RECONVERGE®
forge belonging

G2:2019: April 22-25

Capabilities and Contradictions

David Conley

Angles of Attack

S-Curves

Contradictions

Trends of System Evolution

Solution Concepts

1.) Decide on angle of attack

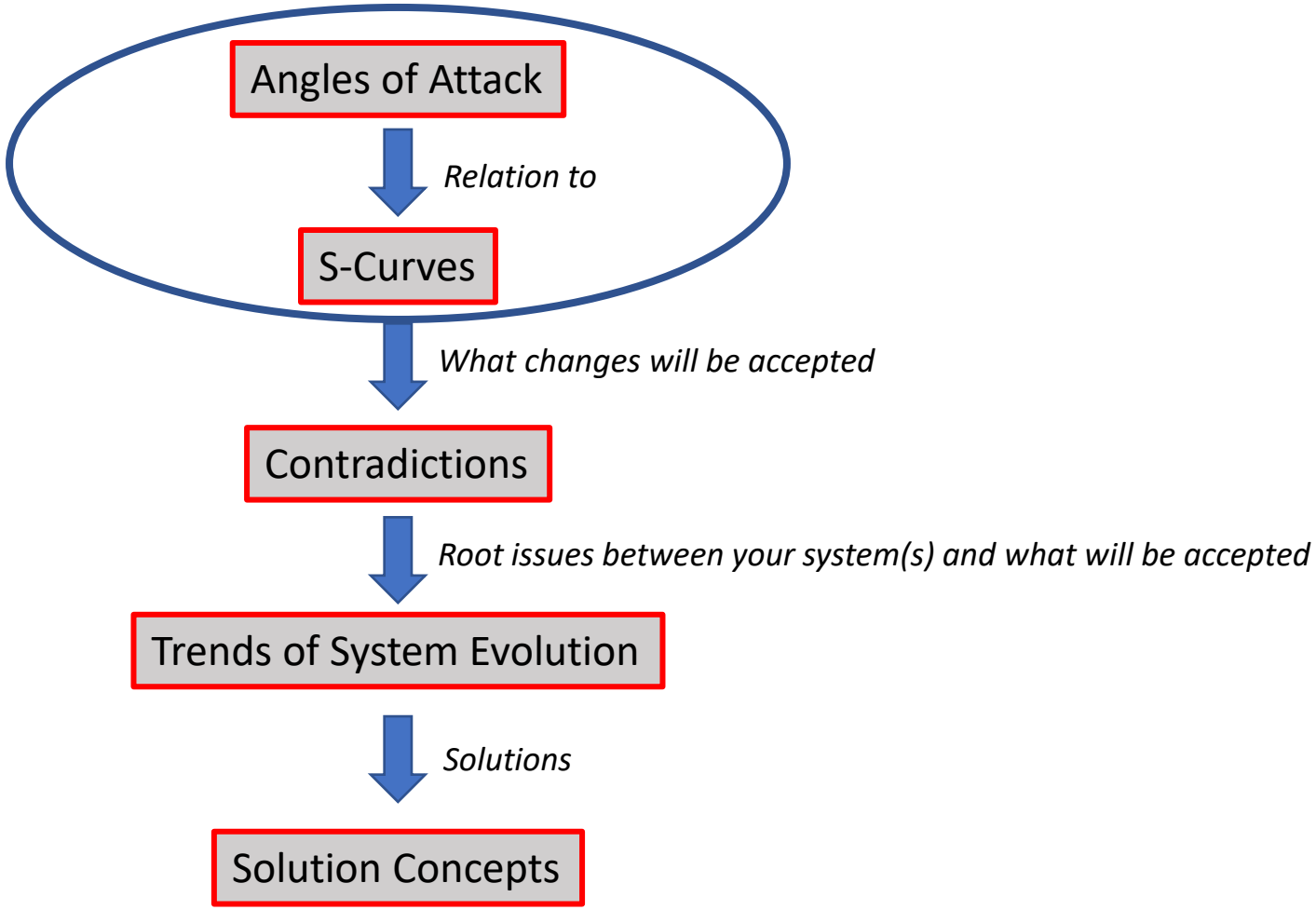
2.) Understand offering changes required to comply with angle of attack

3.) Capture contradiction(s) that reflect your offering's challenges

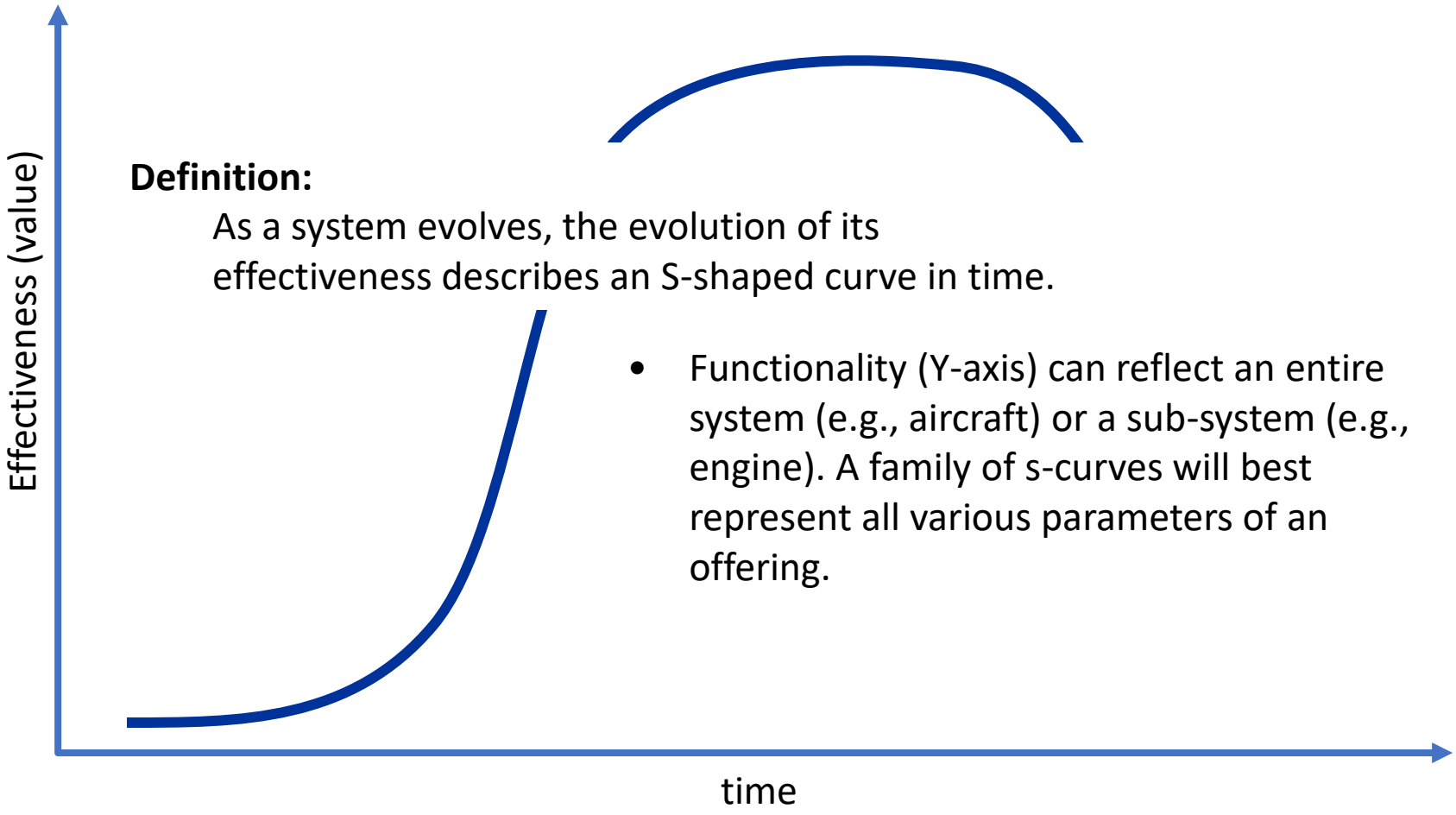
4.) Choose trends of system evolution that might best help address your offering(s) contradictions

5.) Generate solution by applying trends of system evolution to the identified contradictions

“You are here” Map



Trend of S-Curve Evolution



Definition:

As a system evolves, the evolution of its effectiveness describes an S-shaped curve in time.

- Functionality (Y-axis) can reflect an entire system (e.g., aircraft) or a sub-system (e.g., engine). A family of s-curves will best represent all various parameters of an offering.

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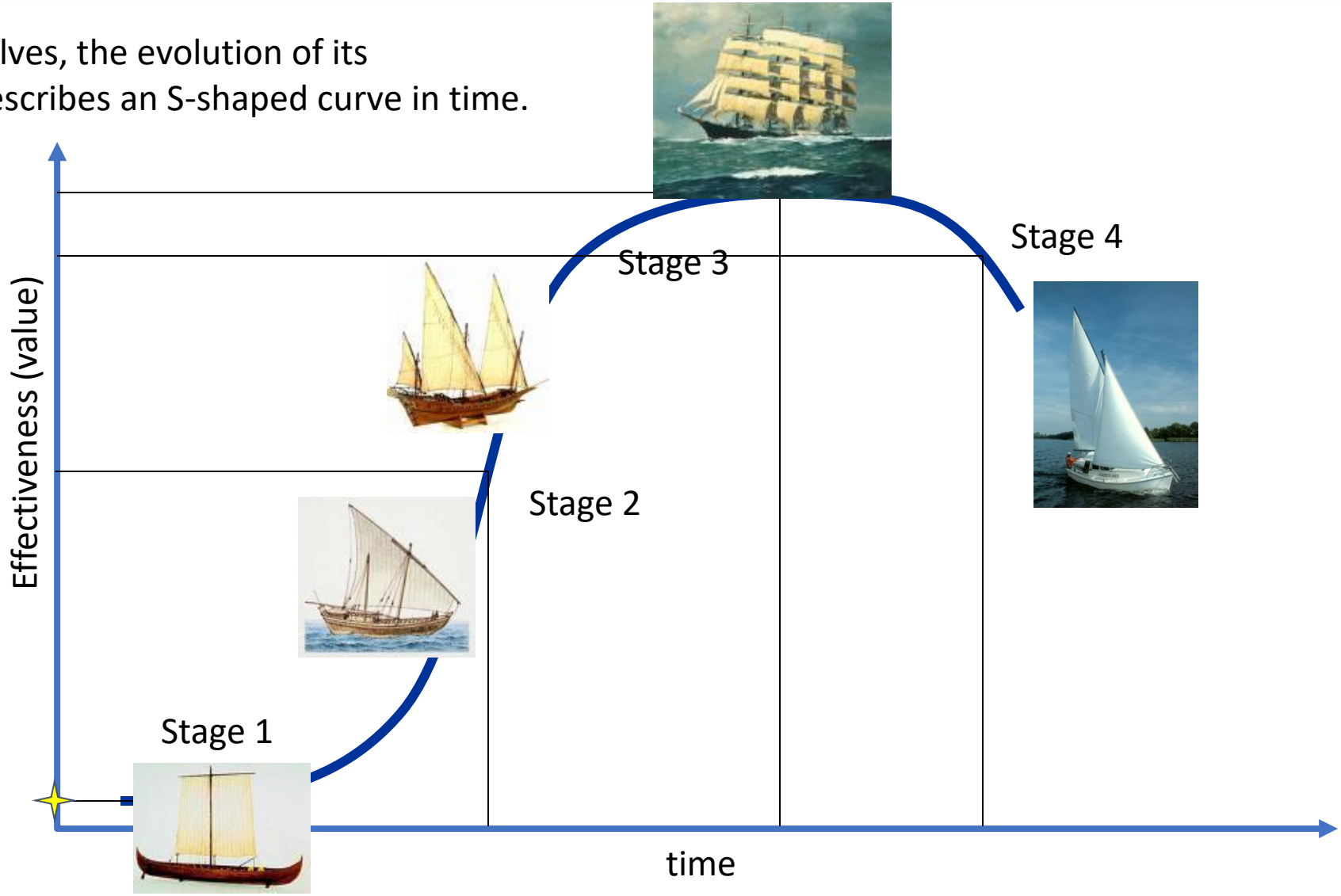

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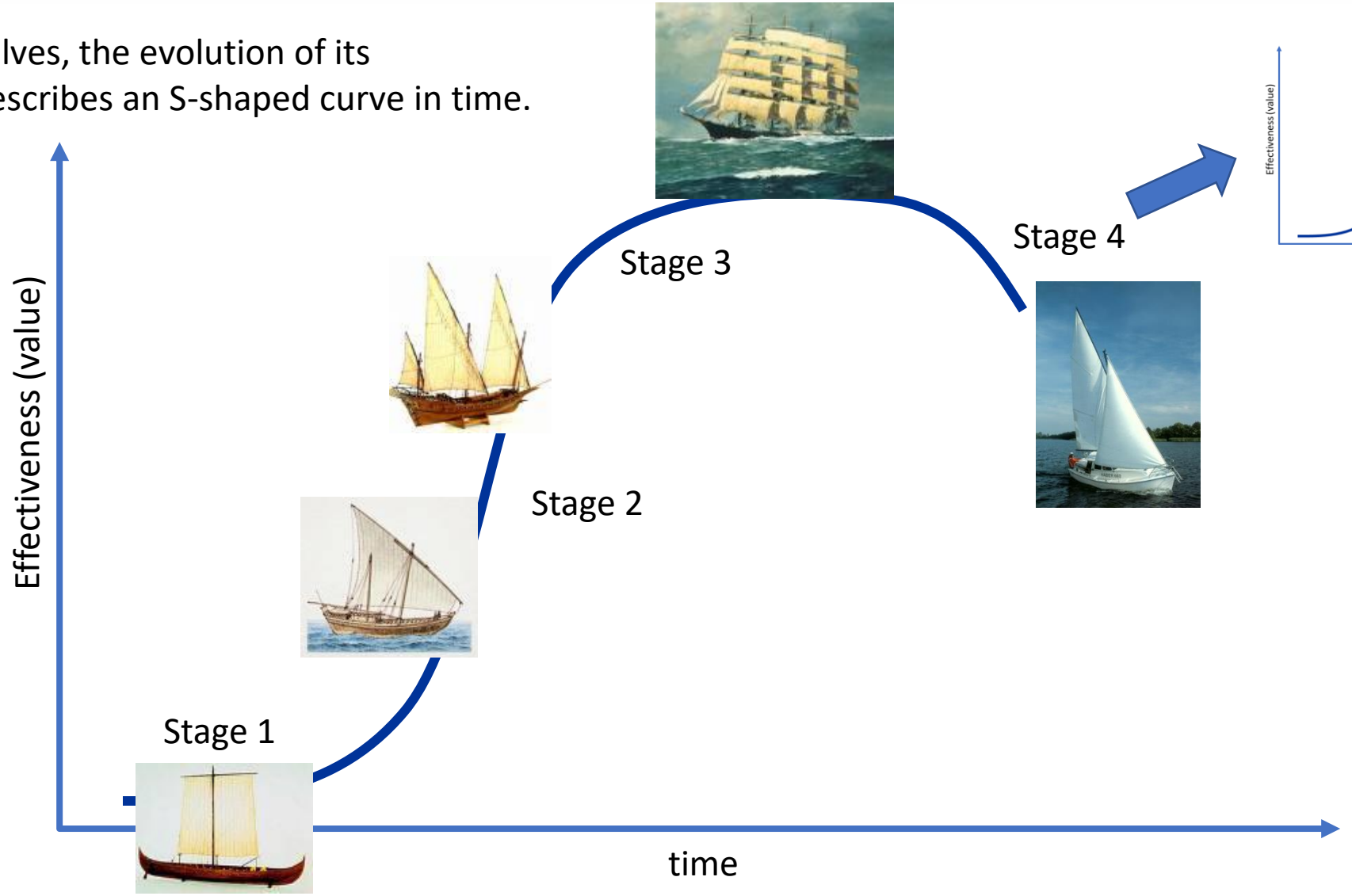

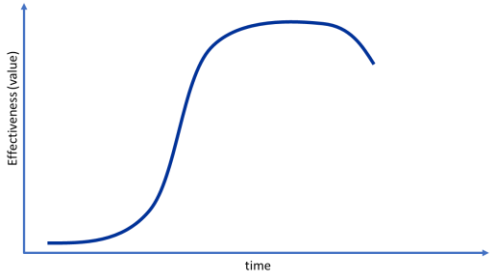

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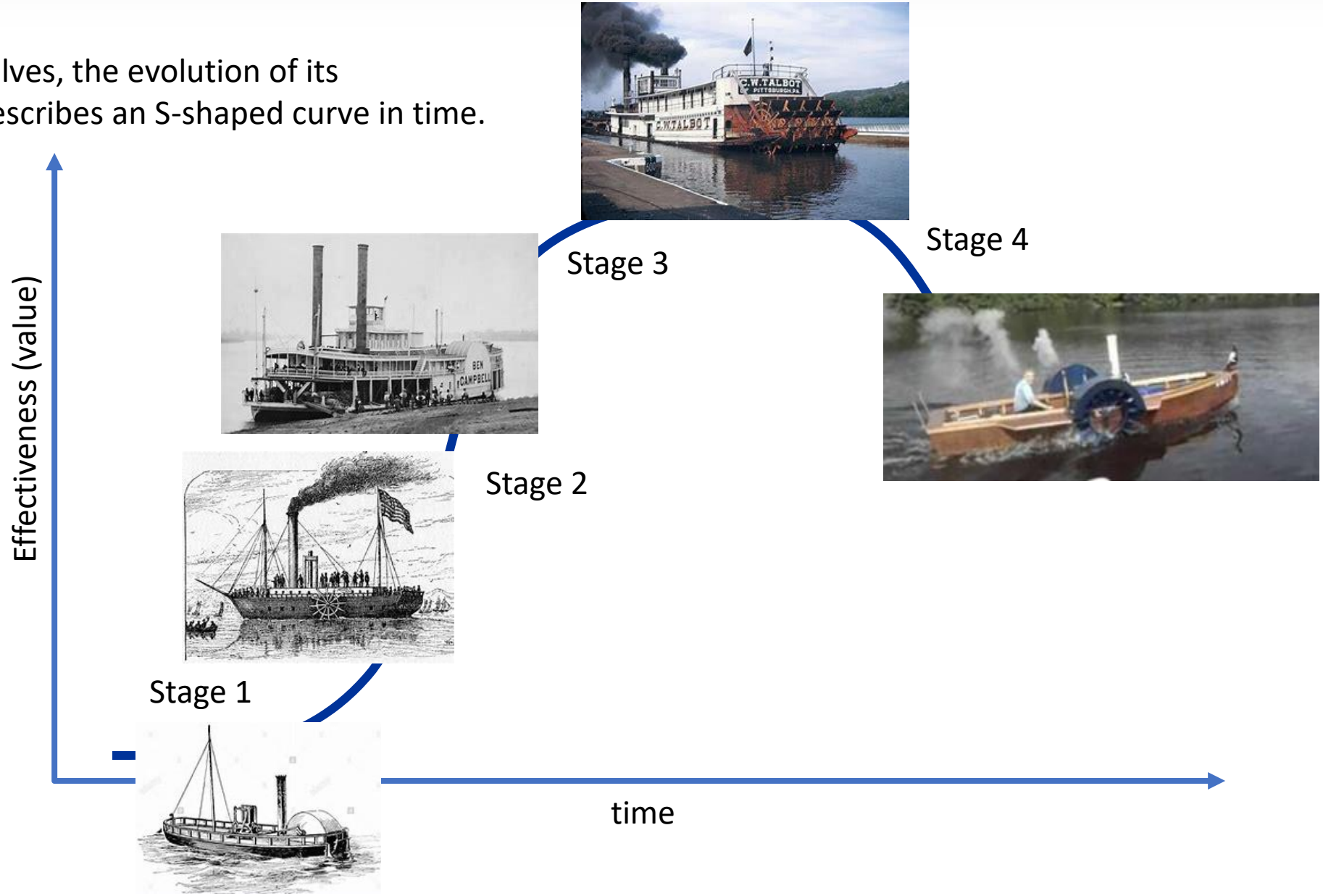
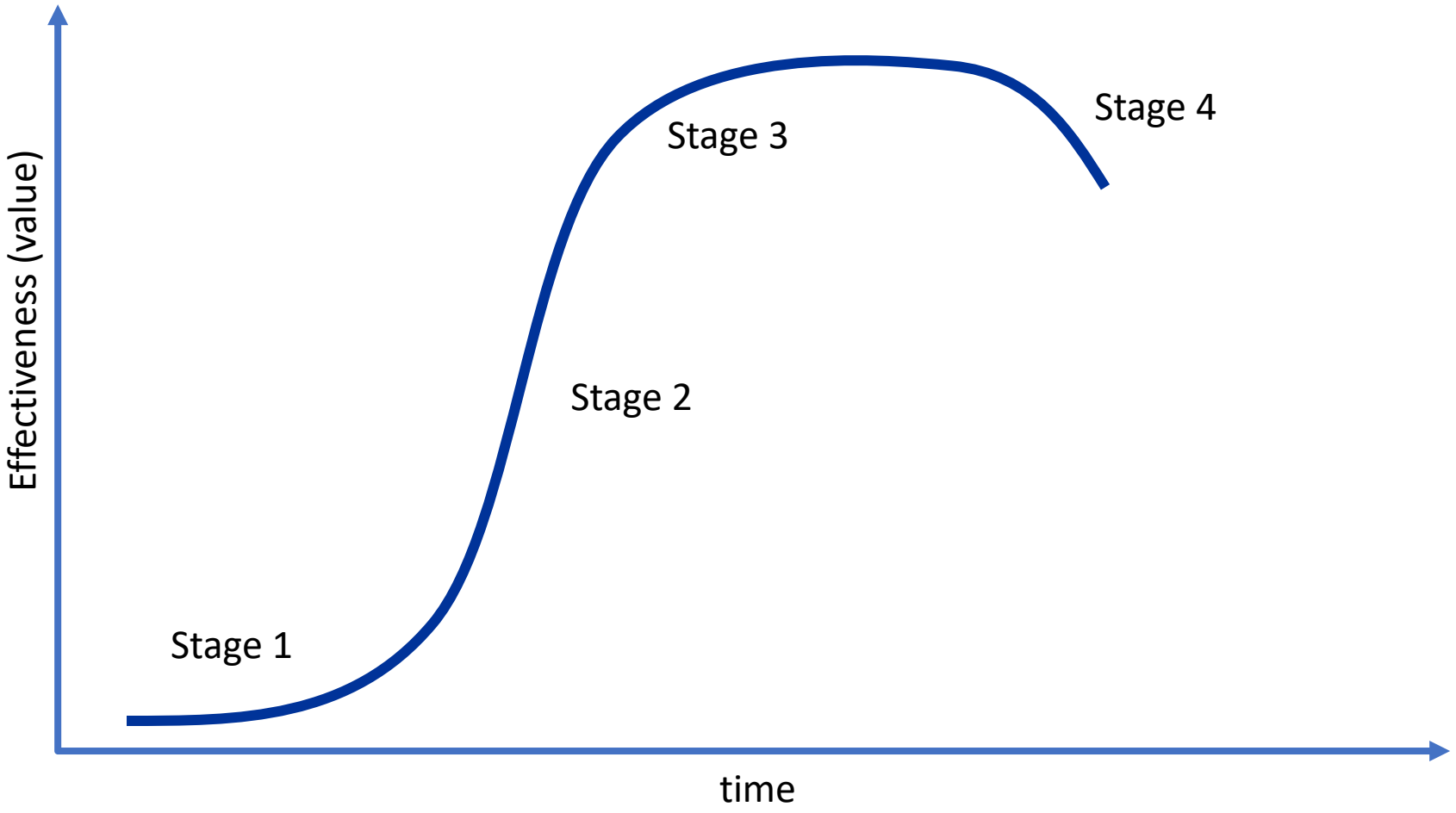


S-Curves

Trend of S-Curve Evolution

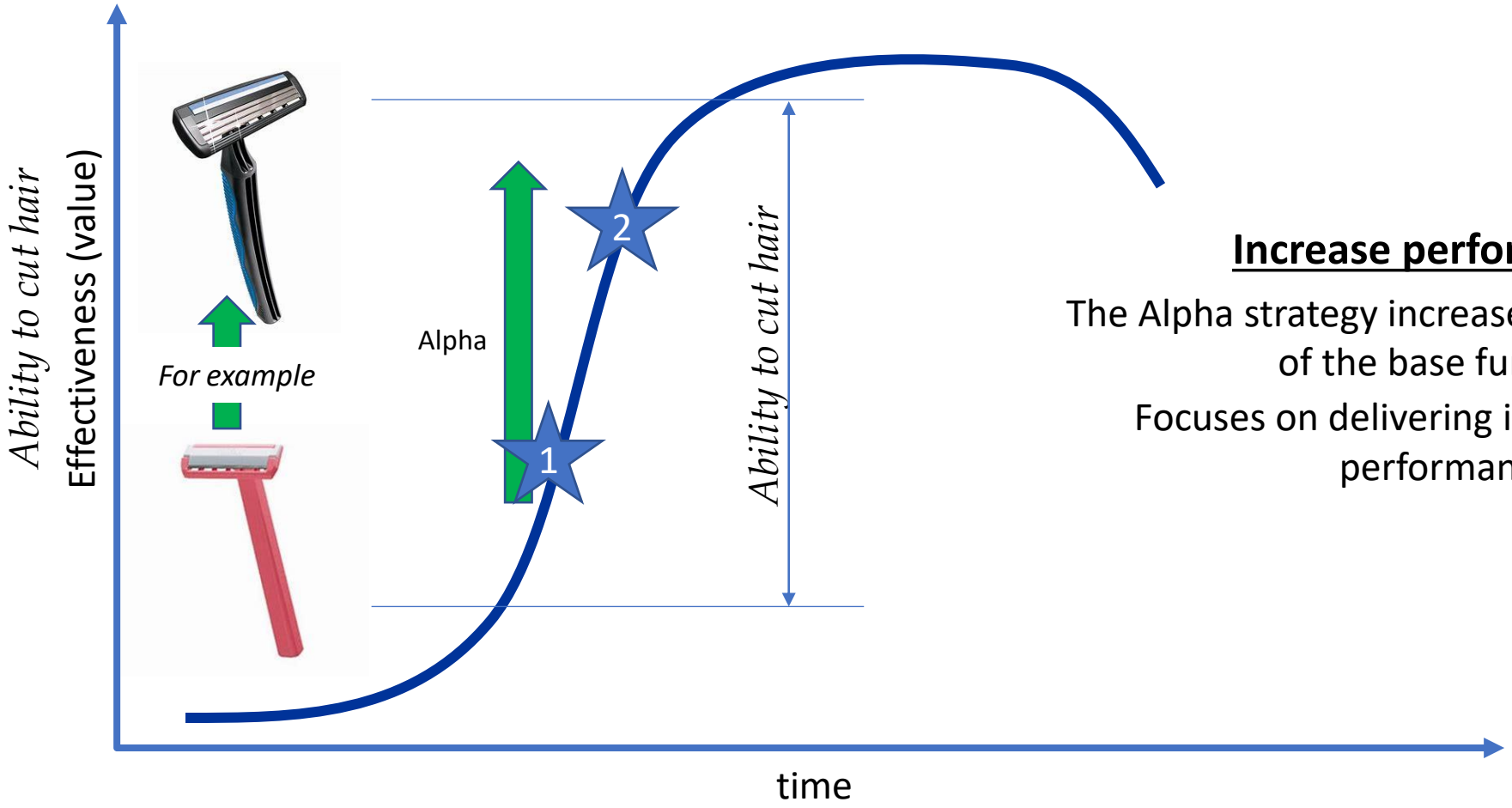
Definition:

Each Angle of Attack has a different relationship to the S-curves and therefore requires different actions for success



Trend of S-Curve Evolution

How s-curves relate to angles of attack: Alpha



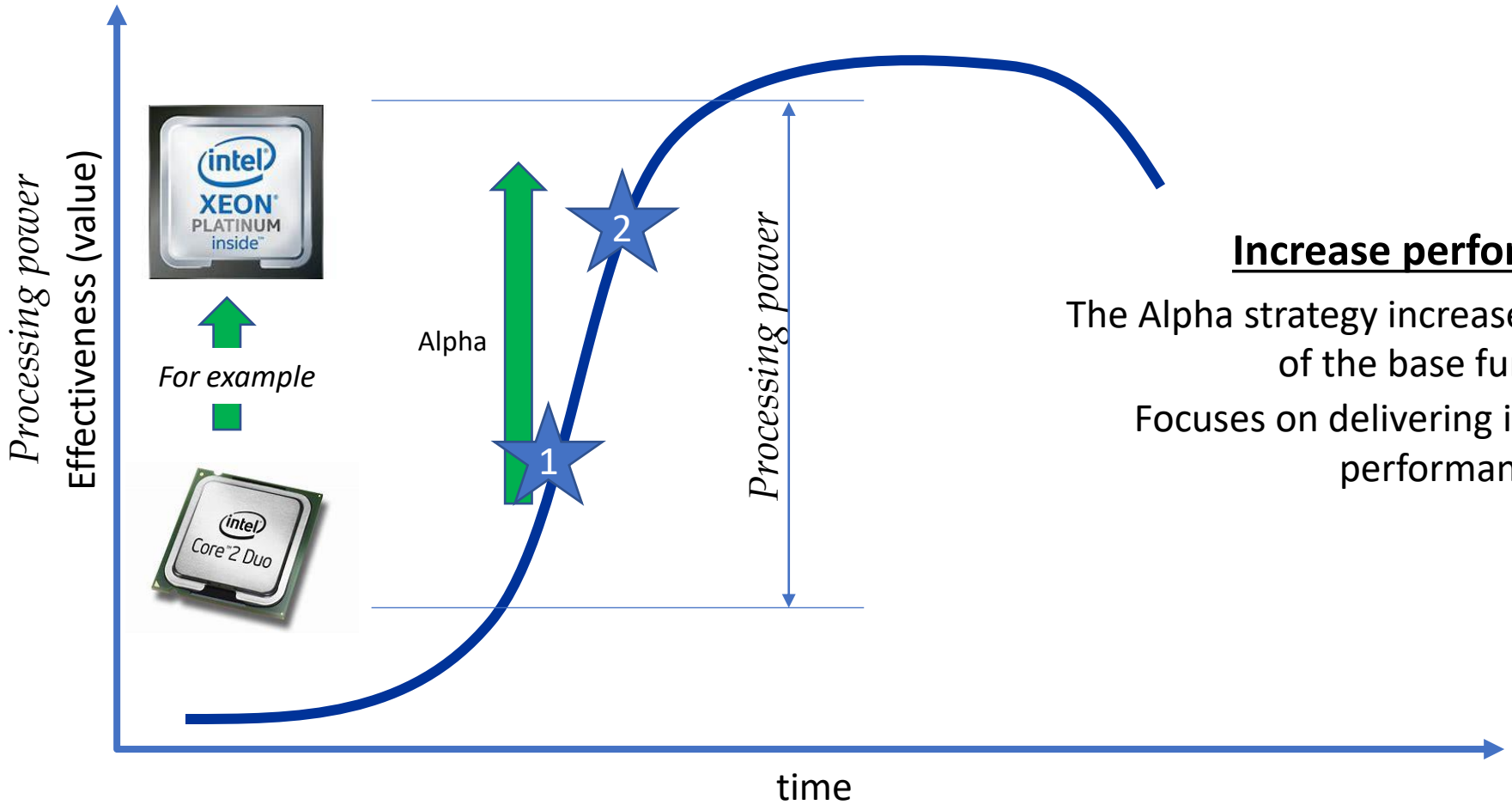
Increase performance

The Alpha strategy increases the effectiveness of the base function.

Focuses on delivering industry leading performance.

Trend of S-Curve Evolution

How s-curves relate to angles of attack: Alpha



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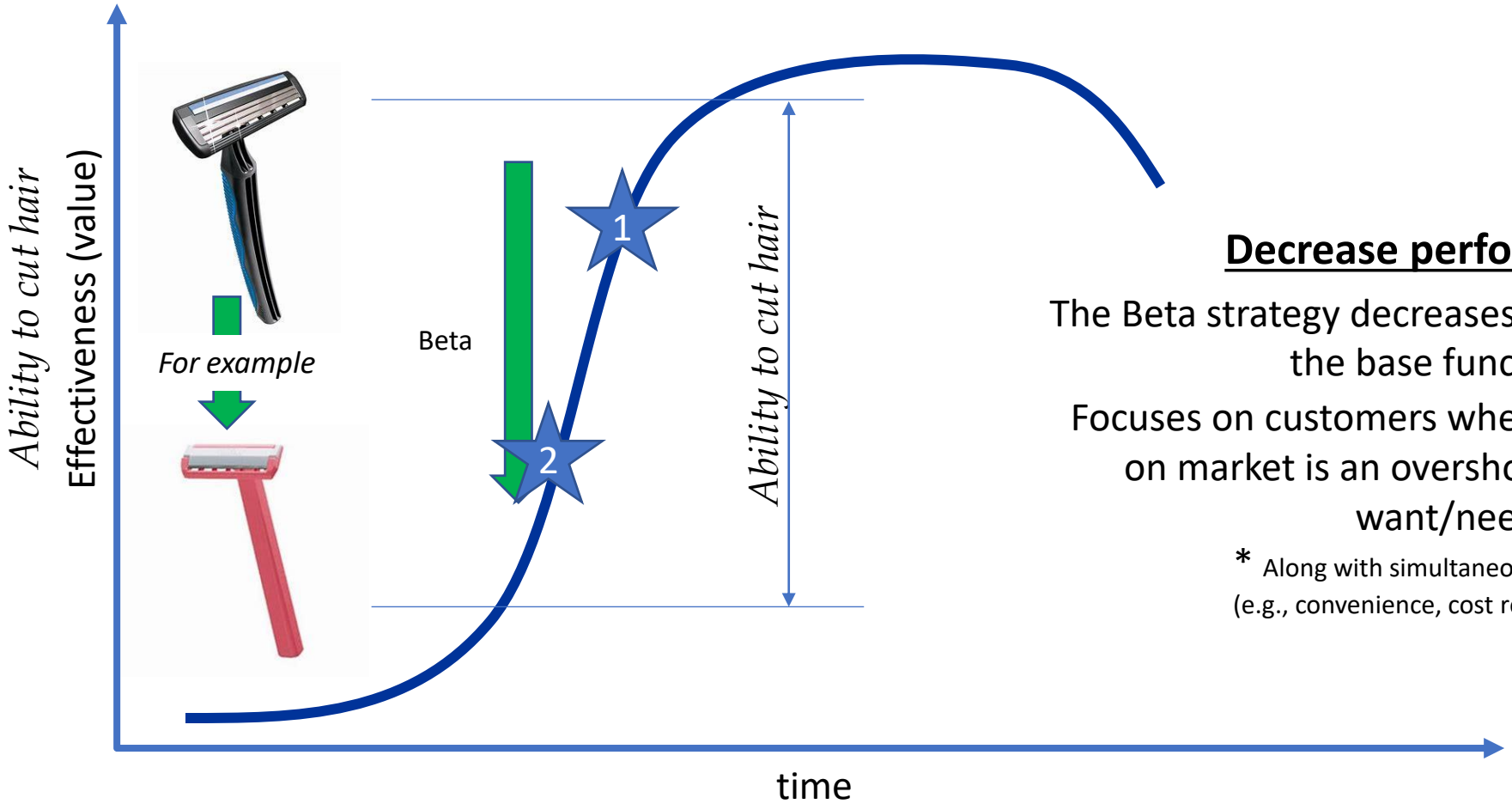
Trend of S-Curve Evolution

How s-curves relate to angles of attack: Beta



Decrease performance

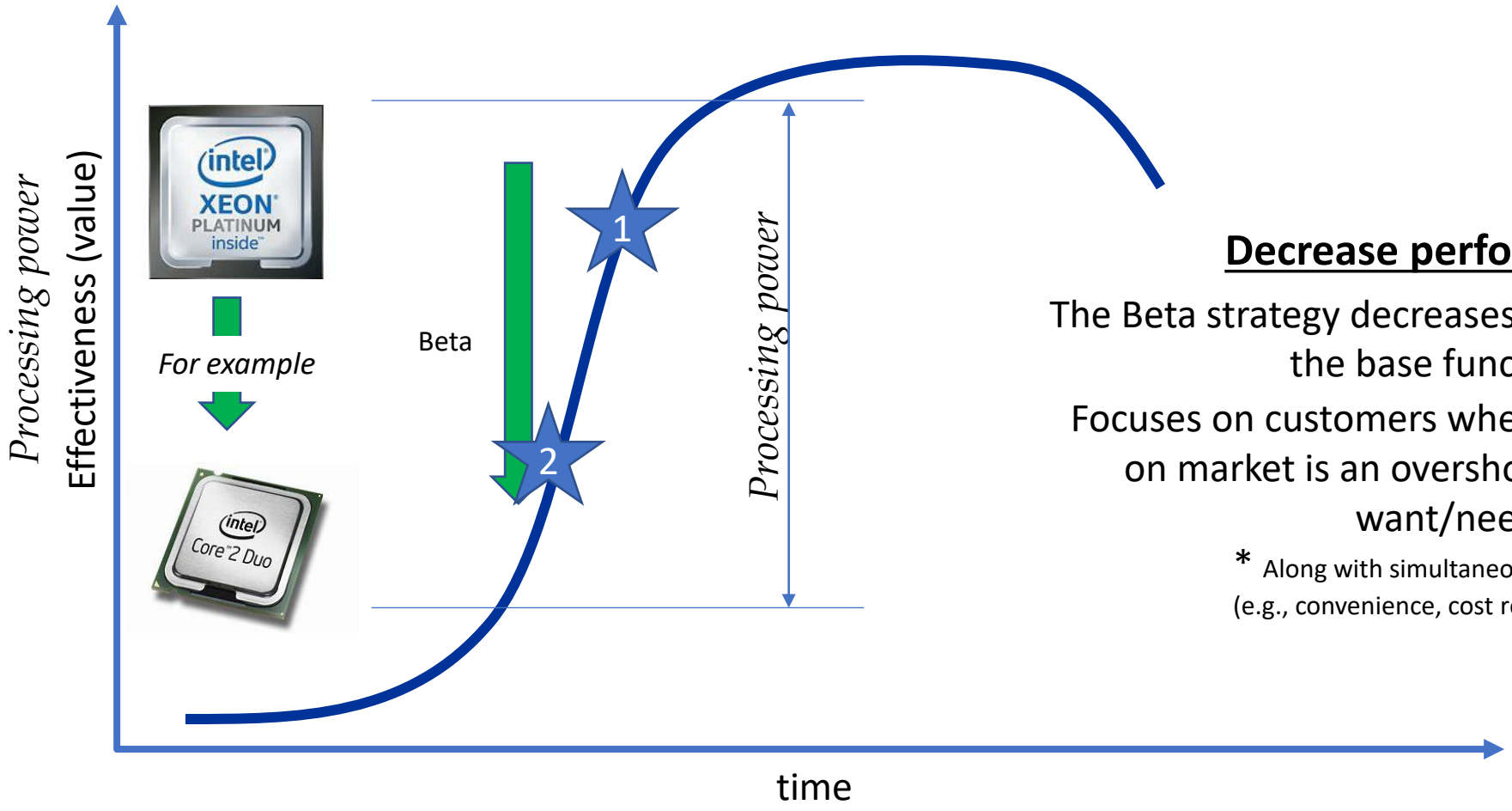
The Beta strategy decreases the effectiveness of the base function.*

Focuses on customers where primary product on market is an overshoot to what they want/need.

* Along with simultaneously inc. some benefits (e.g., convenience, cost reduction, etc.)

Trend of S-Curve Evolution

How s-curves relate to angles of attack: Beta



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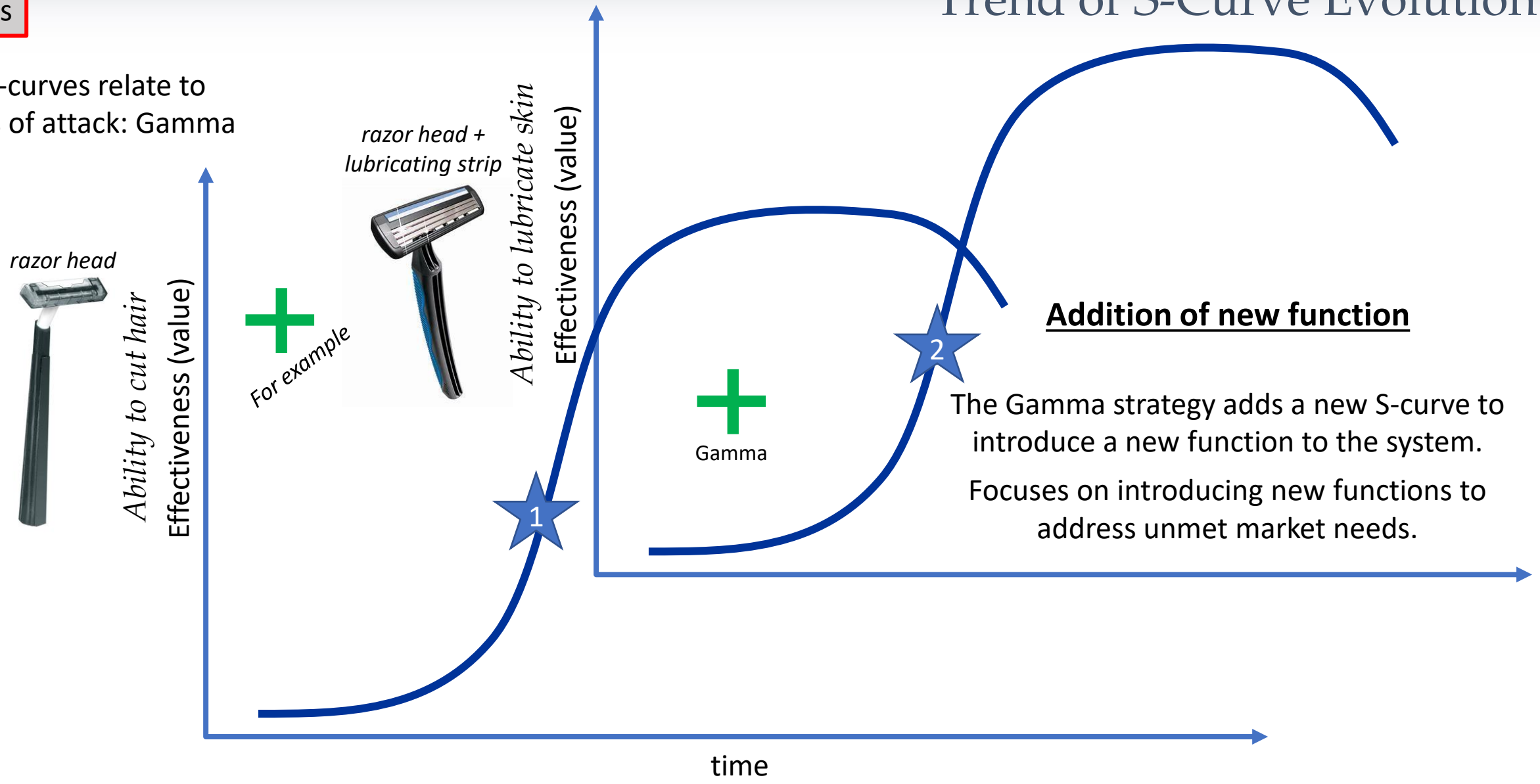
S-Curves

Trend of S-Curve Evolution

How s-curves relate to angles of attack: Gamma



Addition of new function

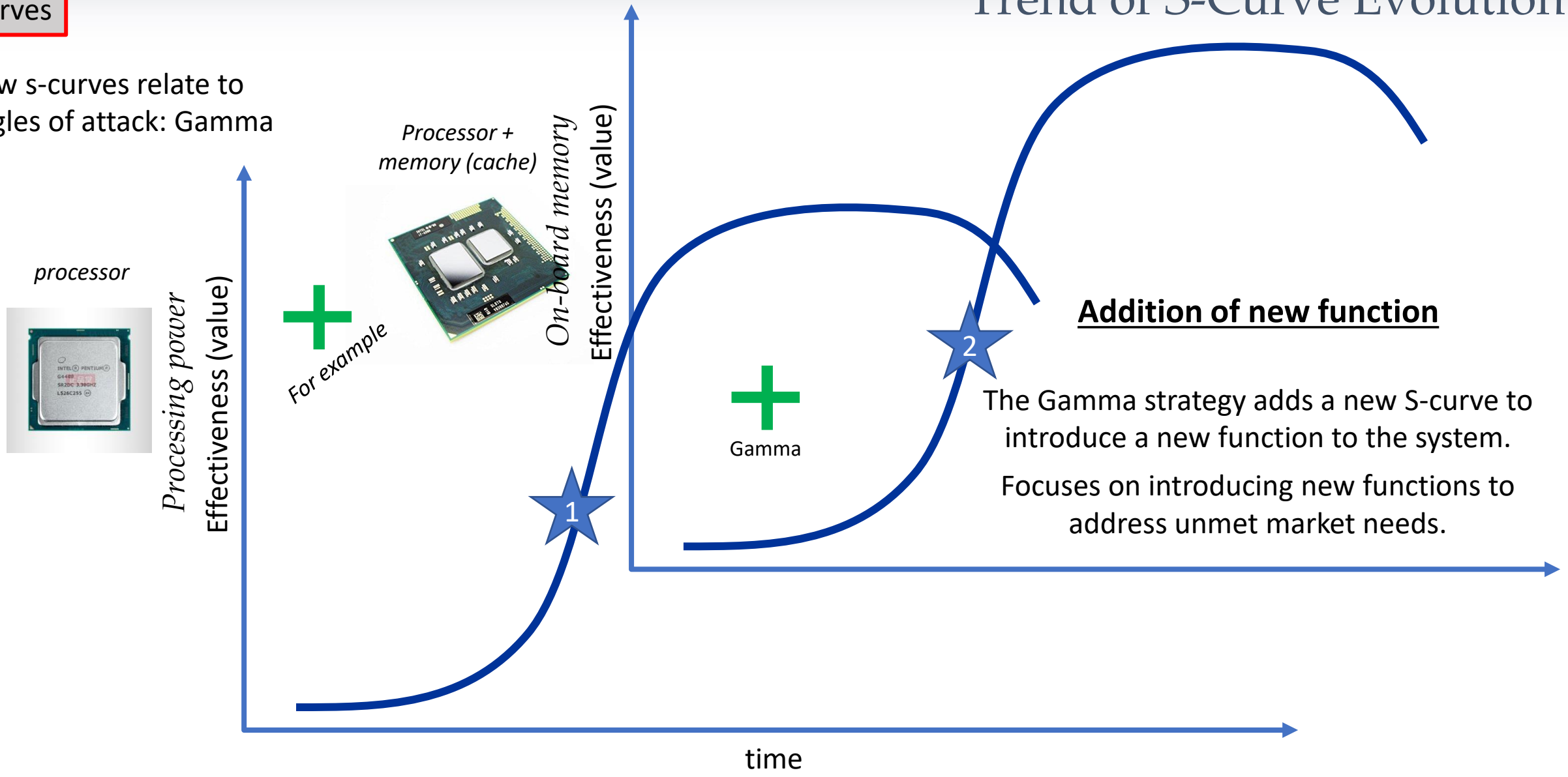
The Gamma strategy adds a new S-curve to introduce a new function to the system.

Focuses on introducing new functions to address unmet market needs.

S-Curves

Trend of S-Curve Evolution

How s-curves relate to angles of attack: Gamma



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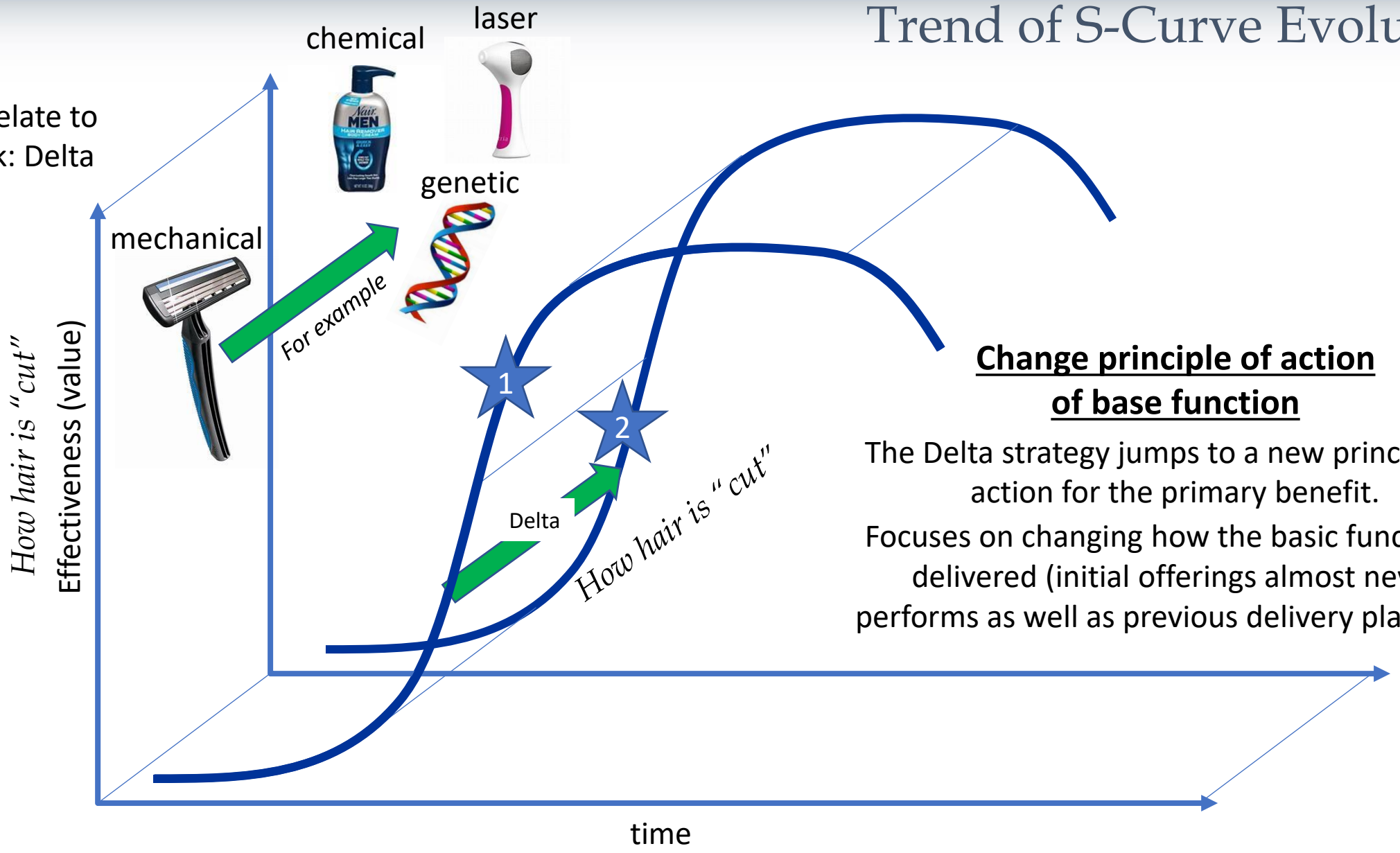
S-Curves

Trend of S-Curve Evolution

How s-curves relate to angles of attack: Delta



Change principle of action of base function

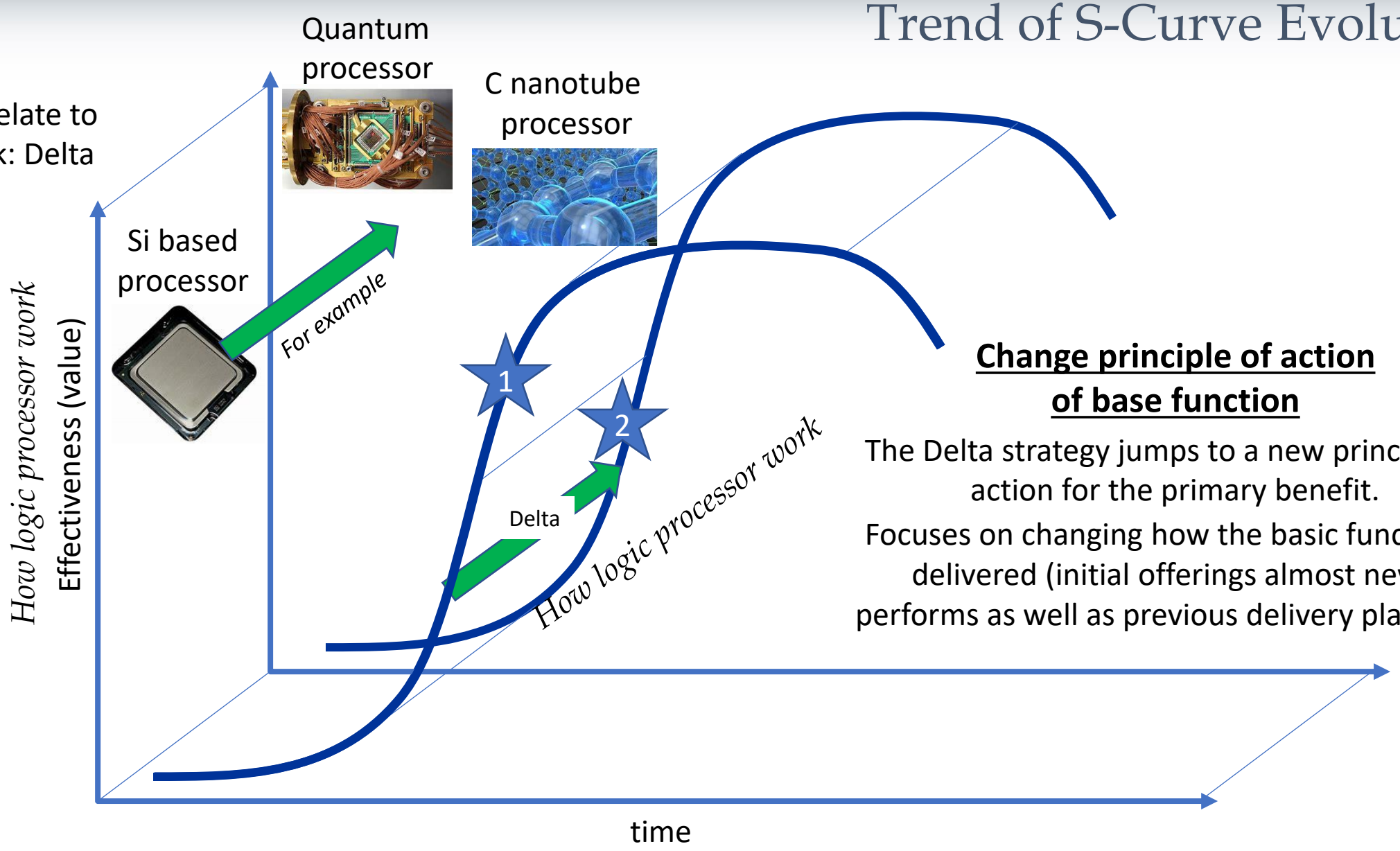
The Delta strategy jumps to a new principle of action for the primary benefit.

Focuses on changing how the basic function is delivered (initial offerings almost never performs as well as previous delivery platform).

S-Curves

Trend of S-Curve Evolution

How s-curves relate to angles of attack: Delta



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Angles of Attack Exercise

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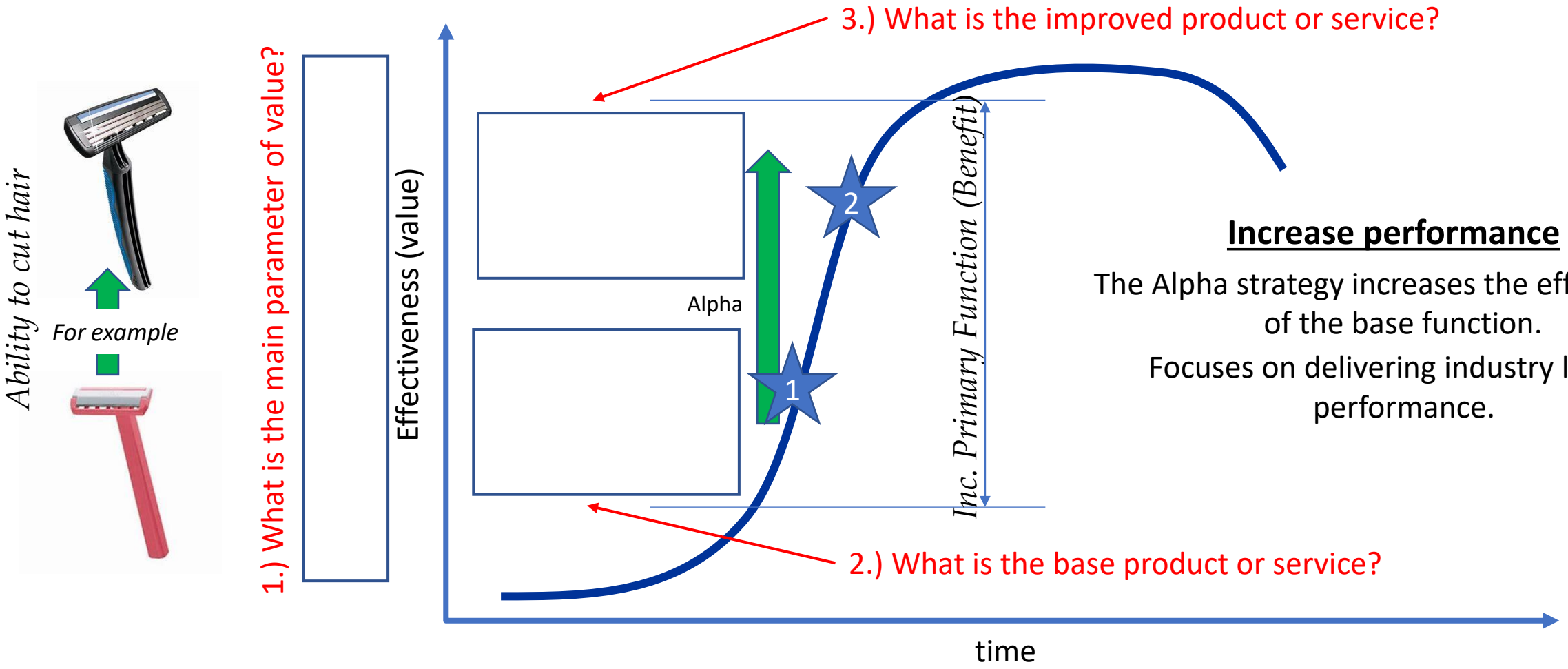

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S-Curves

Angles of Attack Exercise

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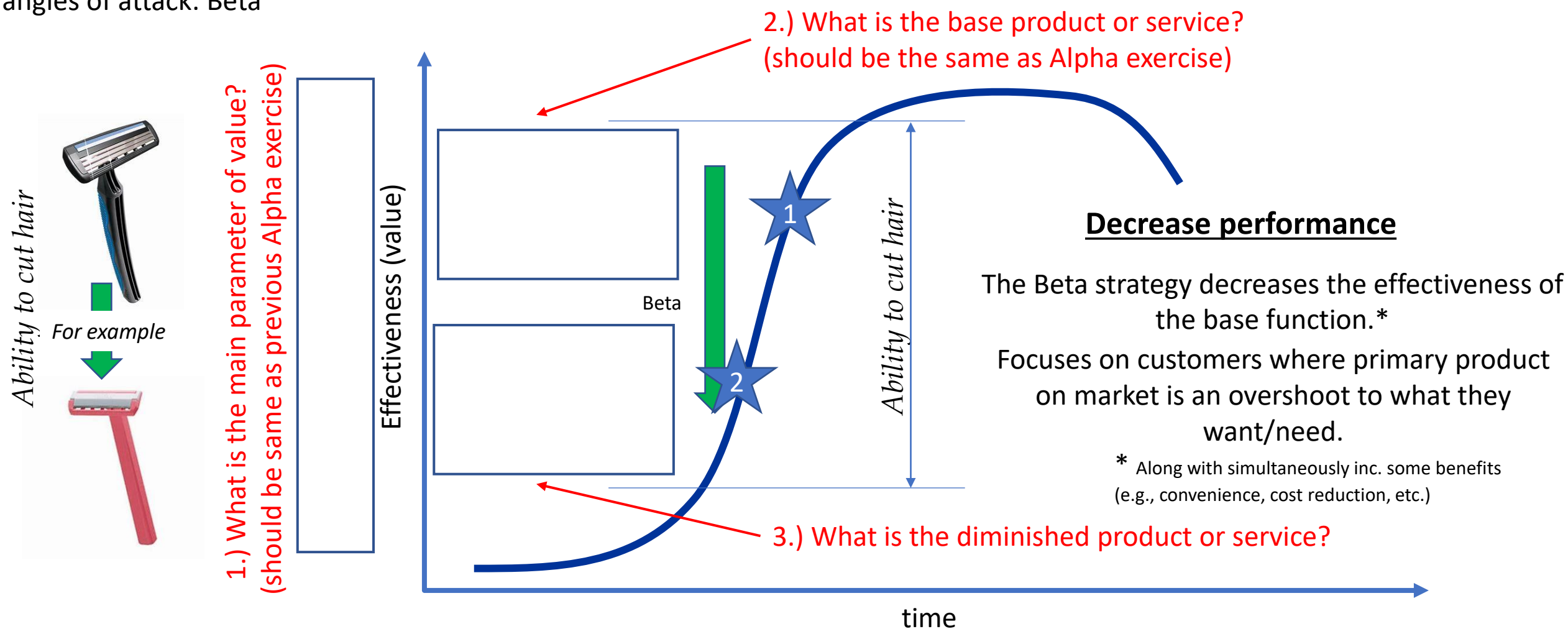

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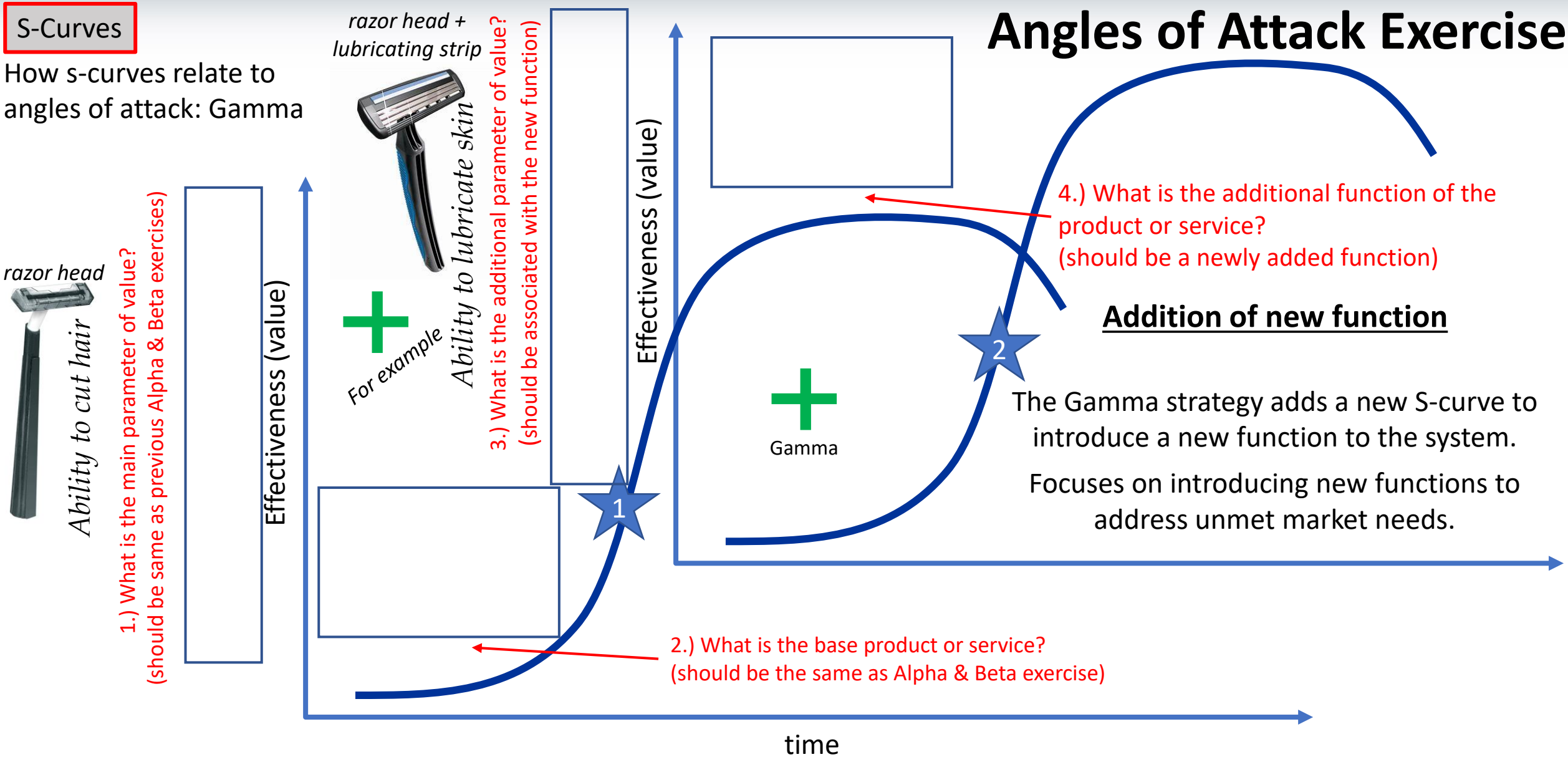

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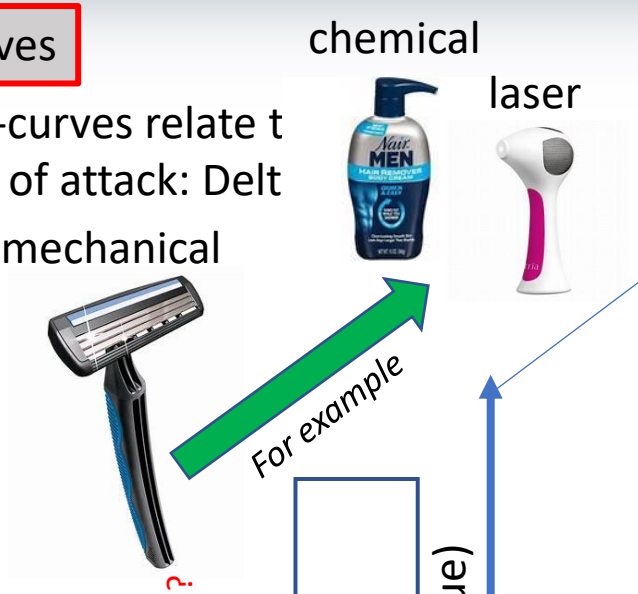


3.) What is the new principle of action of the evolved product or service?

Note – for some businesses or services principle of action may be more abstract (e.g., Taxi hailing (line of sight), Uber hailing (internet))

1.) What is the main parameter of value?
(should be same as previous Alpha, Beta, & Gamma exercises)

Effectiveness (value)

1

2

Delta

time

2.) What is the principle of action of the base product or service?
(should be the same method as utilized in the Alpha, Beta, & Gamma exercises)

Change principle of action of base function

The Delta strategy jumps to a new principle of action for the primary benefit.

Focuses on changing how the basic function is delivered (initial offerings almost never performs as well as previous delivery platform).

Principles of Action : Mechanical, Acoustic, Thermal, Chemical, Electro-magnetic

Superiority Criteria

When thinking about angles of attack it is important to consider superiority criterion:
1.) Satisfiers – what offers must contain to satisfy the market but will not create extra reward if over delivered

Have you utilized valuable resources to over satisfy the market?
If so, you may need to “trim the fat” (why spend the time, money, etc., if the market does not care?)

Reusable grocery bags

Over satisfies the market

Satisfies the market

Writing pens

Over satisfies the market

Satisfies the market

Superiority Criteria

When thinking about angles of attack it is important to consider superiority criterion:
2.) Drivers – portions of offerings that create temporary competitive advantages that produces market share. If the driver is successful in attracting sales then competitors response will be: copy, leap frog, or surrender

Can you add that little extra that drives customers to your offering?
If so, you may want to add those extras if the expenditure pays off in the market place.


Free delivery

Flavored Sodas


Multi-function tail gates

Superiority Criteria

When thinking about angles of attack it is important to consider superiority criterion:
3.) Disruptors – addition of new functions to offerings (gamma) or new principle of action to enable the original function (delta). Often creates new market categories and renders previous categories obsolete.

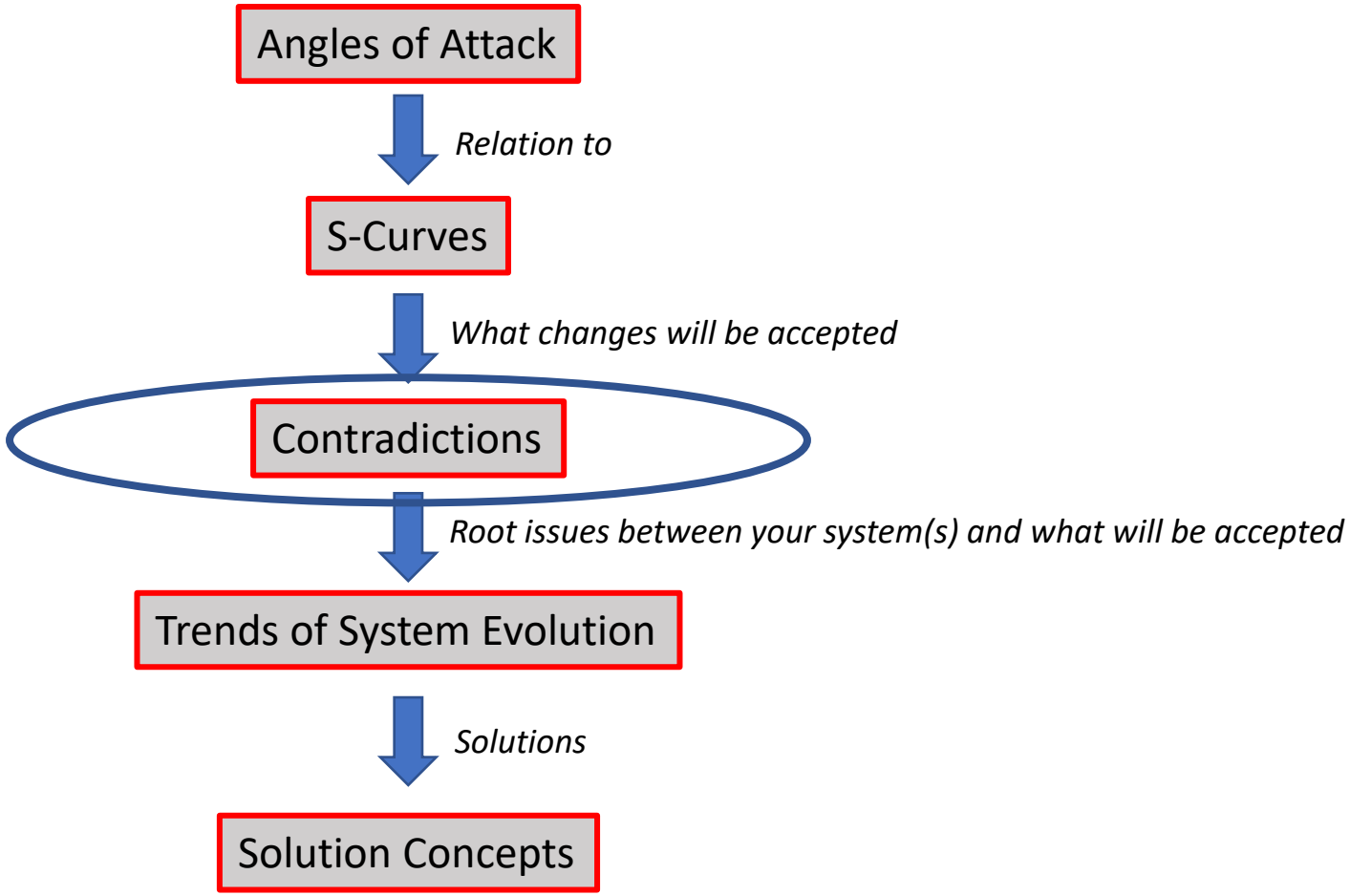
Are there major leaps that technology can support and the market will accept?
If so, you will need to pursue those as the Trends of System Evolution tell us that someone else will, even if you do not.

Loan process

In-person payments

Industrial fabrication

“You are here” Map



What are Contradictions in Problem Solving?

A situation in which an attempt to improve one parameter of a system leads to the worsening (impairment) of another parameter.

For Example –

IF we provide multiple configurations of our offering

THEN we can meet the needs of multiple customer profiles

BUT the offering choices may become confusing in the market place

Improvement – breadth of addressed customer profiles

Deterioration – clarity of offering positions

What are Contradictions in Problem Solving?

If, Then, But
If – a situation exists
Then – there is a positive result
But – there is a negative consequence

If the screen is large
Then the smart phone has a good viewing area
But the system is too big

If, Then, But
If – a situation exists
Then – there is a positive result
But – there is a negative consequence

If modifications are made to align w/ angles of attack
Then there is a better chance of success
But manufacturing process will have to be changed

If, Then, But
If – a situation exists
Then – there is a positive result
But – there is a negative consequence

If the gasket is hard
Then it is durable
But it does not seal well

If, Then, But
If – a situation exists
Then – there is a positive result
But – there is a negative consequence

If we follow the alpha angle of attack
Then we are competing for the largest market share
But we will be competing with industry titans

Contradiction Statements Exercise

- Write one , or more, contradiction statements associated with your angle of attack

If (describes a situation or relationship

If

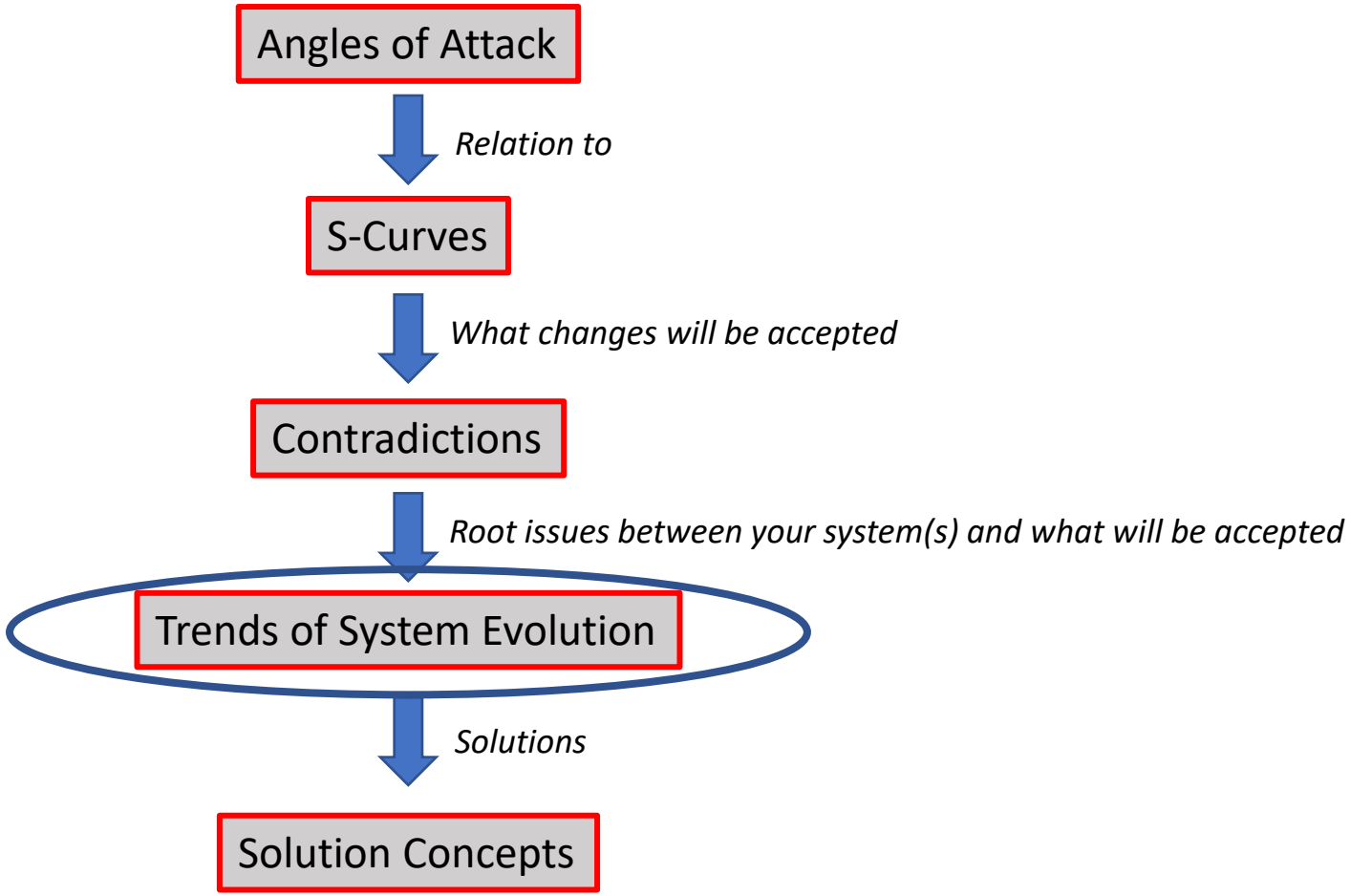
Then (describes what is **good** about the situation or relationship

Then

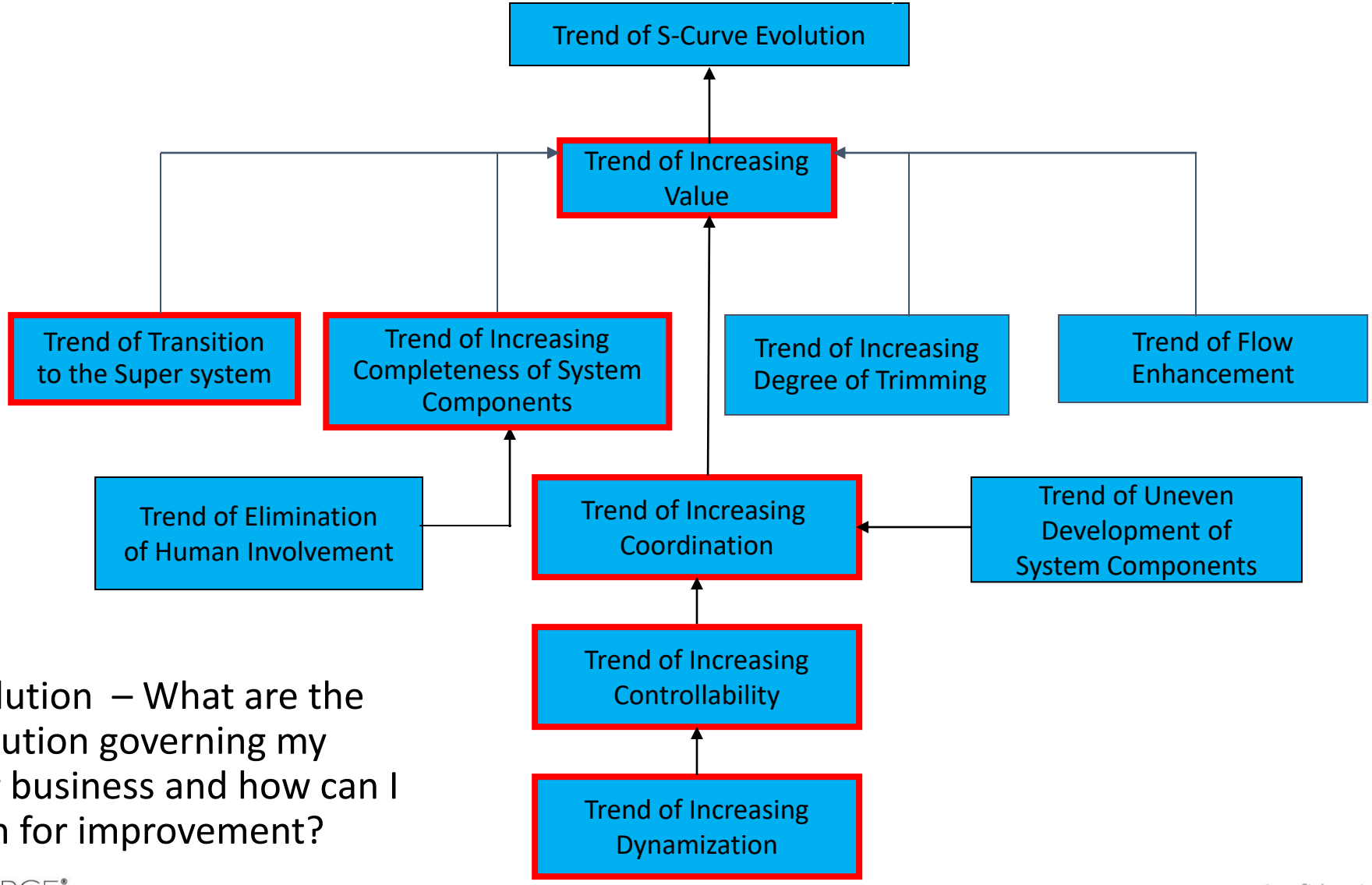
But (describes what is **bad** about the situation or relationship

But

“You are here” Map



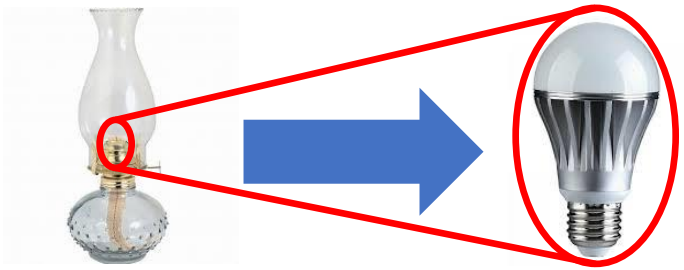
Hierarchy of Trends



- Trends of evolution – What are the trends of evolution governing my technology or business and how can I leverage them for improvement?

Trend of Increasing Value

- As offerings (systems) evolve their value continues to increase until they no longer exist.
- Value is expressed as the functionality of the system divided by its cost.



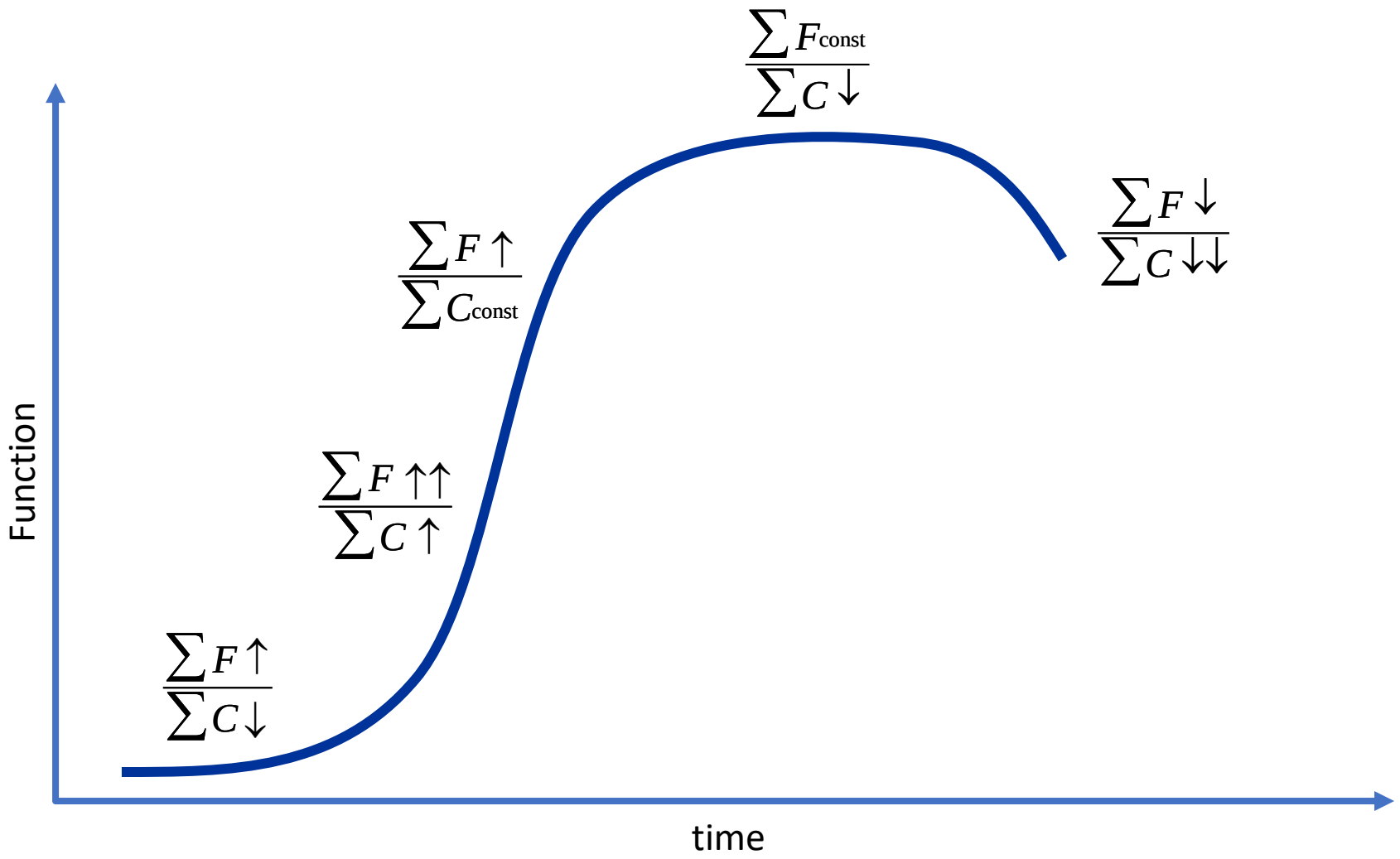
$$\text{Value (Ideality)} = \frac{\Sigma\ \text{Benefits}}{\Sigma\ \text{Costs} + \Sigma\ \text{Harm}}$$

Numerator: The benefit that the system [function(s)] provides. Level of functionality (controls, accelerates, informs, etc..)

Denominator (costs and harmful effects): Factors associated with the "price" of a systems' functionality;

- Cost of the system
- Space it occupies
- Noise it emits
- Harm to humans

Trend of Increasing Value



Trend of Increasing System Completeness
Trend of Decreasing Human Involvement

A decrease in human involvement leads to an increase in system completeness.

Some of the control systems is already in the iPhone. How would the iPhone look and act if all (or more) of its control system was internal to the phone (i.e., no user control, dialing or texting)?

Trend of Increasing System Completeness
Trend of Decreasing Human Involvement

A decrease in human involvement leads to an increase in system completeness.

Trend of Decreasing Human Involvement

Humans Stop Performing:

Trend of Increasing System Completeness

System Starts Performing:

Transmission →

Energy Source →

Control →

Decision Making →

Trend of Transition to the Supersystem

As a system evolves other system increasingly integrate with it.

Subtrend 4 – Increased Integrated Systems

Phone

Mon-System

Phone + Camera

Bi-System

Phone + Camera + Music

Poly-System

iPhone (Phone + Camera + Music + Web + GPS)

Poly + - System

?

Next Gen

Super Poly - System

time →

Increasing Integration

What other functions would consumers find useful in the iPhone?

Trend of Increasing Coordination

As a system evolves its actions become more coordinated w/ other sys.

Sub-trend 4 – Coordinate Action

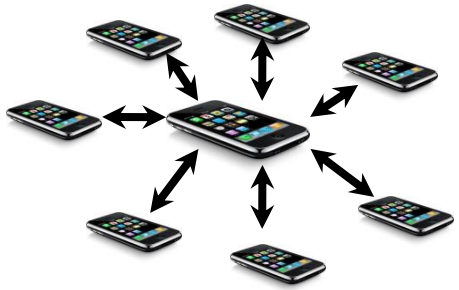
Camera / Calculator

0D (point) action

Phone

1D (line) action

Web Interaction
(i,.e., Facebook)



2D (surface) action

?

Next Gen

3D (volume) action

0D-1D-2D-3D

time → Increasing Connectivity

What would 3D connectivity look like?

Trend of Increasing Coordination

As a system evolves its actions become more coordinated w/ other sys.

Sub-trend 1 – Coordinate Shape

Examples: *Ergonomic design* – conforms to the supersystem shape

Ergonomic
computer keyboard

Ergonomic
cane handle

Trend of Increasing Controllability

As a system evolves its control continues to increase.

Sub-trend 1 – Increase Level of Control

PA System

Uncontrolled system

Fixed Point to Point

Fixed program

"Externally" Dialed iPhone

Externally controlled

?

Next Gen

Self-controlled system

time → Increasing Controllability

What services would a self-controlled iPhone provide?

Trend of Increasing Controllability

As a system evolves its control continues to increase.

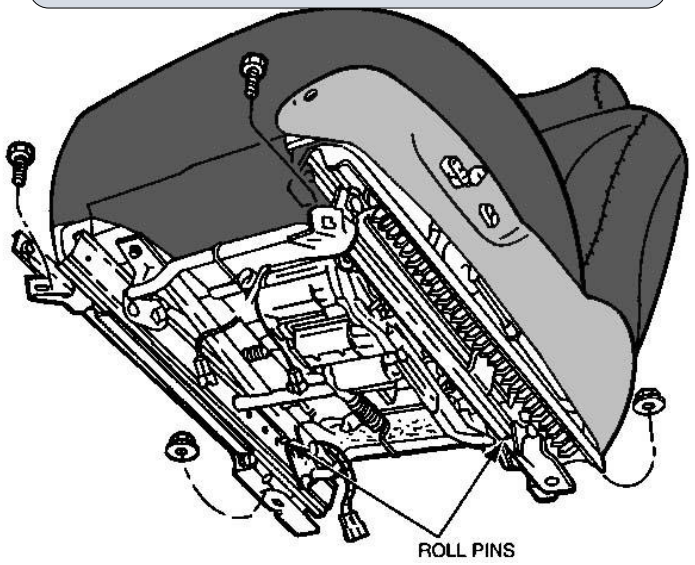
Sub-trend 2 –

Increase # of Controllable States

Examples: *Speakers, power car seat*

Speaker volume and frequency distribution ("tone") are both infinitely adjustable

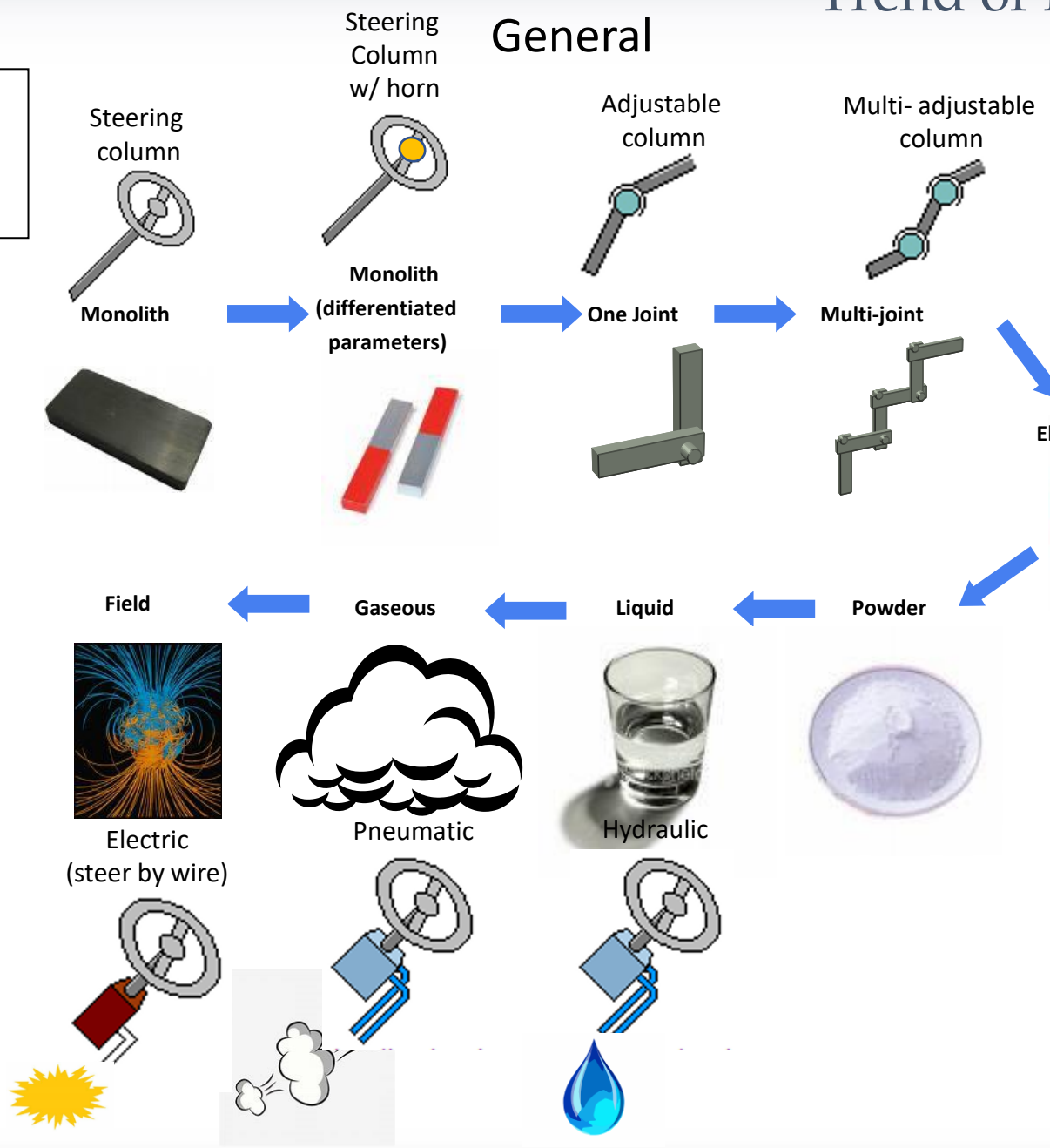
The screw drive of the power seat is infinitely adjustable



Trend of Increasing Dynamization

As a system evolves its associated "fields" become more dynamic.

General



Example: Vehicle Steering

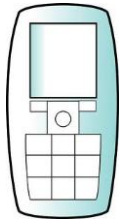
Trend of Increasing Customer Expectations

As a business evolves its customer's expectations increase.

parts

commodity

cell phone



product

customer support, directory assistance, etc.

customer service

iPhone user interface, "Apps," iTunes, etc.

customer experience

?

service transformation (ST)

time →

Increasing Customer Expectations

ST is providing customized services suggested by the business. What would super customization look like in an iPhone?

Question: What do we apply the Trends of System Evolution to?

Answer: We can apply them to any resources we have control over.

Possible Resources:

- Products
- Services
- Work force
- Procedures
- Time
- Capital
- Facilities
- Organizational culture
- Brand
- Information / data
- Intangibles
- Etc.

Evolution of Kerosene Lamp Case Study

System – Bulb (light)

System – Lamp (light)

Chimney → Bulb

Wick – light source → Filament / LED

Wick Adjustment → Electrical Wall Switch

Wick – fuel transmission → Electrical Transmission Line

Fuel Reservoir

Fuel → Power Plant

Increasing value

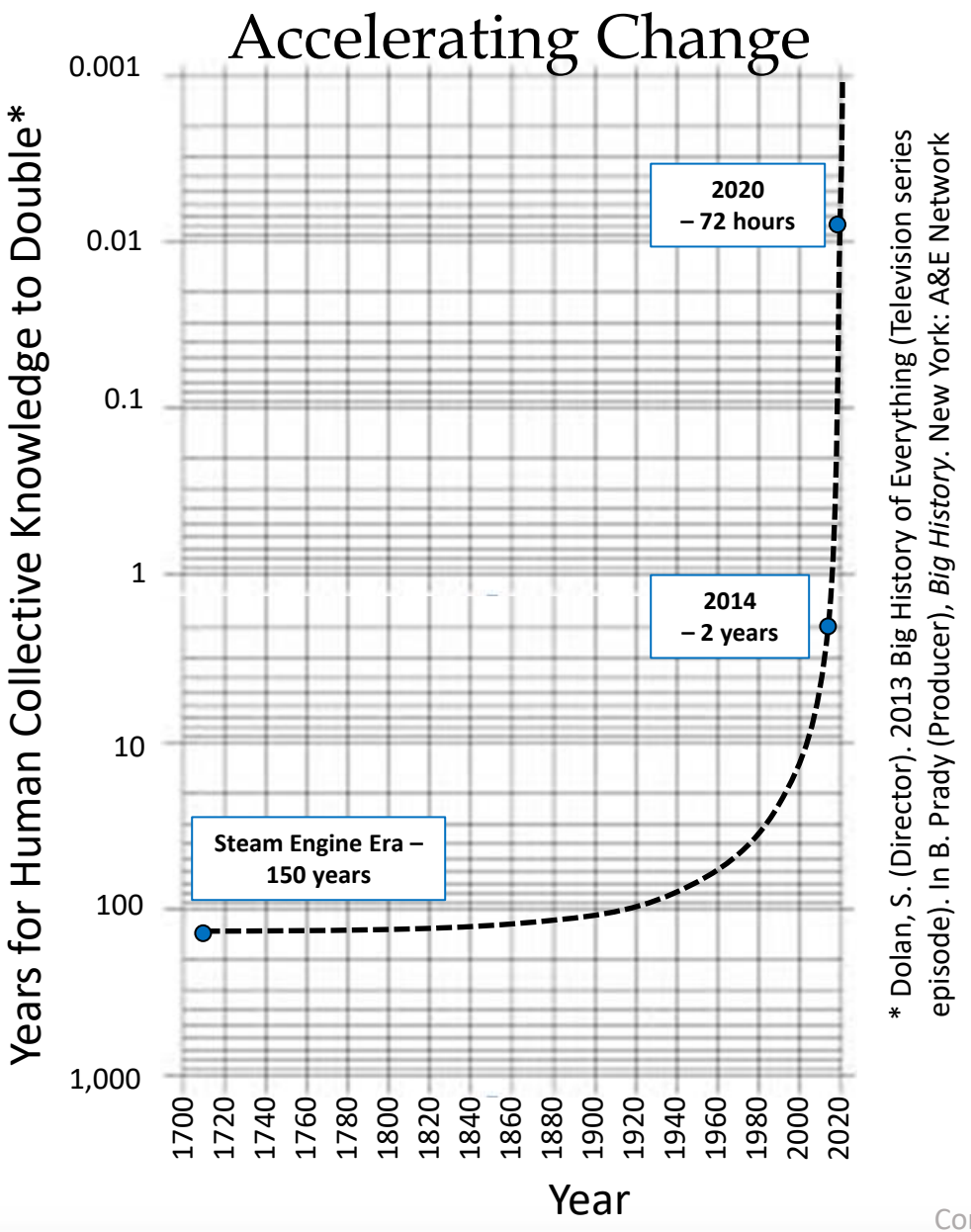
Inc. degree of trimming & therefore transition to super-system & inc. coordination

Super-System
(fuel, transmission, control)

Kerosene lamp's transition towards ideality with help from transition to the super-system, inc. degree of trimming and inc. coordination.

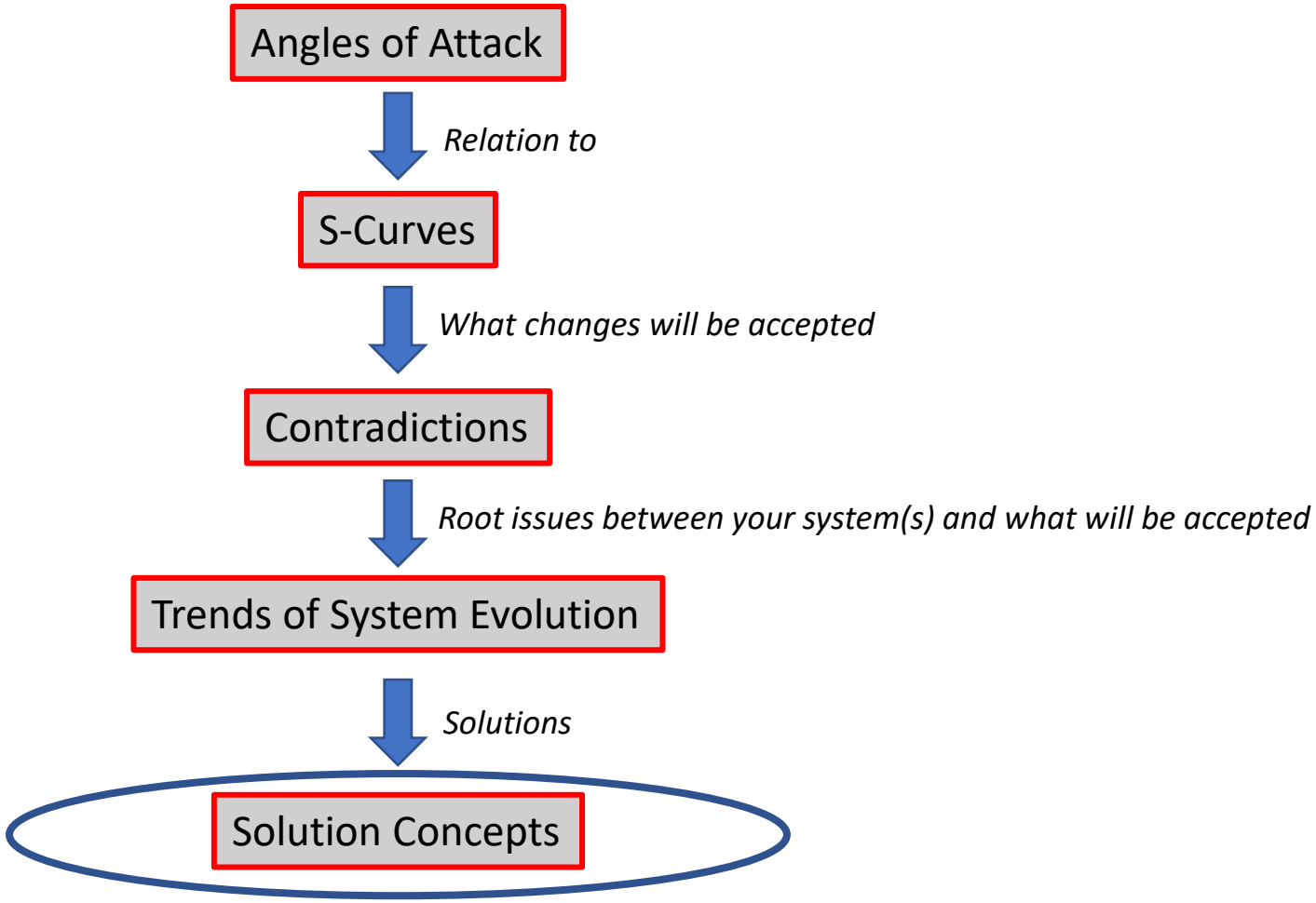
Why is it important to strive to make changes to your offerings?

Human knowledge is growing at an exponential rate. Any limitations you think exist today may very well not exist tomorrow. If you think the technology to create a change does not exist, do not wait long to recheck if it has been developed.



* Dolan, S. (Director). 2013 Big History of Everything (Television series episode). In B. Prady (Producer), *Big History*. New York: A&E Network

“You are here” Map



Solution Generation Exercise

- Brainstorm how you can modify, rearrange, or augment your resources (triggered by trend of system evolution) to address your angles of attach contradiction(s)

Resource examples – people, information, equipment, product line, brand name, org culture, customer base, capital, proprietary information, patent portfolio, facilities, etc.

General Trends:
Increasing value (e.g., reduce cost or raise effectiveness of offering)
System completeness (e.i., transmission, energy source, control, decision making)
Transition to supersystem (e.g., what can be integrated into your system?) (e.g., what from your system can be integrated into the supersystem?)
Inc. coordination (e.g., how can you better coordinate your system with the eco-system/environment?)
Inc. controllability (e.g., how can your system be better controlled?)
Inc. dynamization (e.g., more touch points, segmented systems, etc.)
Inc. customer expectation (e.g., how can you better meet your customers expectations?)

Solution Generation Exercise

Contradiction_____ Trend(s) used_____
Resource modified _____
Solution concept:

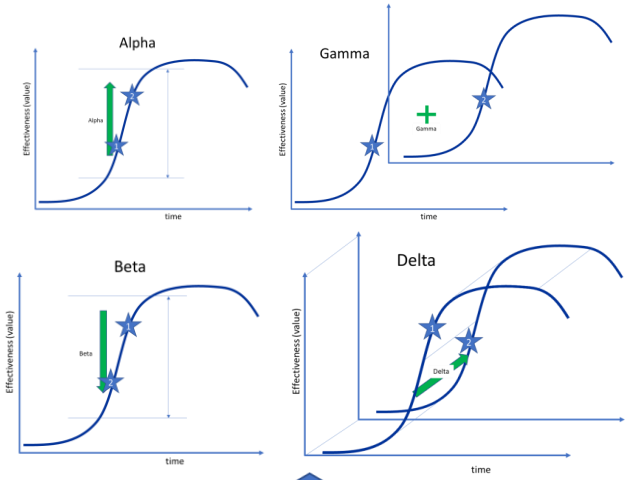
Contradiction_____ Trend(s) used_____
Resource modified _____
Solution concept:

Contradiction_____ Trend(s) used_____
Resource modified _____
Solution concept:

Determining your organization's unique capabilities for utilization in driving your offerings

(just like individuals, organizations have unique resources, skills, and strengths)

Angle of attach



Organization capabilities analysis

1

What you need

2

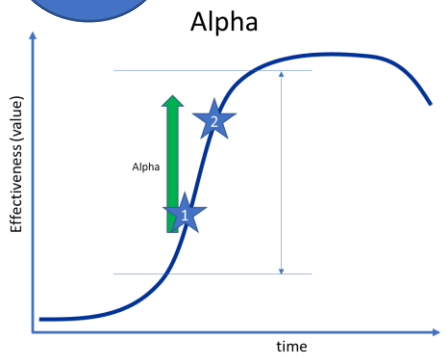
What you have

3

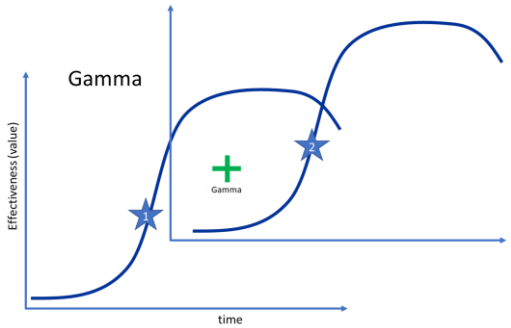
What you can source internally
What you need to outsource
What you need to license
What you can develop
Etc.

Determining your organization's unique capabilities for utilization in driving your superiority offerings
(David Conley, Innovation Consultant – Offering Analysis)

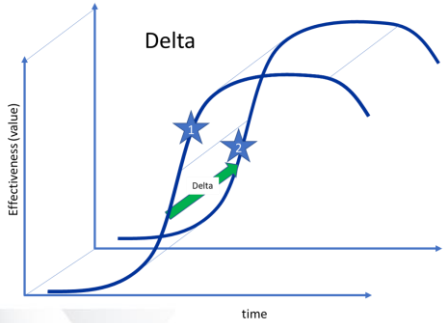
1 Angle of attach



Strive to offer best in class training and project support



Offerings that are combinations of different methods and disciplines



Offerings modified to be directly applicable to a wide variety of analyses and fields

2 Capabilities analysis

-Substantial teaching and project skills & experience

-Cross disciplinary:
- Engineering
- Business
- Finance
- R&D
- Design
- Production

-Vast and varied industry experience

-Fast learner

-Collaborative worker

etc.

3 Execution tactics

Insourcing:
- Technical and Business skills
- Process development
- Materials development
- Analyses and execution

Collaboration:
- Process Development
- Analyses and execution
- (for cross disciplinary req. outside of expertise)

Outsourcing:
- Marketing
- Sales
- Back office
- Etc.