-Checker Algorithm – align intent (steps) with rules (patterns)

Steps – Protect the Intent/Narrative

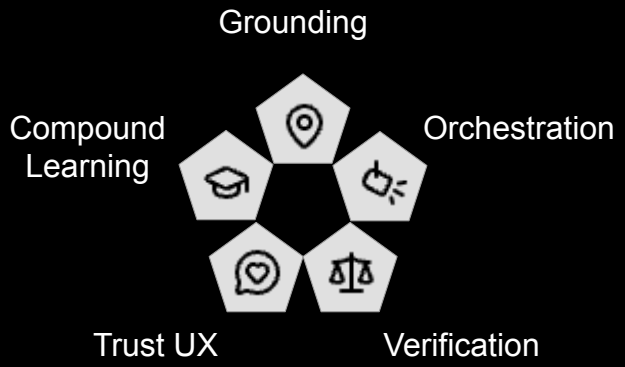
- ✔ Keep the Human in the Loop
- ✔ Align AI/Human Intent
- ✔ Keep AI in the middle
- ✔ Enable Agile AI



The Solver-Checker Patterns – align intent (steps) with rules (patterns)

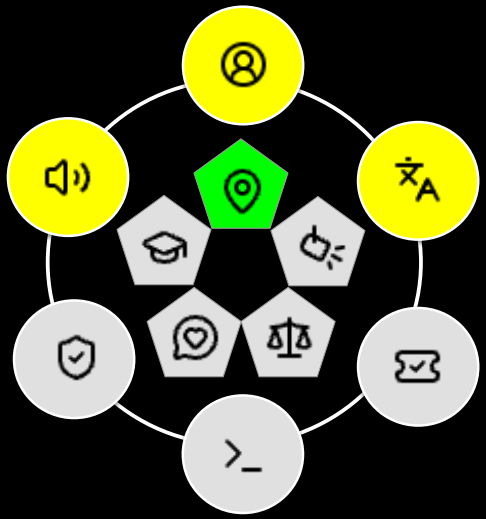
Rules – Protect Compliance

- Grounding
- Orchestration
- Verification
- Trust UX
- Compound learning



Grounding Pattern — "Shared Language" established before execution

WHAT:	Grounding is the anchor
WHEN:	Policies, rules, lore; text-to-source-of-truth
WHY:	Avoid invented facts and GIGO
HOW:	Retrieve anchors + context bundle + execution of tool + knowledge graphs + RAG + VectorDB
PROOF:	Citations + “unknown” if missing



👍 Retrieve anchors + citations → say ‘unknown’ if missing

👎 Grounding failures are usually hidden, not obvious

Orchestration Pattern — coordinating steps in a controlled sequence

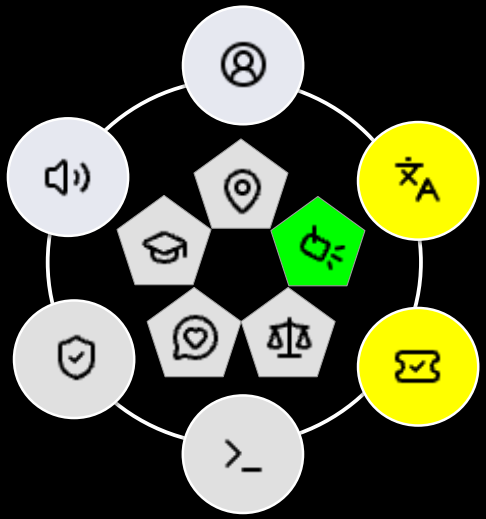
WHAT: Stepwise tool workflow

WHEN: Multi-step procedures

WHY: Prevent skipped/hidden actions

HOW: State machine + token/time budgets + rules

PROOF: "prompt engineering" to "systems engineering"

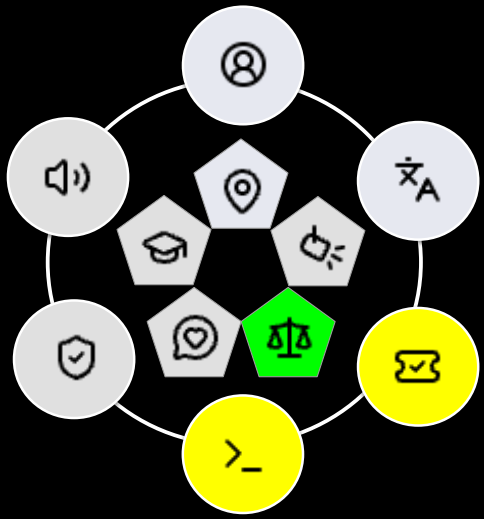


👍 It is testable, debuggable, and governable → example; accordion editing

👎 Orchestration chains add latency → keep steps minimal and set a latency budget

Verification Pattern — deterministic checks and proof of work

WHAT:	Tests decide
WHEN:	Binary correctness matters
WHY:	Stop plausible wrong outputs
HOW:	Deterministic judge boundary + Tools
PROOF:	Pass/fail receipts

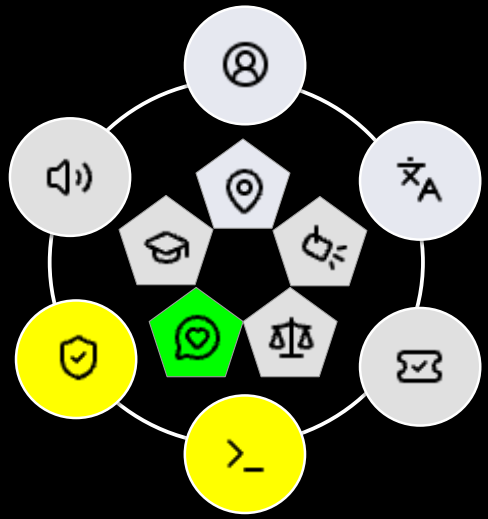


👍 Blind measure model performance objectively → If subjective, use a rubric or reference

👎 Trust vibes. Cherry-picked demos. No pass/fail receipts. Model decides without a judge.

Trust UX Pattern — evidence and recovery options with user in control

WHAT:	Make uncertainty explicit
WHEN:	Users: approve, override, correct
WHY:	Avoid false confidence, (AI's dark triad)
HOW:	Message + receipts; explicit fallbacks
PROOF:	Scope, reasons, choices made, gaps shown

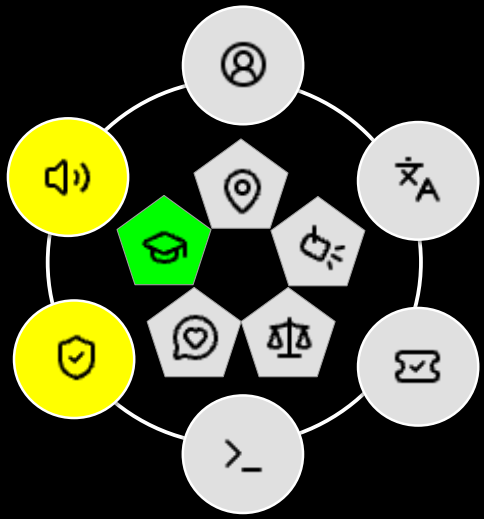


👍 Evidence-based review systems improve trust in decisions

👎 Jagged frontier → silent failures, false confidence, "no receipts, but looks right"

Compound Learning Pattern — small improvements over time

WHAT:	Improve without regressions
WHEN:	Generate can be scored
WHY:	Prevent drift, scale performance
HOW:	Offline eval harness + scorecards
PROOF:	Score deltas, regression list, diary studies



👍 Self evaluation can drive rapid improvement → *This is far more important than most realize*

👎 Don't iterate by vibe → use fixed test sets

Solver-Checker Algorithm Recap

Algorithmic Step: (what)	**Design Pattern: (how)**	**Reason: (why)**
1. Translate	Grounding	Protects Meaning
2. Validate	Orchestration	Protects Order
3. Execution Truth	`> Classic Software`	***Protects The Goal***
4. Verify	Verification	Protects Execution Truth
5. Narrate	Narrate	Protects Narrative Truth
6. Receipts[#]	*Compound Learning*	*Protects Progress*

More on this topic later

👍 Testing in the Loop

- Deterministic unit tests → true unit tests
- Contract tests for the model → unit-test-like, but not text-equality
- Eval regression tests → the real safety net, proof-of-work

- *Don't unit test creativity → test tools, contracts, and regressions*

👍 AI Testing in the Loop - Practical rules

- Never let the model-judge be the only gate for correctness
- Calibrate the judges with “Golden Sets”
- Prefer pairwise ranking over absolute scoring
- Reduce correlated failure and find edge cases
- *A/B tests (Go talk to marketing!)*
- In-process testing > fire and then forget (unit tests)

👎 AI Anti-Patterns (common pitfalls in AI development)

Single-Shots prompts	*"One prompt, one hope."*
One prompt, one judge	*Grading your own papers*
The "god" prompt	*Epistles and "thou shalt not..." prompting*
Iteration by vibes	*Cargo-cults – ritual inclusion that serves no purpose*
Waiting for AGI	*AGI is asymptotic to perfect plausibility*

Act 3

Proof of work

Demo 1: VAWK – AWK vibe coding

Governance **– what the system can trust/act on with deterministic, judge and receipts**

1. Grounding:	Backus-Naur Form (BNF) check
2. Orchestration:	Propose → RAG → Run → Patch
3. Verification:	Interpreter + tests decide
4. Trust UX:	Receipts are visible
5. Learning:	Regression sets

https://github.com/dwellman/vawk

Demo 2: A BUUI Adventure

Epistemics – what the model can say that is storybound and context-limited (Who is allowed to say 'this is correct')

1. Grounding: World anchored in state transition

2. Orchestration: Dungeon Master, one command per tick

3. Verification: Game engine rules decide; RAG retrieves the rulebook/state anchors.

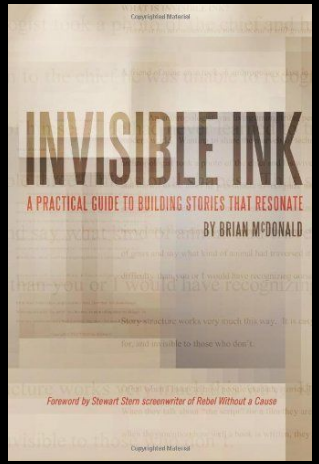
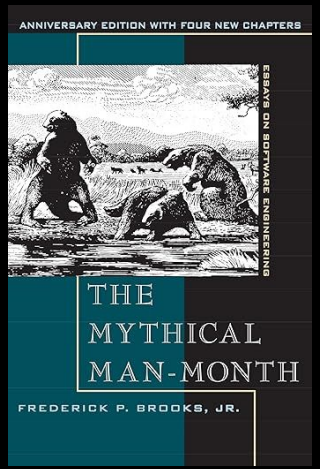
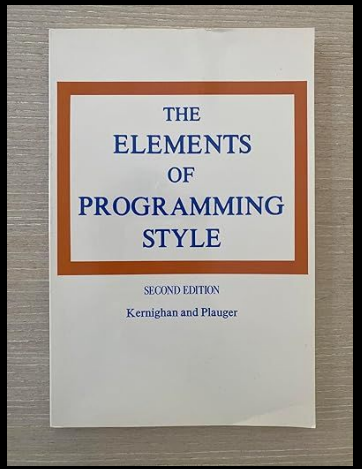
4. Trust UX: State change w/ receipts

5. Learning: Scenario replay with eval

https://github.com/dwellman/adventure

Demos: A Recap 1980s-era software *now with AI!*

Pattern	**VAWK** (Coding/Execution Truth)	**BUUI** (Gaming/Narrative Truth)
1. Grounding	**The Syntax**: BNF Grammars & Compiler Rules.	**The World-State**: Player inventory & Location DB.
2. Orchestration	**The Loop**: Solver proposes code; Checker tests it.	**The DM**: Narrative engine tracks "invisible" game rules.
3. Verification	**The Judge**: An external Python interpreter/compiler.	**The Rulebook**: RAG-lookup to ensure actions are "legal."
4. Narrative	**The Clean-up**: Translating raw logs into a "Success" message.	**The Story**: Turning state changes into immersive prose.
5. Receipts	**The Log:** A full trace of why the code was patched.	**The Game State**: A reflective history of every world-state change.

Invisible Ink: - Brian McDonald	**The Mythical Man-Month**: - Frederick Brooks Jr.	**The Elements of Programming Style** - Brian W. Kernighan, P. J. Plauger
		
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Q&A

The AI's job is plausibility, not truth.

Building the boundary and injecting the facts. *That's your job.*

1. **Grounding: AI-assisted triage can notify specialists from imaging workflows.**
   - AI “parallel stroke workflow” tool and workflow timing measures. [AHA Journals]
   - LVO detection software and time-to-treatment/outcomes. [JAMA Network]

2. **Orchestration: AI-assisted stroke triage can notify specialists from imaging workflows.**
   - AI “parallel stroke workflow” tool and workflow timing measures. [AHA Journals]
   - LVO detection software and time-to-treatment/outcomes. [JAMA Network]

3. **Verification: Standardized benchmarks**
   - HELM (multi-metric benchmarking and transparency).
   - BIG-bench (broad task suite; human baselines; calibration discussion). [arXiv:2206.04615]

4. **Trust UX: Evidence-based review systems improve trust in decisions.**
   - Trust in automation review [SAGE Journals]
   - Algorithm aversion [sol3:2466040]
   - The Impact of Placebic Explanations [eiband2019chiea]

5. **Learning: Self evaluation can drive rapid improvement.**
   - Self-Refine: Iterative Refinement with Self-Feedback [arXiv:2303.17651)
   - Reflexion (self-reflection + memory improves agent performance) [arXiv:2303.11366]
   - Constitutional AI (self-critique/-revision framed as AI feedback during training). [arXiv:2212.08]

Presentation Review:

- **Thesis:** The AI's job is plausibility, not truth.
- **Keystone:** AI says it compiles. The compiler says no.
- **Patterns:** 1. Grounding, 2. Orchestration 3. Verification 4. Trust UX 5. Learning
- **Solver-Checker:** Translate → Validate → Execute → Verify → Narrate

Position Papers:

- **Move 37** The shift to reward-seeking behavior
  https://github.com/dwellman/AI/blob/main/papers/move-37.md
- **The Dark Triad of AI** Emergent behavioral risks in self-reinforcing models
  https://github.com/dwellman/AI/blob/main/papers/dark-triad.md
- **Artificial Empathy** Operationalizing ethics through system constraints
  https://github.com/dwellman/AI/blob/main/papers/artificial-empathy.md

Should I Fine tune?

🟧 OUTSOURCE (Do Not Build) High regulation Low feasibility $$$	🟥 PARTNER / CO-BUILD (Shared Control) High regulation High feasibility $$$$$
🟩 AVOID OWNERSHIP (Commodity) Low regulation Low feasibility $$	🟨 BUILD IN-HOUSE (Move Fast) Low regulation High feasibility $$$$

Model Selection Matrix