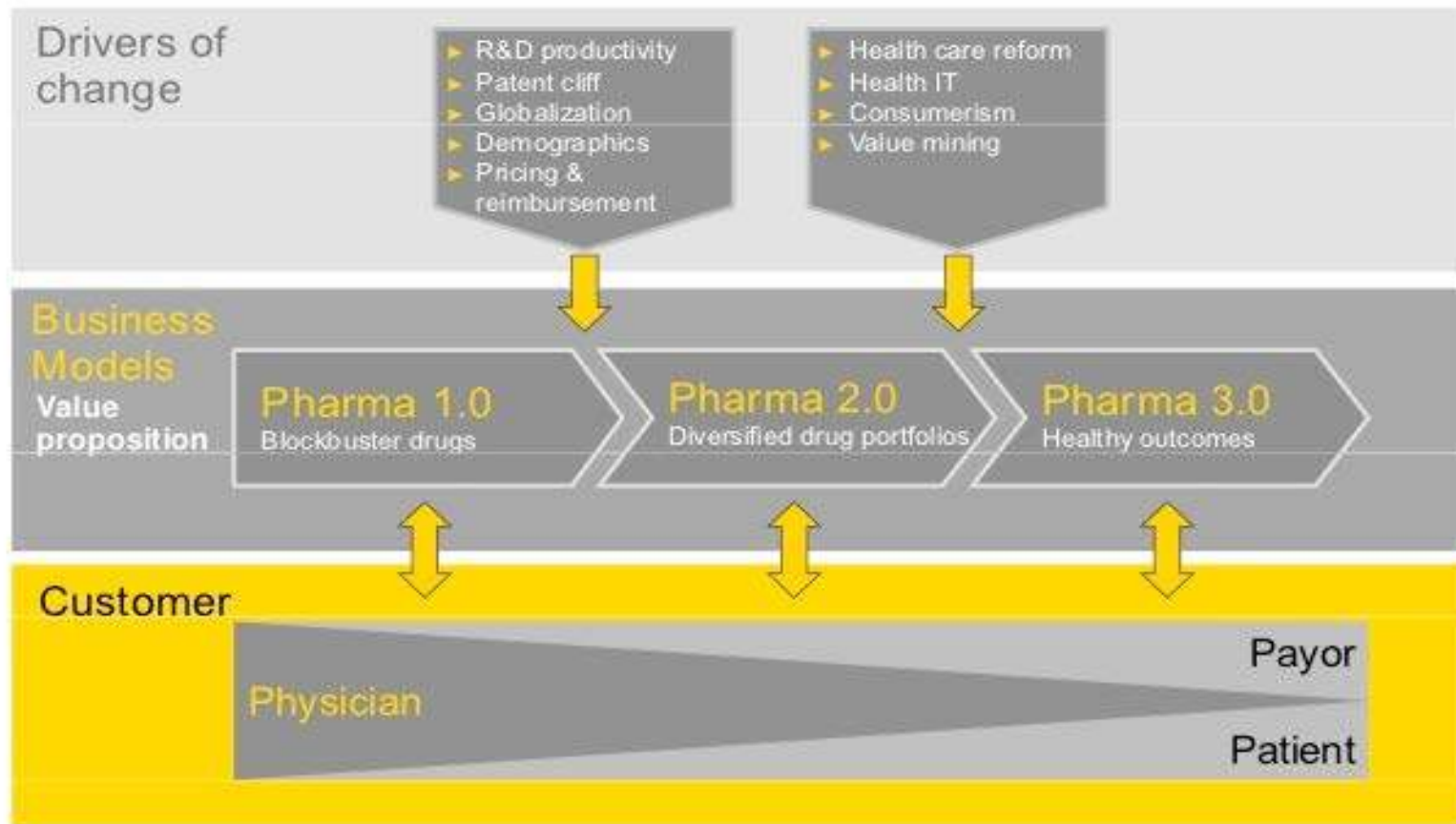


Emerging Open Innovation Business Models to Accelerate Innovation in Biopharma

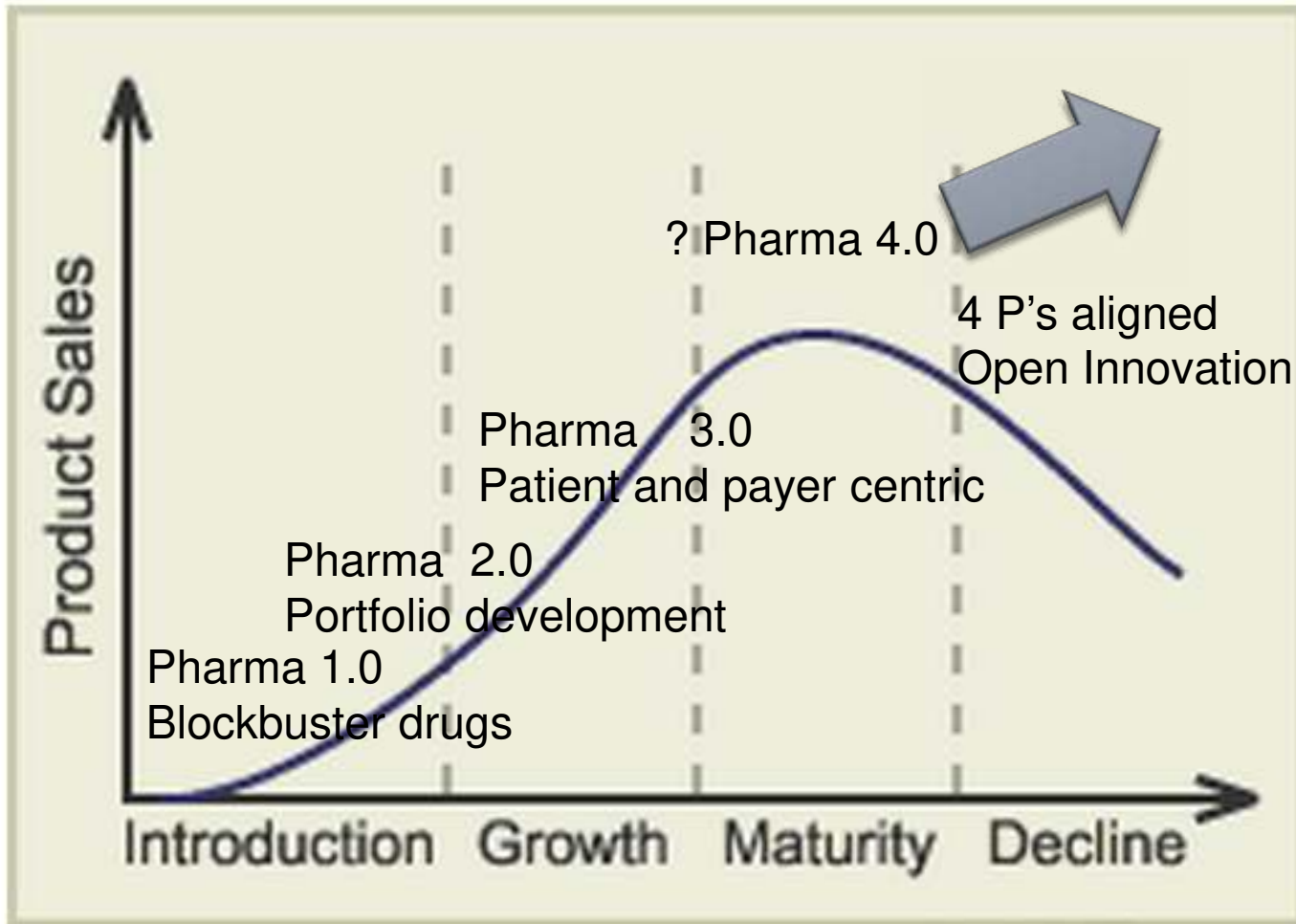
***Arthur A. Boni, PhD & Christopher W. Moehle, Ph.D
J. Commercial Biotechnology, Vol. 20, pp. 37-44 (2014)***

Pharma 3.0

From drugs to healthy outcomes



Product Life Cycle Diagram



Evolution of “new DNA” for Biopharma Industry

- Pharma 3.0 (and beyond)
 - Healthy Outcomes
 - User centric, focused on wellness and prevention
 - New collaborative business models and partners
 - Disruptive and sustained innovation
 - Social media, mobile health, open innovation, networked



DNA for Collaborative Innovation

An open innovation ecosystem (from Chesbrough)

- Collaborative networks – “outside in” and “inside out”
- Private/public partnerships

Cross-disciplinary, collaborative teams working across the product life cycle (from Pisano; Boni et al)

- Organizational structures to “translate research and technology from laboratory to market” efficiently
- Technology, Business, Design, + ---

5 behavioral traits: “base pairs” (from Christensen et al)

- Questioning, Observing, Experimenting, Networking + Associative Thinking (connecting the dots)

Three Fundamental Lessons

1. Focus on creative value sharing
2. Create stage-appropriate financing vehicles (to cross “valley of death”)
3. Develop and grow “seasoned” management teams through collaborations, accelerators, etc.

Lesson 1: Focus on Creative Value Sharing – the Collaborative Team

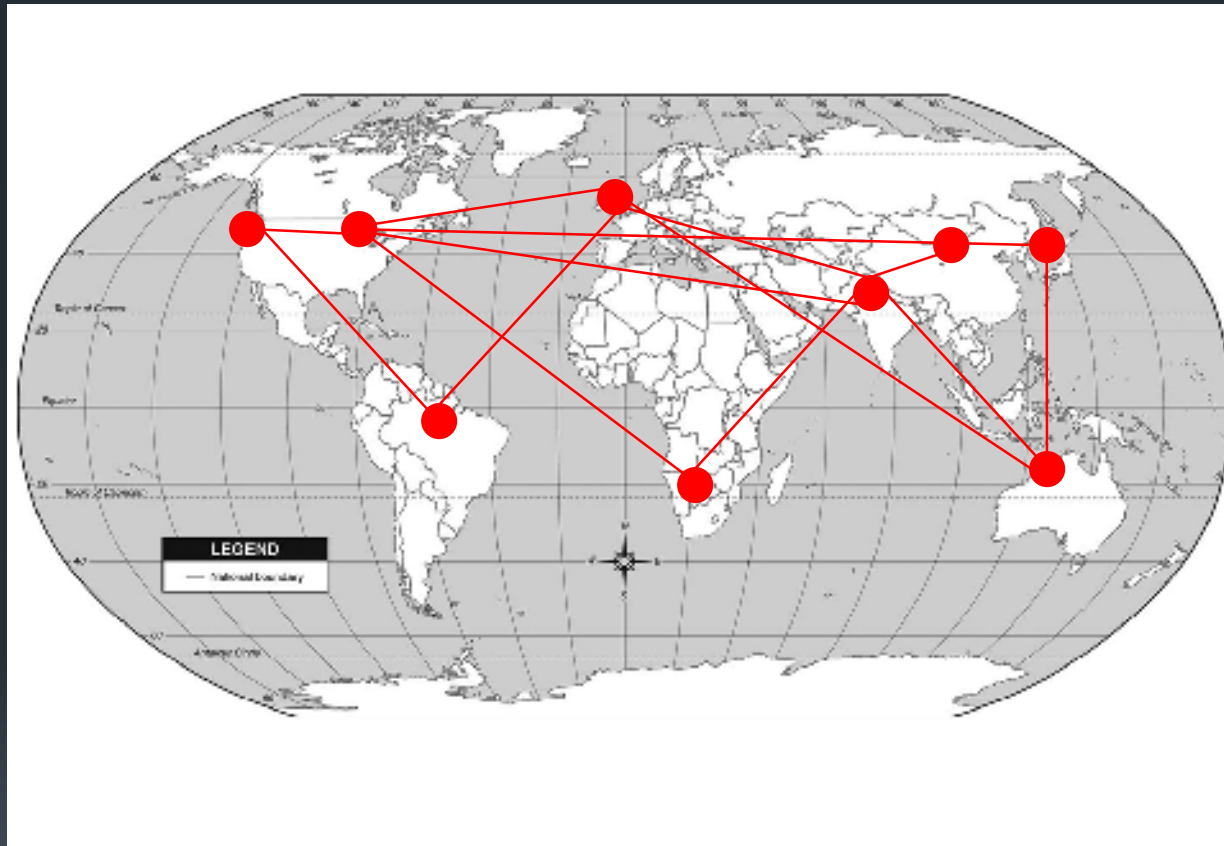


Leverage academia, emerging companies, and industry to form extended teams across the value chain.

Ex 1: Eli Lilly's FIP Net Model Spans the Biopharma Value Chain and Globe

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Ex. 2: *Enlight Biosciences*

Created by Pure Tech Ventures

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Consortium leverages selected market - driven opportunities

Lesson 2: Create “Stage Appropriate” Financing Vehicles

- Create “stage appropriate” financing vehicles for “crossing valley of death” from laboratory to clinic to patient
 - Third Rock Ventures – ab initio formation and growth of Foundation Medicine using open innovation principles learned at Millennium Pharmaceuticals
 - The Harrington Project/BioMotiv
- Partnerships, staged financing, team building from experienced industry “veterans”

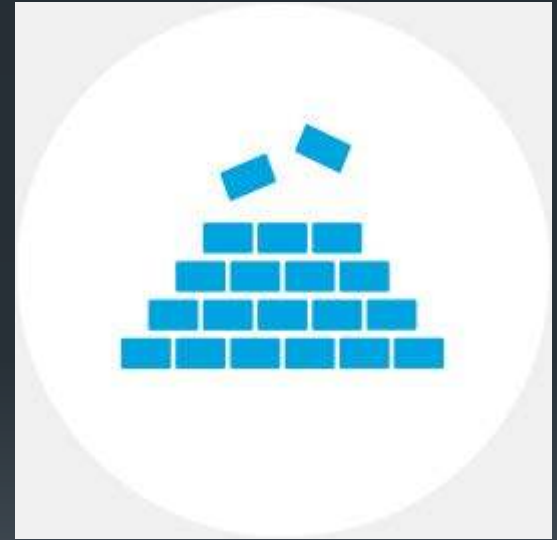
Ex 1: Third Rock Ventures



Discover



Launch



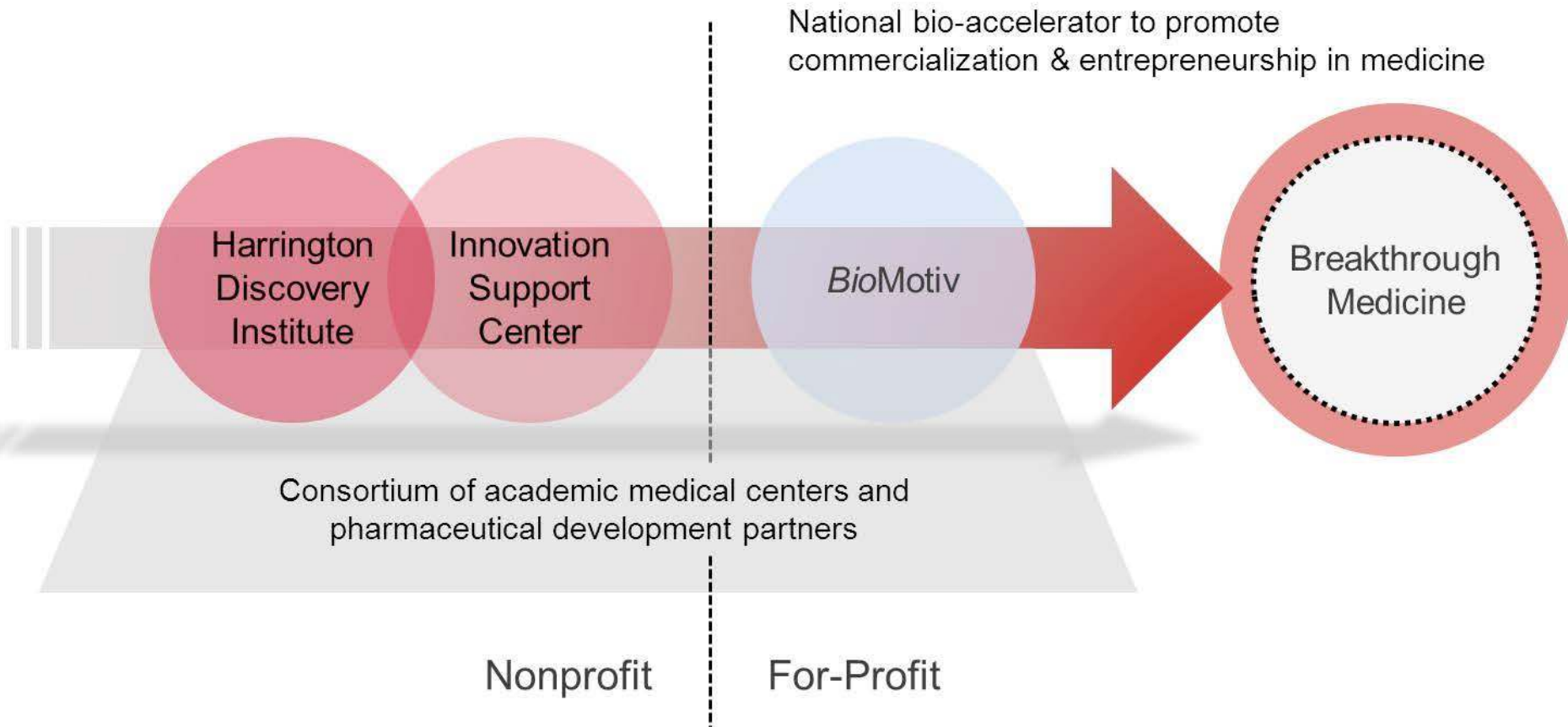
Build

Foundation Medicine – leadership in personalized medicine

Ex. 2 - Harrington/BioMotiv

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Lesson 3: Grow “Seasoned” Management Teams

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Leverage Collaborations and Accelerators

CITRIX® StartupAccelerator



What We Do.



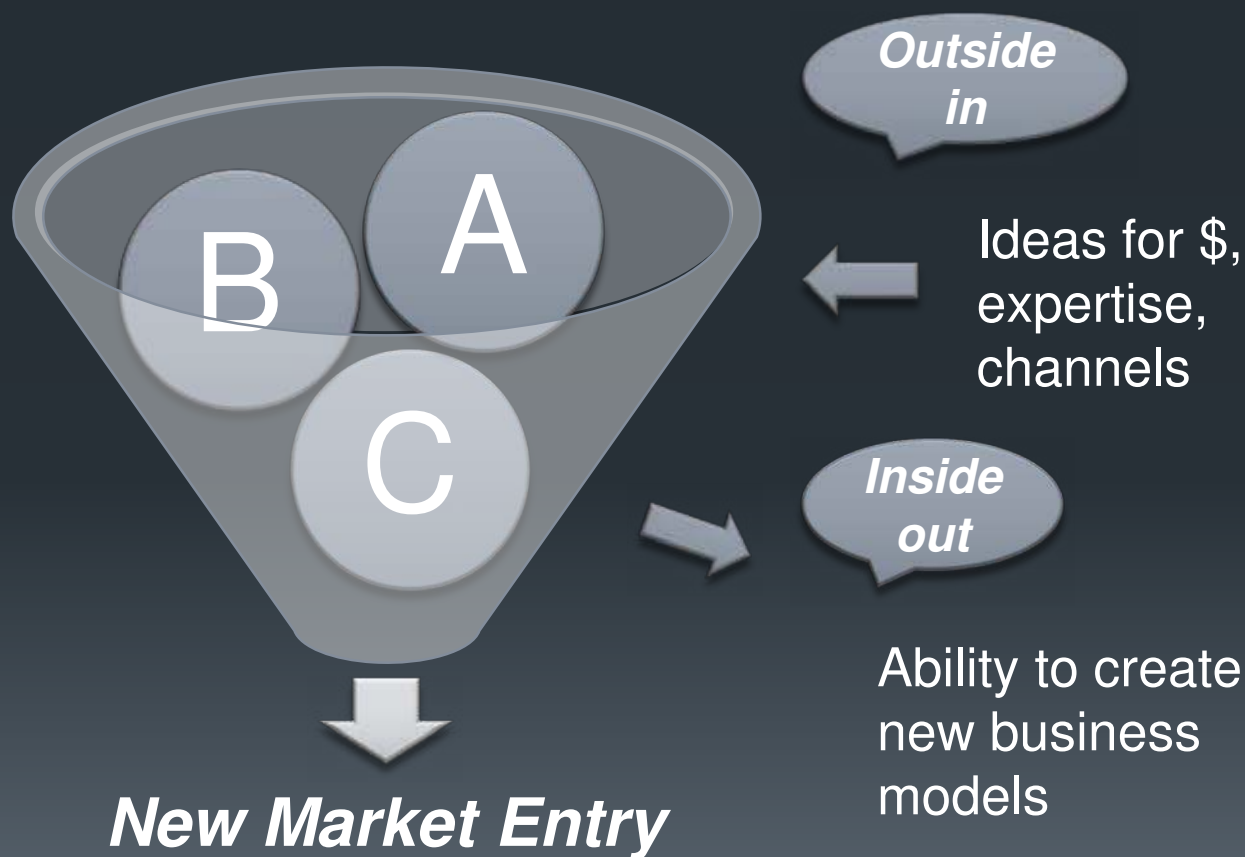
One example from enterprise software

Two Specific Best Practices

- Long development cycles and “high risk” suggest a need for a portfolio based approach
- Need to instill market focus very early in the process

Portfolio Based Approach

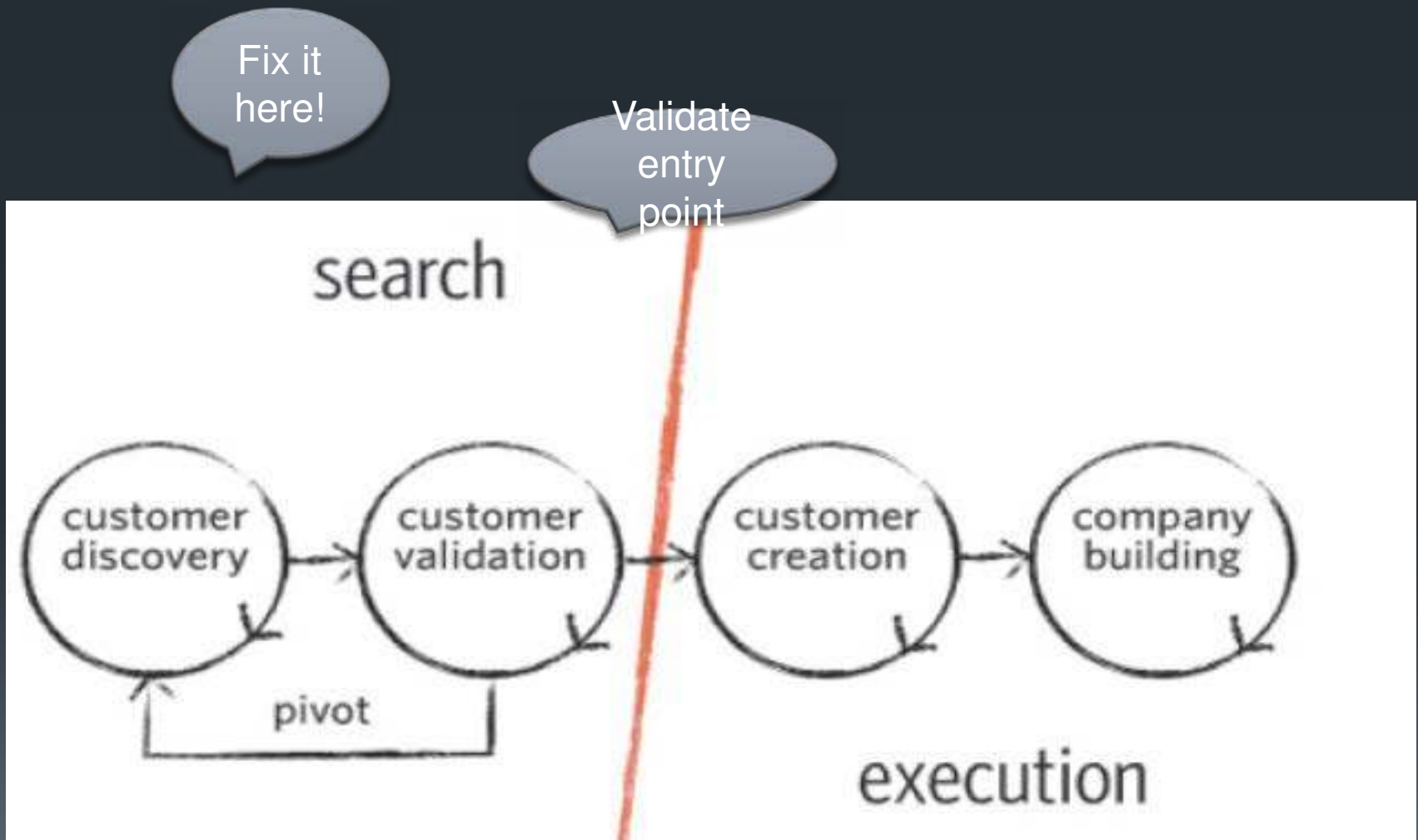
Open Innovation -
collaborative
development across
innovation ecosystem



Instill Market Focus Early

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Four Closing Principles That Apply¹⁸ Cross Industries

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▪ Operate Lean

- Keep cost of capital low while addressing product/market fit

▪ Agile Development

- Team business and technology expertise learn and adapt to market

▪ Creative Financing

- Use for profit and not-for-profit sources and partnerships

▪ Create and Grow Innovation Teams

- Collaborative interdisciplinary teams evolve thru commercialization phases
- But, some of the “DNA” embedded at the earliest stages must persist