

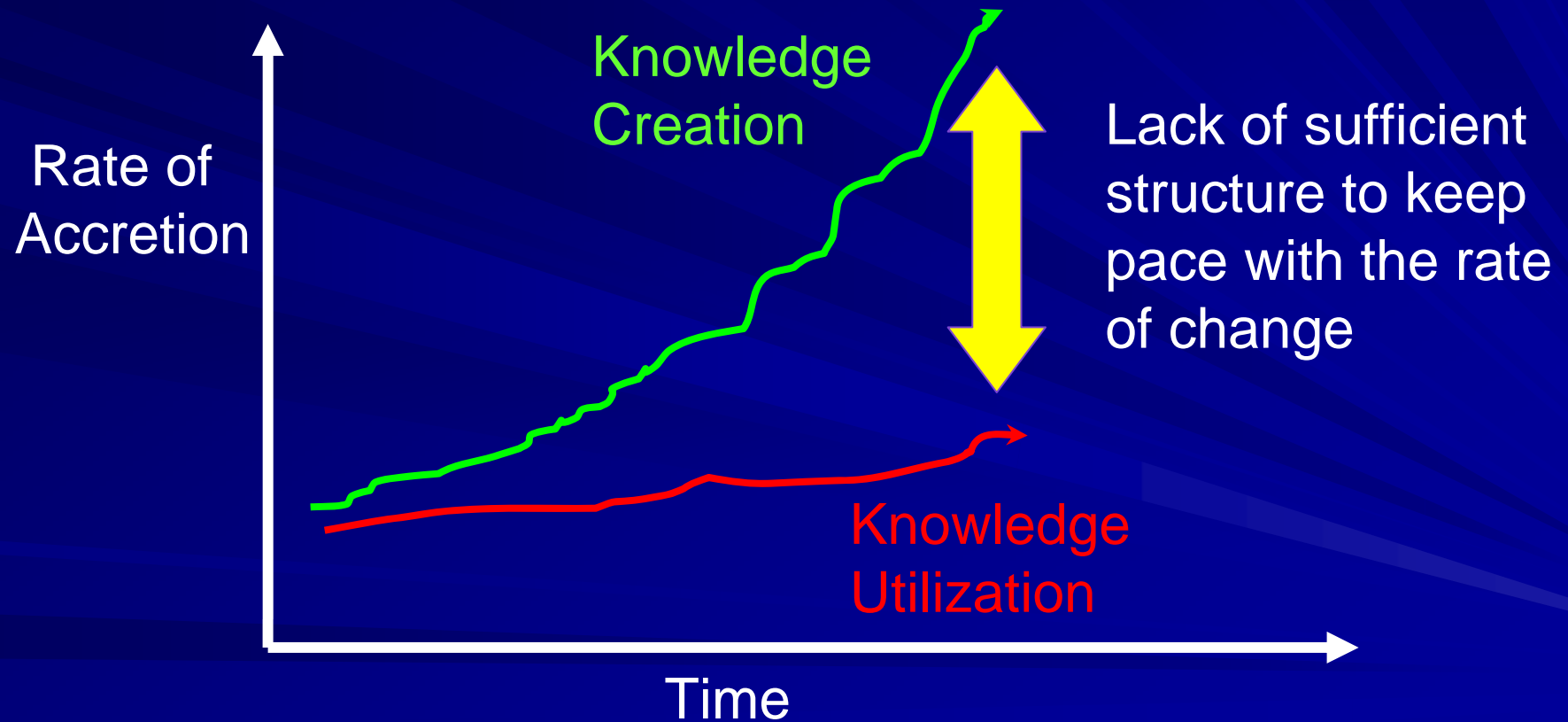
How to Innovate

Using Structure to Foresee the Future and Drive Success

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Knowledge



Trends

Knowing How to Innovate is the Driving Factor

Current

Information / Knowledge Economy

Efficiency / Optimization / Commoditization

Six Sigma

Product Development / Optimization

Enterprise Handoffs / Interfaces

Faster, Cheaper, Better – Pick two

Working Groups

Black Box Innovation / Creative Individuals

Business Schools

Future

Creativity Economy

Innovation / Evolution

Design Strategies

Full Spectrum Innovation / Next Generation Product / Processes

“Silo-Free Engineering”

*Understand Customer Culture
Determine What People Need Before They Can Articulate It
Market Centric Innovation*

Innovation Teams

Structured Innovation / Innovation as a Core Competency

Design Schools

Direction

Widespread



Discrete

We
generally
know what
needs to be
done

Current State

Individual Creativity

The Journey

Desired State

Wide Spread Institutionalized


But how?

Black Box



Core Competency

Increasing capability comes with structure

	<u>Deployment</u>	<u>Optimization</u>	<u>Innovation</u>
<u>Unstructured</u>	<ul style="list-style-type: none">• Experience / guts• Brilliant few people• Hard to duplicate• Not leader in market• Not enough results	<ul style="list-style-type: none">• Best quick guess• Tampering• Shotgun decision• “Engineering judgment”	<ul style="list-style-type: none">• Brilliant insight - unreliable• Huge experience needed• Few people are prolific• Leaders calling for MORE
<u>Structured</u>	<ul style="list-style-type: none">• Tools / methods• Grow skills in people with system• Formal Coaching• Establish New Skills – Move Beyond Commodities	<ul style="list-style-type: none">• Shainin• Six Sigma• Lean• Computer Optimization• DOE• ...and many more	

Today: business, engineering
and scientific talent...

DOES NOT EQUAL
innovation talent

Tomorrow: innovation is...

A disciplined business talent
that is pervasive;
it is no different than the
pervasiveness of mathematics

Today, Choices on “How to Innovate” are Diverse and Somewhat Vaguely Defined

- Many talk about what “not to do” in order to not stifle innovation – Rosabeth Moss Kanter, Nov. '06 HBR
- Some are concerned about having too much innovation
- A few are applying widely varying and emerging approaches on how to innovate
 - Using brilliant individual innovators
 - “Open Source” innovation – collaboration among and contribution from large numbers of independent sources
 - Industrial design recipe – rapid prototyping / graphic representations, “next step” innovation, demonstration products
 - Structured approaches to innovation

Increasing capability comes with structure

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The basis for structuring and spreading innovation has been growing for over 60 years

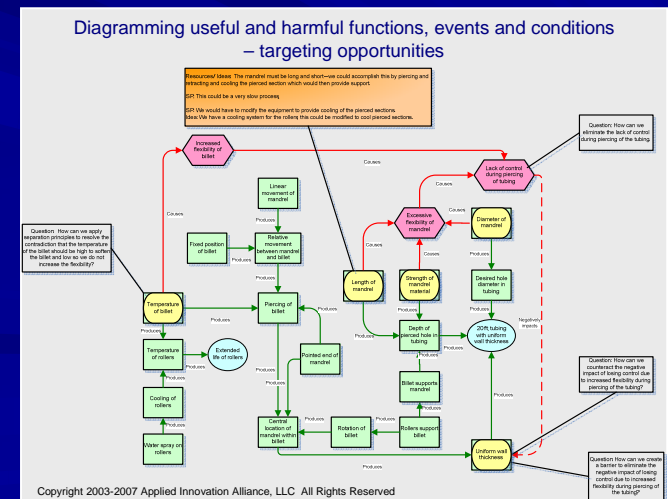
- On-going research of innovation
 - History of technology
 - Worldwide patents
 - Psychological processes of inventing
 - Evolution of business
 - Evolution of markets and market dynamics

Structure implies:

- Sharing and use of a common language of innovation
- Utilization of processes and tools
- Applicable by both individuals and teams
- Applicable to all areas of business
- Enable new levels of decision making
- Measurable progress and results

Practice is supported by:

- Unique theoretical concepts
- Unique conceptual tools
- Unique analytical tools



Innovators use these concepts and tools to resolve contradictory requirements

■ What are contradictions?

– Complex contradictions

- As one characteristic is improved the other degrades; examples include:

- Strength / weight
- Cost / quality
- Adaptability / complexity



Difficult to solve

– Simple contradictions

- A characteristic must exist to opposing states; examples include:

- Thin / thick
- Rigid / flexible
- Fast / slow



Easy to solve

An Example: Jet engine noise

- 50 year old problem
 - Estimated cost – over \$1 billion (engine research / material science focused)
- Situation
 - Complex contradiction: excessive noise levels vs. thrust (as one was improved the other degraded)
- Simple contradiction
 - The engine housing must be long and short

Solution was changing the geometry which could have been implemented 50 years earlier



Different structures apply for different types of challenges

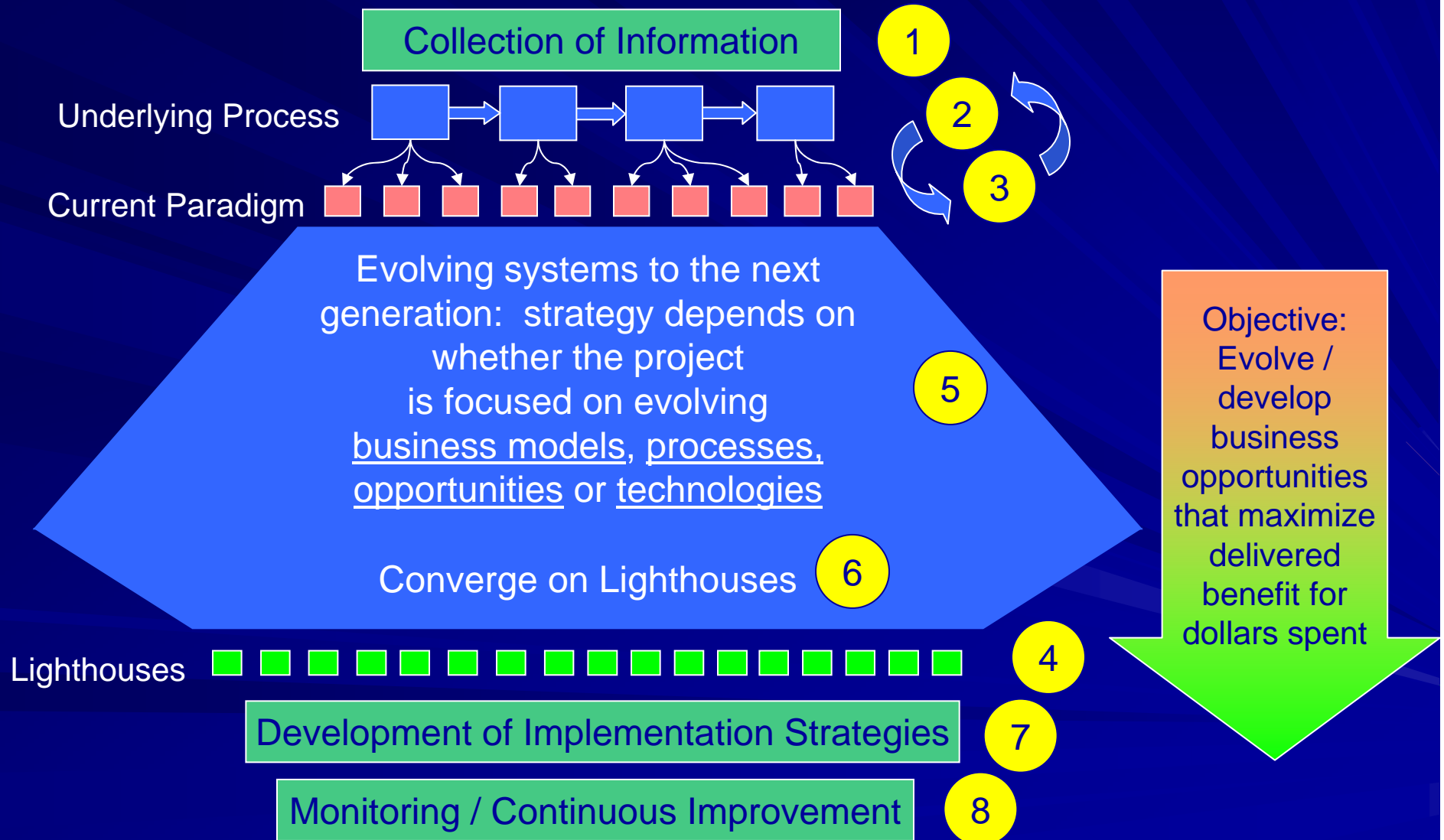
- Invention / intellectual property development
- Warranty / recall / unexplained failures
- Technology improvement / optimization
- Cost reduction
- Process improvement / reinvention

- Web-based team problem solving / collaboration

- Business model evolution / revolution
- Technology roadmapping
- Comprehensive mapping of all futures
- Evolution of technologies matched to evolving markets
- Competitive strategies

The Broadest Opportunity – Competitive Opportunity Management

Evolving business models, processes, opportunities and technologies



The “Open Source” Model

Project Definition



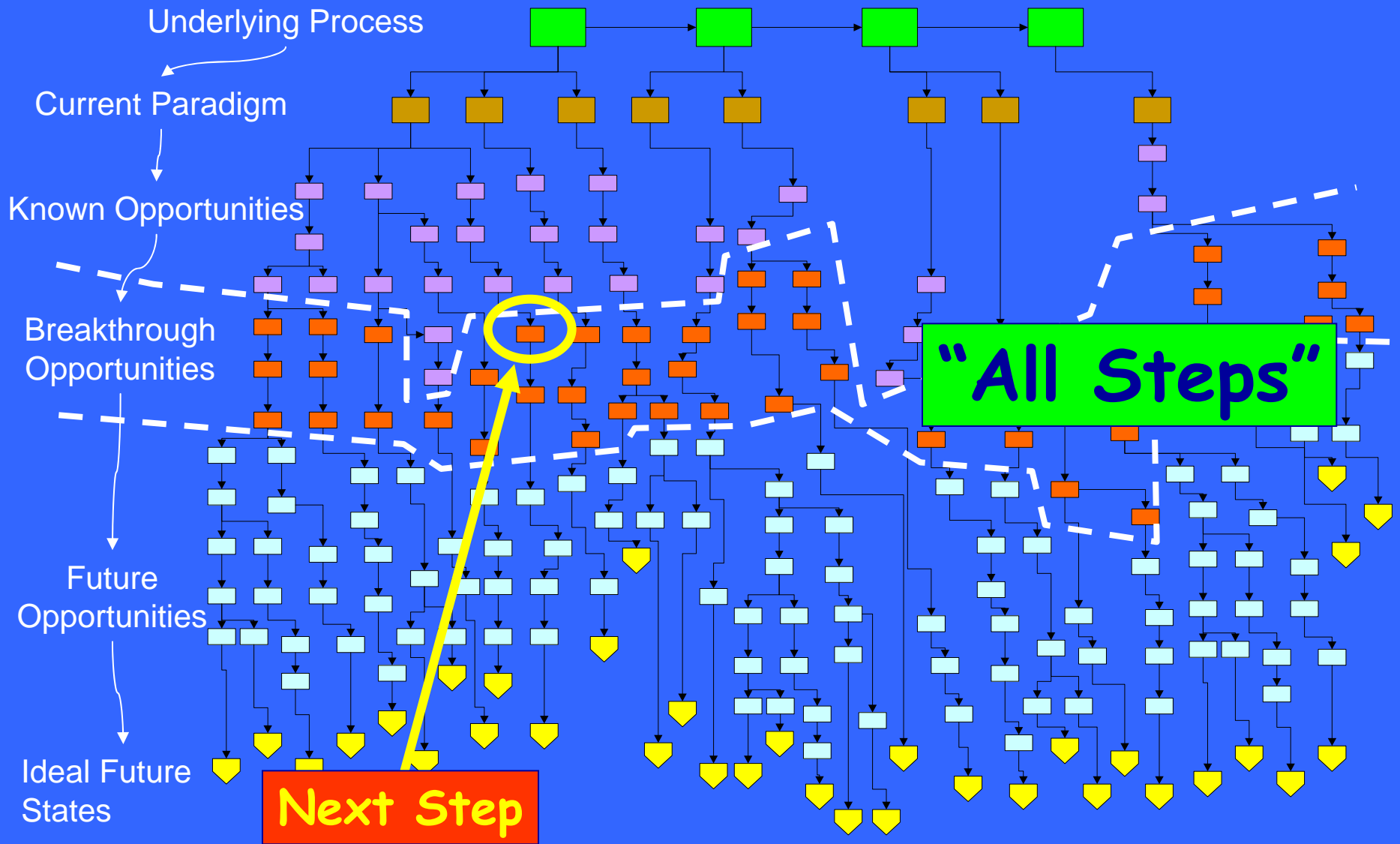
Information
Cloud

Development of Implementation Strategies

Implementation

Monitoring / Continuous Improvement

Next Step and "All Steps" Innovation



A Closing Thought – Financial Benefits with Structured Innovation Management

- Generating one-time cash flow benefits
- Saving product development cost
- Improving on-going operational costs
- Increasing existing market profit
- Increasing existing market share
- Taking control of a new market niche
- Increasing overall market size
- Creating whole new markets
- Increasing P/E multiple for the enterprise

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