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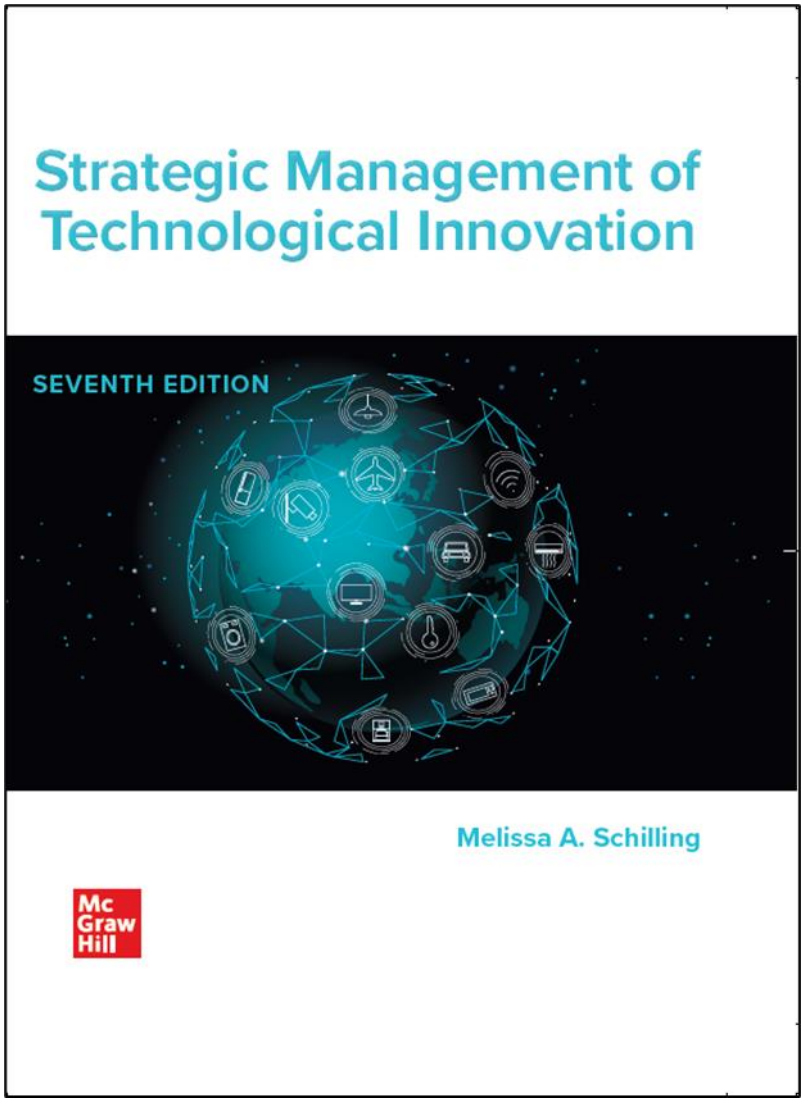
# Chapter 11

Managing the New Product Development Process

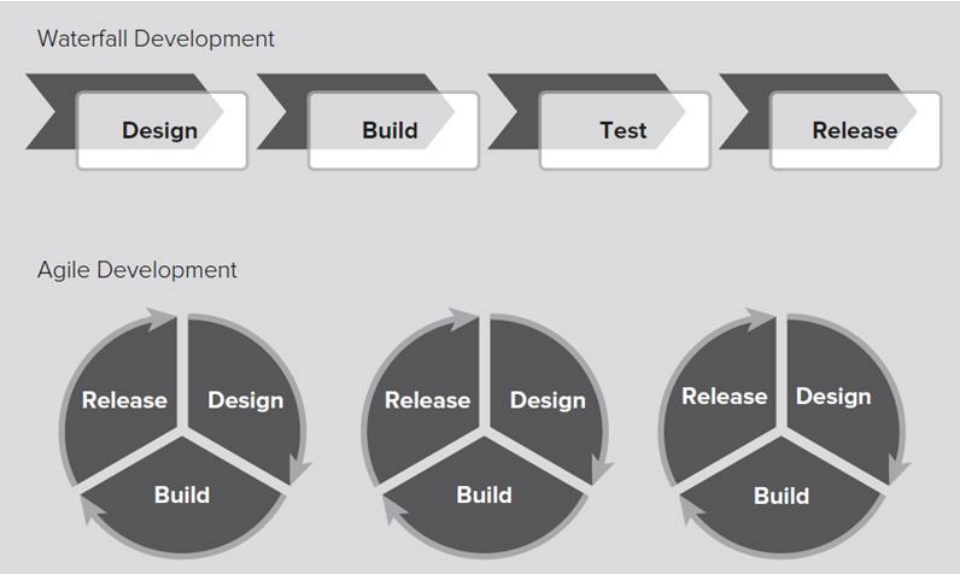
**Strategic Management of Technological Innovation, 7th Edition**
**Melissa A. Schilling**



# Agile Development at Cisco Systems [1]

Cisco Systems had long used a “waterfall” method to develop its software where teams moved through stages of the development process sequentially, often taking 18 months or more.

In 2014 they decided to try an agile development process, whereby a product is broken up into many smaller parts or features that are built by autonomous teams and released quickly, enabling developers to get feedback and fix bugs early.

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# Agile Development at Cisco Systems 3

In agile development, rather than having grand comprehensive product redesigns, the product is constantly, incrementally adapted. Introducing small changes one or a few at a time helps to reduce risk, and also improves transparency about what works and what does not work.

For this approach to work a product has to be fairly modular, that is, it must be possible for a large product to be broken down into many smaller, relatively independent problems that can be worked on separately.

In the right setting agile development can accelerate product development, improve customer satisfaction, and improve employee satisfaction by giving them much more autonomy and a sense of ownership in their jobs.

# Overview

Despite the intense attention paid to innovation, failure rates are still very high.

More than 95% of new product development projects fail to earn an economic return.

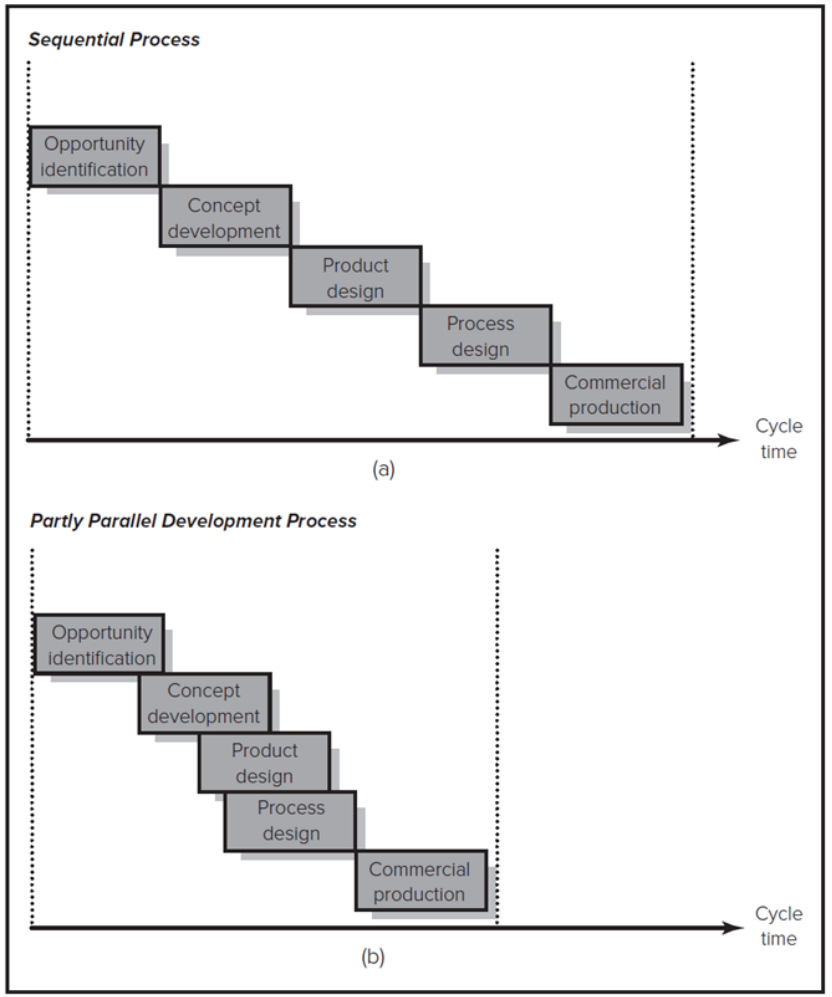
This chapter summarizes research on how to make new product development more effective and efficient.

# Sequential versus Party Parallel Development Processes

Before mid-1990s, most US companies used sequential NPD process; now many use partly parallel process.

Partly parallel process shortens overall development time and enables closer coordination between stages.

In some situations, however, a parallel development process can increase risks.

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# Project Champions

68% of North American firms, 58% of European firms, and 48% of Japanese firms report using senior executives to champion their NPD projects.

**Benefits of Championing.**

- Senior execs have power to fight for project.
- They can gain access to resources.
- They can communicate with multiple areas of firm.

**Risks of Championing.**

- Role as champion may cloud judgment about project.
- May suffer from escalating commitment.
- Others may fear challenging senior executive.

May benefit firm to develop “anti champions” and encourage expression of dissenting opinion.

# Research Brief [1]

**Five Myths About Product Champions.**

Markham and Aiman-Smith argue that a number of myths have become widely accepted about champions.

- **Myth 1: Projects with champions are more likely to be successful in the market** (many factors determining market success are typically beyond champion's control).
- **Myth 2: Champions get involved because they are excited about project rather than from self-interest** (results suggest that champions more likely to support projects that benefit their own departments).
- **Myth 3: Champions are more likely to be involved with radical innovation projects** (equally likely to be involved with incremental projects).
- **Myth 4: Champions are more likely to be from high (low) levels in firm** (either is equally likely).
- **Myth 5: Champions are more likely to be from marketing** (15% from R&D, 14% from marketing, rest were from other functions or were users).

# Involving Customers and Suppliers in the Development Process 1

## Involving Customers.

Customer is often best able to identify the maximum performance capabilities and minimum service requirements of new product.

Customers may be involved on NPD team.

Firms may also use **beta testing** to get customer input early in the development process.

In **agile development** processes, individual features or functionalities are developed into **minimum viable products** and presented to customers for feedback.

Some studies suggest that it is more valuable to use “lead users” than a random sample of customers.

- Lead users: Customers who face the same general needs of marketplace but experience them earlier than rest of market and benefit disproportionately from solutions.

# Involving Customers and Suppliers in the Development Process 2

## Crowdsourcing.

- Firms can also open up an innovation task to the public through crowdsourcing, where people voluntarily contribute their ideas or effort. Platforms such as InnoCentive, Yet2.com, and TopCoder are well-known crowdsourcing sites.

- Crowdsourcing challenges typically go through a four-step process:

1. **Need Translation**. A clear, concise and compelling need statement is articulated (for example, 1-2 page **Request for Proposal**).
2. **Connecting**. The innovation challenge is broadcasted to the network of potential solution providers.
3. **Evaluation/Selection**. Proposals reviewed in depth, and the most interesting are selected.
4. **Acquisition**. The firm engaged with the solution provider and negotiates an agreement to exchange knowledge, intellectual property, and compensation.

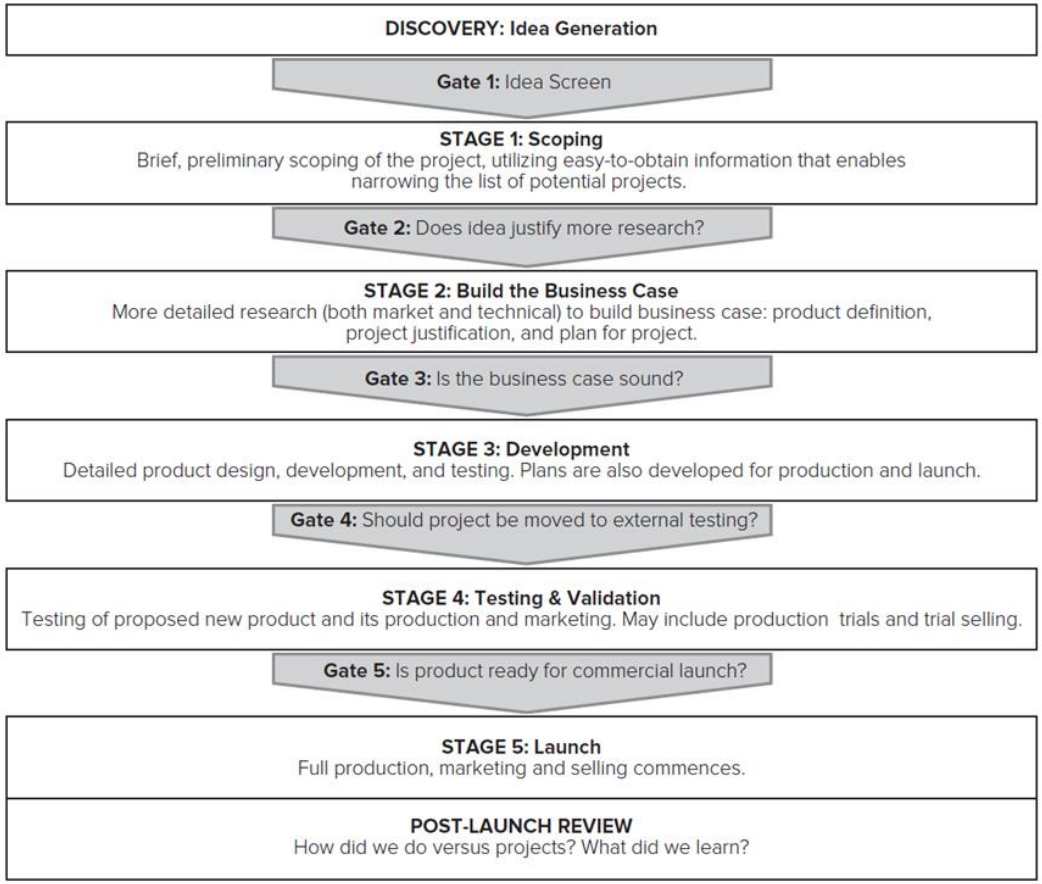
# Involving Customers and Suppliers in the Development Process 3

## Involving Suppliers.

- Involving suppliers on NPD team or consulting as an alliance partner can improve product design and development efficiency.
- Suppliers can suggest alternative inputs that reduce cost or improve functionality.

# Tools for Improving the New Product Development Process [1]

## Stage-Gate Processes




Utilize tough go/kill decision points in the development process help filter out bad projects.

Source: R. G. Cooper, "Stage-Gate Idea to Launch System," **Wiley International Encyclopedia of Marketing: Product Innovation & Management** 5, B. L. Bayus (ed.), (West Sussex UK: Wiley, 2011).

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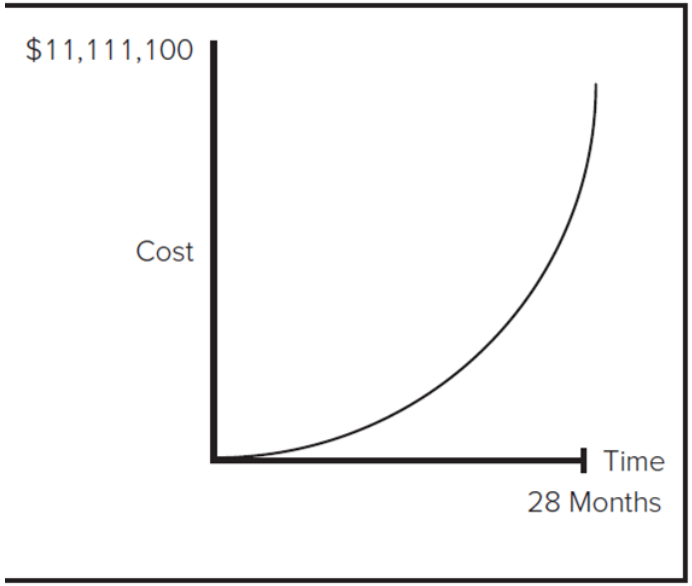
# Tools for Improving the New Product Development Process 2

The time and cost of projects escalates with each stage, thus stage-gate processes only permit a project to proceed if all assessments indicate success.

| Stage | Time | Cost |
|---|---|---|
| 0. "Here's an idea!" | - | - |
| 1. Formulate-describe and sketch | 1 week | $100 |
| 2. Conduct preliminary investigations | 2 weeks | $1,000 |
| 3. Design and define specifications | 1 month | $10,000 |
| 4A. Develop prototype and test | - | - |
| 4B. Market research | - | - |
| 4C. Strategic fit evaluation and NPV risk analysis | 2 months | $ 100,000 |
| 5A. Scale up, build pilot plant | - | - |
| 5B. Market test | 8 months | $ 1 million |
| 6A. Build plant | - | - |
| 6B. Promote, launch, market | 16 months | $ 10 million |

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# Computer-Aided Design/Computer-Aided Manufacturing

**Computer-Aided Design** (CAD) is the use of computers to build and test designs.

- Enables rapid and inexpensive prototyping.

**Computer-Aided Manufacturing** (CAM) is the use of machine-controlled processes in manufacturing.

- Increases flexibility by enabling faster changes in production set ups. More product variations can be offered at a reasonable cost.
- **Three-dimensional printing** is where a design is printed by laying down thin horizontal strips of material until the model is complete.

# Discussion Questions

1. What are some of the advantages and disadvantages of a parallel development process? What obstacles might a firm face in attempting to adopt a parallel process?
2. Consider a group project you have worked on at work or school. Did your group use mostly sequential or parallel processes?
3. Are there some industries in which a parallel process would not be possible or effective?
4. What kinds of people make good project champions? How can a firm ensure that it gets the benefits of championing while minimizing the risks?
5. Is the Stage-Gate process consistent with suggestions that firms adopt parallel processes? What impact do you think using Stage-Gate processes would have on development cycle time and development costs?
6. What are the benefits and costs of involving customers and suppliers in the development process?

# Chapter 12

Managing New Product Development Teams

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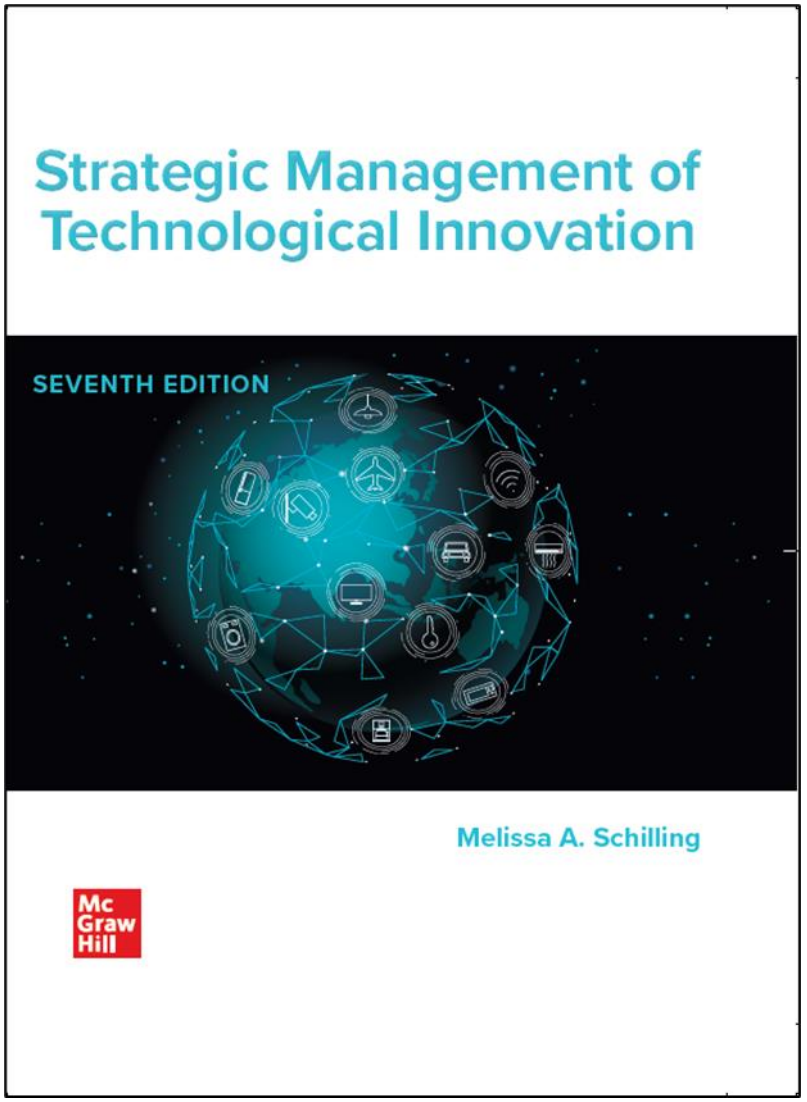


# Overview

Many organizations now use cross-functional teams to lead and manage the NPD process.
There is considerable variation in how these teams are formed and managed.
The chapter will look at size, composition, structure, administration, and leadership of teams.

# Constructing New Product Development Teams [1]

## Team Size.

- May range from a few members to hundreds.
- Bigger is not always better; large teams create more administrative costs and communication problems.
- Large teams have higher potential for **social loafing**.

## Team Composition.

- Including members from multiple functions of firm ensures greater coordination between functions.
- Firms around the world rely heavily on cross-functional teams for their new product development efforts.

# Constructing New Product Development Teams 2

Diversity in functional backgrounds increases breadth of knowledge base of team.
Other types of diversity (for example, organizational tenure, cultural, gender, age, etc.) can be beneficial as well.

- Provides broader base of contacts within and beyond firm.
- Ensures multiple perspectives are considered.

However, diversity can also raise coordination costs.

- Individuals prefer to interact with those they perceive as similar ("homophily").
- May be more difficult to reach shared understanding.
- May be lower group cohesion.

Extended contact can overcome some of these challenges.

# Research Brief [1]

## Why Brainstorming Teams Kill Breakthrough Ideas.

Dozens of laboratory studies have shown that brainstorming groups produced fewer ideas and ideas of less novelty than the sum of the ideas created by the same number of individuals working alone.

Three main reasons:

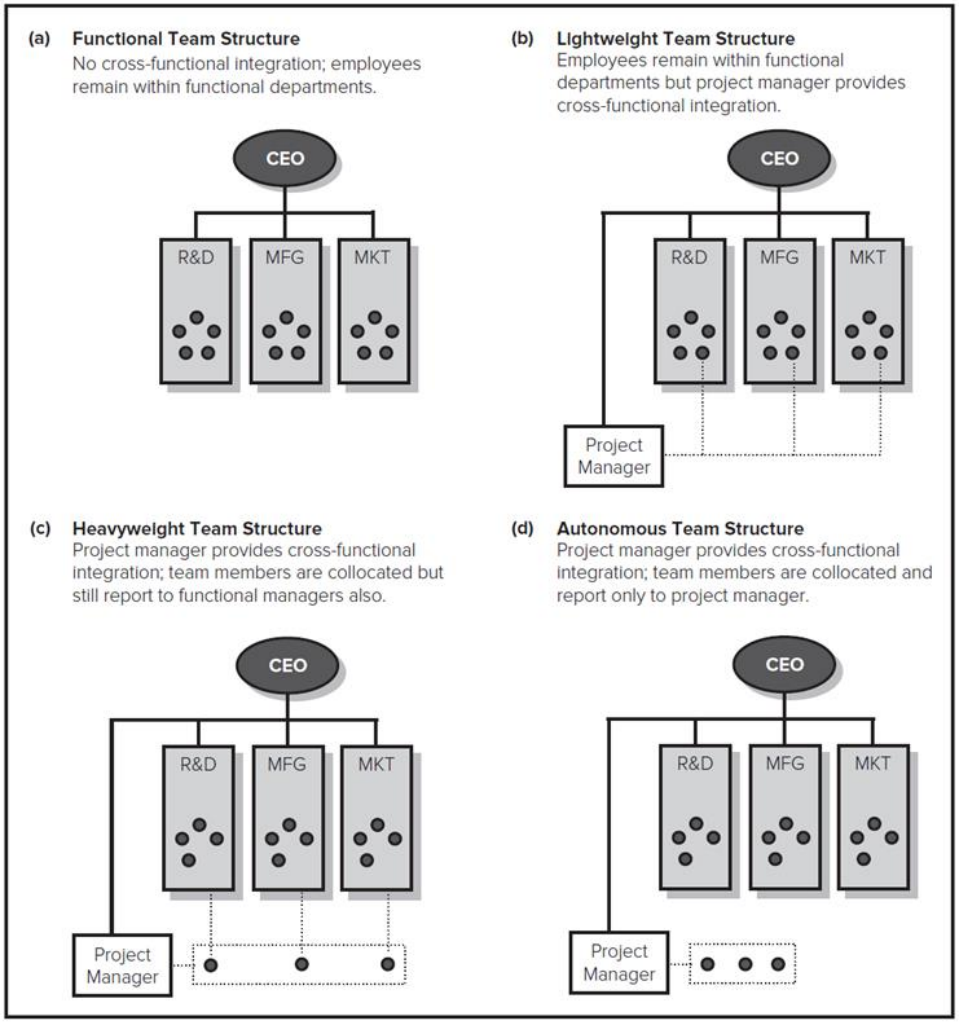
- Fear of Judgment – people self-censor many of their most creative ideas for fear of being judged.
- Production Blocking – when one person is talking, others are blocked from ideating.
- Feasibility Trumps Originality – groups tend to weight “feasible” more highly than “original”.

Indicates that people should brainstorm alone first and elaborate their ideas before moving into team development.

# Structure of New Product Development Teams [1]

One well-known typology of team structure classifies teams into four types:

- **Functional.**
- **Lightweight.**
- **Heavyweight.**
- **Autonomous.**

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# Structure of New Product Development Teams 2

## Functional Teams.

- Members report to functional manager.
- Temporary, and members may spend less than 10% of their time on project.
- Typically no project manager or dedicated liaison personnel.
- Little opportunity for cross-functional integration.
- Likely to be appropriate for derivative projects.

## Lightweight Teams.

- Members still report to functional manager.
- Temporary, and member may spend less than 25% of their time on project.

# Structure of New Product Development Teams 3

- Typically have a project manager and dedicated liaison personnel.
- Manager is typically junior or middle management.
- Likely to be appropriate for derivative projects.

**Heavyweight Teams.**

- Members are **collocated** with project manager.
- Manager is typically senior and has significant authority to command resources and evaluate members.
- Often still temporary, but core team members often dedicated full-time to project.
- Likely to be appropriate for platform projects.

# Structure of New Product Development Teams 4

**Autonomous Teams.**

- Members collocated and dedicated full-time (and often permanently) to team.
- Project manager is typically very senior manager.
- Project manager is given full control over resources contributed from functional departments and has exclusive authority over evaluation and reward of members.
- Autonomous teams may have own policies, procedures and reward systems that may be different from rest of firm.
- Likely to be appropriate for breakthrough and major platform projects.
- Can be difficult to fold back into the organization.

# The Management of New Product Development Teams [1]

## Team Leadership.

Team leader is responsible for directing team's activities, maintaining alignment with project goals, and communicating with senior management.

Team leaders impact team performance more directly than senior management or champions.

Different team types need different leader types:

- Lightweight teams need junior or middle manager.
- Heavyweight and autonomous teams need senior manager with high status, who are good at conflict resolution, and capable of influencing engineering, manufacturing, and marketing functions.

# The Management of New Product Development Teams 2

## Team Administration.

Many organizations now have heavyweight and autonomous teams develop a project charter and contract book.

- **Project charter** encapsulates the project's mission and provides measurable goals. May also describe:
  - Who is on team.
  - Length of time members will be on team.
  - Percentage of time members spend on team.
  - Team budget.
  - Reporting timeline.
  - Key success criteria.

# The Management of New Product Development Teams 3

**Contract book** defines in detail the basic plan to achieve goals laid out in charter. It provides a tool for monitoring and evaluating the team's performance. Typically provides:

- Estimates of resources required.
- Development time schedule.
- Results that will be achieved.

Team members sign contract book; helps to establish commitment and sense of ownership over project.

# The Management of New Product Development Teams 4

## Managing Virtual Teams.

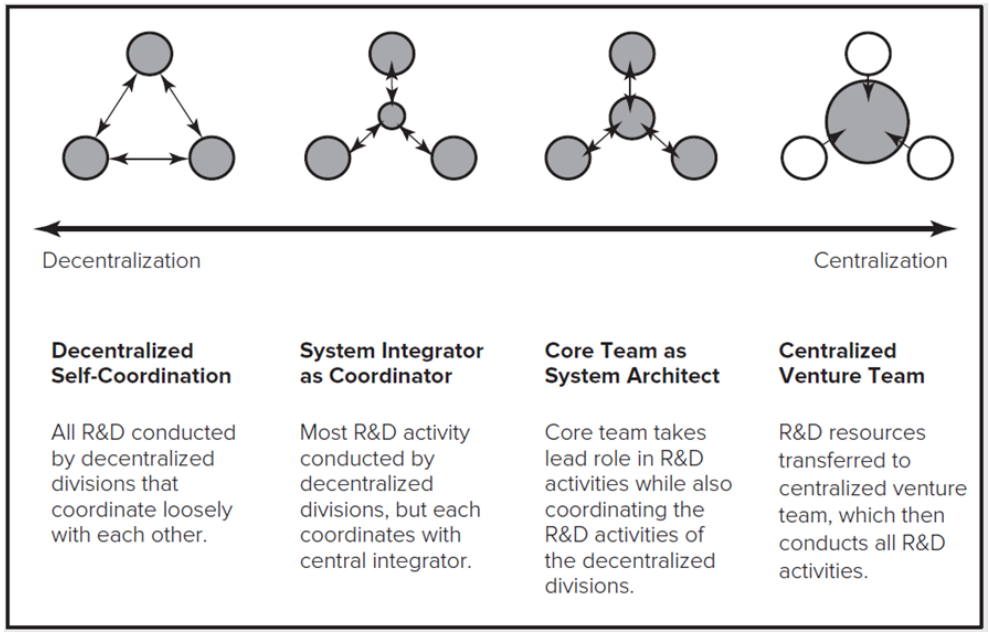
In **virtual teams**, members may be a great distance from each other, but are still able to collaborate intensely via videoconferencing, groupware, email, and internet chat programs.

- Enables people with special skills to be combined without disruption to their personal lives.
- However, may be losses of communication due to lack of proximity and direct, frequent contact.
- Requires members who are comfortable with technology, have strong interpersonal skills and work ethic, and can work independently.

# Research Brief 2

## Virtual International R&D Teams.

- Gassmann and von Zedtwitz studied 34 technology-intensive multinationals and identified four patterns of virtual international R&D teams:

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# Discussion Questions

1. Why are the tradeoffs in choosing a team's size and level of diversity?
2. What are some of the ways that managers can ensure that a team reaps the advantages of diversity while not being thwarted by some of the challenges team diversity raises?
3. Can you identify an example of a development project, and what type of team you believed they used? Do you think this was the appropriate type of team given the nature of the project?
4. What are some of the advantages and disadvantages of co-location? Are there some types of projects for which “virtual teams” are inappropriate?


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