

# Unlimited Potential – Leveraging the Power of Mind in Design

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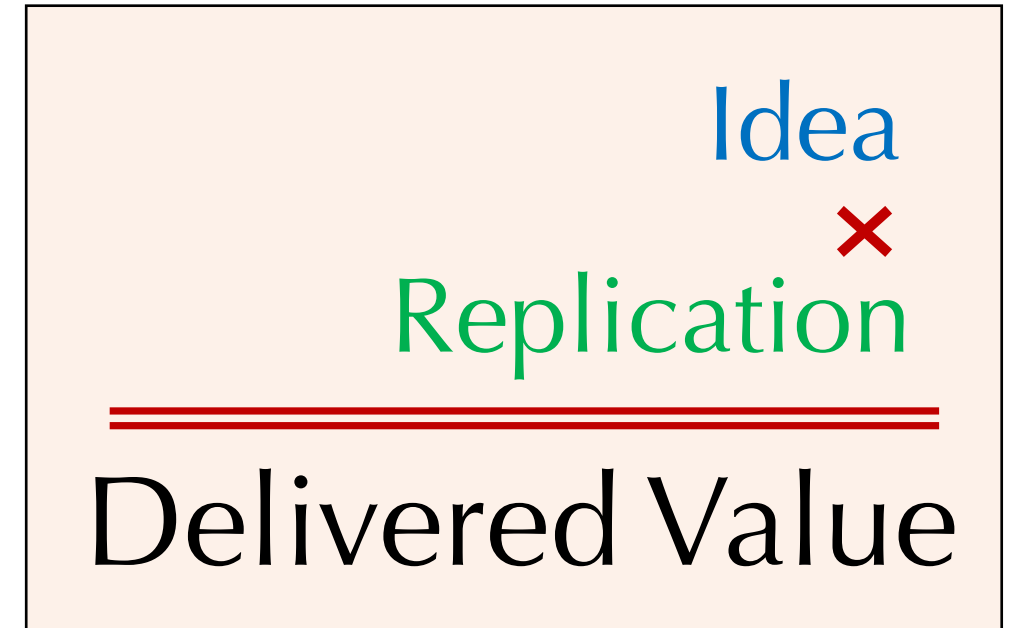
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# The Potential to Improve

- 100 years ago both design and production were infants
- Production matured, and is today *at least* a thousand times more efficient
- By contrast, design is still in diapers
  - Messy
  - Unpredictable
  - Rich with untapped potential



*Perfect replication of a terrible idea is no better than terrible replication of a great idea.*

# An Era of Exponentially Advancing Technology

- Processing, storage, connectivity
- 3-D CAD, CFD, VR, AR
- Spacecraft now well beyond the limits of our Solar System
- Atomic scale rearrangement of matter
- Genetic manipulation of life itself
- Emergence of artificial intelligence



*Technology now allows virtually anything that humans can imagine to be made a reality.*

# An Era of Exponentially Expanding Access

- Entrepreneurs
- Marginalized professionals
- Maker community
- Students
- Retirees



*Access introduces an unprecedented number and diversity of new design thinkers.*

# An Era of Exponentially Enabled Connection

- Anyone
- Anywhere
- Any topic
- Now has a social network constituency
- Or can generate one in seconds



*Connections form rapidly, creating flash markets and punishing perceived error with equal efficiency.*



# But Also Creating An Era of Exponentially Growing Needs

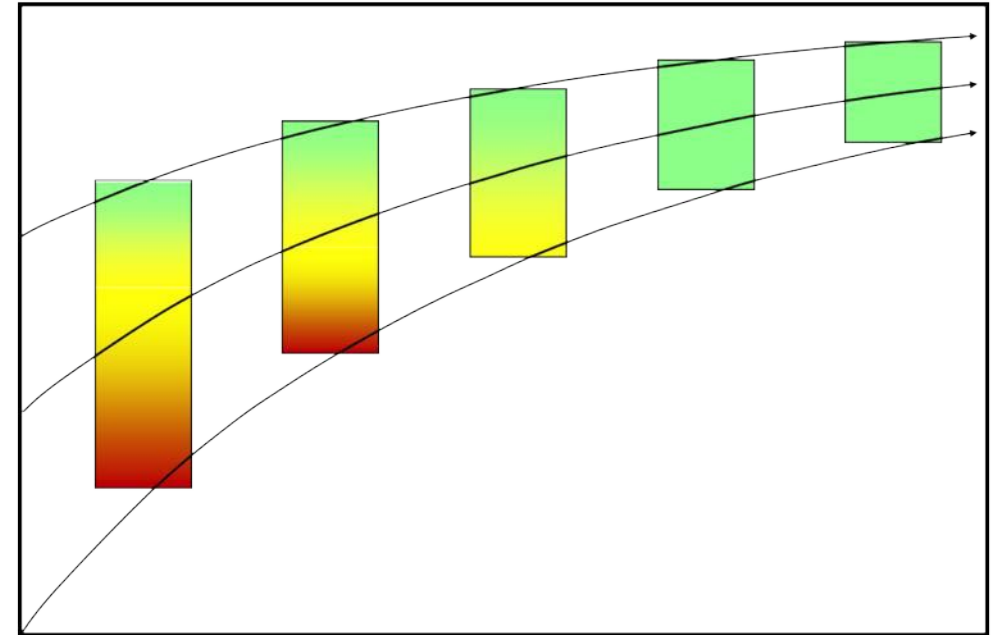
- Energy
- Environmental
- Medical
- Social, Legal, Political
- Infrastructure
- Traditional and Cyber Defense
- STEM Workforce
- Technically Literate Voters



*Humanity has always had unmet needs, often our “solutions” just create increasingly difficult needs.*

# Design Must Respond with Exponential Improvement

- Stable = Dead
- Evolution is tolerated
- Disruption is expected
- Systems of Systems
- Stakeholders everywhere
- Competitors everywhere
- Weakness exposed immediately



*Accomplished by raising the floor and the middle first, then the top of the skill distribution.*

# Design Progress is a Vector Sum

- Definition is altitude
- Execution is velocity
- You need both to reach orbit



*Definition and execution are simultaneous variables that together determine progress.*



# Exponential Design Improvement Requires Intellect

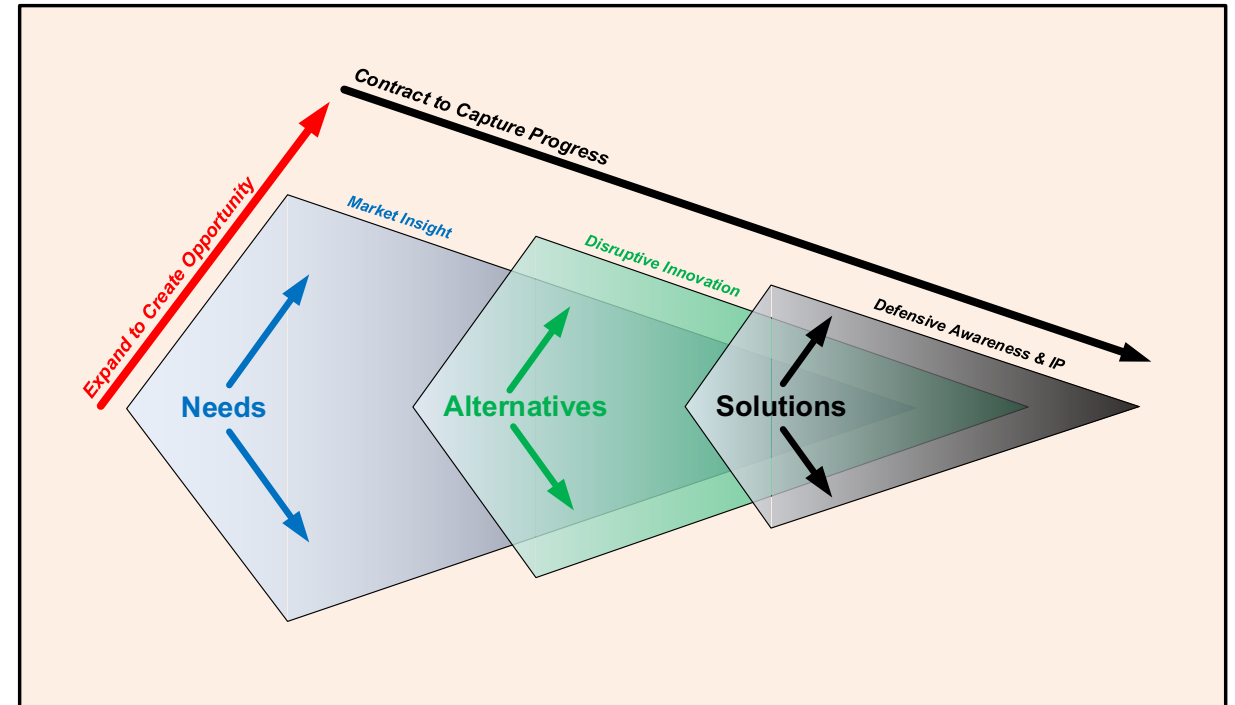
- In key roles
  - Stakeholder Interaction
  - PM
  - Engineering
- At critical decision points
  - Scope
  - Requirements
  - Architecture and Design
  - Risk Acceptance
  - Cost / Schedule / Technical tradeoffs



*Seek to function as a single “design-mind”, with all skills and relevant interactions supported.*

# Where Value is Created and Lost

- Potential is created during expansion cycles
- Potential is captured or lost during contraction



*Potential is unlimited in nature, fractionally identified during design, and fractionally captured thereafter.*

# Expansion Creates Potential

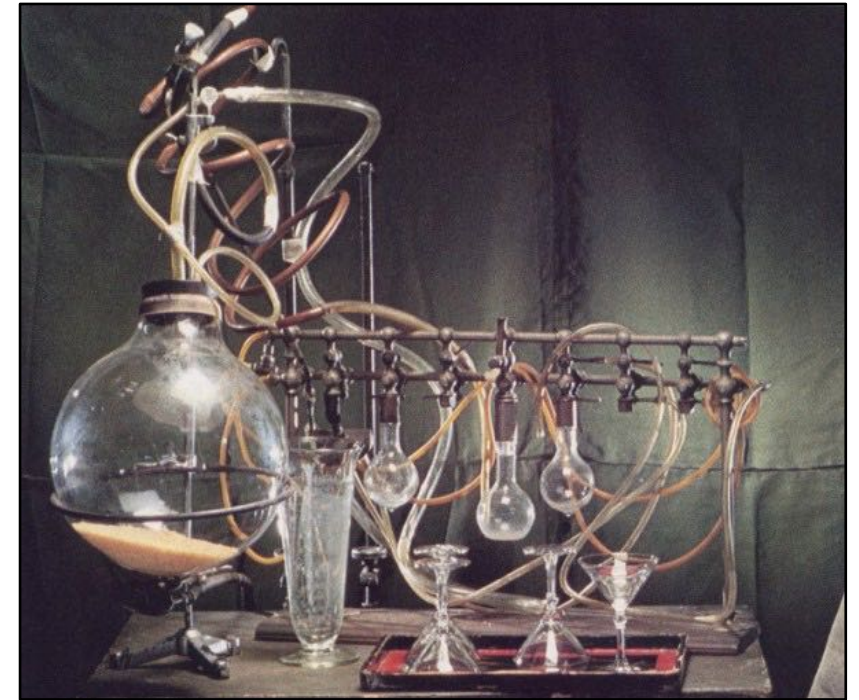
- User & Market insight
- Exploration of technology
- Alternate approaches
- Alternate architectures
- Alternate embodiments
- Defensive awareness and IP
- Learning opportunities



*During expansion, strive to identify all potential benefit deemed worth chasing.*

# Contraction Captures Progress

- Resolve conflicting needs
- Establish requirements
- Baseline management
- Reduction to practice
- Bridge to production
- Continuous improvement



*During contraction, seek to lose as little identified potential as possible.*



# The Mind is a Defense Against Failure

- People who understand, not just obey, are essential
- They act like antibodies to defend the effort
  - Against poorly crafted policy and process
  - Against short term optimization
  - Against conflicting goals and rewards
  - Against remaining stuck in the present



*Intellect offers a design immune system, but only if you allow people freedom to act.*

# The Mind Enables Learning from Mistakes

- Learning offers you a “dividend-check”
  - IF you know how to uncover it
  - AND you cash it before it expires
  - THEN compounding can make you rich
- Difficult to warn people who do not yet feel at risk



*Wanting to help is not enough, you must first gain the attention and trust of those you wish to serve.*

# Conclusion

- We live in an era of exponentially expanding
  - Technology
  - Access
  - Connection
  - Needs
- Design must respond with exponential improvement
  - Intellect in key roles and decision points
  - Creating potential and capturing progress
- We must leverage the power of the human mind
  - As an “immune system” that protects against failure
  - To recognize critical opportunities for learning and improvement



Questions?

**Thank you for attending!**  
**Share your experiences at #HWGSEC**

