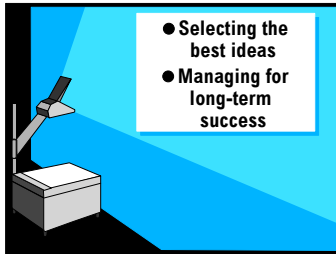


## Using Systems Thinking to Profit from Innovation

The Colorado Innovation Summit  
Cable Center, DU Campus  
July 18, 2003

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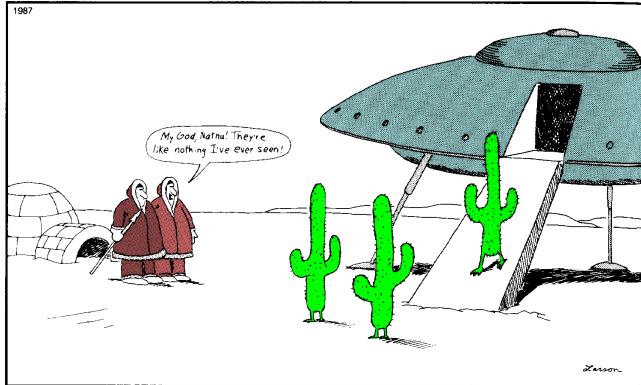
## Outline

### Profiting Points (PP)

- **What is Systems Thinking?**
  - PP #1: Use It!
- **Selecting the Best Ideas**
  - PP #2: Align Innovation with Strategy
- **Innovation**
  - PP #3: Prepare to Shift from Integration to Modularization
- **Prospering in the Pre-Paradigmatic Phase**
  - PP #4: Allow Designs to Adapt until Standards Emerge
- **Prospering in the Paradigmatic Phase**
  - PP #5: Focus R&D on Protectable Innovation
  - PP #6: If Not Protectable, Own Needed Specialized Assets
- **Summary**

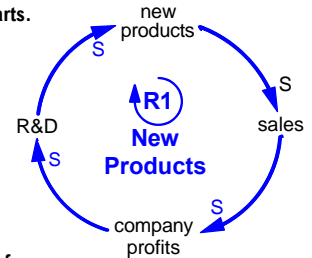
## What Is Systems Thinking?

What the ... ???

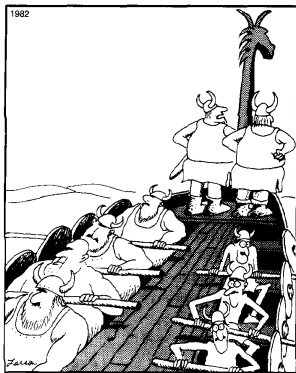


## What is systems thinking?

- Seeking to understand system behavior by examining "the whole" ... instead of by analyzing the parts.
- Use systems thinking when you don't just have problems,
- ... you have "messes!"
- Nothing grows without reinforcing feedback.
- Nothing grows forever ... some balancing (negative) feedback always limits growth.
- Having a shared understanding of feedback is itself an innovation ... in thinking.
- Product & service innovation are within feedback loops.



## An Example of Structure

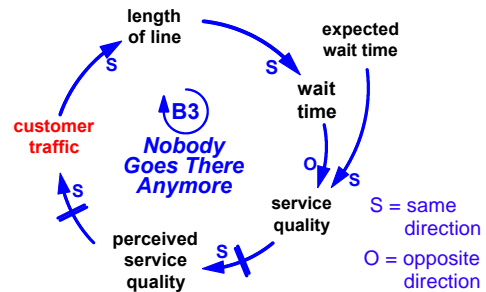


understand structure  
↓  
understand behavior  
↓  
design policy

## Structure Determines Behavior

### Example: A Popular Restaurant

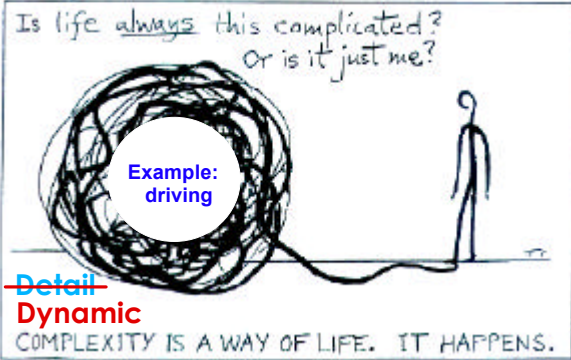
- "That place is too popular. Nobody goes there anymore." Yogi Berra



understand structure  
↓  
understand behavior  
↓  
design policy

## Complexity Happens

### TRUIZMS



Todd Siler, *THINK LIKE A GENIUS*, 1997, p. 169

## Organizations & Their Problems Are Complex

- "My worry when executives say, 'Keep it simple stupid,' is ... that they're underestimating the complexity of their own organizations and environments."

From "Sense and Reliability, A Conversation with Celebrated Psychologist Karl E. Weick", *Harvard Business Review*, April 2003.

- "Success and failure arise primarily as a result of the internal system structure and policies, even where it's clear there was an external cause."

Jay Forrester  
founder of system dynamics

## How Important Is Systems Thinking?

### ■ Top-ranked influences leading to project failure:

- 1 poor scope definition
- 2 lack of proj mgmt discipline
- 3
- 4
- 5 incomplete specs
- 6 poor change control
- 7
- 8
- 9
- 10

Normal PM  
Responses

March 2003 workshop,  
Colorado Springs Chapter of the  
Project Management Institute

## How Important Is Systems Thinking?

### ■ Top-ranked influences leading to project failure:

- 1
- 2
- 3 fire fighting
- 4
- 5
- 6
- 7 inadequate systems thinking
- 8 group multiple personality disorder
- 9
- 10 defensive routines

Systems  
Thinking-  
Related  
Responses

March 2003 workshop,  
Colorado Springs Chapter of the  
Project Management Institute

## How Important Is Systems Thinking?

### ■ Top-ranked influences leading to project failure:

- 1
- 2
- 3
- 4 poor business processes
- 5
- 6
- 7
- 8
- 9 not in support of company value proposition
- 10

Strategy-  
Related  
Responses also  
feedback  
issues

March 2003 workshop,  
Colorado Springs Chapter of the  
Project Management Institute

## How Important Is Systems Thinking?

### ■ Top-ranked influences leading to project failure:

- 1 poor scope definition (Proj Mgmt)
- 2 lack of proj mgmt discipline (Proj Mgmt)
- 3 fire fighting ===== (SystemsThinking)
- 4 poor business processes ----- (Strategic)
- 5 incomplete specs (Proj Mgmt)
- 6 poor change control (Proj Mgmt)
- 7 inadequate systems thinking ===== (SystemsThinking)
- 8 group multiple personality disorder == (SystemsThinking)
- 9 not in support of company value proposition ----- (Strategic)
- 10 defensive routines =====(SystemsThinking)

March 2003 workshop,  
Colorado Springs Chapter of the  
Project Management Institute

## The Need for Continuous Improvement for Fire Prevention instead of Firefighting

- ... operational excellence at the business-unit level is fundamental to our prescription for success. What? Operational excellence? During the past 20 years, haven't U.S. companies achieved this, or at least come pretty darn close?
- Well, that hadn't been our experience. While many companies may have improved their operational performance in certain areas - for example, product quality and reliability - most still have a long way to go.

"Uncovering Hidden Value in a Midsize Manufacturing Company"  
James E. Ashton, Frank X. Cook, Jr., and Paul Schmitz  
*Harvard Business Review*, June 2003

## The Need for Continuous Improvement for Fire Prevention instead of Firefighting (continued)

- Continuing this improvement in other areas that contribute to customer satisfaction - such as customized design, improved lead time, and comprehensive technical support - can give them a tremendous competitive advantage. If a company's existing business doesn't have a firm foundation of operational excellence, any initiatives to protect that business, to further penetrate existing markets, and to extend and diversify the business are likely to prove mediocre at best and disastrous at worst.
- Time and again, we have seen companies that hadn't achieved the operational excellence needed to allow their existing businesses to hum along without undivided management attention. Consequently, when the companies started venturing into new areas, their core generators of revenue began to sputter. James E. Ashton, Frank X. Cook, Jr., and Paul Schmitz  
*Harvard Business Review*, June 2003

## Profiting Point #1 Use Systems Thinking!

- Get "looped" ...
- We must get feedback working for us, not against us.

## Selecting the Best Ideas

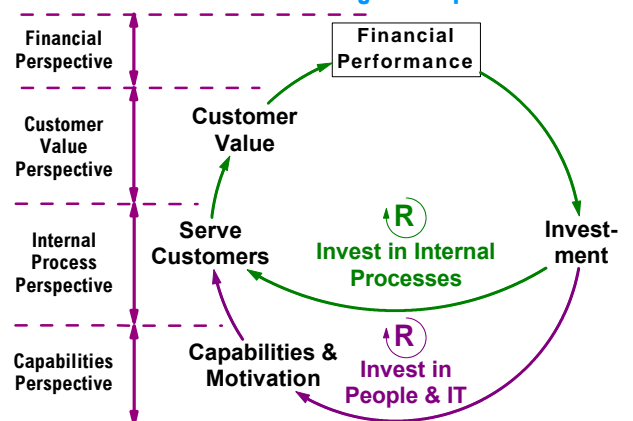
## Primary Management Practices

"Got to Have All"

- **Strategy**
  - Build a strategy around a clear customer value proposition
- **Execution**
  - Develop and maintain flawless operational execution
- **Culture**
  - Hold high expectations about performance
- **Structure**
  - Foster favorable feedback

"What Really Works"  
Nitin Nohria, William Joyce, and Bruce Roberson  
*Harvard Business Review*, July 2003

## "Balanced Scorecard" Strategic Perspectives



## Profiting Point #2

### Align Innovation with Strategy

- To focus innovation on customer value proposition

## Innovation

## Innovation: A Secondary Management Practice

- Innovation
  - Anticipate disruptive events
  - Pursue disruptive technologies
  - Enhance all operating processes, not only new product & service design

"What Really Works"  
Nitin Nohria, William Joyce, and Bruce Roberson  
*Harvard Business Review*, July 2003

- "The power to make money shifts away from companies that design and assemble the end-use product toward the back end of the value chain to those companies that supply subsystems with internal architectures that are still technologically interdependent."

"Skate to Where the Money Will Be,"  
Christensen, et al., *Harvard Business Review*, Nov. 2001

## Secondary Management Practices

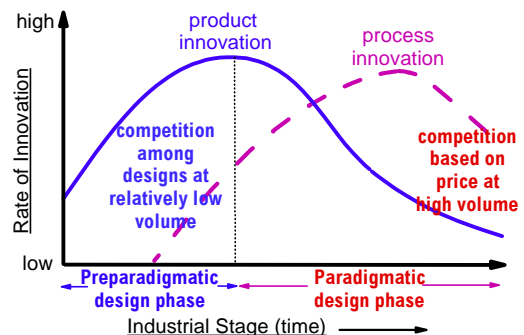
### "Got to Have at Least Two"

- Talent
    - Talented employees,
    - Top-of-the-line training and development
  - Innovation
    - Anticipate disruptive events
    - Pursue disruptive technologies
    - Enhance all operating processes, not only product & service design
  - Leadership
    - Link leadership team pay to performance
    - Hone capacity to spot opportunities and problems early.
  - Mergers & Partnerships
    - Leverage existing customer relationships
    - Complement core strengths.
- "What Really Works"  
Nitin Nohria, William Joyce, and Bruce Roberson  
*Harvard Business Review*, July 2003

## Profiting Point #3: Prepare to Shift from Integration to Modularization

- Because of the inexorable advance of technology.

### The Pre-Paradigmatic and Paradigmatic Phases of Innovation



From David J. Teece, "Profiting from Technological Innovation: Implications for Integration, Collaboration, Licensing, and Public Policy, *Research Policy*, 15 (1986), p. 285-305



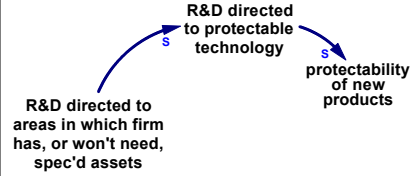
### Profiting Point #4:

In Pre-Paradigmatic Phase Stay Flexible

- Allow designs to adapt until standards emerge to increase appropriability of returns from innovation

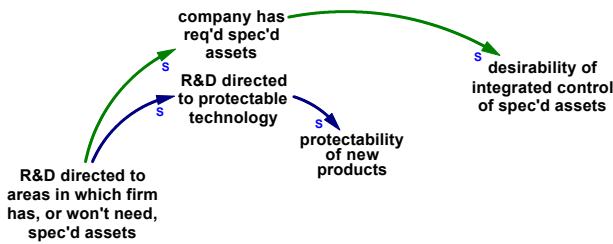
### Paradigmatic Phase

Focus on Protectable Technology or Own Spec'd Assets



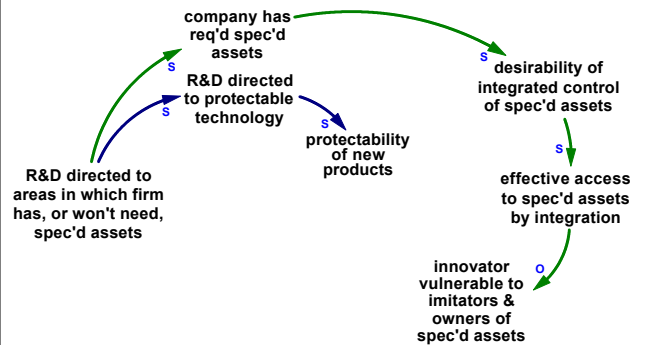
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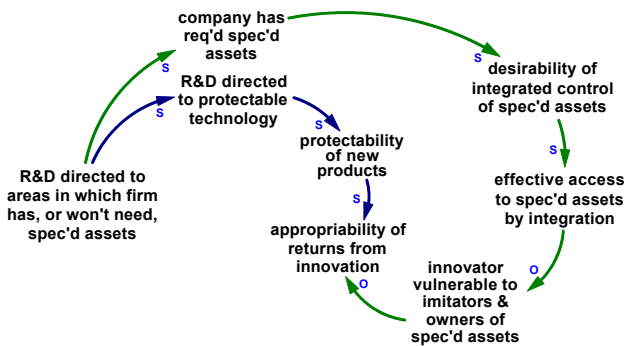
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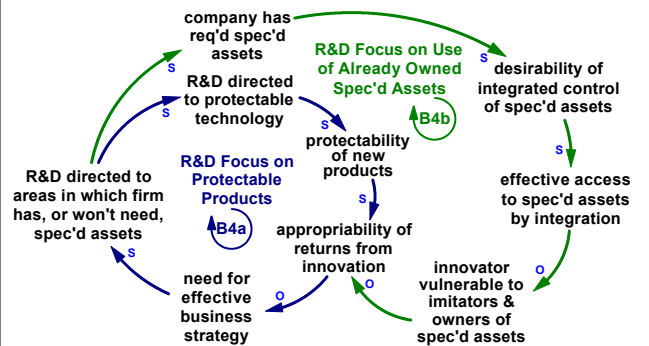
### Paradigmatic Phase

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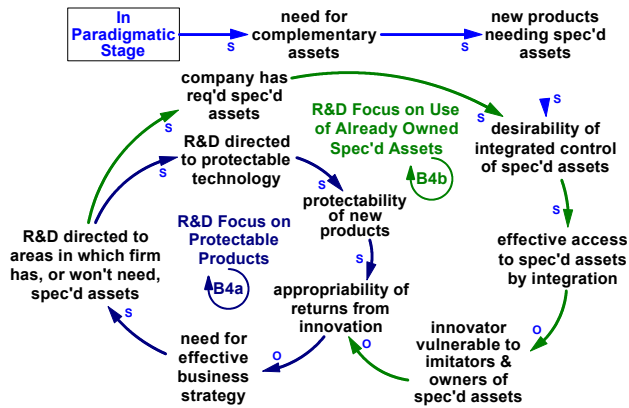
### Paradigmatic Phase

Focus on Protectable Technology or Own Spec'd Assets



## Paradigmatic Phase

Focus on Protectable Technology or Own Spec'd Assets



## Profiting Point #5 & #6:

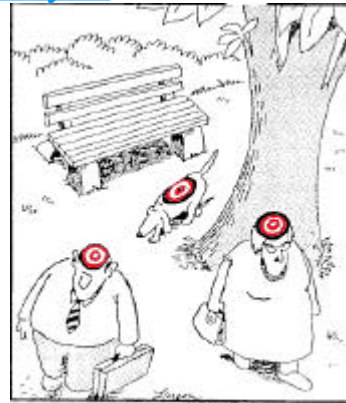
In Paradigmatic Phase

- Focus on protectable technology, if possible.
- If innovation is not protectable, better own needed specialized assets.

## Profiting Points Summary (PP)

- PP #1: Use Systems Thinking!
- PP #2: Align Innovation with Strategy
- PP #3: Prepare to Shift from Integration to Modularization
- PP #4: in the Pre-Paradigmatic Phase  
Allow Designs to Adapt until Standards Emerge
- PP #5: In the Paradigmatic Phase  
Focus R&D on Protectable Innovation
- PP #6: If Not Protectable,  
Own Needed Specialized Assets

## Everyone Has Mental Models



How birds see the world.

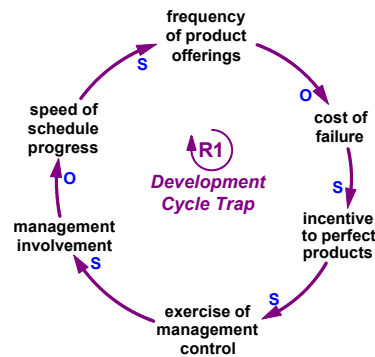
## Systems Thinking:

We make it look easy ... and it's fun, too!



Continued Improvement Associates • E-mail: [cp@ciassoc.com](mailto:cp@ciassoc.com) • Phone: 710 996-9977

## The Development Cycle Trap



Greater cost of failure can increase striving for product perfection, which can reduce frequency of offerings (trying to "get it right"), and further increase the "cost of failure."

*Developing Products in Half the Time*  
Smith & Reinertsen, 1995 (p. 65)