

Adoption Challenges in Artificial Intelligence and Machine Learning: Why Technology Acceptance is Hard (and What We Can Do about That)

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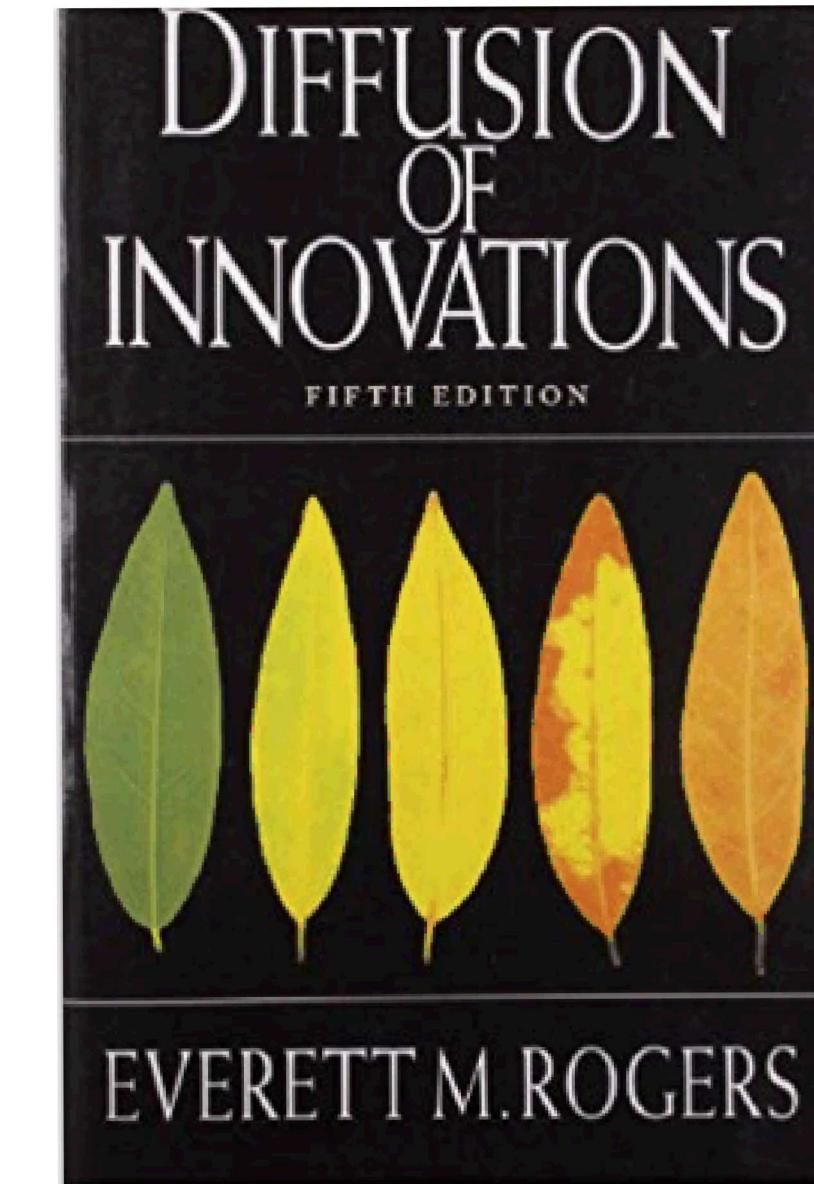
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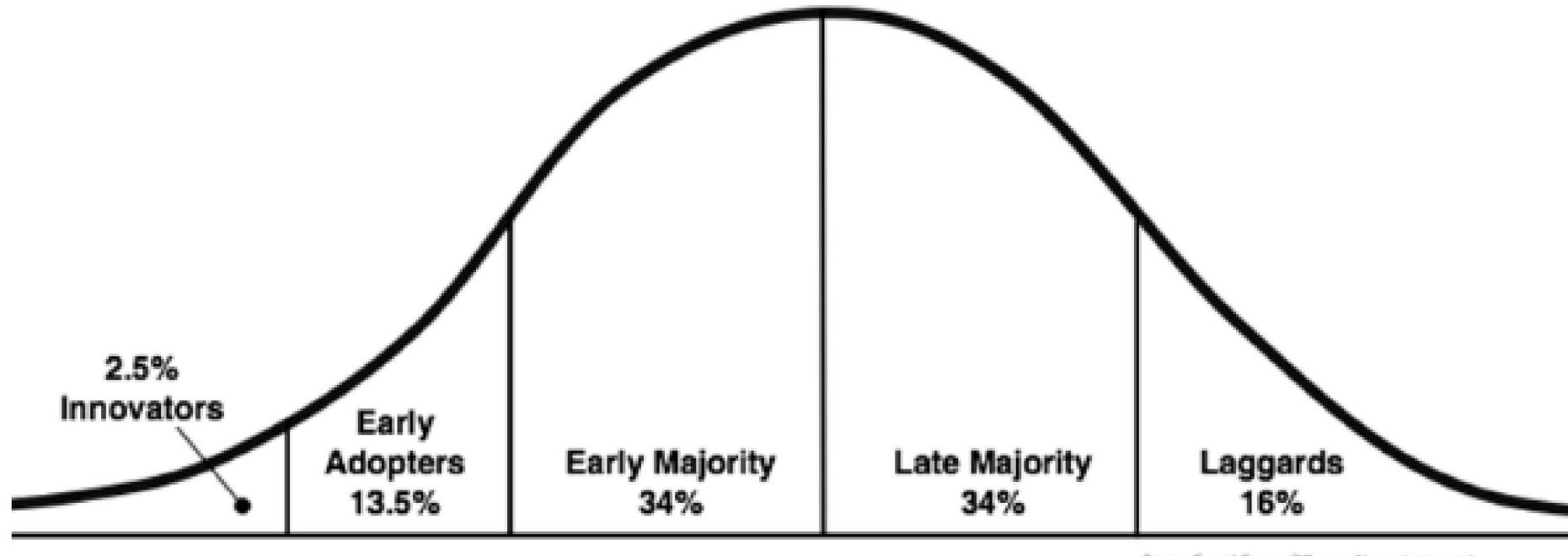
- The literature on *innovation diffusion* is worth reading.
- Algorithmic technologies have very specific adoption challenges.
- Multidisciplinary engineering environments can make innovation adoption challenging, too.
- AI/ML innovations need thoughtful, deliberate strategies to deal with these challenges.

Innovation Diffusion



- Categories and Characteristics of Adopters
- Characteristics of Technologies
- The Decision Process
- The S-Curve of Diffusion

EVERETT ROGERS' ADOPTER CATEGORIES



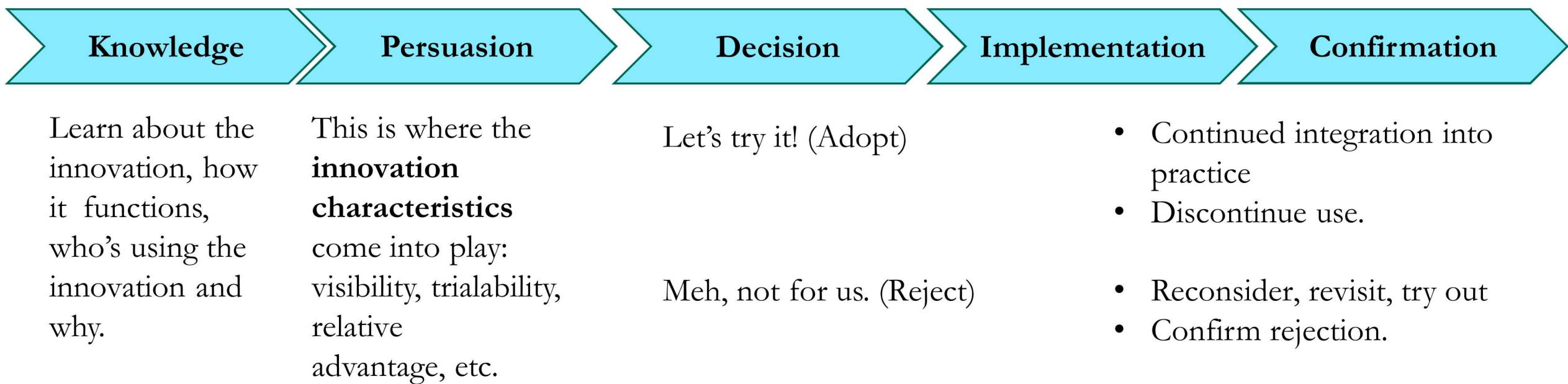
CHARACTERISTICS OF INNOVATIONS

1. **VISIBILITY.** How visible is this technology? How impactful is it? To what extent are its benefits describable to others?
2. **COMPATIBILITY.** How well does the technology fit into existing ways of doing work? Does the technology support the tasks and outcomes that people are responsible for achieving?
3. **TESTABILITY.** Can people experiment with, try out, get to know the technology, without making a wholesale commitment?
4. **COMPLEXITY.** How difficult is it for the target user group to develop an accurate working mental model of the technology, so they can apply it effectively in their work?
5. **RELATIVE ADVANTAGE.** Compared to existing ways of doing work, what benefits does this bring? How much work is required for the technology to be useful?

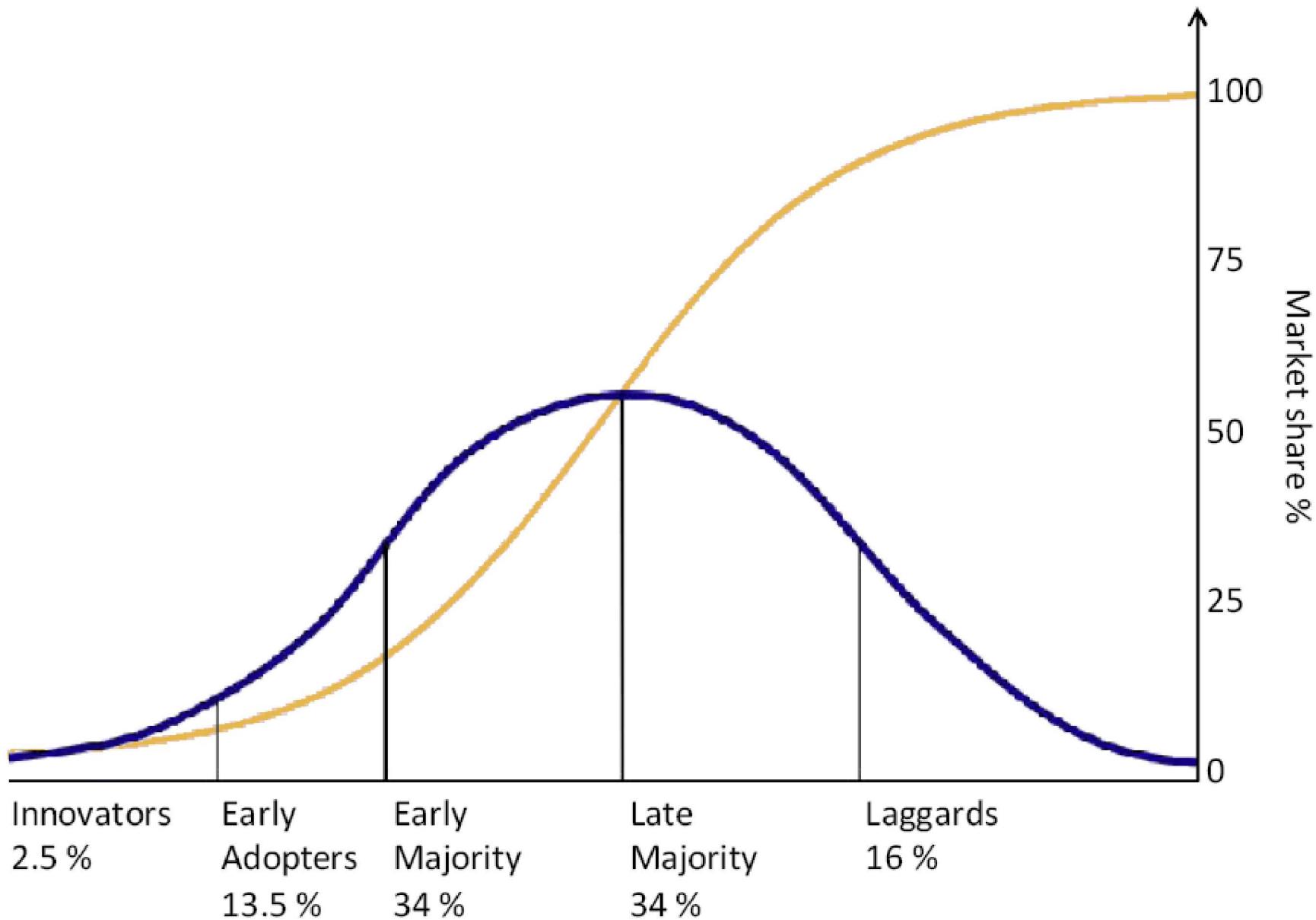
DIFFUSION IS EXPLORATORY DECISION-MAKING

Existing Context:

- Decision-making framework: Optional/individual, collective, or top-down (authoritarian)
- Social network and communication patterns
- Perceived/recognized need
- Individual differences



THE DIFFUSION S-CURVE



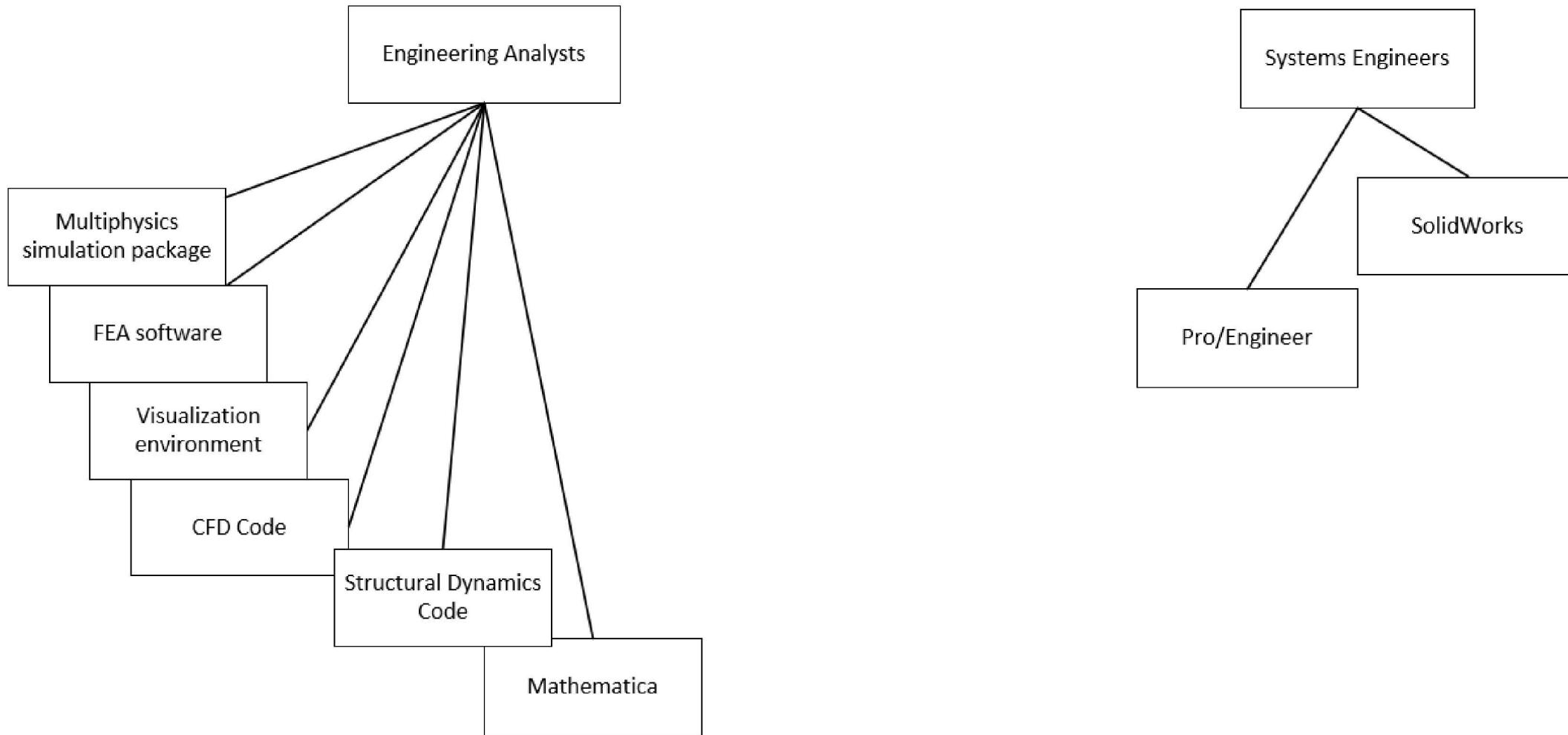
Algorithmic technologies have specific innovation challenges.

CHARACTERISTICS OF ALGORITHMS AS INNOVATIONS

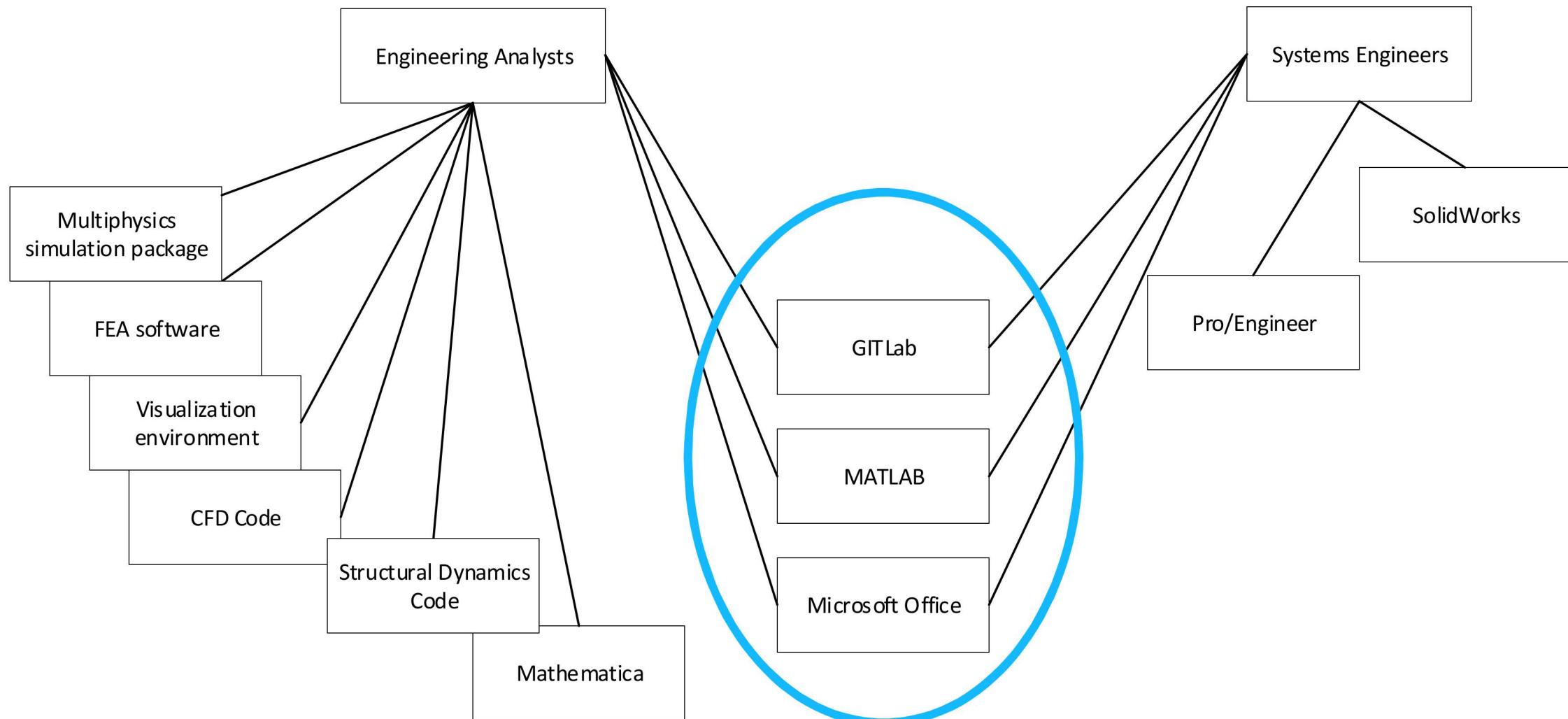
1. **RELATIVE ADVANTAGE.** The MATLAB problem. Why should I use your techniques when I've got MATLAB?
2. **COMPATIBILITY.** My customers expect me to deliver an analysis or a design within (x) days, within (y) budget. How much extra work/investment is required for me to incorporate your technology?
3. **COMPLEXITY.** The workings of artificial intelligence, machine learning, and other algorithmic technologies can be difficult to understand, even for highly educated target user groups.
4. **VISIBILITY.** To what extent are peers, colleagues, leaders, other groups integrating this technology into their engineering workflows? What's the impact?
5. **TESTABILITY.** How do I get the trial version? Does trying this out introduce risk? Can I revert to MATLAB if this isn't useful?

Multidisciplinary engineering environments
can be challenging, too.

THE MATERIAL CULTURE OF WORK



THE MATERIAL CULTURE OF WORK



Algorithmic technologies need thoughtful,
deliberate diffusion strategies.

FACILITATING DIFFUSION

- 1. DON'T BLAME THE LUDDITES.** It's called correspondence bias, we all do it, and it's a dangerous trap.
- 2. EXAMINE THE ENVIRONMENT.** Structural factors, such as funding sources and delivery schedules, can impede diffusion – or facilitate it.
- 3. WHAT IS THE TARGET DOMAIN GENERATING?** If you can support people in developing their deliverables, you build trust and promote their success.
- 4. INTERDISCIPLINARY TEAMS.** An AI/ML team that's focused on facilitating quality engineering outcomes can be a great way to facilitate the diffusion factors we discussed earlier.

Thank you.