Innovation and Entrepreneurship

ENTREPRENEURSHIP

- Identify a need or opportunity
- Create a solution - Innovation
- Implement solution to create value
- Harvest or other long-term strategy

"There is only one definition: An entrepreneur is someone who gets something new done."

"Innovation is the specific tool of the entrepreneur." Peter F. Drucker

Entrepreneurship Types and Risk and Rewards

1. Opportunity – based
2. Necessity – based

Young people 25-34 are dominant participants in entrepreneurship.

Risks:

- Business Failure
- Unpredictable Business Conditions
- Long Hours
- Product/Service compete on Price only
- Imitation strategy

Rewards:

- Financial
- Emotional – building a business
- Pride
- Recognition
- Flexibility
- Creativity

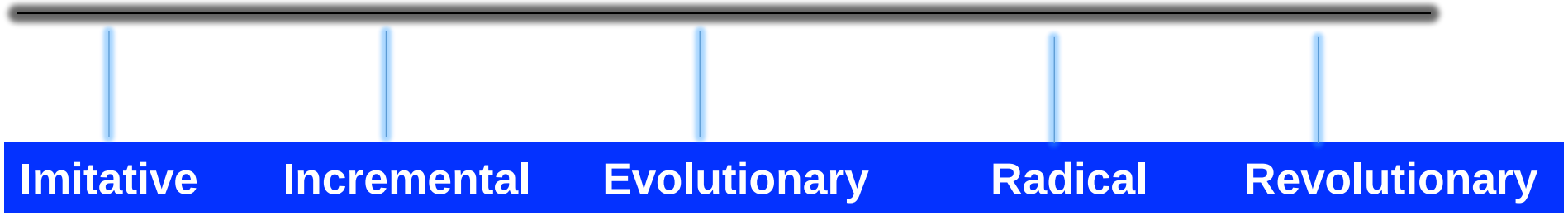
Entrepreneurship: The Art and Science of Building Value

Two Important Considerations for Entrepreneurs

- Innovation / Creativity
- Opportunity Identification

- **Art**: Creativity; Energy; Feel; Insight
- **Science**: Analysis; Discipline; Systematic Approach

Continuum of Innovation



Imitative: copies something well-known and accepted

Incremental: small improvements; faster, better, cheaper

Evolutionary: new to firm but not to world (i.e., technologies in new places)

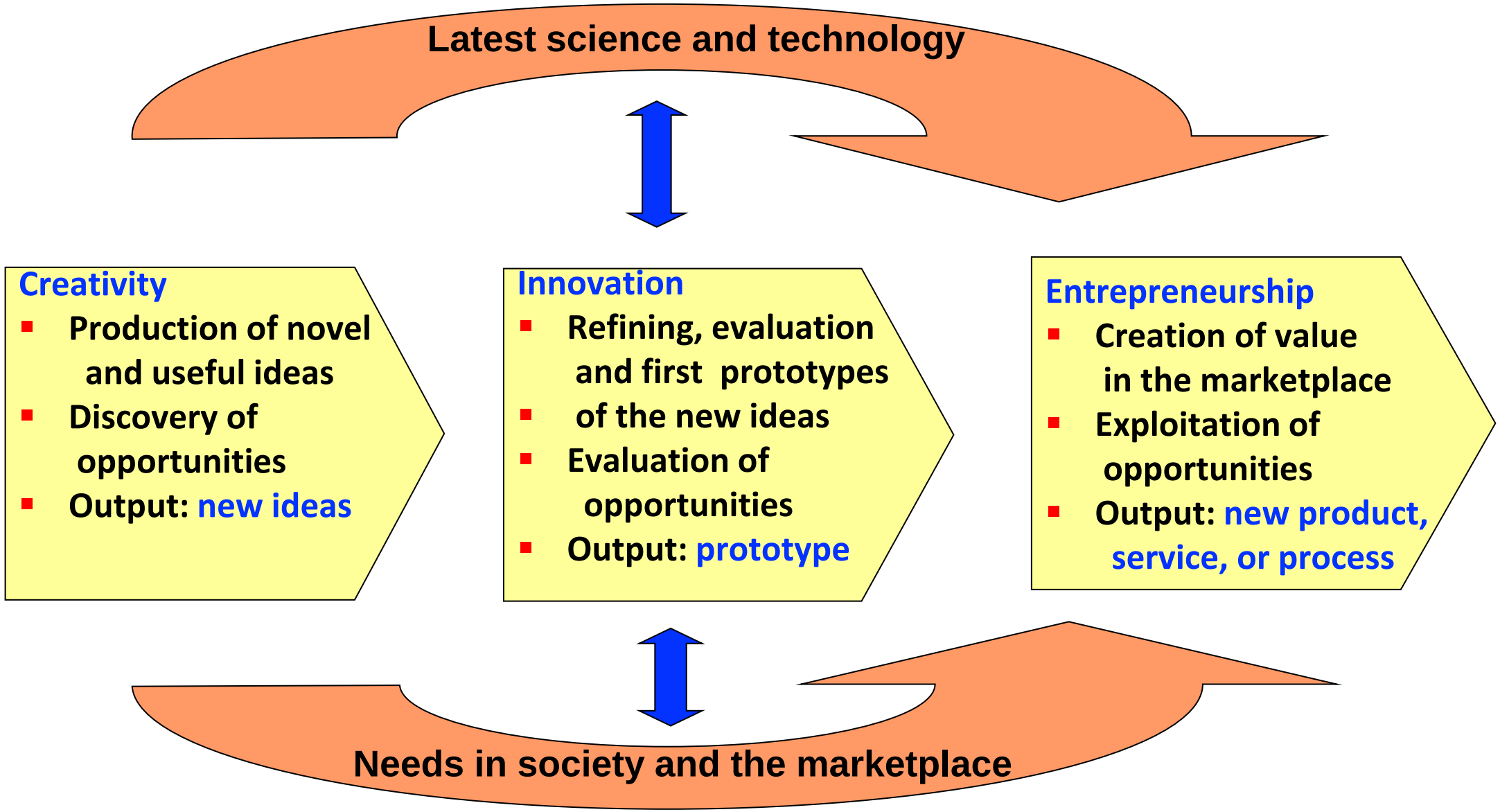
Radical: technologies that give large performance improvements or lower costs

Revolutionary: new to individual, firm, and the world

The secret to innovation is uncovering an unmet consumer need and the filling it in an innovative, creative way.

Best Opportunities between Incremental and Radical

The Creativity-Innovation-Entrepreneurship Chain



Types of Innovation

1. **Product:** early stage of product life cycle, innovations are frequent. As rate of product innovation decreases, process innovation increases. (What we make)

2. **Process:** makes manufacturing more efficient through automation, lowering costs. (How we make it)

Product /Service innovation creates much more new wealth than process innovation!

Three Characteristics of Opportunity

- Newness
- Potential Economic Value
- Perceived Desirability
- Opportunity implies something

  - that has not existed or been available before;
  - that can yield potential economic gains; and
  - whose development is consistent with legal and/or moral standards of the society in which it occurs.

Emergence and Recognition of Opportunities

Opportunities emerge from changes in

- knowledge,
- technology, and
- economic, political, social, and demographic conditions.

Recognition depends on

- previous experience which enables people to see
- links between previously unconnected
- changes, knowledge, or events.

Product Opportunity Gap

Social:

Social and Cultural trends, Historical trends

Technology:

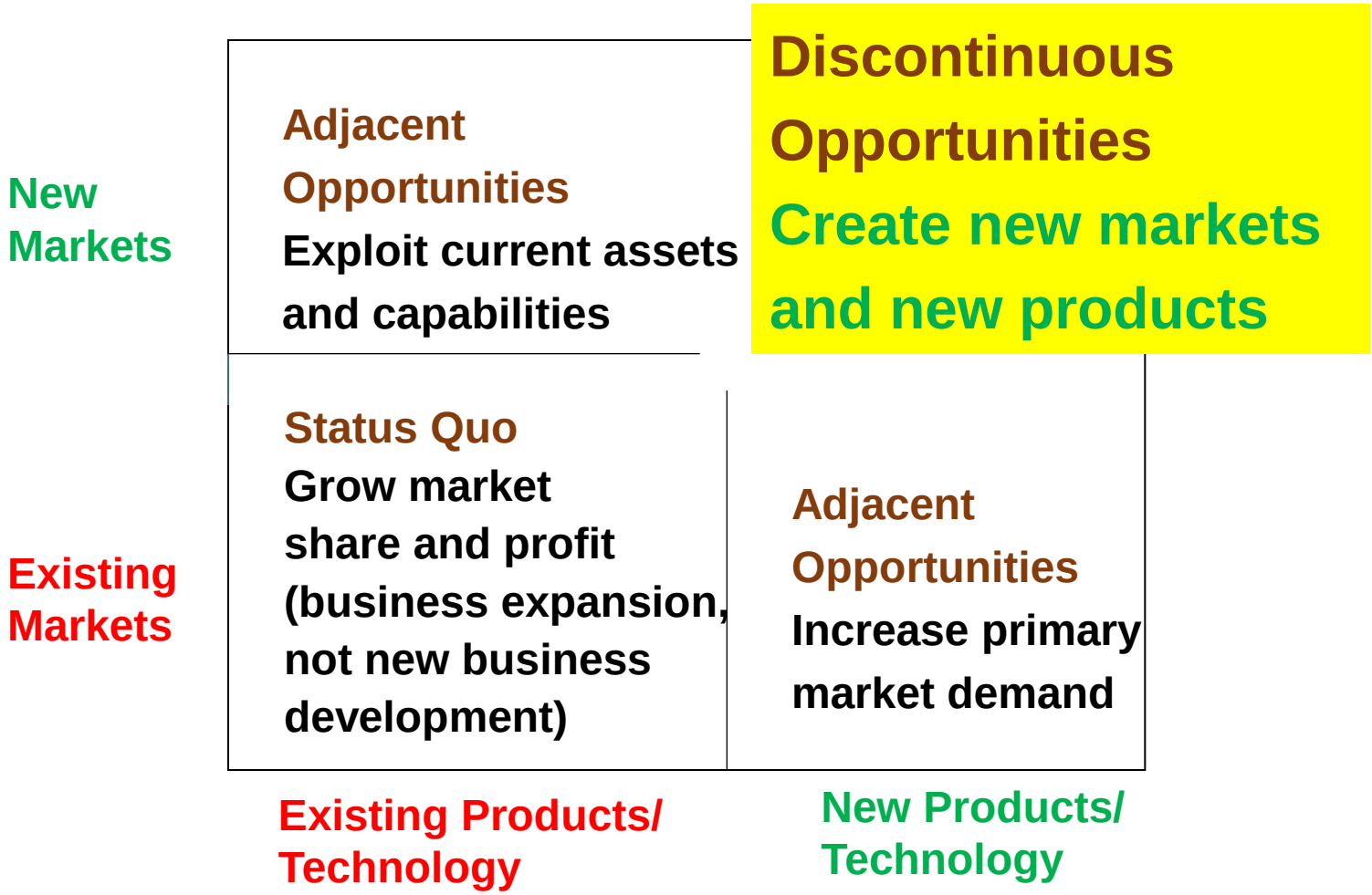
Emerging technologies, Re-evaluating existing technologies

Economic:

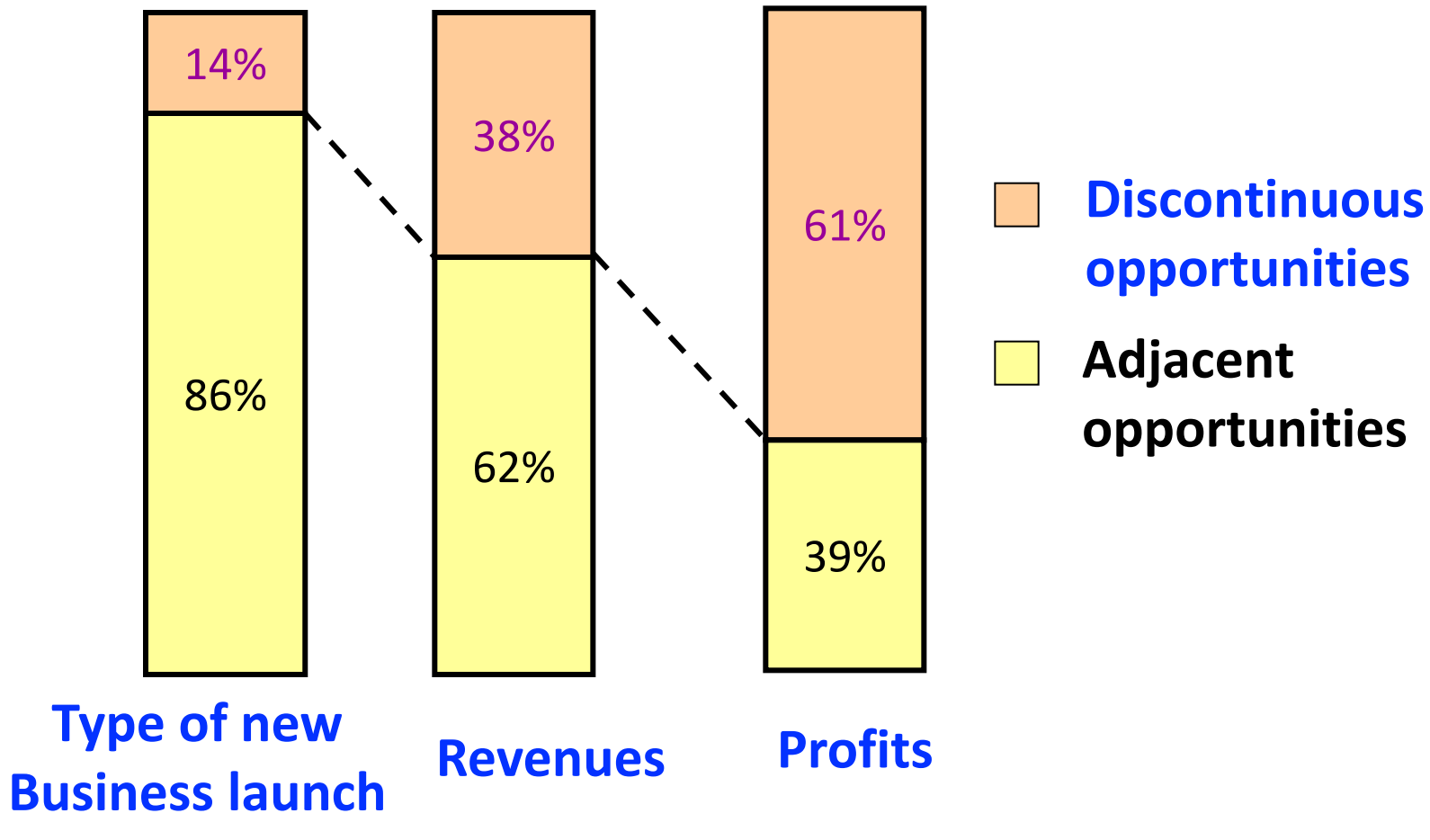
State of the Economy, Level of Disposable Income, Changing Investment Opportunities

Video

Discontinuous Opportunities: Source of Radical Innovation



Disproportionate Wealth Relative to Adjacent Opportunities



Entrepreneurship as a Process

- Three Major Steps:
- The search for exploitable technology
  - Recognition and Evaluation of OPPORTUNITIES
  - Technology Risk
- Planning the New Venture
  - Marshalling RESOURCES in the presence of RISK
  - Business Risk
- Managing the New Venture
  - Building the NEW business venture
  - Execution Risk

What is Technological Entrepreneurship?

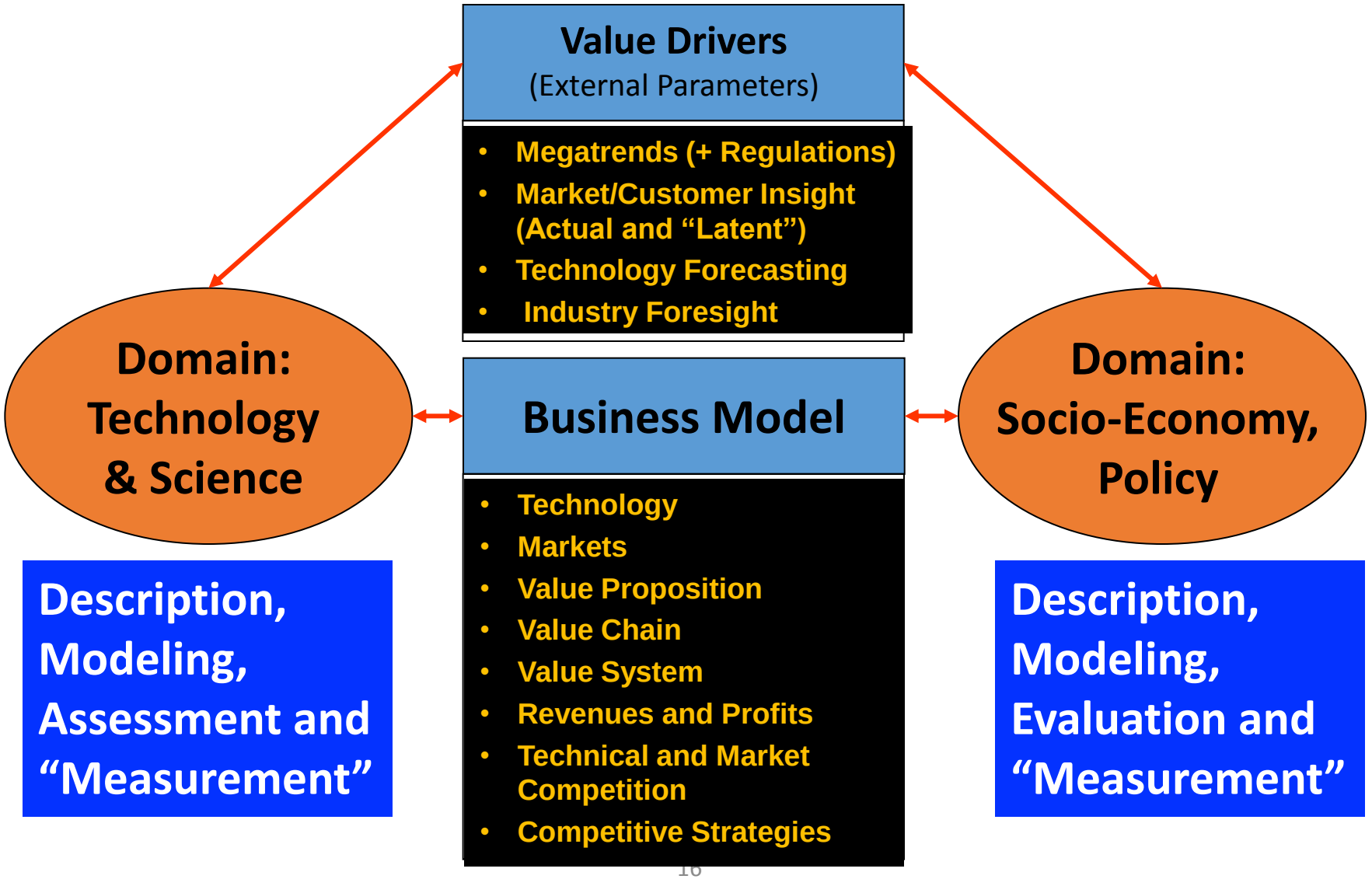
- New for-profit venture
- Technology based business
- Innovative products or Innovative processes
- Possible service component
- Start small, Think BIG!
- Large, global, market opportunity
- Potential to become a market leader
- Defendable competitive advantages
- Will provide a strong return on investment

Value Creation and Capture through Technology

The Business Model

- **How do you plan to make money?**
- **An organization's core logic for creating value; a hypothesis how to create value**
- **A set of planned arguments and assumptions about how a firm will create value for all its stakeholders**
- **A decision and a process to transform scientific or technology ideas or opportunities into market value**

Mediating between Domain-Specifics and Drivers



Value Creation: Market and Technical Value

Market Value:

degree to which a real customer perceives the need for the company's offering (e.g. product) and after a cost/benefit assessment pays the offering price to purchase it.

⇒ Which customers (market segment)?

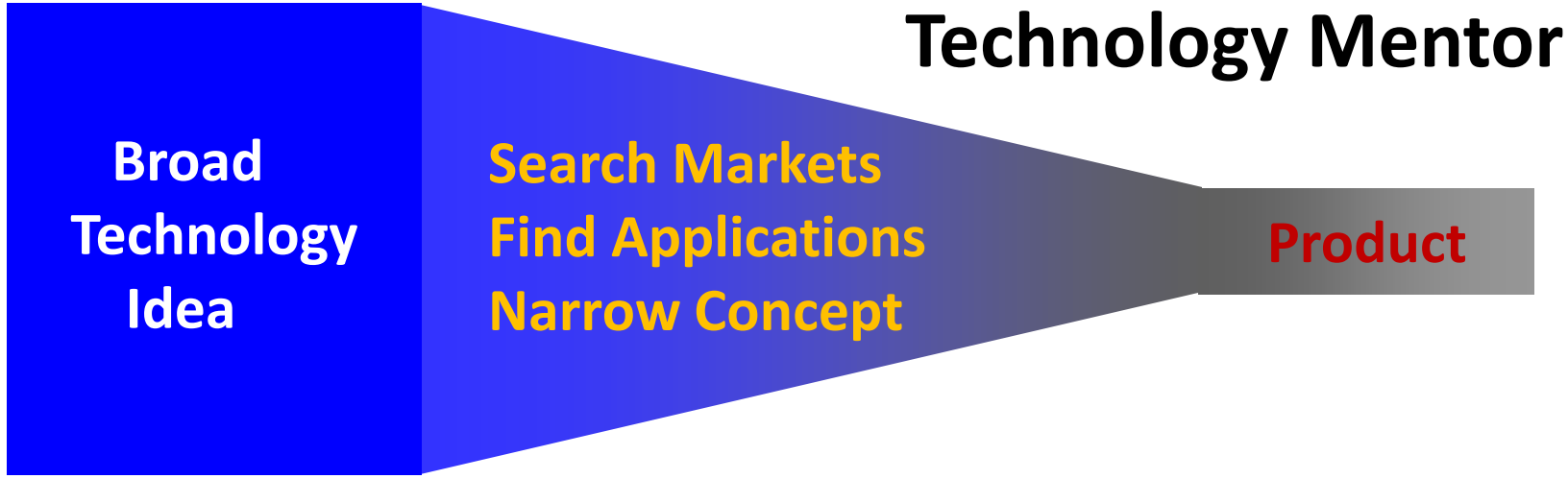
Technical Value:

different perspectives for producer or supplier and customer

Market value and technical value does not necessarily match!

Mentor Models

Technology Mentor



Customer Mentor

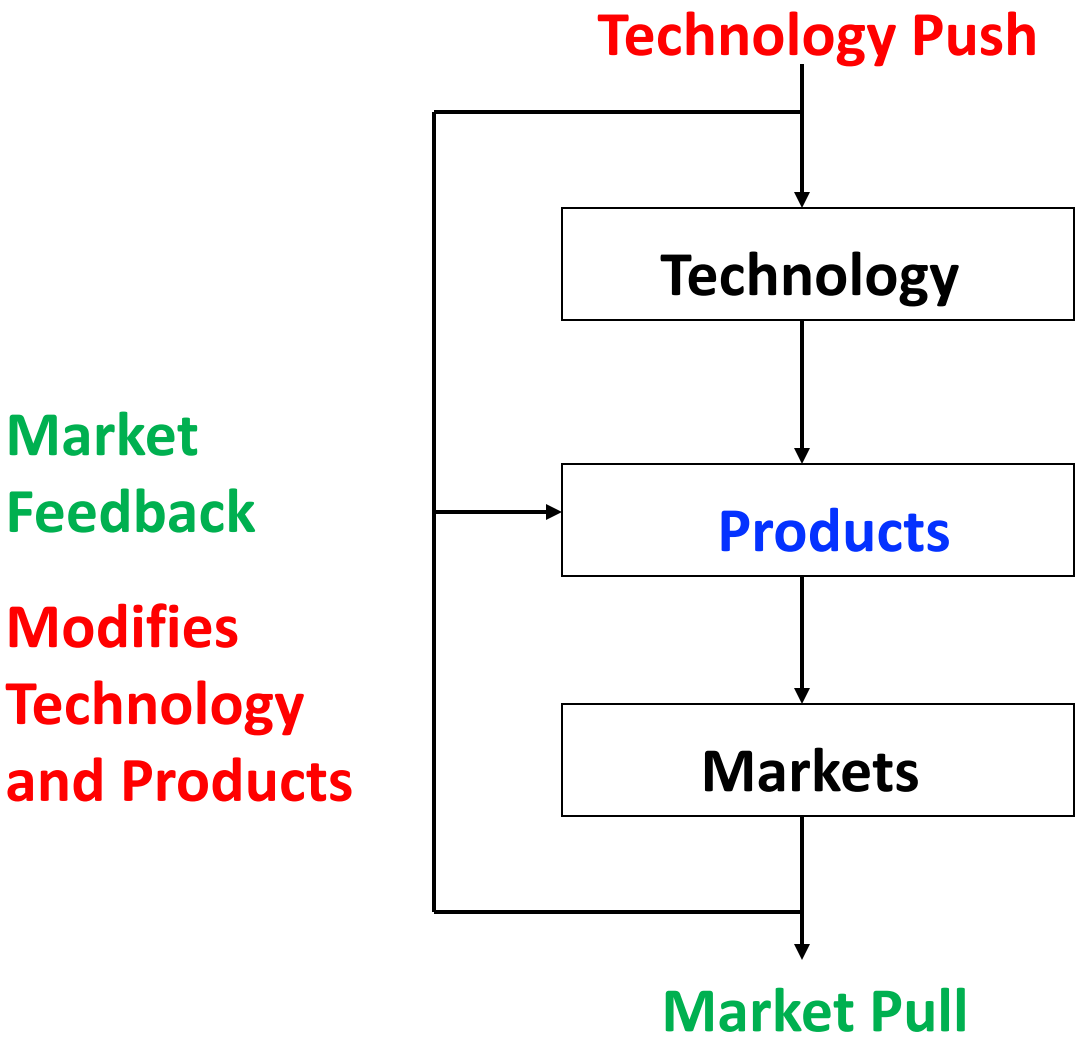
Elements of Value

- **Value: worth, importance/relevance or usefulness**
- ***Value and Price*: Value (what you get) = worth of the social and economic benefits a customer pays (price; in monetary terms) for an offering**
- **Most *technology-based products* are *initially focused* on functionality *and* performance**
- **Values Offered to a (Technical) Customer:**
  - **Product (Functionality, Performance)**
  - **Service (Technical Service, Consulting)**
  - **Price**
  - **Access (Sales Channels; Sales Cycle)**
  - **Experience**

Nine Types of Revenue/Profit Models

Name	Description	Example Firm
1. Installed base	Build a large installed base of customers (and sell consumables or upgrades)	Microsoft
2. Protected innovation	Create a unique, innovative product and protect it using patents and copyrights	Gorilla Glass Corning
3. New business model	Find unmet customer needs and build a new business model	Air BnB, OYO
4. Value chain or value system specialization	Specialize in one or two functions on a value chain or system	Polymaterials AG; most large chem. Firms; Foxconn
5. Brand	Create a valued brand for your product	Coca Cola
6. Blockbuster	Focus on creating a series of big winners	Large pharma firms, Novartis
7. Profit multiplier	Build a system that reuses a product in many forms [platform technology]	Toyota, Sony
8. Solution	Shift from product to unique total solutions (incl. process chains of customers)	BASF, DuPont, 3M,GE etc.
9. Low cost	Create a low-cost product to offer; low price per unit of value	Dow Chemical (China, India!)

Technology, Products, and Markets



The role of the Engineer in Entrepreneurship

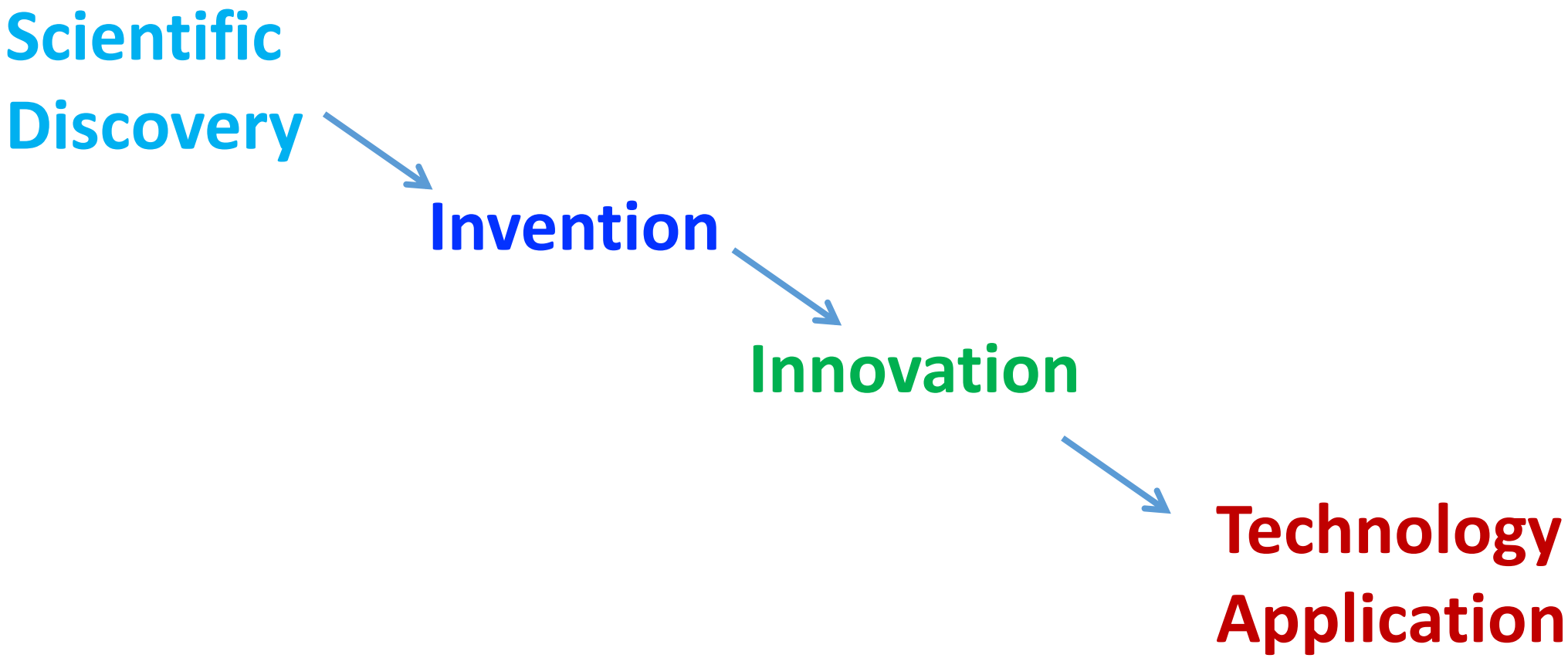
- Engineers drive technological entrepreneurship, as inventors, researchers, designers, and as managers
- Engineers make up the largest percentage of:
  - Silicon Valley start-up founders and early employees
  - Chief Executive Officers of the top 1,000 public corporations
- Engineers are often the first hires and an important part of the new venture team
- Technically, engineers are well-qualified in many respects for start-up activity, but often lack the necessary business skills and entrepreneurial mindset

Greatest 20th Century Engineering Achievements

1. Electrification
2. Automobile
3. Airplane
4. Water Supply and Distribution
5. Electronics
6. Radio and Television
7. Agricultural Mechanization
8. Computers
9. Telephone
10. Air Conditioning and Refrigeration
11. Highways
12. Spacecraft
13. Internet
14. Imaging
15. Household Appliances
16. Health Technologies
17. Petroleum and Petrochemical Technologies
18. Laser and Fibre Optics
19. Nuclear Technologies
20. High Performance Materials

Thank You

Managing Technology - Discovery to Application



Sustaining vs. Disruptive Technologies

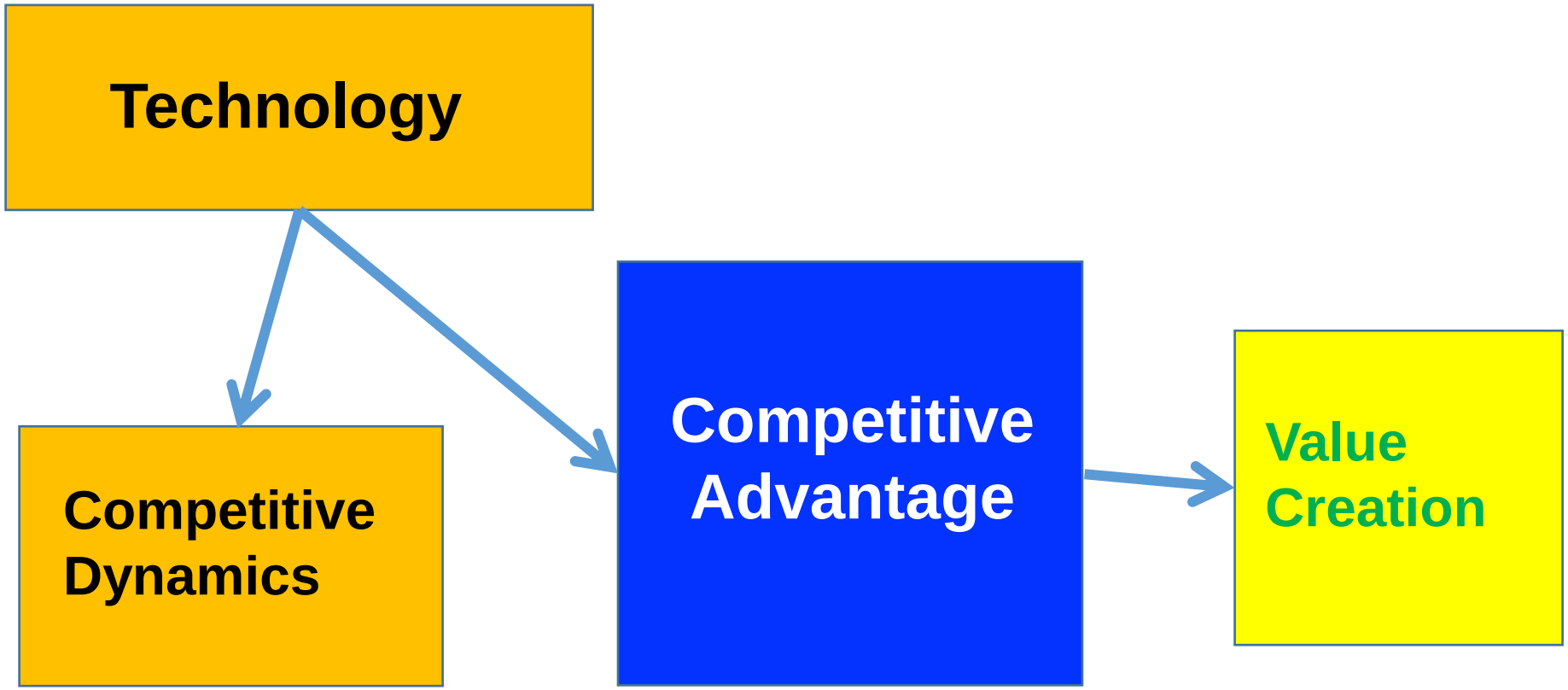
Sustaining technologies focus on improvements of importance to existing customers.
Existing companies best with incremental innovation.

Disruptive technologies create a new value proposition, reach new markets and customers.
New companies better at disruptive, radical innovation.

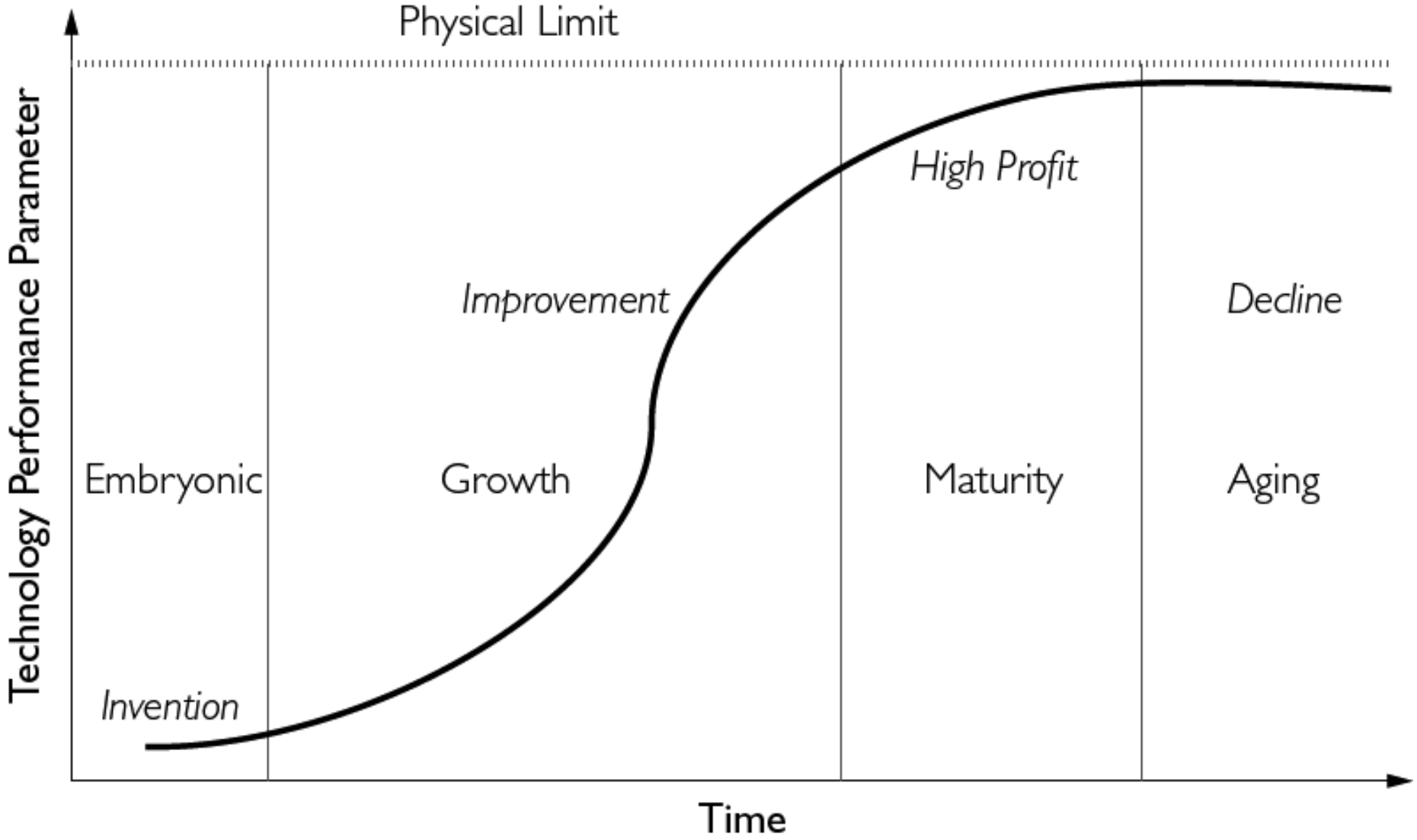
Creating Competitive Advantage

- Competitive Advantage
  - Something that the firm does better than any of its competitors.
  - Goal: To have a sustainable competitive advantage
    - Requires that the advantage:
      - Must be valued by customers
      - Not easily duplicated by competitors

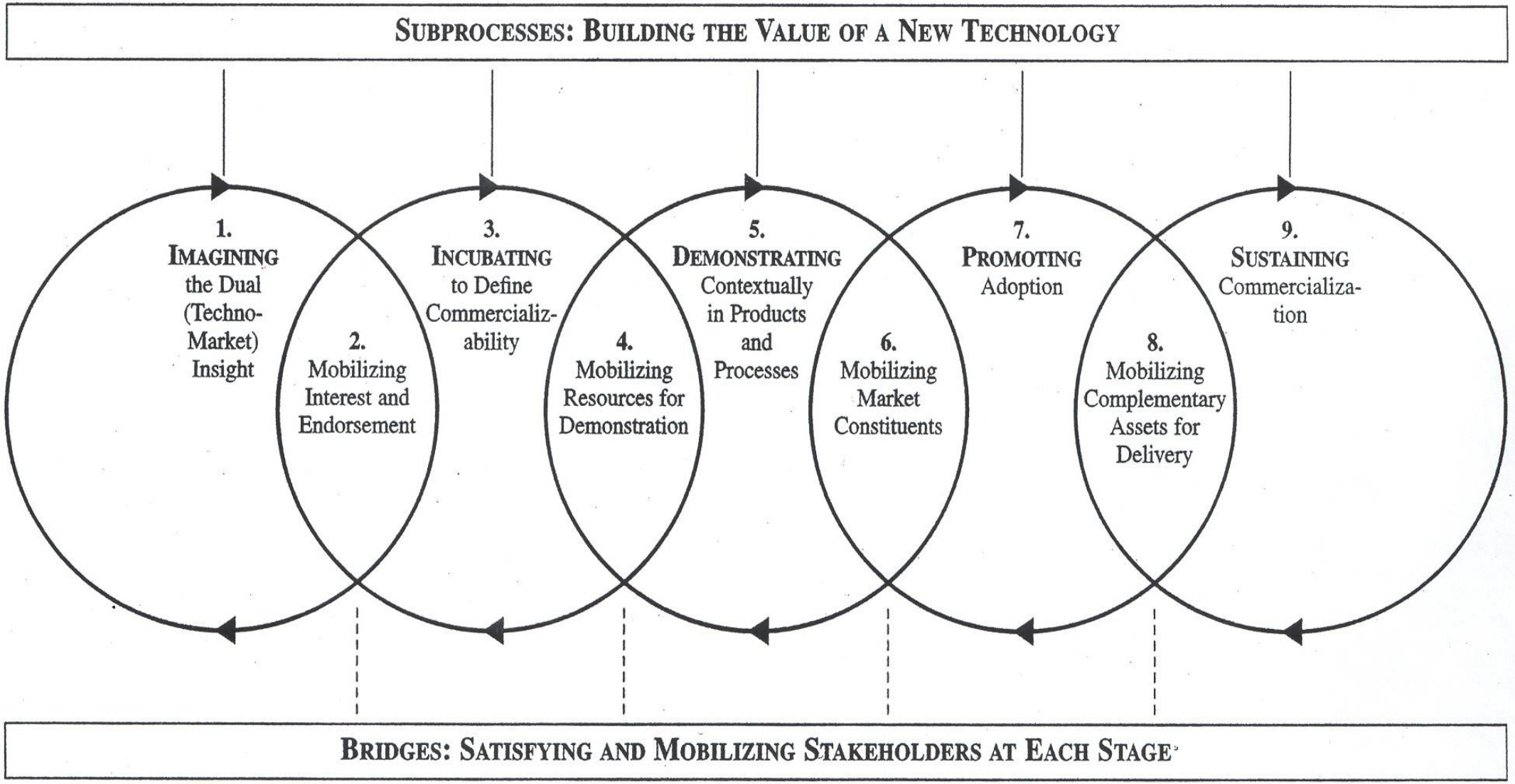
Technology and Competitive Advantage



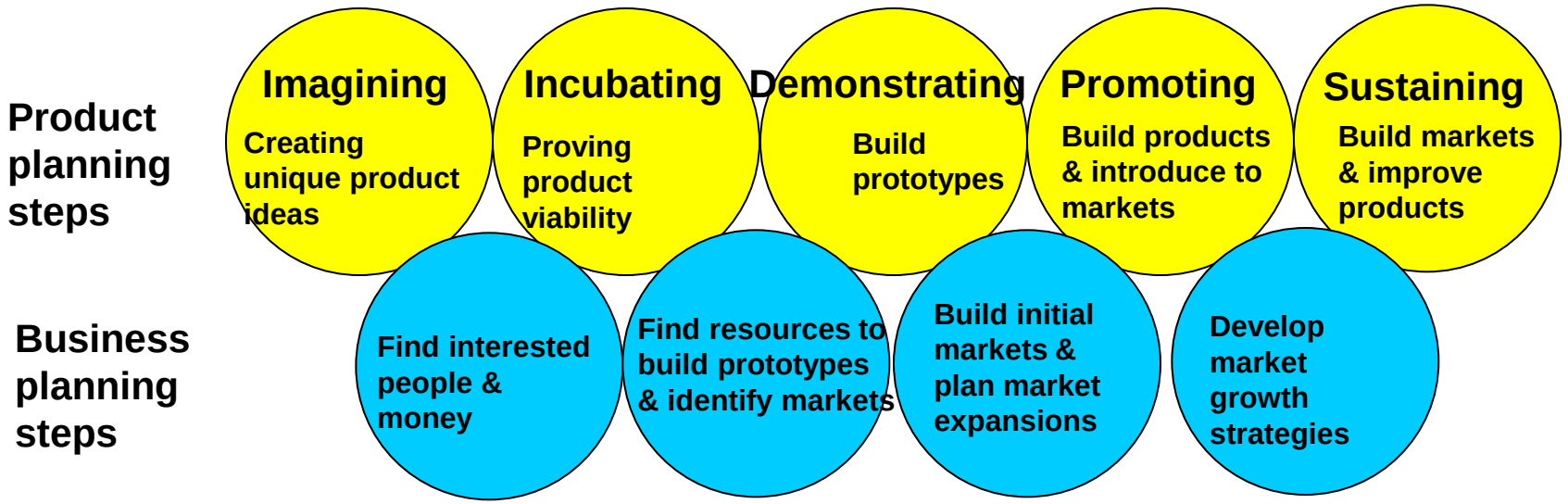
The S-Curve of Technological Progress



The Process of Technology Commercialization



Technology Commercialization Process

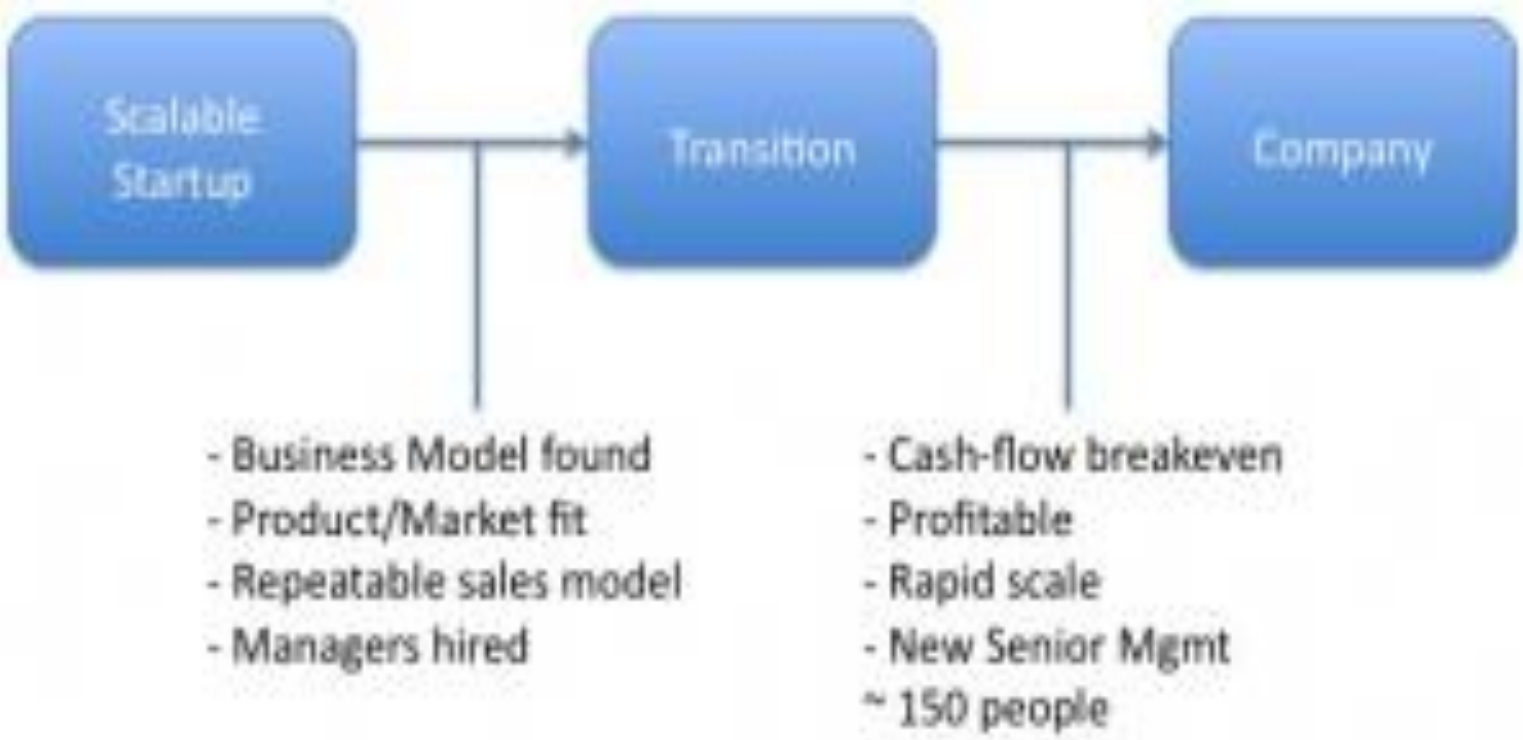


Resource Needs

People	Small	Moderate	Medium	Large
Physical	None	Moderate	Medium	Large
Financial	None	Moderate	Large	Largest

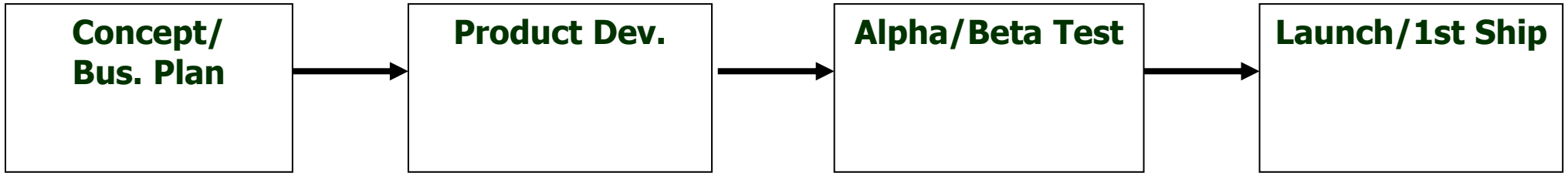
Search for Business Model

Execution of Business Model

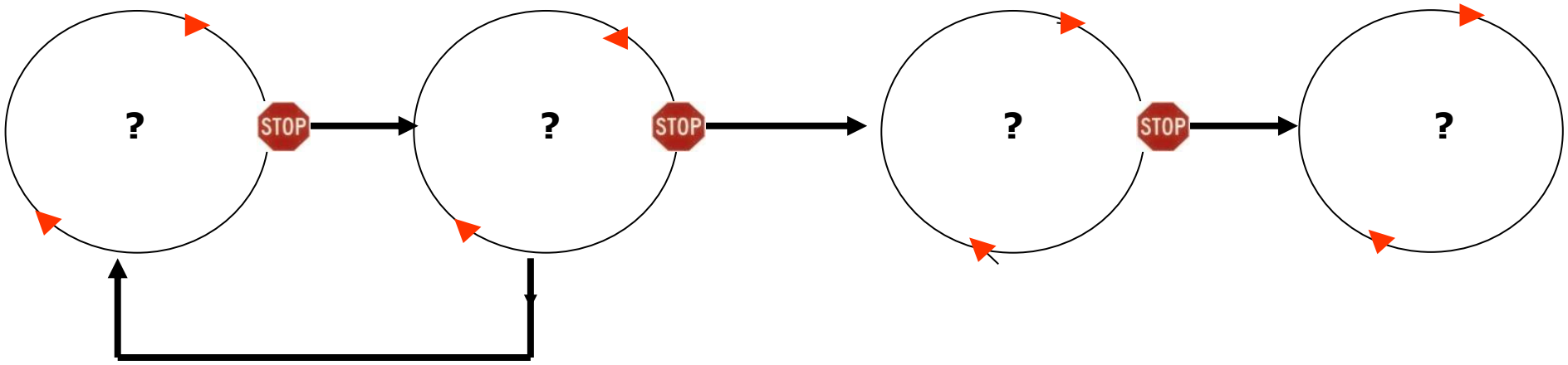


Build a Customer Development Process

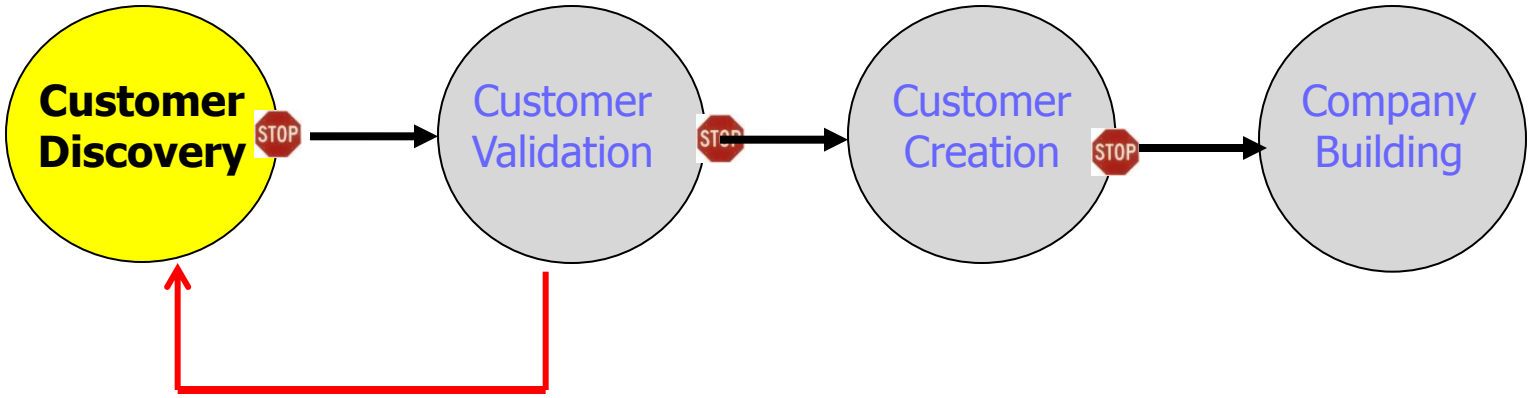
Product Development



Customer Development



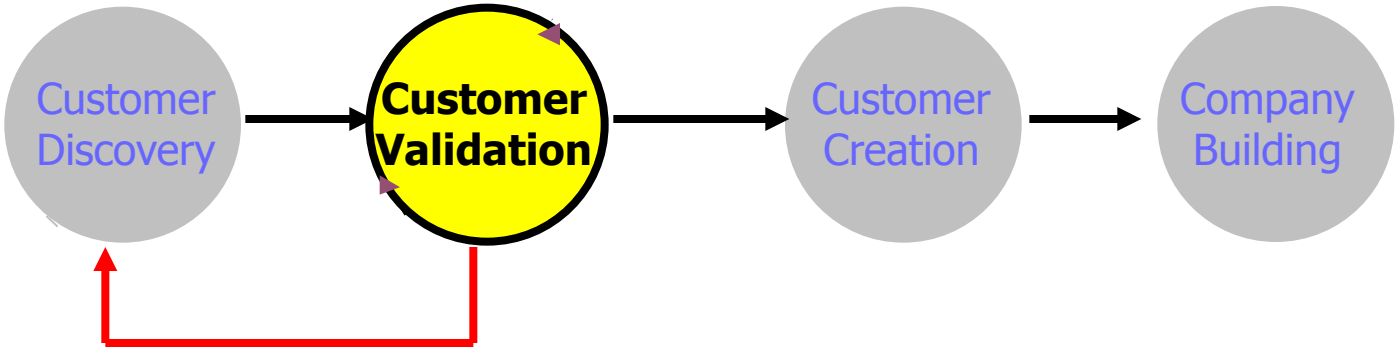
Customer Discovery: Step 1



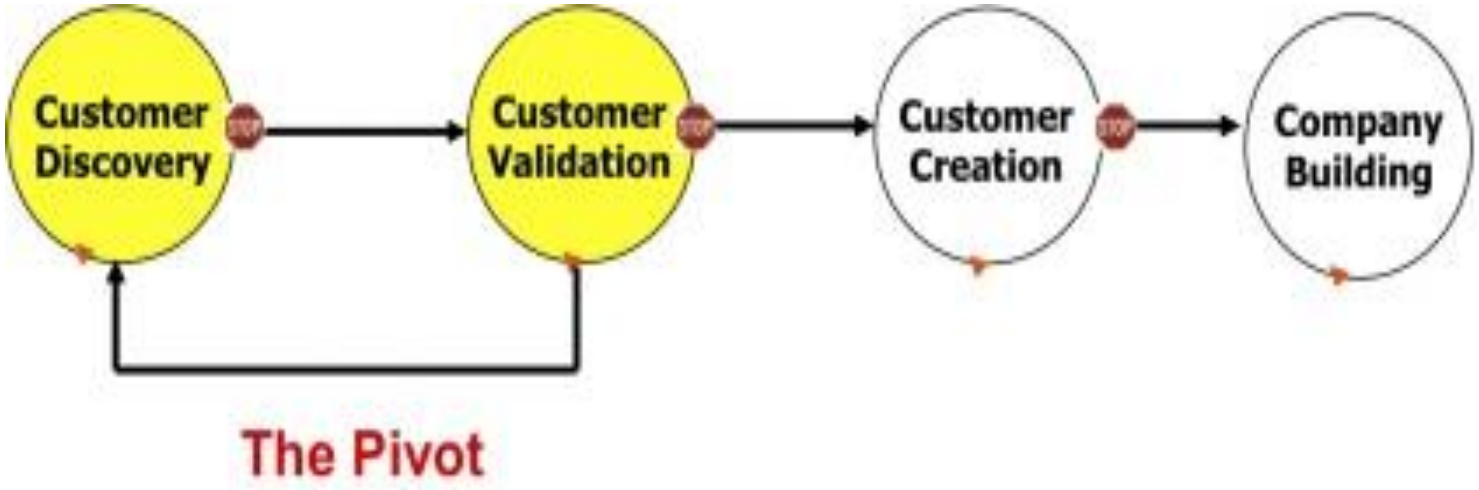
- **Stop selling, start listening**
  - **There are no facts inside your building, so get outside**

- **Test your hypotheses**
  - **Two are fundamental: problem and product concept**

Customer Validation: Step 2

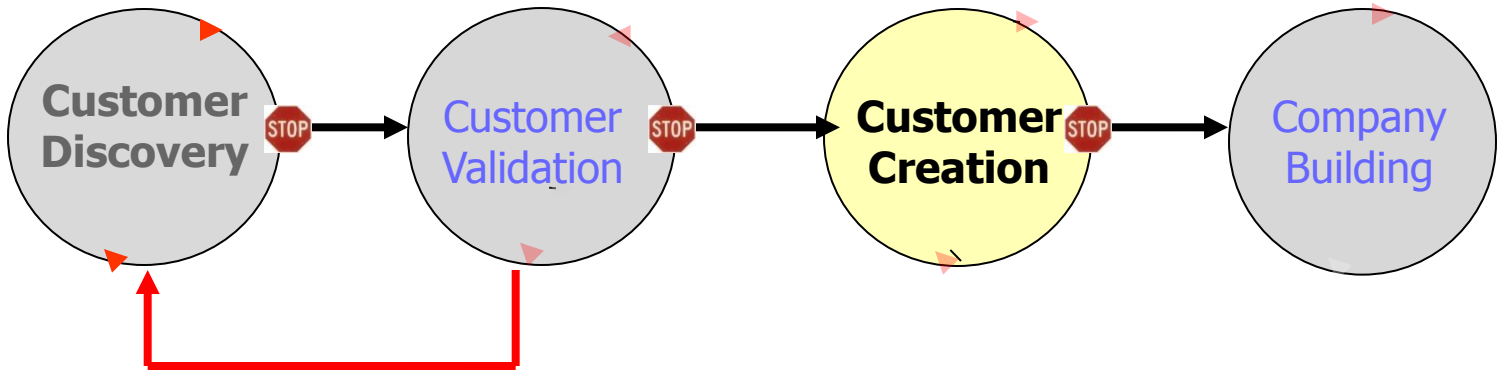


- **Develop a *repeatable* and *scalable* sales process**
- **Only earlyvangelists are crazy enough to buy**



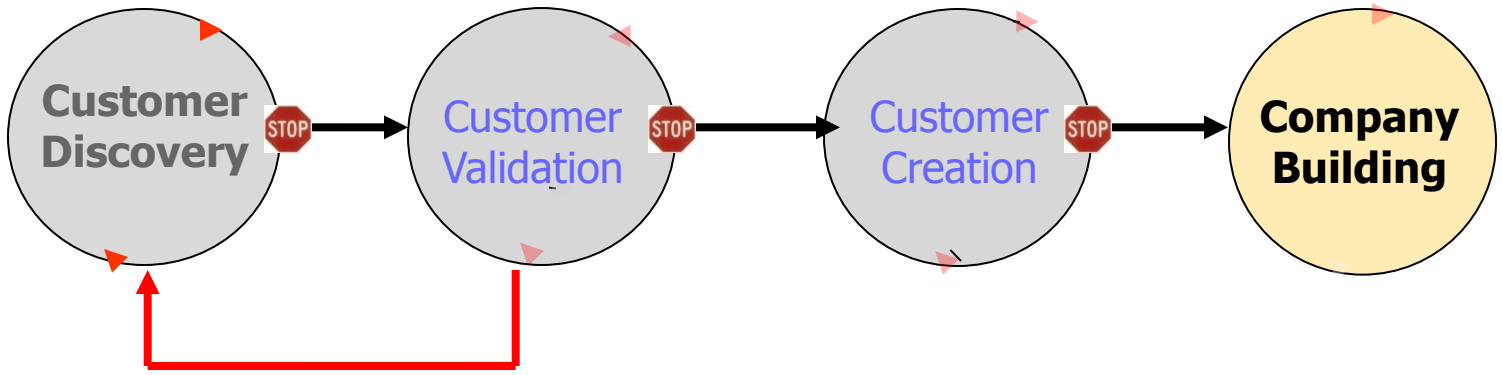
“Pivoting” is changing a fundamental part of the business model. It can be simple: recognizing that your product was priced incorrectly. It can be more complex: your target customer needs to change, the feature set is wrong, you chose the wrong sales channel or your customer acquisition programs are ineffective.

Customer Discovery: Step 3



- **Goal is to create end-user demand and drive that demand into the sales channel.**
- **Marketing message will be different based on the kind of market being entered and the customers being sought**
- **Brand building and heavy advertising work in existing markets but not so much in new markets.**

Customer Discovery: Step 4

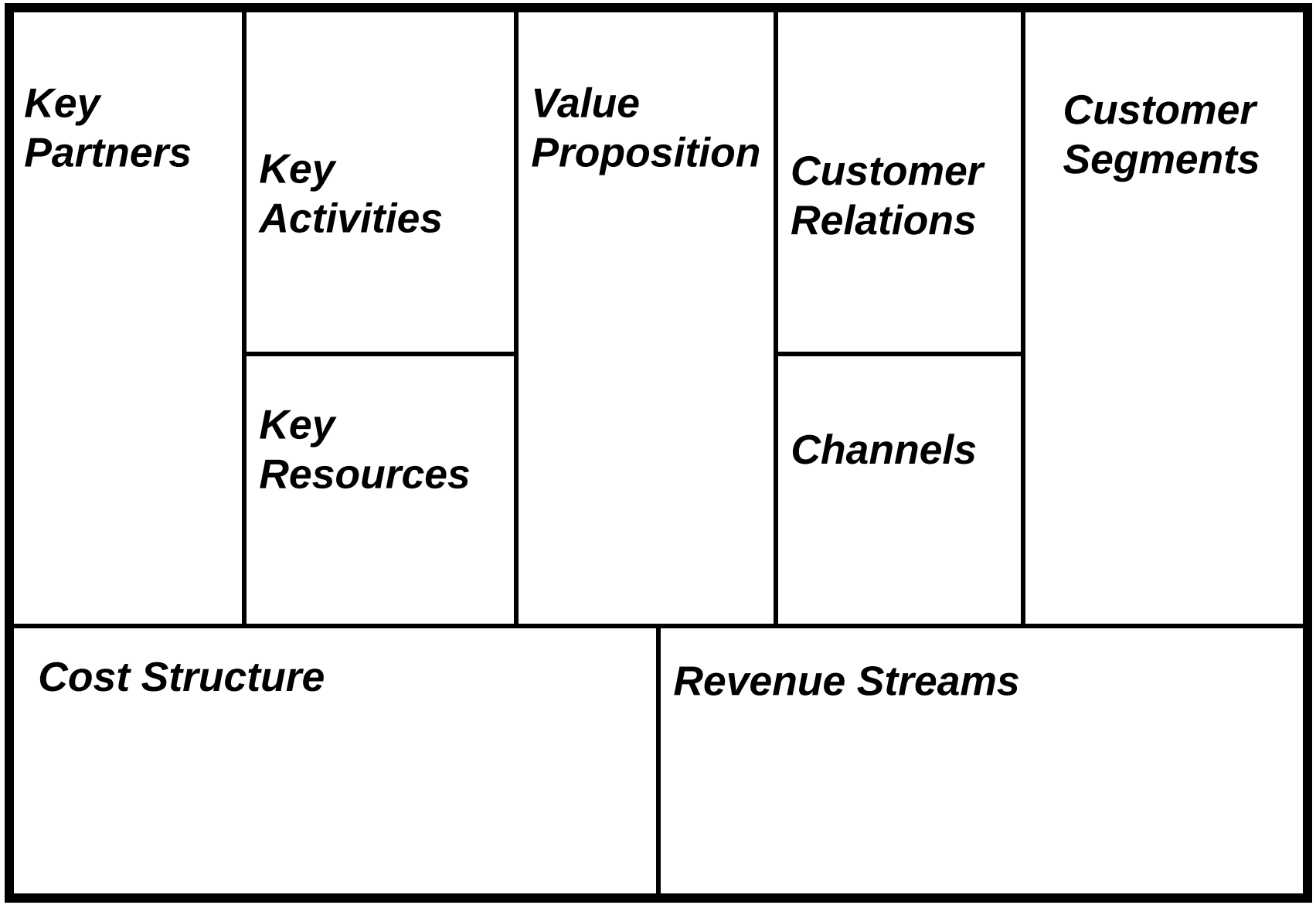


- **Where the company transitions from informal, learning, and discovery to formal departments of Sales, Marketing, Business Development**
- **Build departments to exploit early market success**
- **Add employees to meet demand for products**

Nine Blocks of the Business Model

1. Customer Segments
2. Customer relationships
3. Value propositions
4. Channels
5. Key Resources
6. Key Activities
7. Key Partners
8. Revenue streams
9. Cost Structure

Business Model Canvas



Customer Segments

Mass Market: focus on one large group; i.e., consumer electronics

Niche Market: specific segments; i.e., supplier-buyer relationships like auto parts manufacturers

Segmented: different needs and problems; i.e., banks and professional services (engineering, consultants)

Diversified: unrelated segments; i.e., Amazon selling products and providing computer services

Multi-sided platforms: credit card companies; i.e., card holders and merchants

Value Proposition: Five Key Values

- ***Product*: Performance, quality, features, brand, easy to use, safe.**
- ***Price*: Fair, visible, consistent, reasonable.**
- ***Access*: Convenient location, found in reasonable time.**
- ***Service*: Ordering, delivery, return, check-out.**
- ***Experience*: Emotional, respect, ambiance, fun, intimacy.**

- **One value selected to dominate value proposition, a second to differentiate, and remaining three meet the industry norm.**

Customer Relationships

Motivations: Customer acquisition, customer retention, Boosting sales (upselling)

- **Personal Assistance**
- **Dedicated Personal Assistance**
- **Self-service**
- **Automated service**
- **User communities**
- **Co-creation of innovative products**

Key Resources

Physical: facilities, buildings, equipment

Human: especially for creative industries

Financial: sources of funding

Intellectual: patents, copyrights, partnerships, customer databases

Key Activities

Production: designing, making, delivering

Problem solving: consulting, services, hospitals

Platform/network: software, networks, social media, brands, platform promotion

Key Partnerships

Strategic alliances between non-competitors and financial sources

Strategic partnerships with competitors

Joint Ventures

Buyer-supplier relationships to assure reliable supplies

Revenue Streams

One-time customer purchases

Recurring revenues

Asset sales, Usage fee, Subscription fees, Lending/Renting/Leasing, Licensing

Pricing considerations

Cost Structure

Cost-driven model: minimize costs, low prices, maximum automation, extensive outsourcing, process innovation

Value-driven model: value creation, premium values, personalized service, product innovation

Economies of scale
Fixed costs

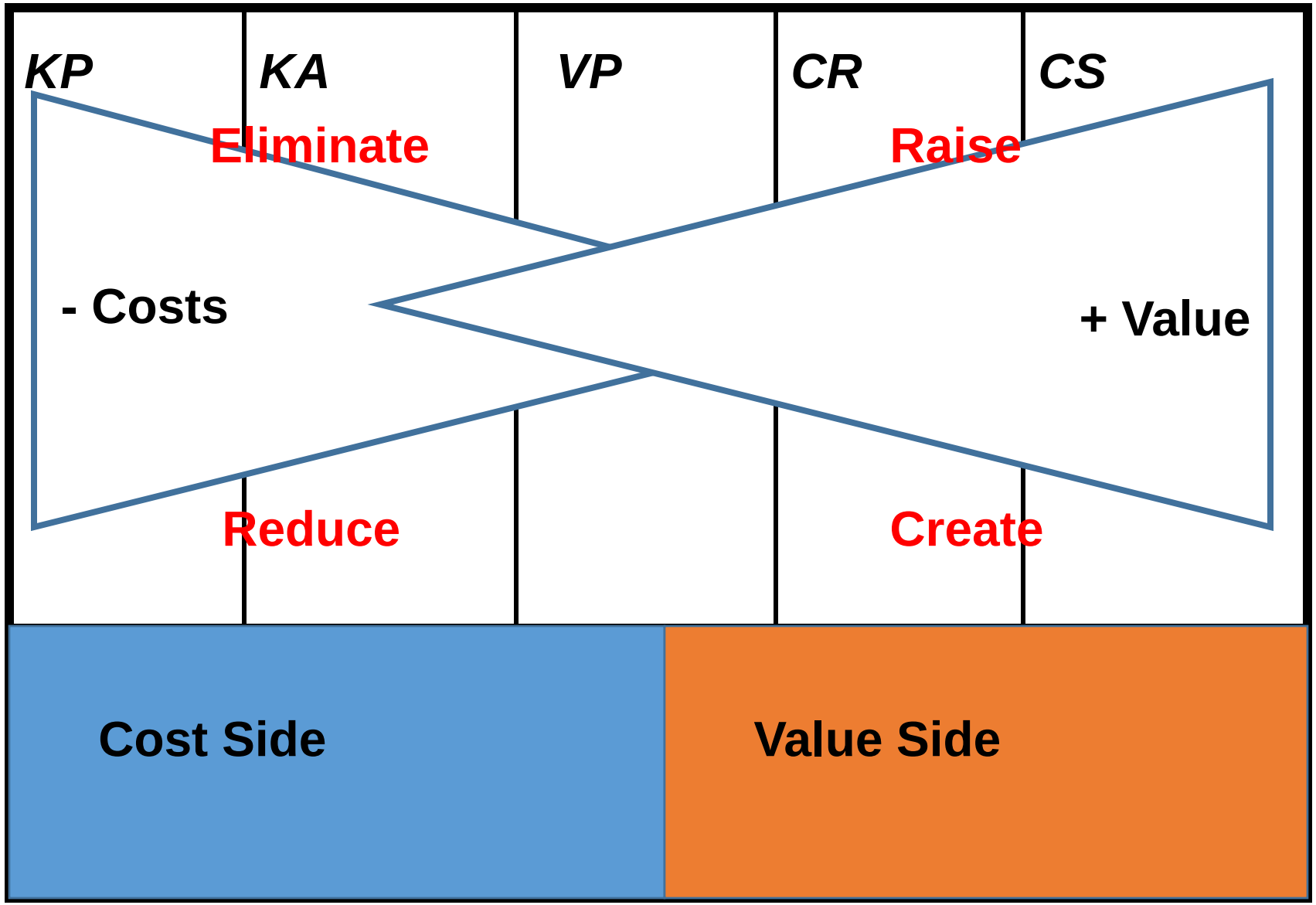
Economies of scope
Variable costs

Business Model Canvas

Key Partners	Key Activities	Value Proposition	Customer Relations	Customer Segments
	Key Resources		Channels	
Cost Structure			Revenue Streams	

Business Model Canvas – SWOT Analysis

Business Model Canvas – Value Innovation



Apple iPod/iTunes Business Model

What about your Company????

Thank You