Basic Concepts of Innovation and Innovation Management
-Student Material-

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With a big Thank You to Dr. Tony Davila and Dr. Rob Cooper
## Introduction

### What is Innovation?

- Innovation is typically understood as the *introduction* of something *new* and *useful*
- Innovation is the embodiment, combination, or synthesis of knowledge in original, relevant, valued new products, processes, or services

- Invention is the first occurrence of an idea for a new product or process, while innovation is the first attempt to carry it out into practice
- All innovation begins with creative ideas . . . We define innovation as the successful implementation of creative ideas within an organization. In this view, creativity by individuals and teams is a starting point for innovation; the first is necessary but not sufficient condition for the second

Innovation is the lifeblood of any organization. Without it, not only is there no growth, but, inevitably, a slow death.

Innovation, like many business functions, is a management process that requires specific tools, rules, and discipline.
Introduction

What is Innovation?

An Innovation is an Invention that becomes Implemented and taken to the Market

Key Decision Making Points

Creativity

Know-How

Marketing

The challenge is to cultivate and leverage innovation capabilities that allow to continuously deliver innovations
Introduction
Why is Innovation so important?

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Introduction

Why is Innovation so important?

![Bar chart showing revenue over time with sections for current (Today), 3-year, and 5-year projections:
- Core Business
- Incremental Growth
- New Products in Development
- New Business](image-url)
Introduction

Why is Innovation so important NOW?

- Increased Rate of Change in the environment
- Globalization of the Economy

• Big opportunities for innovating firms
• Big threats for established firms

So, what side are you on?
Key Concepts
Technological Innovation

- Can you give some examples of technological innovation?
Key Concepts

Business Model Innovation

- Can you give some examples of business model innovation?
Key Concepts
Process & Organizational Innovation

- Can you give some examples of process and organizational innovation?
Key Concepts
Innovation Matrix

Key Concepts

Innovation Matrix: Types of Innovations

- **INCREMENTAL INNOVATION**
  - Small improvements
  - Problem-solving skills, constrained creativity
  - Dominant form of innovation in established companies
  - Fights commoditization

- **TECHNOLOGY INNOVATION**
  - Significant technological changes delivering quantum leaps in performance or important architectural changes
  - Deep knowledge and specialized capabilities required
  - Intellectual Property (Patent) is a key tool

- **BUSINESS MODEL INNOVATION**
  - Significant change in the business model dimension
  - Leverages existing or slightly change technology in a new way
  - Deep understanding of market dynamics and competition and out-of-the-box thinking required

- **RADICAL INNOVATION**
  - Significant changes in both technology and business model dimensions
  - “Game changers”

Key Concepts

Innovation Matrix

- Formulate improvements and changes to a mainstream product:
  -
  -
  -
  -

- How many can be thought of?
Key Concepts
Innovation Matrix: Change Levers

A given Innovation is normally characterized by changes in **both** technology and business model dimensions

**TECHNOLOGY CHANGE LEVERS**
- Developed Technology
- Process Technologies
- Enabling Technologies

<table>
<thead>
<tr>
<th>TECHNOLOGY</th>
<th>Expected Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change Lever</td>
<td>Moderate</td>
</tr>
<tr>
<td>Developed Technologies</td>
<td></td>
</tr>
<tr>
<td>Process Technologies</td>
<td></td>
</tr>
<tr>
<td>Enabling Technologies</td>
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</tbody>
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**BUSINESS MODEL CHANGE LEVERS**
- Value Created
- Target Market
- Supply Chain

<table>
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<th>BUSINESS MODEL</th>
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<td>Target Market</td>
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<tr>
<td>Supply Chain</td>
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The timely combination of:
• A business-model dominant semi-radical innovation (A), with
• a technology-dominant semi-radical innovation (B),
results in
an (Ersatz A+B ) radical innovation with much higher value than its parts.

The innovation funnel shows the progress and filtering, inside an innovating firm, across the path from Idea to Innovation.
Innovation Management
The Challenge

- It is not only about winning (Roland Garros) once … it is about winning Roland Garros for the second time, and for the third time, and for the fourth time, …

- For a established firm the challenge is leveraging and cultivating innovation capabilities that allow for continued business growth
Innovation Management
The Questions

- Is it possible to manage innovation?
- Can innovation be measured?
- How do leading companies manage their innovation?
Innovation Management
The Scope of Innovation Mgmt

- Changes in Customers, Industry, Technology, Economy, Society,

From Idea to Commercialization

New Products, Solutions and Services

Innovation Management
Innovation Management
The framework for Innovation Mgmt

- What are the elements of an innovation framework?
  
  -
  -
  -
  -
  -
  -
Innovation Management
The Framework for Innovation Mgmt

a. Innovation Strategy

b. Innovation Organization

c. Innovation Systems (Processes, Teams & Networks)

d. Innovation Metrics

e. Innovation Learning

f. Innovation Culture
Innovation Management

Innovation Strategy

- How would you define and formulate an Innovation Strategy?
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Innovation Strategy: Key Strategic Decisions

Innovation Matrix Strategy

<table>
<thead>
<tr>
<th>Technology</th>
<th>Business Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close to Existing</td>
<td>Close to Existing</td>
</tr>
<tr>
<td>Radically New</td>
<td>Radically New</td>
</tr>
</tbody>
</table>

- 15% ?
- 5% ?
- 70% ?
- 10% ?

How much innovation is needed of each type?

Balances & Levers

Setting an Innovation Strategy requires defining the sought balances between these levers:

- Value Capture
- Creativity
- Incremental Innovation
- Radical Innovation
- Technological Innovation
- Business Innovation
- Internal Innovation
- External Innovation

Recommended Reading: Davila et al – Making Innovation Work 2005
Innovation Management
Innovation Organization: Organizational Approaches

Where is Innovation generated?
Where could innovation be generated?
Where could each type of innovation be generated?
How can Innovations find the higher chances to get through?
Innovation Management

Innovation Systems: Processes, Teams & Networks

- Innovation Systems must be designed and tuned in order to execute the Innovation Strategy

- Innovation Systems require both Processes and Teams

- Innovation Systems leverage and expand the Innovation Culture
Innovation Management
Innovation Systems: Processes, Teams & Networks

Company Vision & Strategy

Innovation Process
- Analysis & Strategy
- Ideation & Selection
- Realization & Validation

Communication & Deal-Making
- Cross-Functional Teams
- Internal Innovation Ecosystems
- Extended Teams with Partners and Customers

Innovation Teams

Innovation Culture

Changes in:
- Technology
- Market
- Industry
- Economy
- Society
- ...

New Products, Solutions and Services

Innovation Systems must be designed and tuned in order to execute the Innovation Strategy, leveraging and expanding the Innovation Culture
Innovation Management

Innovation Systems: Processes

Changes in Customers, Industry, Technology, Economy, Society

E2E Innovation Management Process

New Products, Solutions and Services

Research
Innovation Strategy Formulation
Ideation
Selection
Realization & Validation

Feedback & Learning

Innovation Processes enable effective and efficient management of innovation initiatives and allow for a continuous improvement cycle
Innovation Management
Innovation Systems: Processes (Example)

Changes in Customers, Industry, Technology, Economy, Society

Surveillance
Analysis
Focus
Idea Generation
Idea Collection
Select
Solution Creation
Validate
Landing

New Products, Solutions and Services

E2E Innovation Management Process

Surveillance
Actively scan changes in Technology, Market, Economy, Society

Analysis
Identify Trends & Critical Uncertainties and foresee Opportunities and Threats

Idea Generation
Find new Ideas/Paths for innovation in the analyzed scenarios

Idea Collection
Record, organize and make easily accessible all ideas generated

Solution Creation
Figure out and prove innovative Solution Concepts for those new paths

Landing
Help new innovations grow and land in the target industry/market

Learning
Innovation Management

Innovation Systems: Processes

Idea Management

- How would you organize for collecting, evaluating and steering on new ideas?
Innovation Management

Innovation Systems: Processes

Idea Management

- How would you organize for collecting, evaluating and steering on new ideas?

  - Case Study 1: Innovation Steering at Ericsson Spain’s Technology & Innovation Unit
  
  - Case Study 2: Technology Leadership Program at Ericsson BU Networks
  
  - Case Study 3: IdeaBoxes, an Ericsson-wide initiative
Portfolio management for new products is a dynamic **decision process** wherein the list of active new products and R&D projects is constantly revised.

In this process, **new projects** are evaluated, selected and prioritized. **Existing projects** may be accelerated, killed, or de-prioritized and **resources** are allocated and reallocated to the active projects.

The portfolio decision process is characterized by **uncertain and changing information**, **dynamic opportunities**, **multiple goals and strategic considerations**, interdependence among projects, and multiple decision makers and locations.

*Source: Cooper (2001) – Portfolio Management for New Products*
What goals have leaders in innovation in mind when they set up and use methods for portfolio management?

Source: Cooper (2001) – Portfolio Management for New Products
Innovation Mgmt
Innovation Systems: Processes
Innovation Portfolio Management

Maximize the **Value** of the Portfolio

Achieve a **Balanced** Portfolio

Build **Strategy** into the Portfolio

*Source: Cooper (2001) – Portfolio Management for New Products*
Innovation Mgmt

Innovation Systems: Processes

Innovation Portfolio Management

- Financial Methods
- Scoring Models
- Portfolio Maps / Bubble Diagrams
- Road-mapping
- Strategic Buckets Model
- Project Selection with Built-in Strategic Criteria
- Mixed Strategic Approaches

Source: Cooper (2001) – Portfolio Management for New Products
Innovation Mgmt
Innovation Systems: Processes
Innovation Portfolio Management

<table>
<thead>
<tr>
<th>KEY FACTOR</th>
<th>QUESTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BUSINESS STRATEGY FIT</td>
<td>Is the project aligned with the business strategy, and is it strategically important?</td>
</tr>
<tr>
<td>COMPETITIVE ADVANTAGE</td>
<td>Does the product offer unique customer benefits, meet customer needs better than competitors, provide good value for money?</td>
</tr>
<tr>
<td>MARKET ATTRACTIONIVENESS</td>
<td>Is the target market attractive – size, growth, margins, competition?</td>
</tr>
<tr>
<td>SINERGIES (LEVERAGES CORE COMPETENCIES)</td>
<td>Does the project build on strengths, experiences, and competencies in marketing, technology and operations?</td>
</tr>
<tr>
<td>TECHNICAL FEASIBILITY</td>
<td>What is the likelihood of technical feasibility – size of gap, complexity, uncertainty?</td>
</tr>
<tr>
<td>FINANCIAL REWARD</td>
<td>Can this project make money? How certain are we? Is it worth the risk?</td>
</tr>
</tbody>
</table>

Source: Cooper (2001) – Portfolio Management for New Products
Innovation Management

Innovation Systems: Processes

Innovation Portfolio Management: Portfolio for Focus Area A (Example)

<table>
<thead>
<tr>
<th>INNOVATION OPPORTUNITIES</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>01 Innovation Opportunity -A1</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>02 Innovation Opportunity -A2</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>03 Innovation Opportunity -A3</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>04 Innovation Opportunity -A4</td>
<td>✓</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>05 Innovation Opportunity -A5</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
Innovation Management
Innovation Systems: Processes
Innovation Strategy Follow-Up

Innovation Matrix Follow-up

How much innovation of each type am I actually creating?

Close to Existing  
Radically New

Technology

Value Capture  
Creativity

Incremental Innovation  
Radical Innovation

Technological Innovation  
Business Innovation

Internal Innovation  
External Innovation

Balances & Levers

Checking the expected balances between these levers:

Close to Existing  
Radically New

Business Model
Innovation Management

Innovation Systems: Teams & Networks

INNOVATION PROCESS TEAMS
- Management & Steering Teams defining, enforcing and following up the Innovation Strategy
- Teams executing the process (surveillance, idea mgmt, steering, portfolio mgmt, …) and improving it

INNOVATION PROJECTS TEAMS
- Cross-functional teams executing innovation projects
- External Partners
- Project Steering Groups

INTERNAL INNOVATION ECOSYSTEMS
- Internal Organizations & Processes that promote and fund innovation activities
- Also known as internal innovation market-places or Corporate Venture programs

EXTERNAL NETWORK
- Universities and Research Institutions
- Technology and Business Partners
- Partner Customers
- Private and Public Organizations
Innovation Management

Innovation Metrics

- How would you measure Innovation?
## Innovation Management

### Innovation Metrics Framework

<table>
<thead>
<tr>
<th>RESOURCES (INPUTS)</th>
<th>EXECUTION (PROCESS)</th>
<th>OUTPUT (PERFORMANCE)</th>
<th>OUTCOME (VALUE-ADDED)</th>
</tr>
</thead>
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<td></td>
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## Innovation Management

### Innovation Metrics Framework

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</thead>
<tbody>
<tr>
<td>Funding</td>
<td>Effective Project Exec.</td>
<td>Technology Leadership</td>
<td>Residual Income</td>
</tr>
<tr>
<td>Innovation Strategy</td>
<td>Quality of Pipeline (expected impact of new ideas)</td>
<td>- Patents</td>
<td>Sales Growth</td>
</tr>
<tr>
<td>Access to Talent &amp; Knowledge</td>
<td>Innovation Strategy Follow-up &amp; Enforcement</td>
<td>- Standards</td>
<td>Profit Growth</td>
</tr>
<tr>
<td>Motivation</td>
<td></td>
<td>- Papers</td>
<td></td>
</tr>
<tr>
<td>- Employee Commitment to Innovation</td>
<td></td>
<td>- …</td>
<td></td>
</tr>
<tr>
<td>- Incentives &amp; recognition Schemes</td>
<td></td>
<td>- Technology Performance (Benchmarking vs. Competitors)</td>
<td></td>
</tr>
<tr>
<td>Tools</td>
<td></td>
<td>- New Product Introduction</td>
<td></td>
</tr>
<tr>
<td>- Idea Mgmt</td>
<td></td>
<td>- Process Improvements</td>
<td></td>
</tr>
<tr>
<td>- Know. Mgmt</td>
<td></td>
<td>- On-time Delivery</td>
<td></td>
</tr>
<tr>
<td>- …</td>
<td></td>
<td>- Cost Reductions</td>
<td></td>
</tr>
<tr>
<td>External Network</td>
<td></td>
<td>- …</td>
<td></td>
</tr>
</tbody>
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### RESOURCES (INPUTS)
- Funding
- Innovation Strategy
- Access to Talent & Knowledge
- Motivation
  - Employee Commitment to Innovation
  - Incentives & recognition Schemes
- Tools
  - Idea Mgmt
  - Know. Mgmt
  - …
- External Network

### EXECUTION (PROCESS)
- Effective Project Exec.
- Quality of Pipeline (expected impact of new ideas)
- Innovation Strategy Follow-up & Enforcement

### OUTPUT (PERFORMANCE)
- Technology Leadership
  - Patents
  - Standards
  - Papers
  - …
- Technology Performance (Benchmarking vs. Competitors)
- New Product Introduction
- Process Improvements
  - On-time Delivery
  - Cost Reductions
  - …
- Market Performance
  - Increased Sales
  - New Customers
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Innovation Learning

Technologies
- A number of technologies (most of them disruptive) proliferate. Different companies bet on different ones.
- At the end a particular technology (e.g., gasoline engine in the car industry) dominates and the many companies that bet on a different technology disappear.

Performance
- At this stage, performance is measured primarily on a single dimension (e.g., image resolution). Competition is often focused solely on that single dimension.
- The competitive advantage goes to the company able to execute the learning cycles faster.

Segmentation
- As product performance improves, certain customer segments start valuing different product dimensions – price, availability, ...
- The winners are those companies that are able to read the market and understand the differences across market segments.

Efficiency
- As the technology market is becoming mature, competing players focus more and more in efficiency and sustaining technologies.
- Radical innovations may appear at this stage and force the start of a new lifecycle.

Complementarities
- The focus shifts to manage complementarities: synergies with other products and businesses, networks with partners, ...
- At this stage, companies are most vulnerable to radical changes in their environment.

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Innovation Culture

- What are the elements of a strong innovation culture?
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Innovation Culture

- Creativity
- Diversity
- Communication
- Cooperation
- Motivation
- Commitment
- Initiative
- Risk Taking
- Knowledge Sharing
Innovation Management

Moral

‘How you innovate determines what you innovate’

Source: Davila et al. (2005) – Making Innovation Work
Outlook and Trends
Open Innovation Model

- More agility and effectiveness of R&D
- Higher rate of new breakthroughs

Outsourcing + Internal Ideas and Technologies

License in
Spin in
Acquire
Divest

License out
Spin out

Innovations

Current Market
New Markets

Picture from: Dr. Henry Chesbrough’s – Researching a New Paradigm 2007
Basic Concepts of Innovation and Innovation Mgmt 47 M.Lorenzo 2010-03-25
Outlook and Trends

Innovation Ecosystems

- Interdependencies
- Networked Customers
- Cooperation & Integration
- Risk

Innovation Ecosystems enable collaborative arrangements through which firms combine their individual offers into a coherent, customer-facing solution.

In an Innovation Ecosystem all contributing parties can:
- Validate their Strategy in advance
- Create higher value for their customers and customers’ customers
- Secure the right timing for launching new solutions
- Focus their efforts on higher probability innovations

Innovation ecosystems allow companies to create value that no one firm could have created alone.

Inspired in Adner (2006) – Matching your innovation strategy and your innovation ecosystem.
Outlook and Trends
Increasing Focus on Systemic Innovation

- Stronger Innovation Culture company-wide

- Contribution to innovation from all company’s disciplines and organizations

- Each and every employee is key in innovation
References


  ▪ **Christensen, C.** (1997). *The Innovator’s dilemma*. Collins Business Essentials


  ▪ **Cooper, R.** (2001). *Winning at New Products. Accelerating the process from Idea to Launch*. Basic Books