Innovation Tools – Catalyzing Their Adoption

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Introductions

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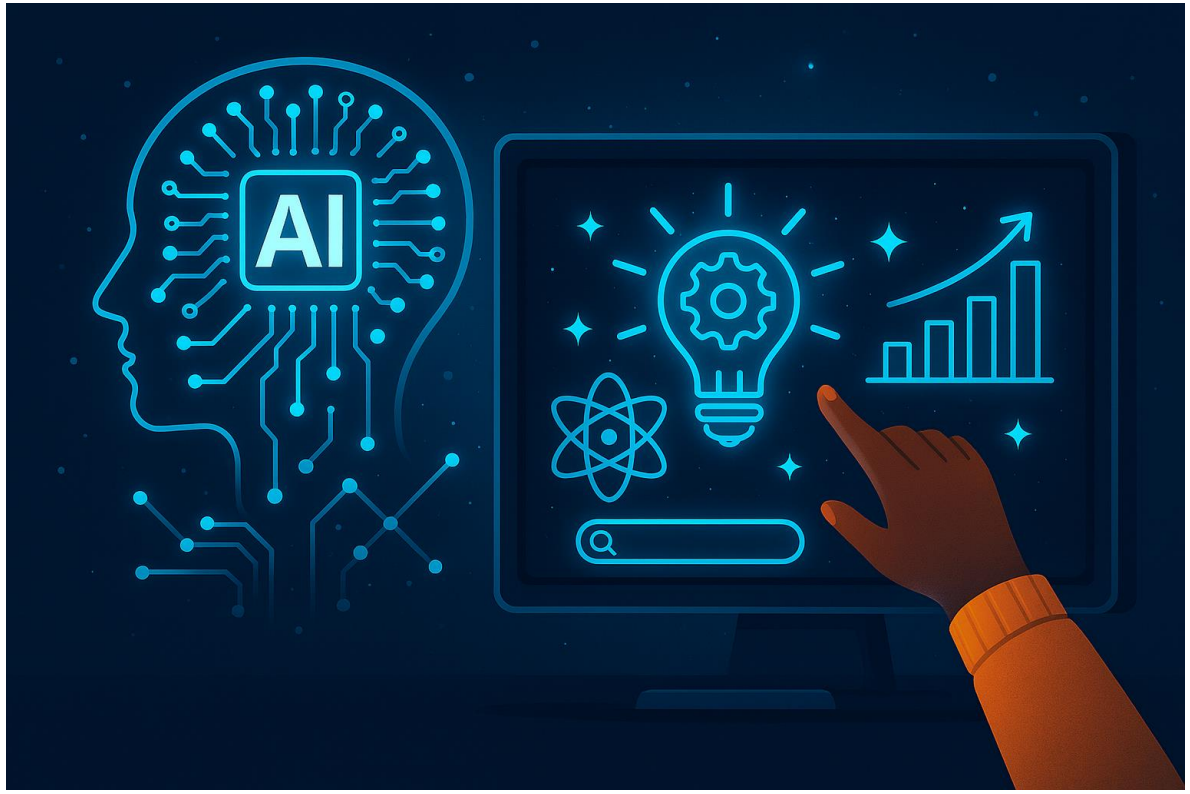
AI for Innovation

- **AI tools are proliferating in innovation**
  - Idea generation
  - Summarize customer insight
  - Product image generation
  - Novel material/protein formulations

What are best practices for implementing novel innovation methods and tools like Generative AI effectively in large R&D organizations?



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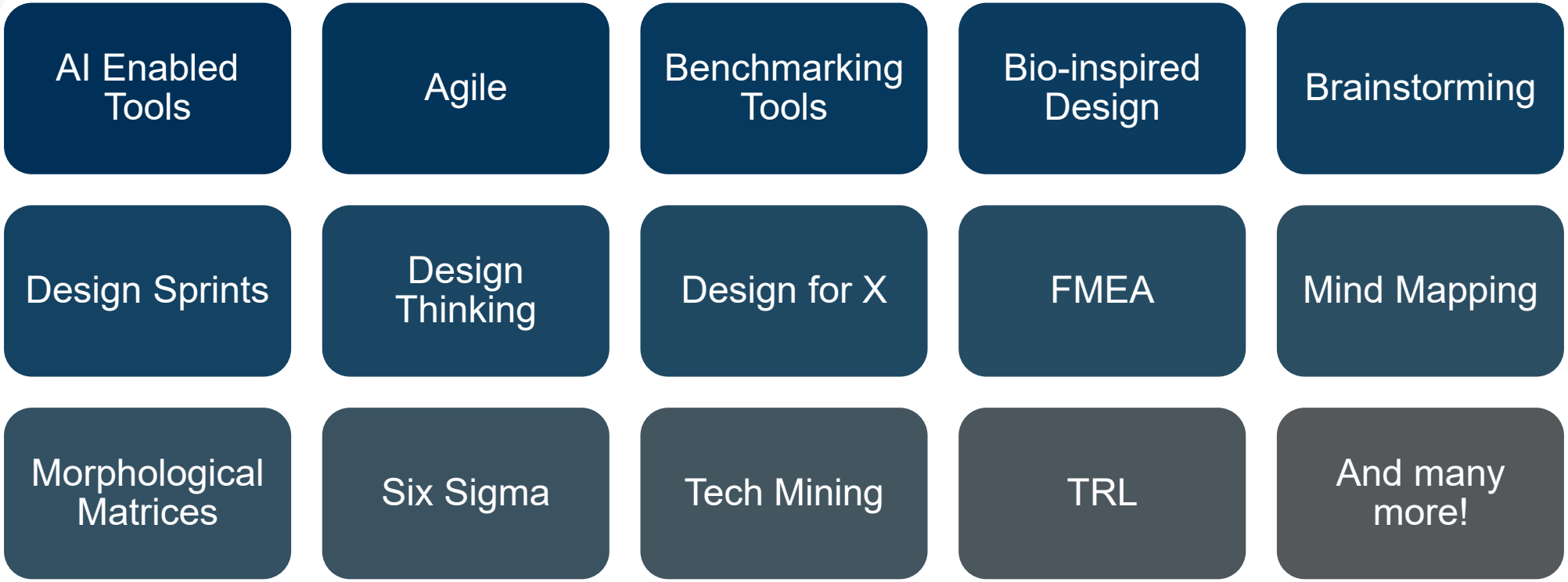
Innovation Methods, Tools, and Processes



We use the term '**Methods**' to refer to all the above

We exclude innovation portfolio management

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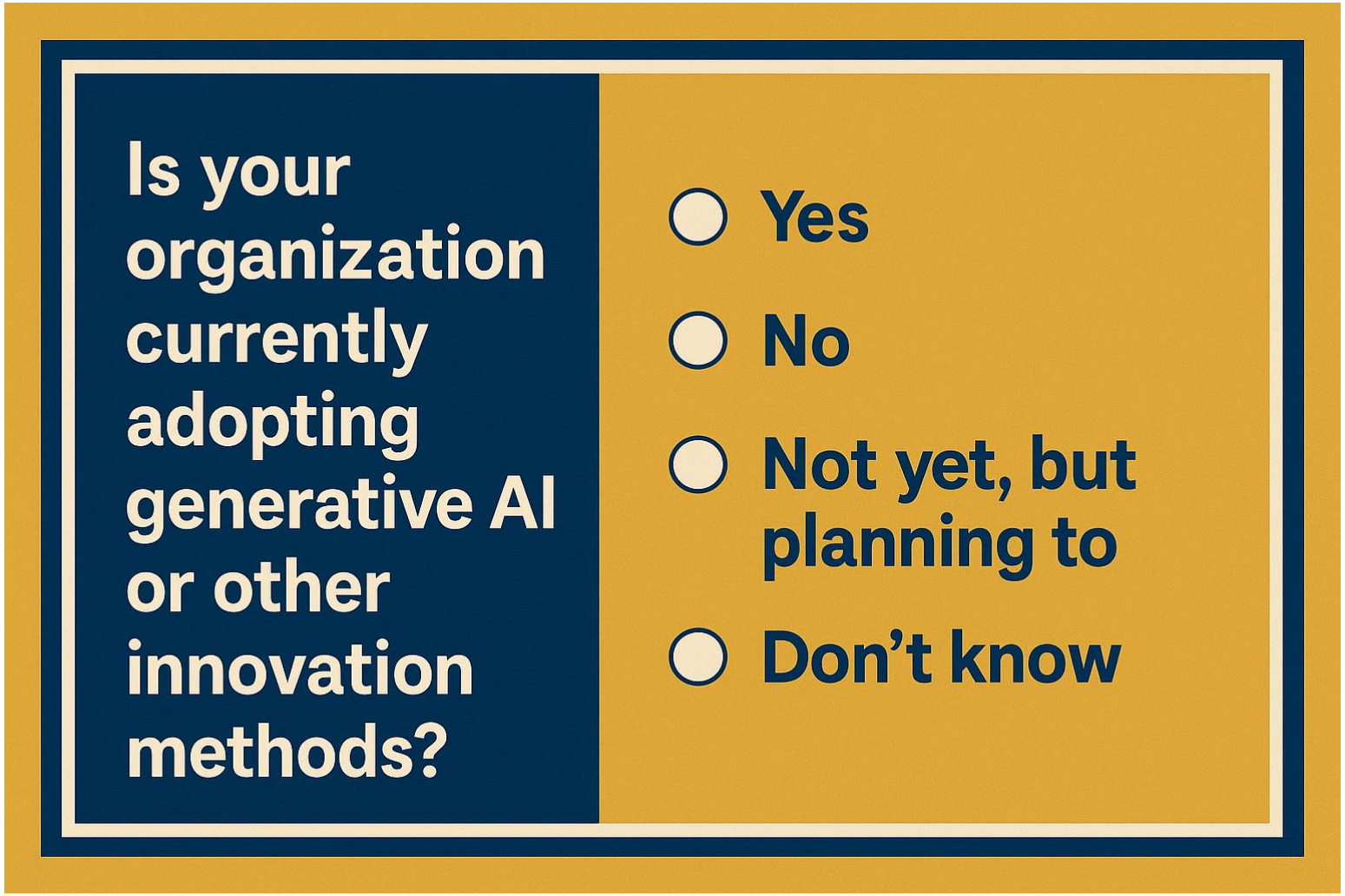
Method adoption challenges in Industry

- **Many methods struggle to achieve widespread implementation**
  - Struggling with mixed adoption
  - Failure to translate across domains
  - Difficulty overcoming cultural differences

Bio-inspired design	• Produced many valuable devices but is not embraced by many industry sectors
Agile	• Revolutionized software development, implementation in physical product development faces challenges
Design Thinking	• Industry sectors seeing value in serving customers, but measuring impact is difficult

Poll



(Excluding innovation portfolio management methods.)

Discussion (5 min)

What challenges have you seen in the adoption of new innovation methods?

Please include additional thoughts and questions in the chat.

Goals of NSF Magnifying Innovation

With respect to the adoption of new design methods and tools at large industrial and governmental organization R&D teams:

1. Understand How and Why
2. Discover the Barriers and Catalysts
3. Identify and Transfer Best Practices

National Science Foundation
WHERE DISCOVERIES BEGIN

Award #2230550: Magnifying Innovation:
Understanding Organizations' Adoption of Novel Design Practices

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Our Research Process

Thread 1

Innovation Adoption Interviews

- Exploratory study
- 60 interviews in up to 7 participating organizations

Thread 2

Innovation Adoption Surveys

- Online survey
- >200 participants across many organizations

Thread 3

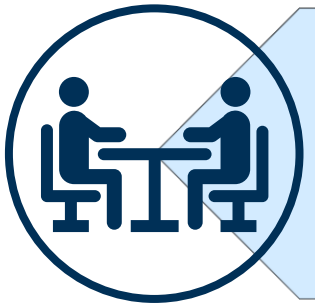
Innovation Adoption Observational Studies

- Tailored workshops
- Classes
- Joint projects at participating organizations

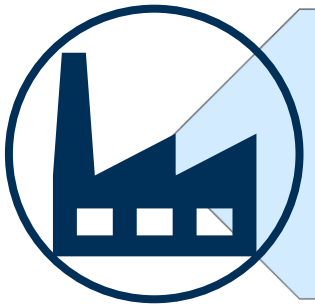
Industry Interviews

Industry Survey

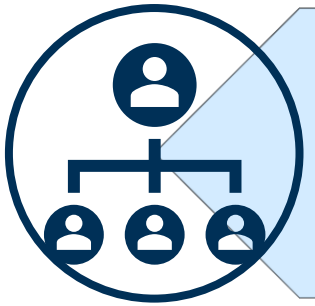
- Developed using results of interviews
- Capture insight from wider audience
- Verify findings



In-depth discussions with industry professionals



Targeting Fortune 500 companies



Individual Practitio
Managers, Execut

Broad, Industry-Focused Survey

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ORGANIZATIONAL FACTORS

Leadership

1. Executive sponsorship
2. Executive buy-in
3. Understanding of costs & benefits
4. Influential individuals championed method

Organizational Fit

1. Org domain & products fit method
2. Org accounted for local needs
3. Consistent language for method
4. Results met expectations

Organizational Resourcing

1. Little to no turnover in personnel
2. Financial investment
3. Sufficient personnel
4. Dedicated team for implementation
5. Provided continued support
6. Access to subject matter experts
7. Institutional knowledge

Organizational Change Culture

1. Comfort with learning from failure
2. Effective change management
3. Mandated use of method

PRACTITIONER & METHOD FACTORS

Confidence in the Method

1. Successful internal use
2. Successful external use
3. Support from successful practitioners

Characteristics of Method

1. Formal structure
2. Low barrier to getting started
3. Leveraged large amounts of data
4. Transparent computer support

Practitioner benefits

1. Easy to use
2. Results not obtained elsewhere
3. Method saved time
4. Direct benefits

Characteristics of Practitioner

1. Prior awareness of method
2. Alignment with work approach
3. Enjoyment
4. Open to change
5. Risk tolerant

Method Training

1. Training showed context
2. Included relevant examples
3. Demonstrated clear value

Organization Fit

- **Method must match the organization culture and existing processes**
  - The organization's domain and products fit the method well
  - The organization accounted for local needs (e.g., markets, geography)
  - The organization had consistent language for the method
  - Results met expectations

Full list of Catalysts and Barriers

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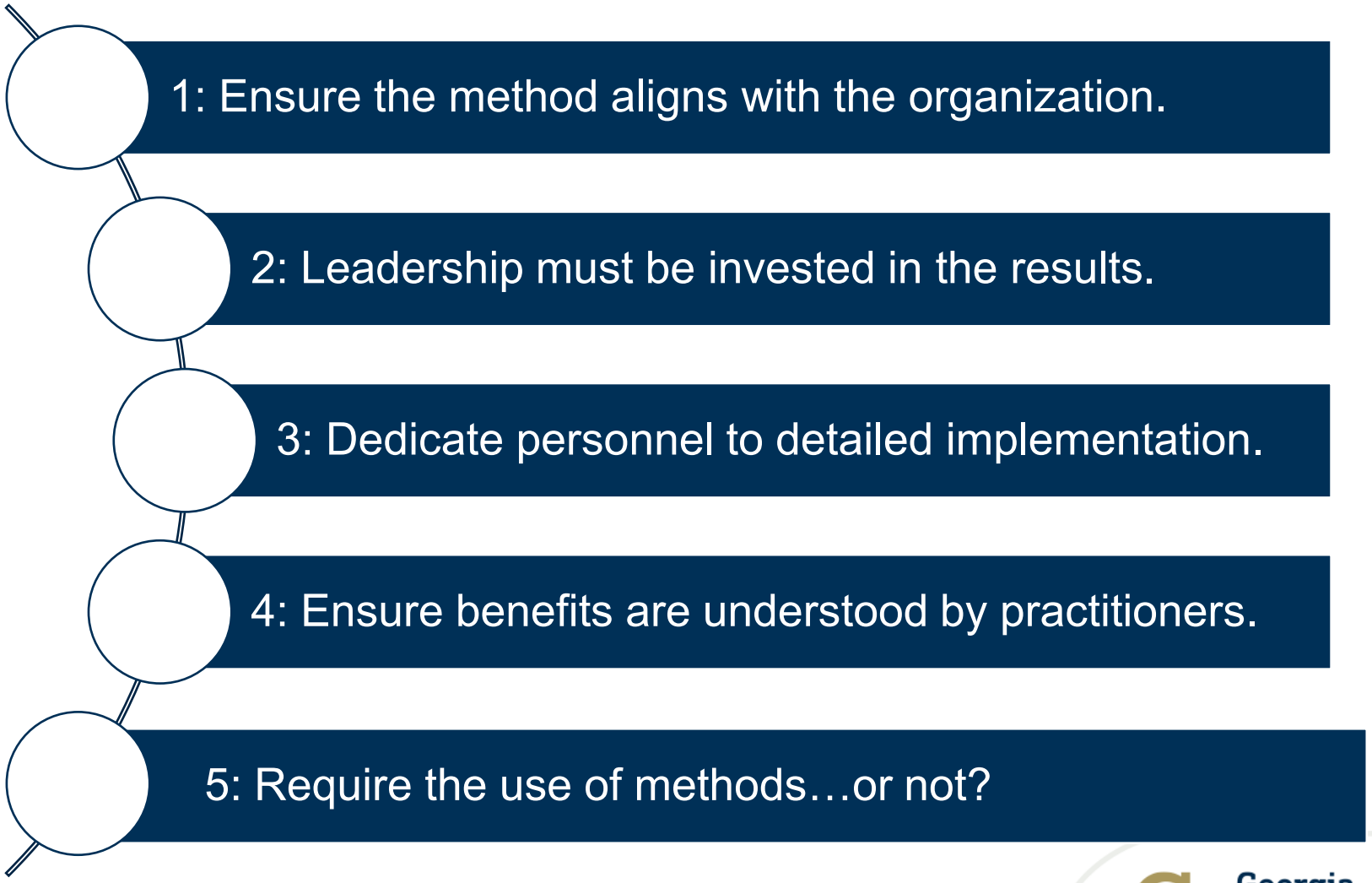
Preliminary Takeaways – Best Practices

Five early best practices emerged.

- We use *frequency* as a proxy for importance
- Analysis is independent of position or rank
- Best practices are interdependent – no panacea



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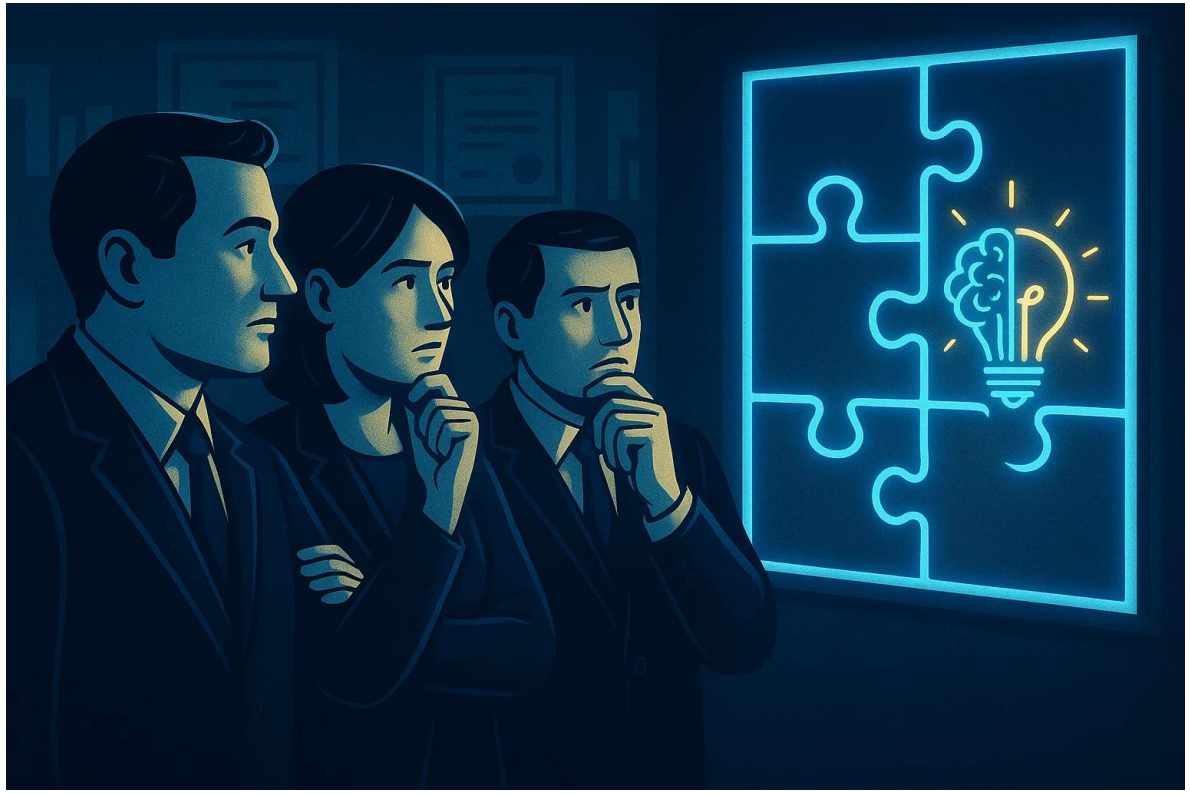
Best Practice 1: Ensure the method aligns with the organization.

- **Consider upfront investment to adapt tool to organization needs.**
  - Beware of one-size fits all.
  - Slow roll-out with iteration.
- **Relevant examples of success within organization (or very similar case study).**
- **Not invented here vs “roll your own”**
  - Not all organizations are sufficiently skilled to implement modern tools
  - We can do this ourselves, but should we?



Best Practice 2: Leadership must be invested in the results.

- **Executive Buy-in**
  - Openly discuss the method
  - Link to the success of the company.
  - Align managers with executive messaging.
  - *Leaders ask for the results of method; use those results to inform decisions.*
- **Leadership Understands the Tool**
  - Discuss the cost and benefits of the method, especially *from the perspective of the practitioner.*
- **Dedicated Resources**
  - Dedicate resources to the successful roll-out and support of the tool.

Best Practice 3: Dedicate personnel to implementation.

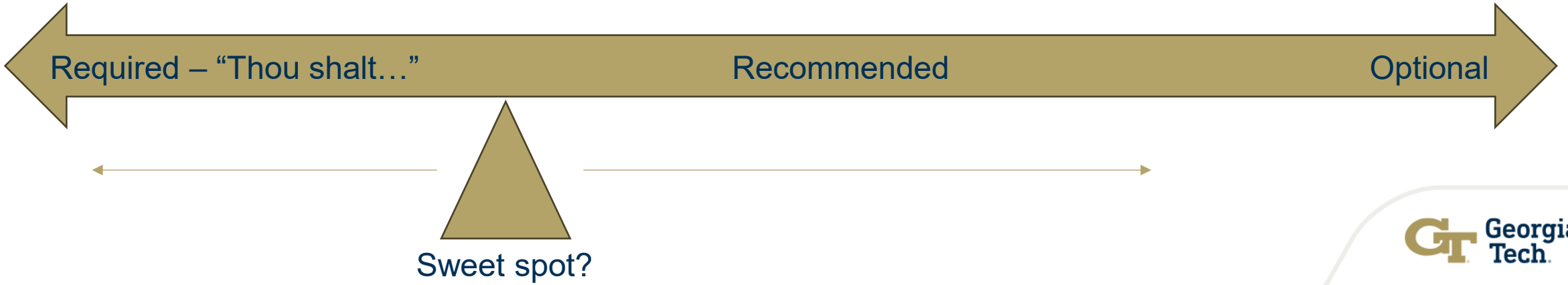
- **Dedicated adoption team**
  - Budgeted time & funding.
  - Team should be responsive to feedback; practitioners should feel heard.
  - Model side-by-side learning between expert practitioners and new adoptees.
- **Learning from failure should be encouraged**
- **Encourage consistent terminology, use, and training**

Best Practice 4: Ensure benefits are understood by employees

- **Benefits must warrant training and additional cost to use (if any).**
  - #1 Saves Time, or
  - Otherwise makes life easier
- **Increases the perceived value of employee's work product.**
  - Link to job performance.
  - Link to peer competition.
- **Increases the perceived value of the employee to the market.**
- **Provides value to the organization**
  - Benefits to the collective must be tied to the benefits to the individual.

Best Practice 5: Require the use of methods…or not?

- **Top-down mandates seen as both good and bad.**
  - Some initiatives require company wide adoption to be effective.
  - Practitioners may chafe when required: “this too shall pass.”
  - “Soft” requirements such as inclusion in stage-gate justifications, perception of peer competition, performance reviews.
  - May force out change resistant; risks marginalizing existing experts.



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Open Discussion

- **Discussion Questions**
  - Is there anything that's missing?
  - Is there anything that particularly resonates with you?
  - What can we do to increase the value of this research to industry?

Survey

- Quickly provide your perspective on the adoption of design methods in industry

Broad, Industry-Focused Survey

Interviews

- Provide your detailed perspective on adoption while gaining third party insight and customized feedback from the research team

Interview Interest Contact Page

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Thank you!

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Full list of Catalysts and Barriers

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Broad, Industry-Focused Survey