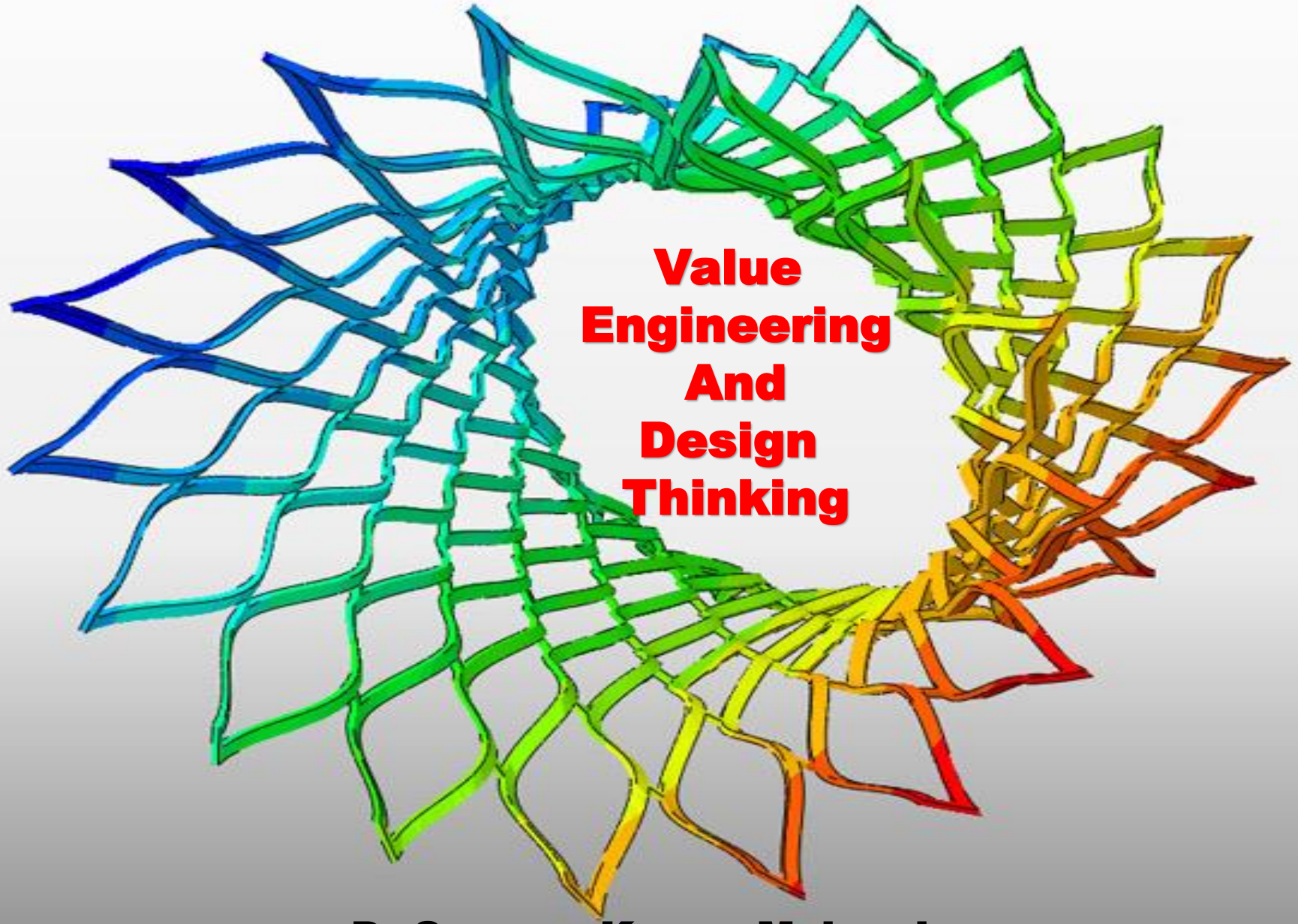
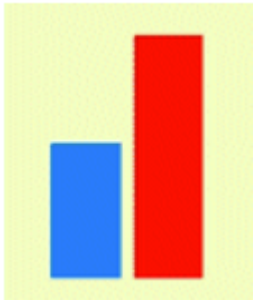


Value Engineering And Design Thinking

Dr Swapan Kumar Majumdar

Note: This Teaching Notes contains many of my own work as well as it has adapted slides from variety of sources.

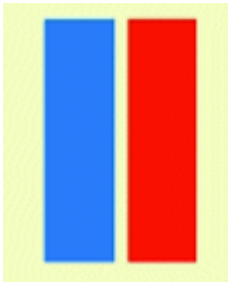
What is Value?



Worth < Cost

Low Value

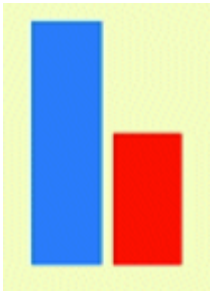
Low Appeal



Worth = Cost

Medium Value

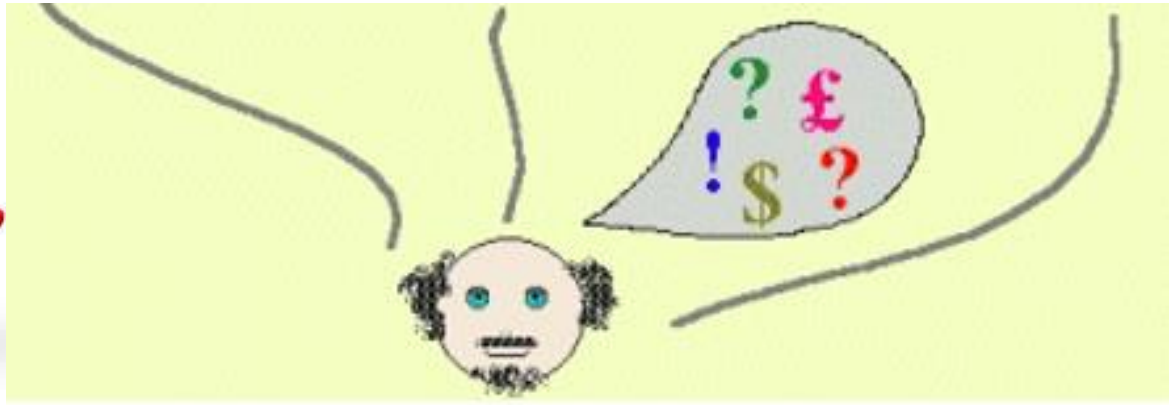
Medium Appeal



Worth > Cost

High Value

High Appeal



Value Is:

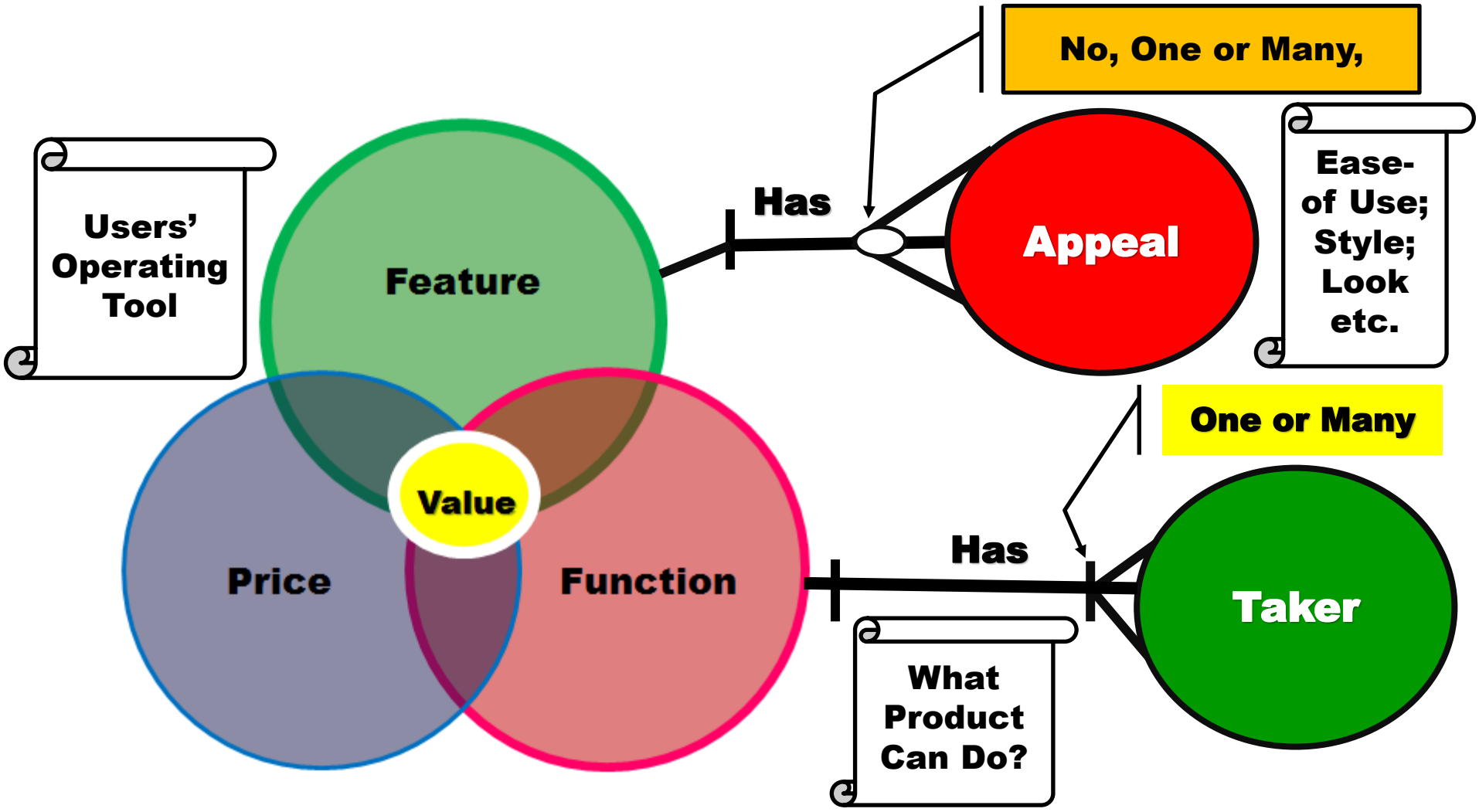
VALUE = WORTH

- **VALUE** = Worth, Merit, Usefulness or Importance.

Value Perception Varies from User 2 User

- **PRODUCT** = Things Fit for Use.

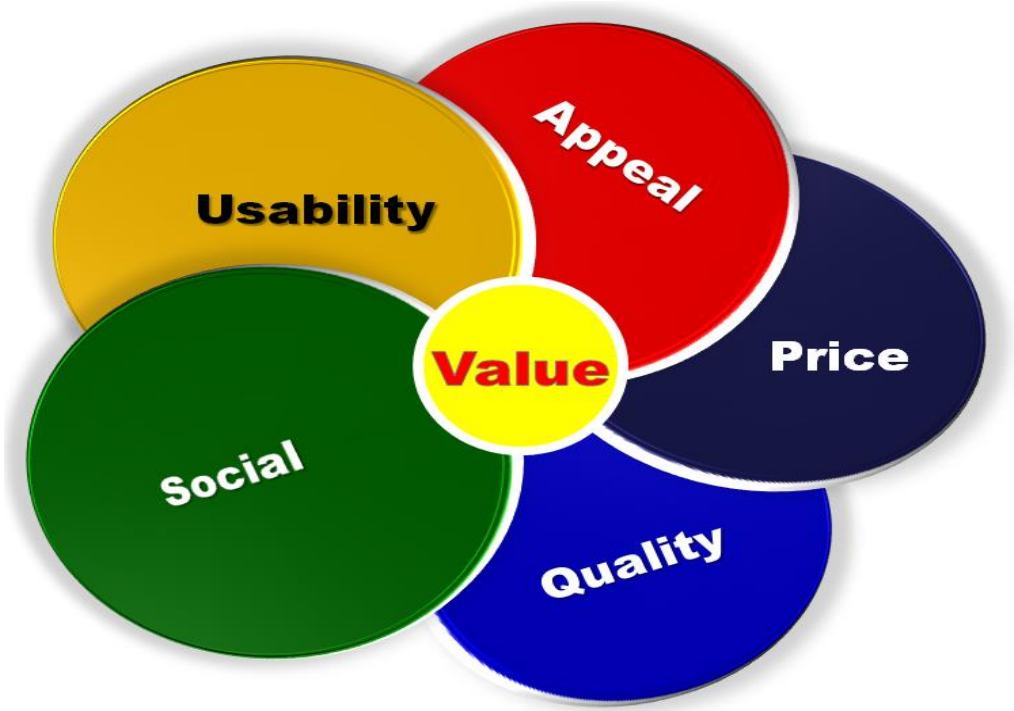
Marketable Product Has



If User = Person, Then
Product = Domestic Product

If User = Machine, Then
Product = Industrial Product

Worth of Domestic Products



- **Value =** $\dfrac{\text{Usability + Quality + Appeal + Environment Friendliness}}{\text{Price User Pay}}$

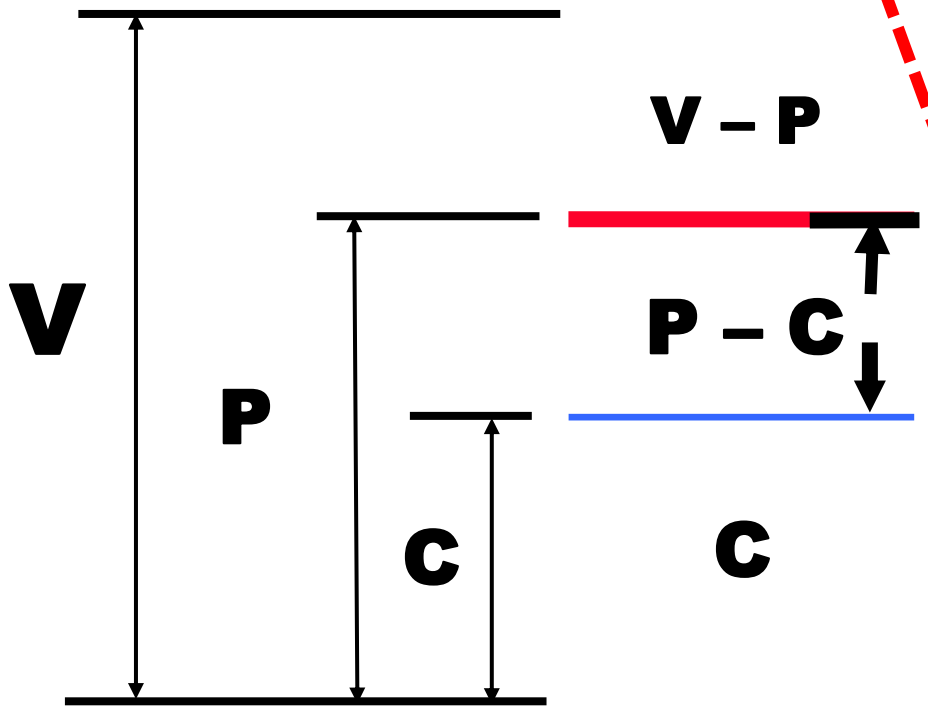
Worth of Industrial Products

- **Value = $\frac{\text{Utility + Quality + EF}}{\text{Price User Pay}}$ = Value 4 Money**

Business = Creating & Delivering Value for Customers

- **On Time**
- **On Budget**
- **On Value**

Goal of Business



V = Perceived Customers' Value

P = Price (What Customer is WTP)

C = Costs (Total Costs)

V – P = Customer Surplus

P – C = Profit Margin

Creation and Delivery of Customers' Value

P – Controlled by Market & Completion, can not be easily increased

C – Can be decreased by efficient & innovate Production & Distribution Processes

V – P: Attracts customers ⬇ P – C = Decreased Profitability.

Strategy = ⬆ V, ⬆ P, ⬇ C to ⬆ Profitability


Value Search
Value Creation
Value Enhancement
Value Engineering
thinking outside of the box

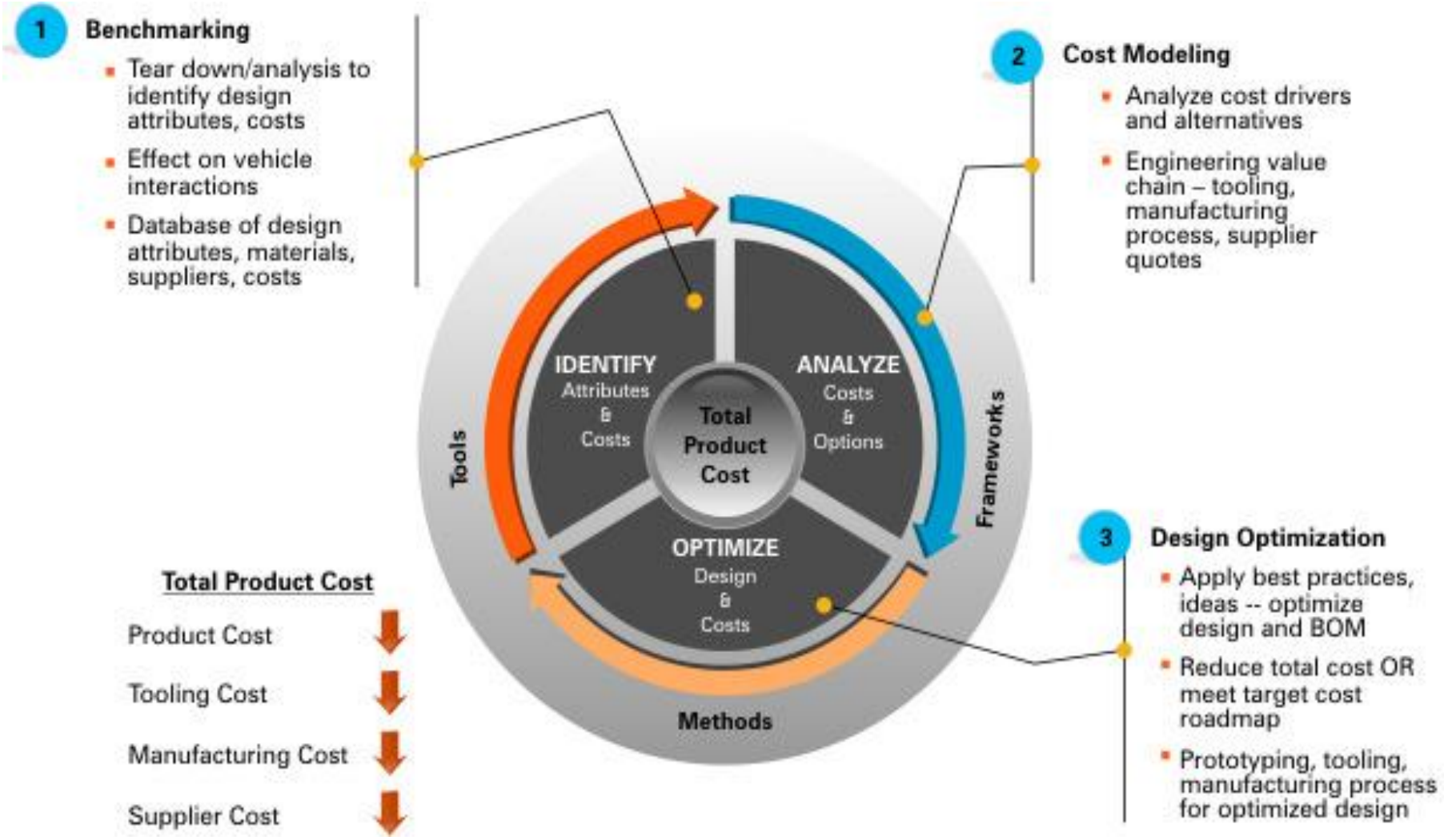
What is Value Engineering?

- **Value Engineering (VE) is defined as an organized effort directed at analyzing the functions of systems, equipment, facilities, services, and supplies for the purpose of achieving the desirable functions at the lowest life-cycle cost consistent with required performance, quality, reliability and safety.**
- **VE is focused on the design stage**

Source: OMB Circular A-131, Value Engineering, May 23, 1993

Consider the Usability, Appeal & Value For Money

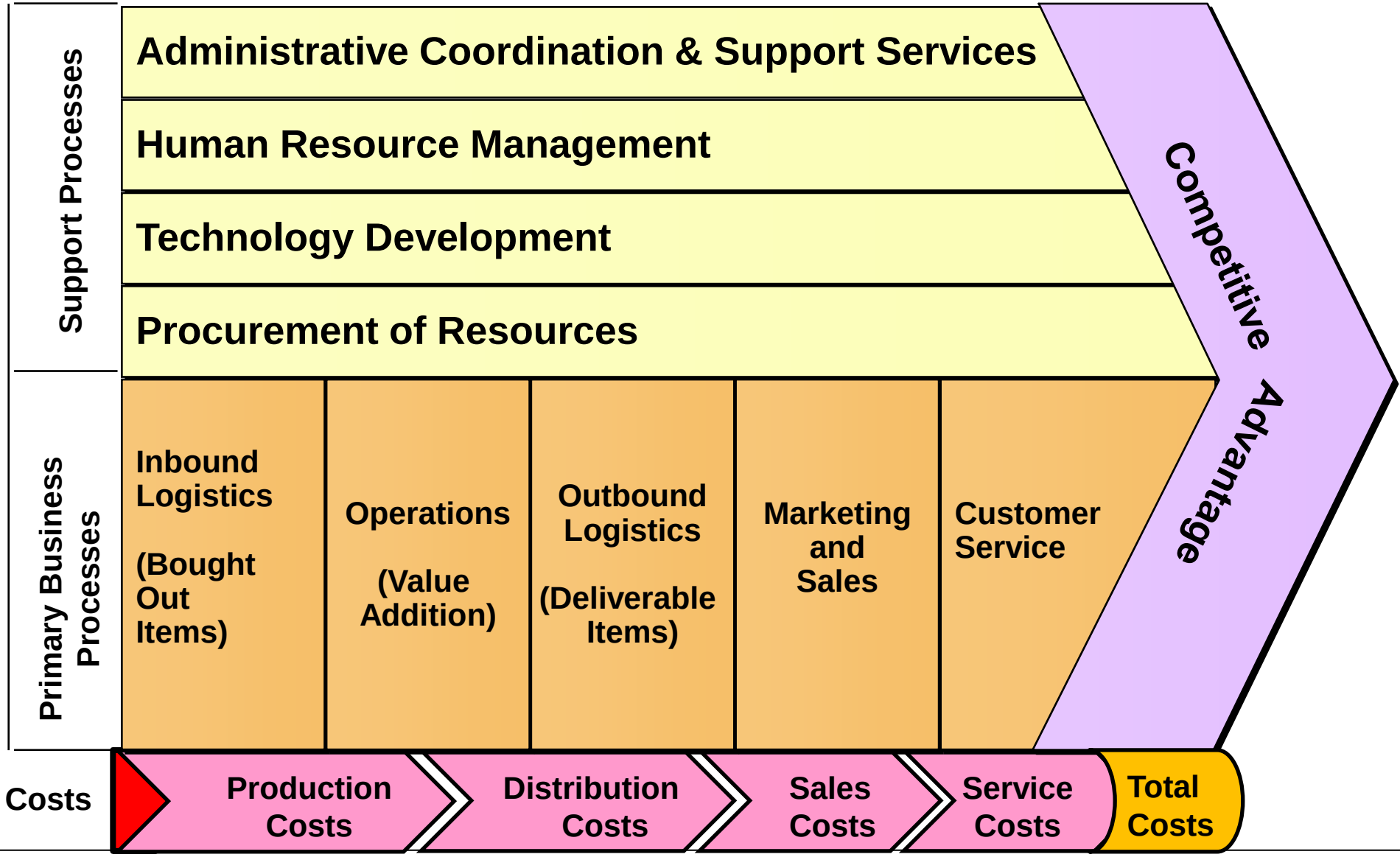
Value Creation



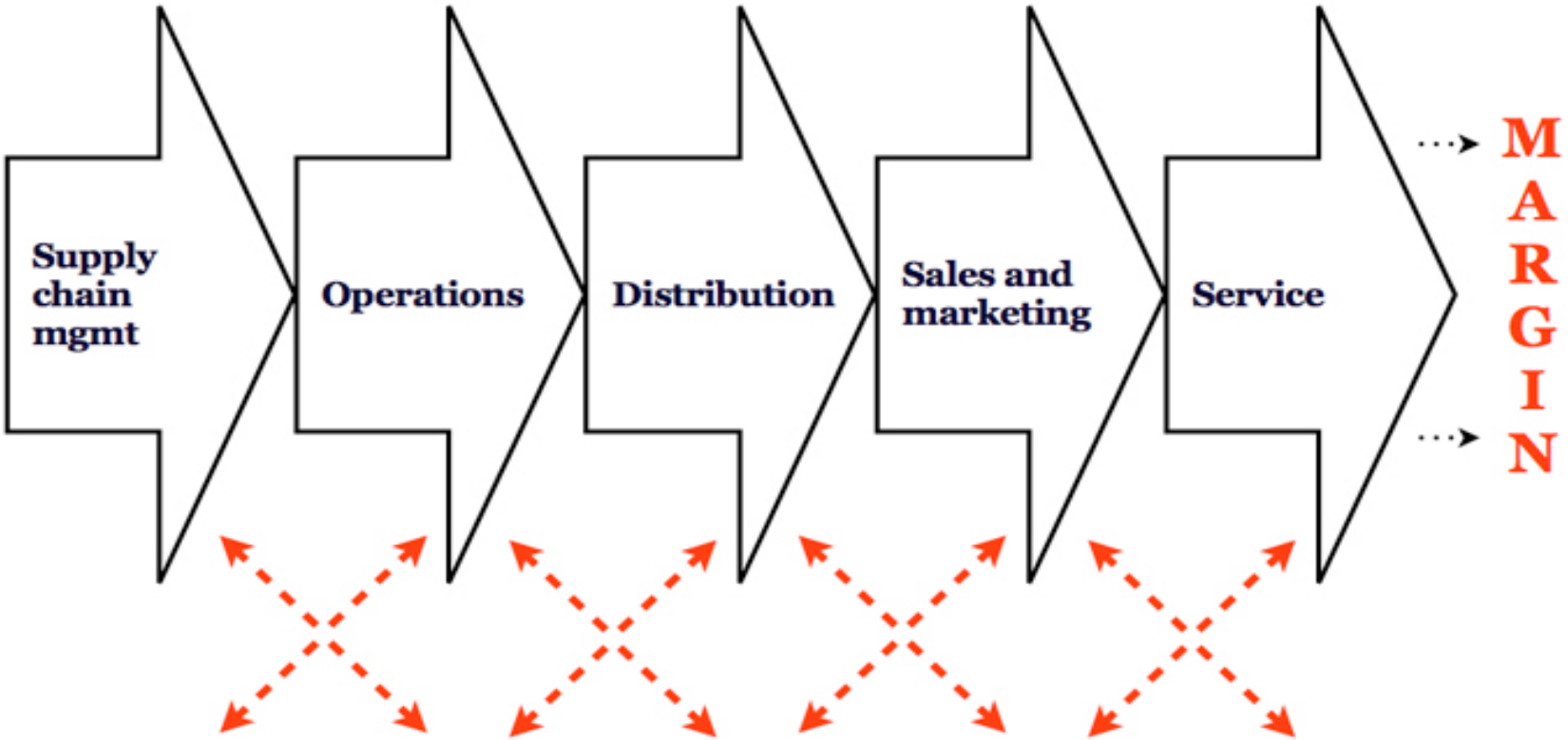
Case: Koo The Indian Social Networking Platform

- **The homegrown micro-blogging website, Koo, has become the best alternative to Twitter.**
- **The platform was started by Aprameya Radhakrishna and Mayank Bidawatka in March 2020. Koo is giving a voice to a billion Indians.**
- **It is currently available in four Indian languages including Hindi, Kannada, Tamil and Telugu. Just like Twitter, Koo allows users to express themselves through 400 characters of text or 1-minute short audio or video "Koos."**
- **The users have the option to follow others and send them 1-1 direct messages and use hyper local hash tags on Koo.**
- **Discussion Questions:**
  1. **How Koo adds value to its Customers?**
  2. **Figure out the challenges of Koo w.r.t Tweeter.**

Business Value Chain



The value chain shows *where* to learn



Scope for strategic learning

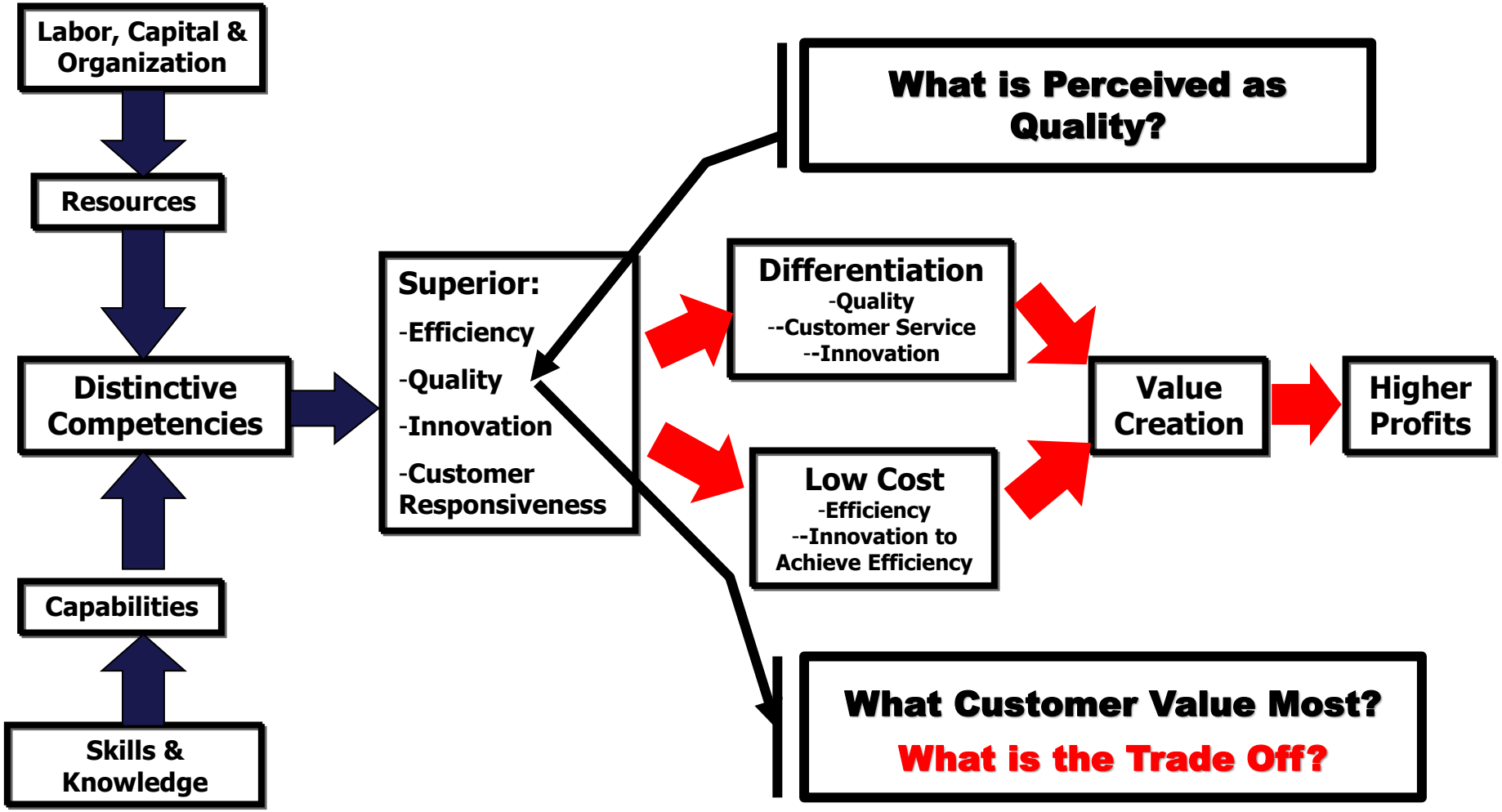
Product R&D, technology and systems development
Human resources and management
General administration

Competitive Advantage

- **An advantage over competitors gained by offering consumers greater value than competitors' offer**

The Roots of Competitive Advantage

(Hill, pp. 138, Nelson & Winter, & Dranov, et al.)



Design Thinking is Thinking for Customers' Value Creation

Dr. Swapan Kumar Majumdar

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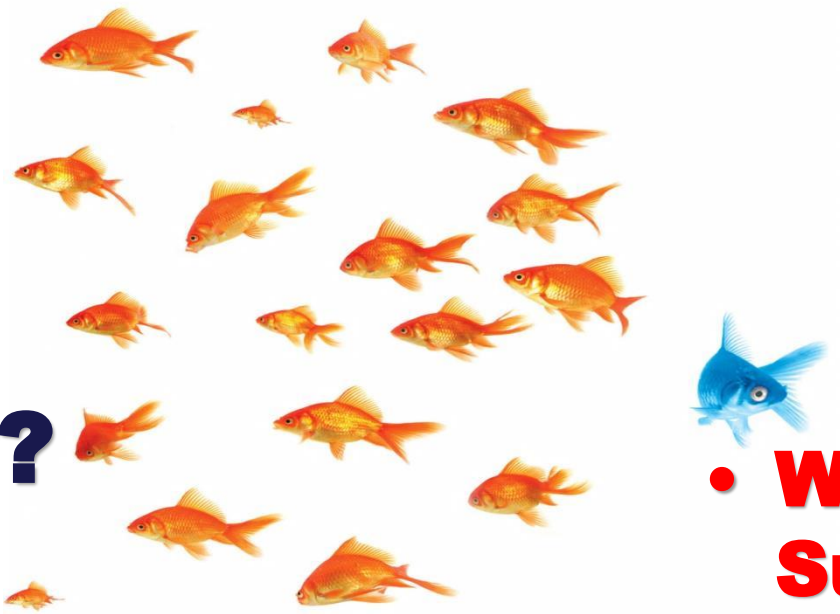
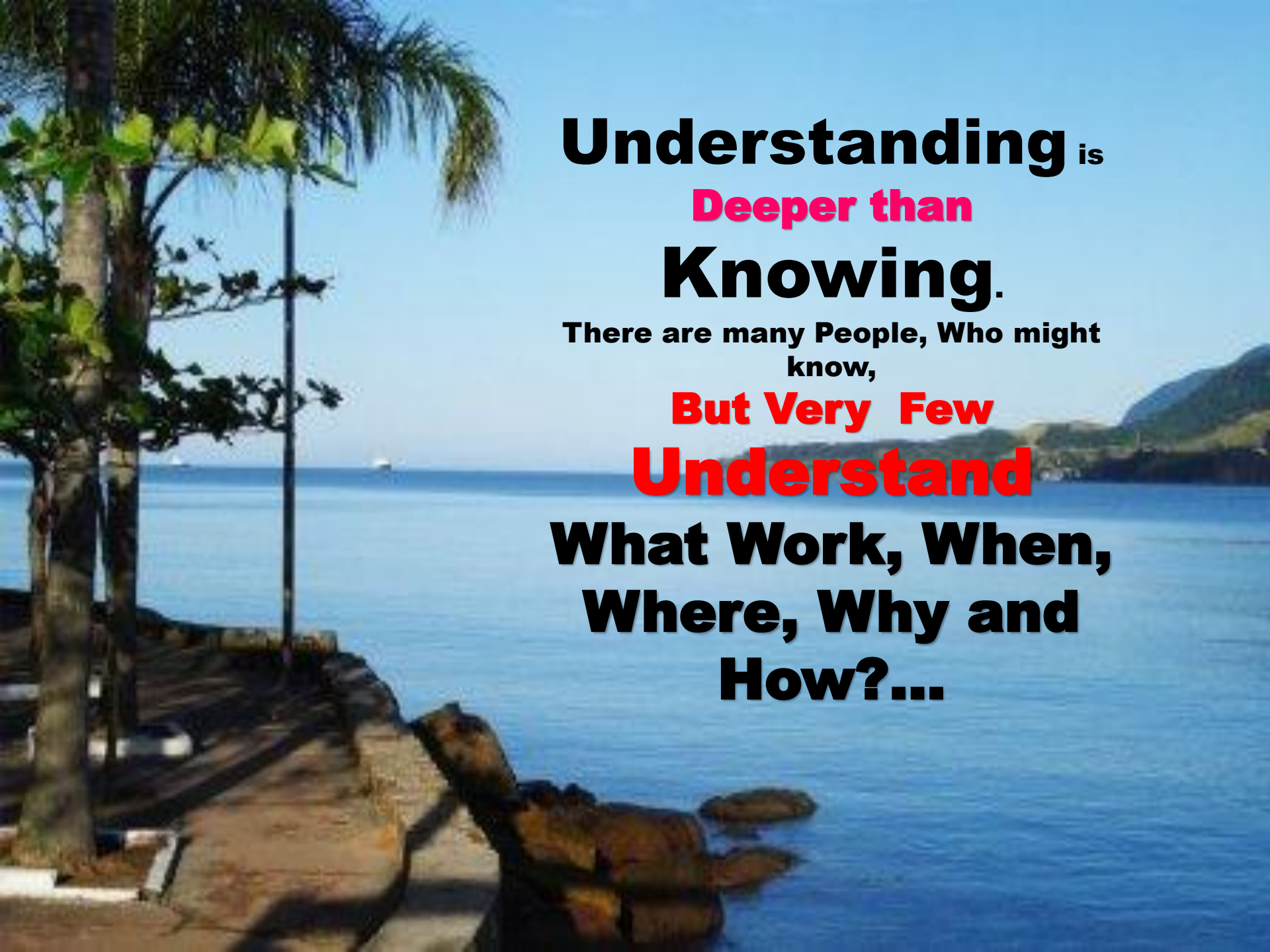
Many Aspire To Be Successful

- Only 1 or 2 Succeed?
- Why?



- Who Succeeds?

One Who is Critical, has Deeper Understanding of What Works, Where, When, Why and How and Does Things Differently?

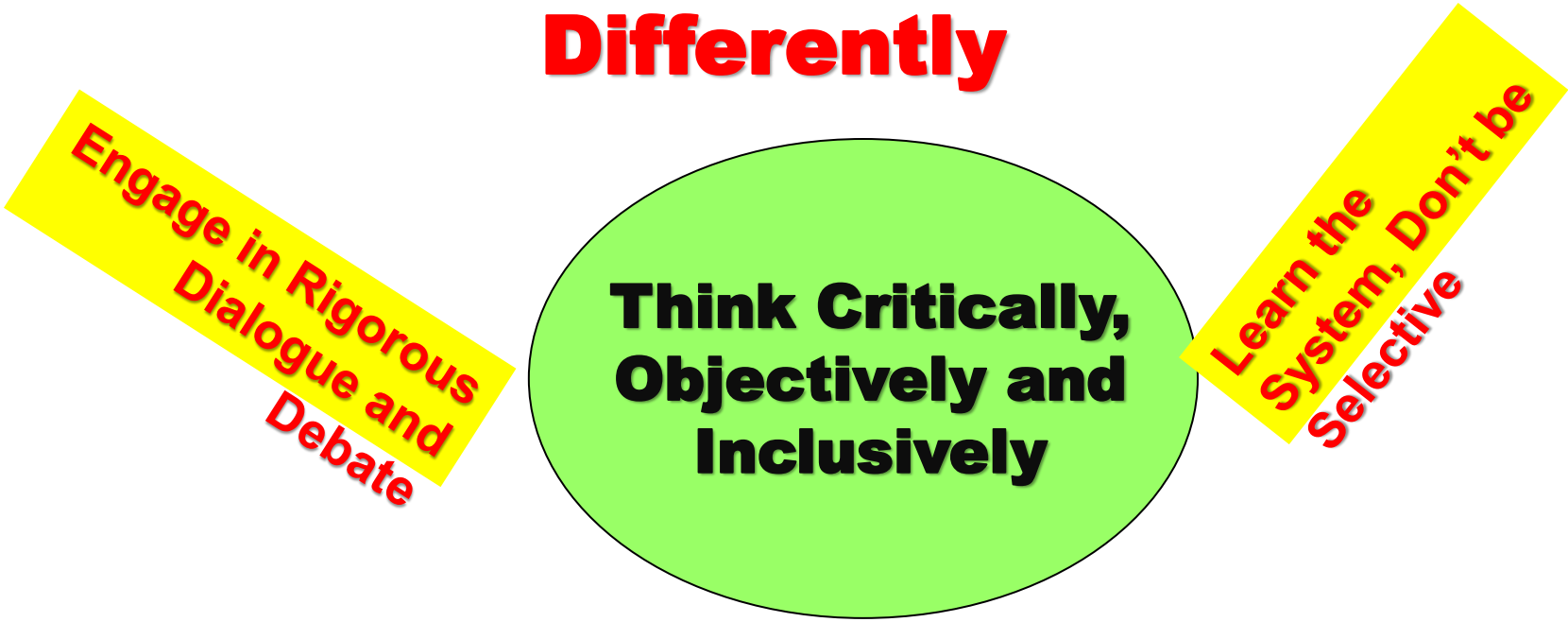

Understanding is
Deeper than
Knowing.
There are many People, Who might know,
But Very Few
Understand
What Work, When, Where, Why and How?...

3 Grand Global Challenges for the 21st Century

1. **Freedom from Want,**
2. **Freedom from Fear, and**
3. **Freedom from Constraints (Time, Geography & Choice)**

– Adapted from UN Secretary General Kofi Annan

Entrepreneurs Need to Think Differently



"From Either-Or" To "Both-And"

MECE

(Mutually Exclusive Collectively Exhaustive)

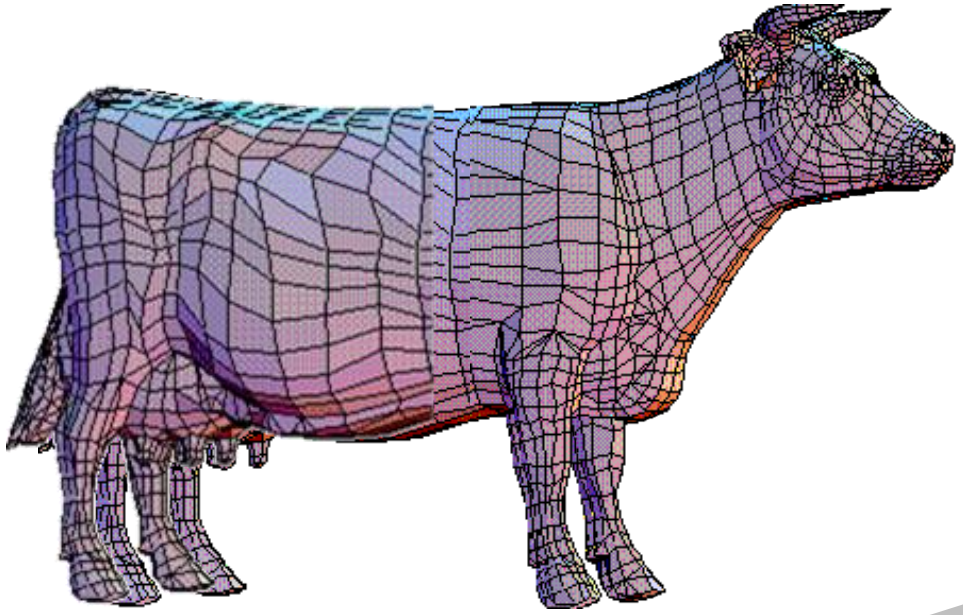
ICE

(Inclusive & Holistic)

Understand the System
Uncover the Causal Loops & Decision Chains

What is System?

- **A system is any group of interacting, interrelated, or interdependent parts that form a complex and unified whole that has a specific purpose**



Dividing a Cow in half does not give you 2 smaller Cows

Integrative Thinking is Required to Solve Complex Problems

Understanding of Causal Loops of All Sub-Systems of the Total System and their Interactions

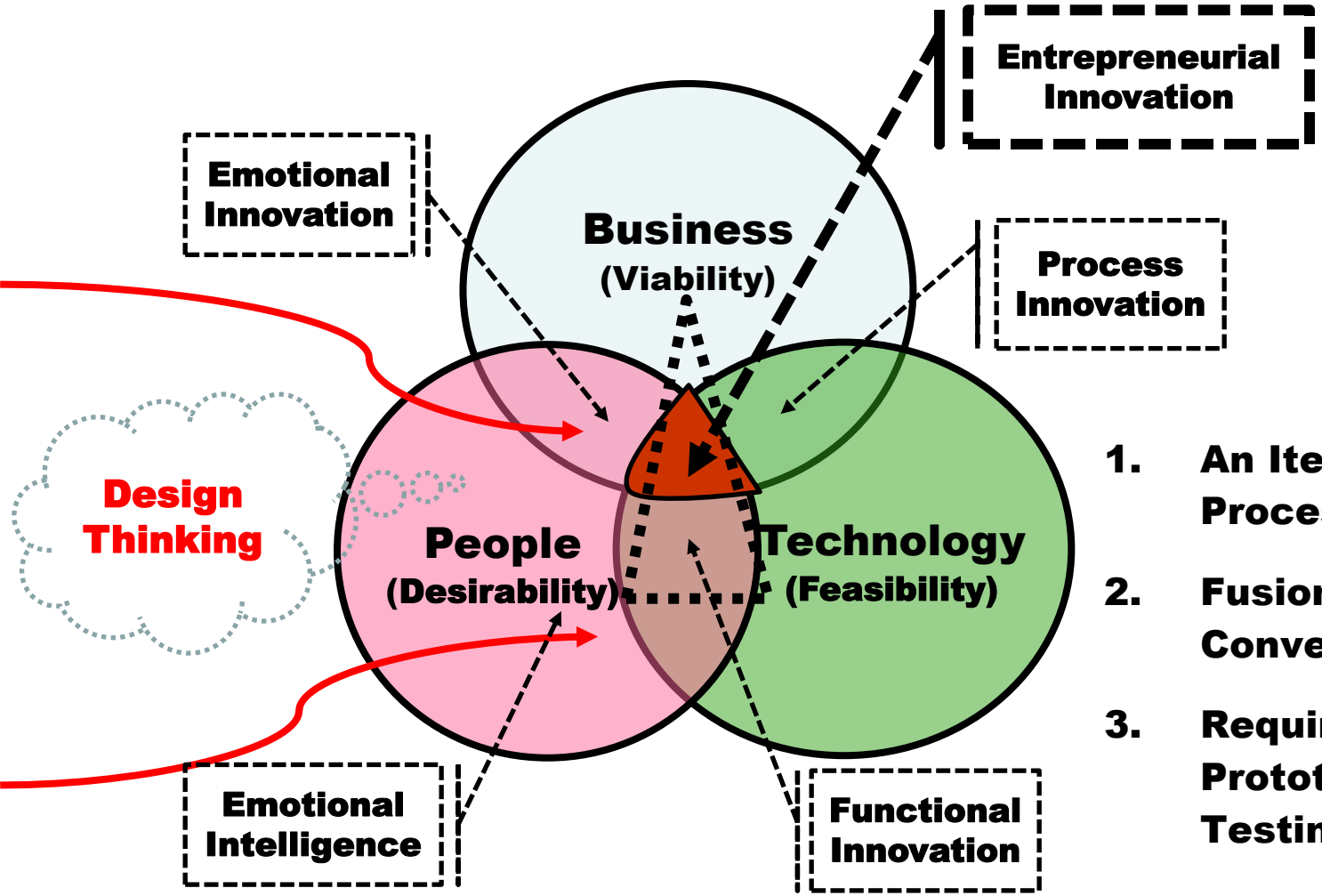
What is Design Thinking?

- **'Design thinking is a human-centered approach to innovation that integrates the needs of people, the possibilities of technology, and the requirements for business success.'**
  - ***- Tim Brown, CEO, IDEO***

Design Thinking

- **A Method of Designing Products and Services that are based on:**
  - **What people need and want**
  - **What people like or dislike**
    - **In regards to production, packaging, marketing, retailing, support, or all of them**
- **A skill that allows a designer to align what people want with what can be done, and produce a viable business strategy that creates customer value and market opportunity**

21st Century Entrepreneurship is Customer–Centric Technology Driven Creative Pursuits



1. An Iterative Learning Process
2. Fusion of Diverse and Converse Phases
3. Requires Repeated Prototyping and Testing

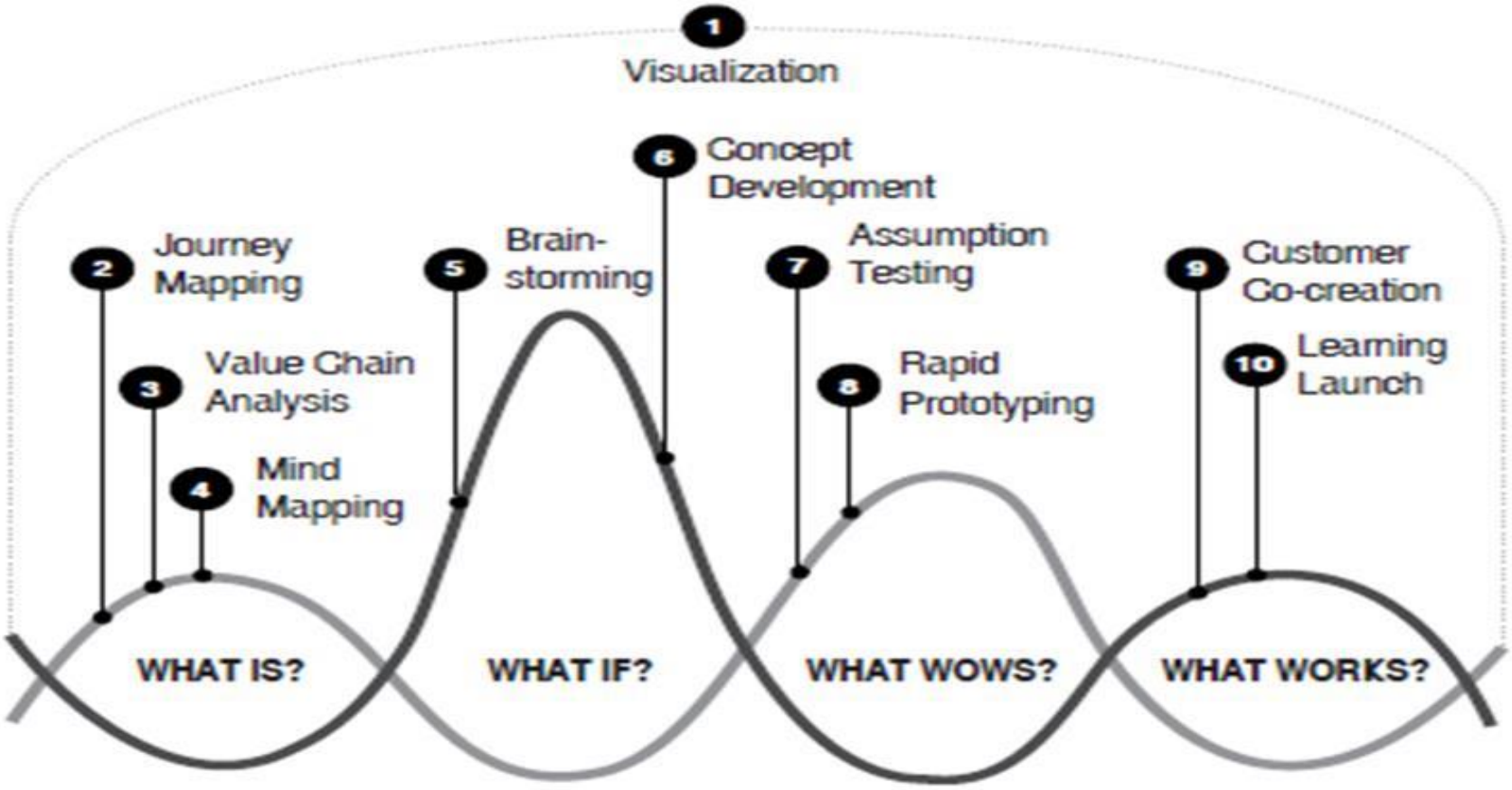
DVFA = Desirability, Viability and Feasibility Analysis

Design Thinking Mindsets, Tools & Templates

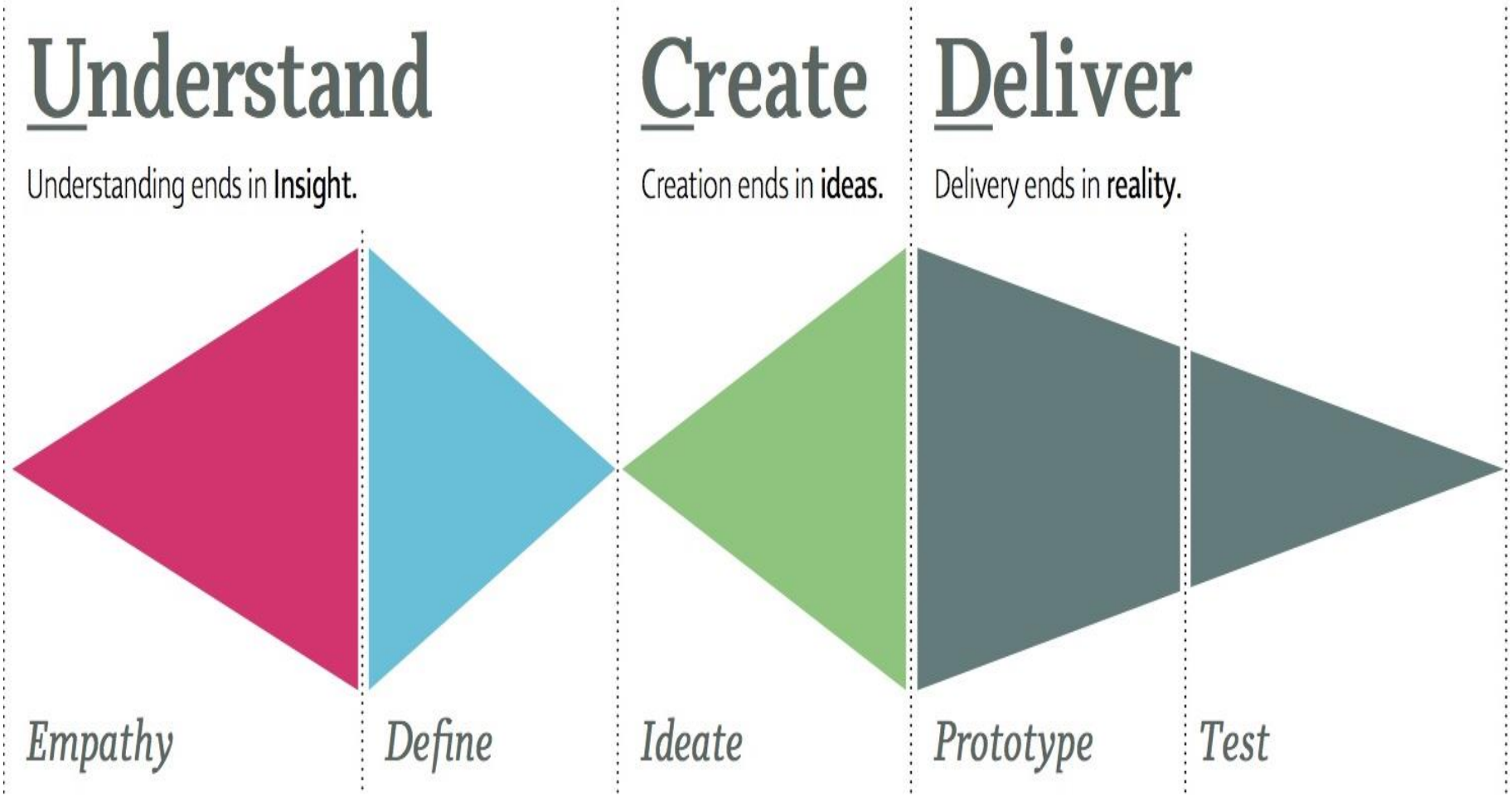
1. Think users first
2. Ask the right questions
3. Believe you can draw/ visualize
4. Commit to explore
5. Prototype to test

3 GEARS OF BUSINESS DESIGN

Visualization to Valuation

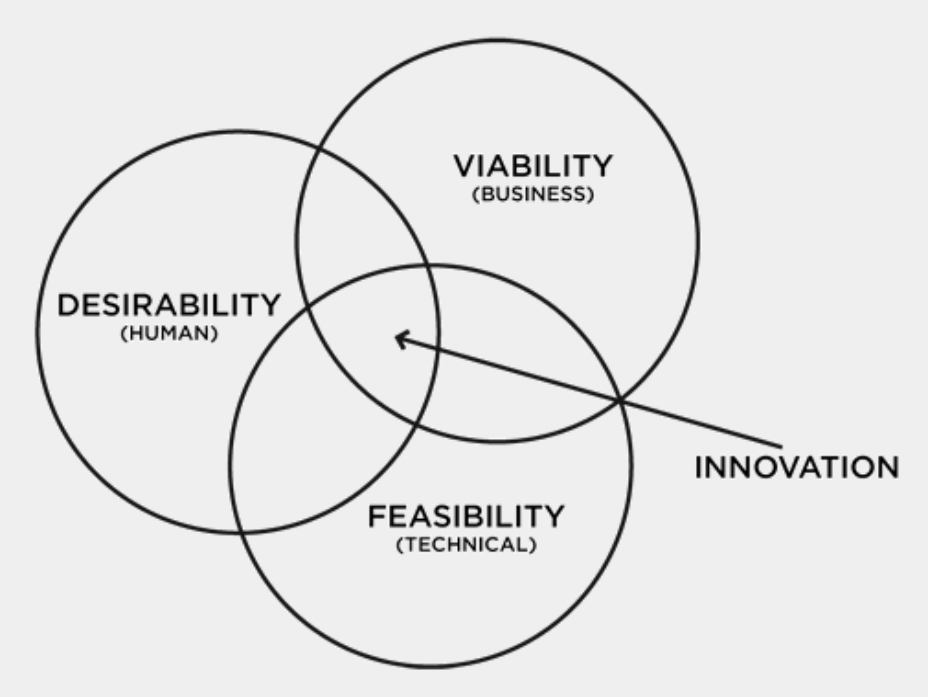


Design Process



Design Principle

- **Phases:**
  0) **Understand/observe**
  1) **Visualize/Realize**
  2) **Evaluating/Refining**
  3) **Implement (detailed engineering)**
  4) **Implement (manufacturing liaison)**



Inspiration

- **Identify a problem**
  - **When something isn't perfect, there is opportunity for design thinking**
  - **Example: A Medical Group had issues with information flow between nurses during shift change**
    - **Problem: patient care wasn't perfect; nurses had no system for cataloging patient information, inefficient, and incomplete.**

Phase 0: Understand/Observe

- **Study current market**
  - **Current users**
    - **Likes**
    - **Dislikes**
  - **Current techniques**
  - **History**
  - **Cost structure**
- **Understand how things are**
  - **Create feasibility record**
  - **Other creative firms avoid this process**

Phase 1: Visualize/Realize

- **Begin creating prototypes for potential solutions**
  - **Rough**
  - **Rapid**
  - **Right**
- **Constant contact with client**
- **Full context of product use**
  - **Storyboarding of characters using potential idea**
  - **Brainstorming**
    - **Focused**
    - **Encourage wild ideas**
    - **No judgment**
    - **Build on others ideas**
    - **Go for quantity**

Ideation

- **Prototyping**
  - **Does not have to be complex or expensive**
    - **`Must be physical**
      - **Intangibles can be taped**
      - **Visualizing helps review**
    - **True prototypes beg for improvement**
      - **A “finished” prototype isn’t necessarily the best prototype**
  - **Used to identify strengths and weaknesses of an idea and direct the next prototype in the best possible direction**
  - **Test, re-prototype, test, re-prototype, test, re-prototype…**

Phase 2: Evaluating/Refining

- **Begin turning rough prototypes of foam into functional prototypes**
  - **Shift from human factors/needs to engineering**
  - **Resolve technical issues**
- **Concurrent engineering**
  - **Engineer functionality**
  - **Design aesthetically pleasing product**

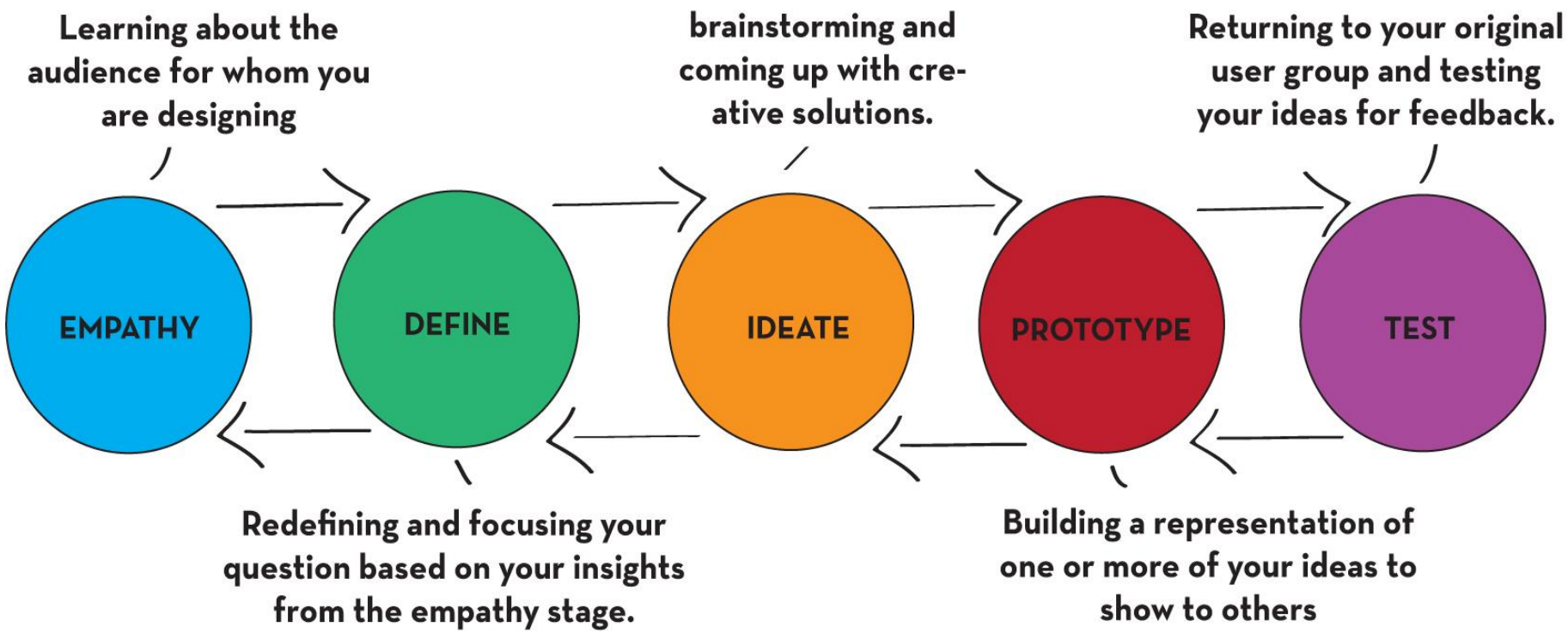
Phase 3: Implement (Detailed Engineering)

- **Verify the final product works**
  - **Successfully does what you set out to do**
  - **Meets regulations**
  - **Stress test**
- **Manufacturing protocols**

Phase 4: Implement (Manufacturing Liaison)

- **Move product from shop floor to client's manufacturing facility**
  - **Supervise production tooling**
  - **Regulatory approvals**

5 Steps of Design Thinking



Five Action Phases of Design Thinking

1. Empathize - understand your customers/users' Pain Points
2. Define - outline clear project/business objectives
3. Ideate - explore ideas and solutions
4. Prototype - build and visualize ideas and solutions
5. Test - review and decide

Conclusion

- **The World of Business is Constantly Changing**
  - **Technology shifts**
  - **Shifting demographics**
  - **Market shifts**
- **Design thinking helps to find solutions**
  - **Innovate**
  - **Human-centered Ideas that Creates and Delivers Value to Their Customers**
  - **Inspire**

Contact Details

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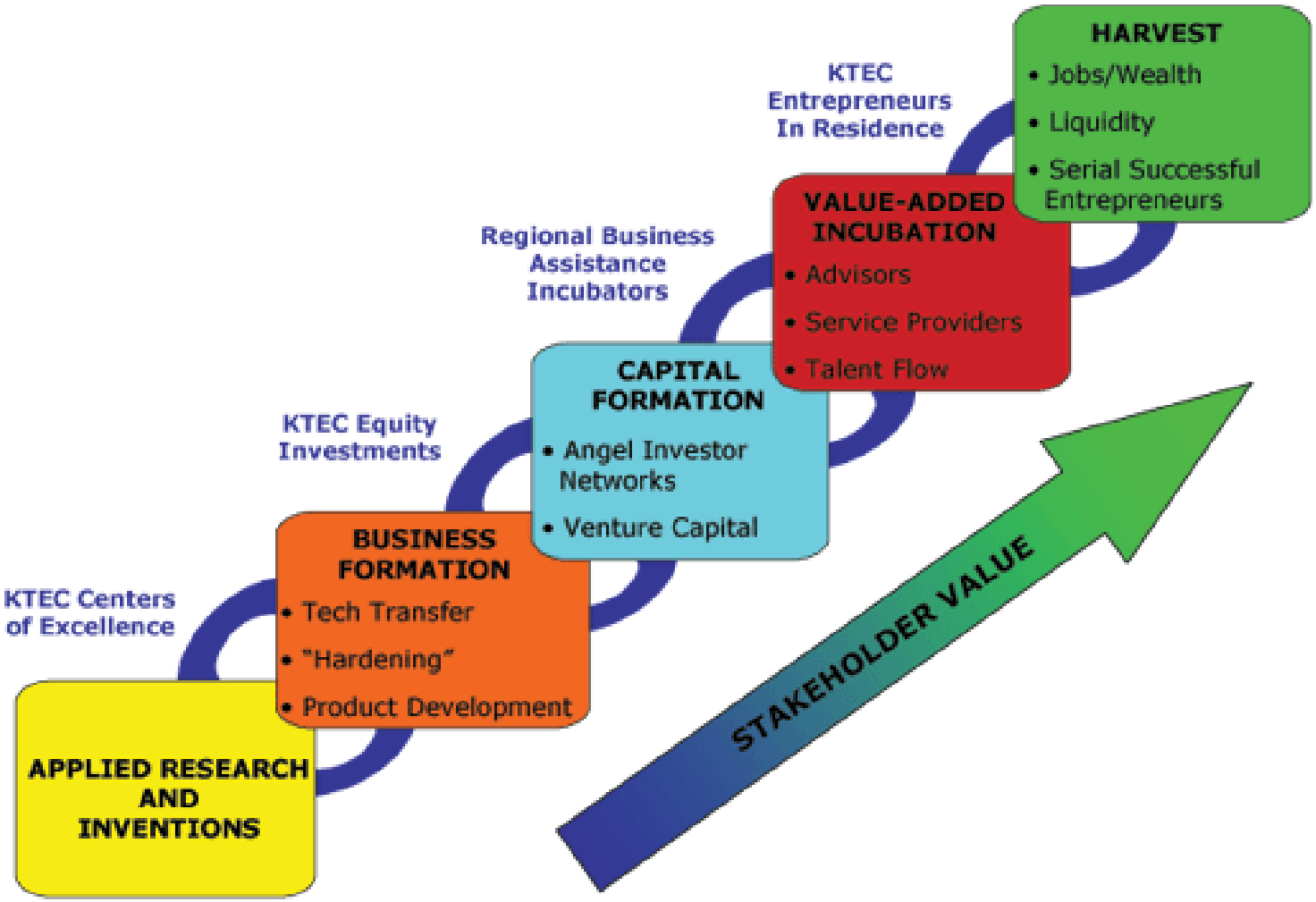
Thanks You For Your Attention


HARVEST
• Jobs/Wealth
• Liquidity
• Serial Successful Entrepreneurs
KTEC Entrepreneurs In Residence
VALUE-ADDED INCUBATION
• Advisors
• Service Providers
• Talent Flow
Regional Business Assistance Incubators
CAPITAL FORMATION
• Angel Investor Networks
• Venture Capital
KTEC Equity Investments
BUSINESS FORMATION
• Tech Transfer
• "Hardening"
• Product Development
KTEC Centers of Excellence
APPLIED RESEARCH AND INVENTIONS
STAKEHOLDER VALUE