Management of Innovation

Prof. R. O’Callaghan
What is innovation?
Innovation

• From the Latin “innovare”: to make something new

• Innovation is a broad term covering change of many kinds, and also describing the process whereby such changes are introduced.

• Innovations have different characteristics at different stages in their life cycles, and the emphasis may shift over this period.
Key dimensions of innovation

• product, process or service;
• incremental or radical;
• components or systems;
• new to the world or new to a particular context;
• embodied in a physical system—a machine or a product—or intangible—for example, a new working method or a different philosophy of control.
Innovativeness is relative

- New to the world: 6.7%
- New to the industry: 31%
- New to the company: 9%
- Significant upgrade existing product: 24%
- Minor modifications existing products: 29%

Based on a US sample of 45 new products in 2004, by Ettlie and Elseback.
Dimensions of innovation space

Transformation

Perceived extent of change

Radical

Incremental

Product  Service  Process

What is changed
Innovation as a Management Process

• Innovation is not a single event:
• It is a process, a knowledge-based process
• The process can be modeled in stages:
  – E.g. stages for identifying, designing, developing and launching a new product
Stages of innovation

Scientific Findings...
Laboratory Feasibility...
Operating Prototype...
Commercial Introduction...

Widespread Adoption...
Diffusion to Other Areas...
Social & Economic Impact...
Evidence shows that innovation is by no means automatically successful, and that even commitment of large amounts of resources to the problem does not guarantee success.

It is a risky and uncertain activity, with many variables, including the technology itself, the nature of the competition, the market context into which it might be launched, the wider social and political context, etc.
Successful management of new adopted technology

Risky… but necessary

• Risky innovation is an imperative
• Organizations which do not change-and continue not to-are unlikely to survive in the long term.
• Studies of long-lasting organizations show that they place a premium on change-and are willing to-’re-invent’ themselves.
Importance of innovation

- In March 2005, McKinsey surveyed 9,300 business and technology leaders around the world on the trends affecting the global economy.

- 81% of the executives see technological innovation as a critical global trend.
Innovating for growth

% of respondents¹

CIOs and CTOs see innovating around current products as most important . . .

. . . and recognize innovation as the most important capability for growth

Most important action for growth over next five years

<table>
<thead>
<tr>
<th>Action</th>
<th>CIO/CTO respondents (n = 251)</th>
<th>All respondents, including CIOs/CTOs (n = 9,345)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innovating around current products</td>
<td>33</td>
<td>25</td>
</tr>
<tr>
<td>Developing new products</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>Acquiring an existing business</td>
<td>16</td>
<td>15</td>
</tr>
<tr>
<td>Developing better distribution</td>
<td>15</td>
<td>16</td>
</tr>
<tr>
<td>Entering new geographic markets</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Cutting prices to gain market share</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Most important capability for growth

<table>
<thead>
<tr>
<th>Capability</th>
<th>CIO/CTO respondents (n = 251)</th>
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<tbody>
<tr>
<td>Ability to innovate</td>
<td>53</td>
<td>43</td>
</tr>
<tr>
<td>Ability to allocate the best talent</td>
<td>22</td>
<td>25</td>
</tr>
<tr>
<td>Ability to manage a global organization</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Ability to allocate capital</td>
<td>15</td>
<td>17</td>
</tr>
<tr>
<td>Ability to manage increasing regulation costs</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

¹All data weighted by GDP of constituent countries to adjust for differences in response rates from various regions.

Source: Mar 2005 McKinsey Quarterly survey of 9,345 global executives
## IT’s talent challenge

**In executing your company’s strategy over the next 5 years, which of the managerial challenges below will be most significant?**

<table>
<thead>
<tr>
<th>Finding talent</th>
<th>Cost of talent</th>
</tr>
</thead>
<tbody>
<tr>
<td>% of respondents</td>
<td>% of CIO/CTO respondents reporting constraint to be ‘significant’ or ‘very significant’</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Challenge</th>
<th>CIO/CTO respondents</th>
<th>All respondents, including CIOs/CTOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing size and scale of company</td>
<td>25</td>
<td>19</td>
</tr>
<tr>
<td>Greater competitive intensity</td>
<td>17</td>
<td>22</td>
</tr>
<tr>
<td>Increasing number of markets</td>
<td>7</td>
<td>11</td>
</tr>
<tr>
<td>Increasing technology use</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Growing complexity of supply chain</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Growing number of regulations</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Greater geopolitical risk</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>Challenge</th>
<th>CIO/CTO respondents</th>
<th>All respondents, including CIOs/CTOs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Competitive environment</td>
<td>75</td>
<td>71</td>
</tr>
<tr>
<td>Substitutions/innovations by competitors</td>
<td>63</td>
<td></td>
</tr>
<tr>
<td>Increasingly sophisticated consumers</td>
<td>62</td>
<td></td>
</tr>
<tr>
<td>Excessive regulations</td>
<td>57</td>
<td></td>
</tr>
<tr>
<td>Lack of access to capital</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Rising natural-resource costs</td>
<td>38</td>
<td></td>
</tr>
<tr>
<td>Inadequate government/legislative protection</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Rising health care costs</td>
<td>33</td>
<td></td>
</tr>
<tr>
<td>Inadequate infrastructure</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Rising pension costs</td>
<td>28</td>
<td></td>
</tr>
</tbody>
</table>
Enhancing the innovative ability is seen today as the most important lever to increase profitability and growth across industries and regions.

### Levers to Increase Profitability and Growth

<table>
<thead>
<tr>
<th>Levers to Increase Profitability and Growth</th>
<th>Use of Lever</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enhance innovation ability</td>
<td></td>
<td>Innovation is the most important lever across all regions</td>
</tr>
<tr>
<td>Focus on core competencies</td>
<td></td>
<td>Chinese companies focus on innovation too and will not only compete on costs</td>
</tr>
<tr>
<td>Cost cutting</td>
<td></td>
<td>Cost reduction is the most important lever in Dutch Utilities companies and Financial institutions</td>
</tr>
<tr>
<td>Organic growth</td>
<td></td>
<td>Profitability growth through new businesses from organic growth is the most important lever for Dutch Telecom companies</td>
</tr>
<tr>
<td>Capital efficiency</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationalisation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Active pricing</td>
<td></td>
<td></td>
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<tr>
<td>Acquisitions and alliances</td>
<td></td>
<td></td>
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</tbody>
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*Source: Arthur D. Little Innovation Excellence Study 2005*
The importance of innovation – Industry differences

There are fundamental differences between industries with regard to innovation dynamics and efficiency

Source: Arthur D. Little Innovation Excellence Study 2005
Key premises

• Innovation as interaction of technology, market and organization

• Learning and adaptation as essential capabilities in an inherently uncertain future

• Innovation as a generic process for all enterprises
Innovation: a generic process for all enterprises

Innovation as a business process

• **Searching** - scanning the environment (internal and external) for, and processing relevant signals about, threats and opportunities for change.

• **Selecting** - deciding (on the basis of a strategic view of how the enterprise can best develop) which of these signals to respond to.

• **Implementing** – translating the potential in the trigger idea into something new and launching it in an internal or external market. Making this happen is not a single event but requires attention to:
  – **Acquiring the knowledge resources** to enable the innovation (for example, by creating something new through R&D, market research, etc., acquiring knowledge from elsewhere via technology transfer, strategic alliance, etc.)
  – **Executing the project** under conditions of uncertainty which require extensive problem-solving.
  – **Launching** the innovation and managing the process of initial adoption.
  – **Sustaining adoption** and use in the long term - or revisiting the original idea and modifying it – re-innovation.

• **Learning** - enterprises have the opportunity to learn from progressing through this cycle so that they can build their knowledge base and can improve the ways in which the process is managed.
Building blocks

Innovation strategy

Effective linkages

Implementation mechanisms

Supportive organizational context

Innovation process
Knowledge, Innovation and Corporate Strategy

• Innovation is a source of sustainable competitive advantage.
• Firm-specific knowledge is an essential feature.
• Corporate strategy should therefore include an innovation strategy, the purpose of which is deliberately to accumulate and exploit such firm-specific knowledge.

• An innovation strategy must cope with:
  
  – an external environment that is complex and ever-changing, with considerable uncertainties about present and future developments in technology and other dimensions of the business environment;
  
  – internal structures and procedures that must continuously balance potentially conflicting requirements-(i) to identify and develop specialized knowledge within technological fields, business functions and product divisions, (ii) to exploit this knowledge through integration across technological fields, business functions and product divisions.
Successful organizations understand and work with different actors in their environment.

- Market-related linkages: how markets are defined, explored and understood, and how this knowledge is communicated and updated throughout the organization. How market behaviour can be used to launch innovations whether to an external or internal market (whether product or process).

- Collaborative linkages: strategic alliances, networks.
Implementation of innovation

Structures for decision making throughout the life of an innovation project, arrangements for project management and monitoring, and mechanisms to plan and introduce change in the organization.

- Managing internal processes: scanning the environment, selecting projects with a strategic fit, monitoring and managing projects through various stages of development, deciding where and when to stop projects, and where and when to accelerate them, review and capturing learning from completed projects

- Starting up innovative ventures: moving beyond current range of technologies, products and processes, and the associated learning processes. Internal corporate ventures, and new technology-based firms.
Organizational context

One important influence on success and failure of innovations is the organizational context in which they are created and implemented.

- **Components of innovative organization**: vision, will to innovate, structure, key individuals, teamworking, motivation, training and development, communication, creative climate, external focus, learning organization.

- **Building a new organization for innovation**: sources of new technology based firms
The course will explore the supporting role of Information technology (IT) and Information systems (IS) for Knowledge and Innovation Management, as well as the lessons that the Innovation Management perspective bring to IT/IS management.
IT Management seen as Innovation

External Analysis (Intelligence)

- Technology developments
- Trends
- Impacts
- Opportunities

Business Strategy

Organization
- structure
- processes
- people

Info Systems

New Technologies

Technology developments and how they can be used to transform strategies, organizations and systems

POTENTIAL

IM Strategy
(Policy / Org. Design)

WHAT & WHY
- IT/IS adoption
- Innovation
- Systems portfolio

Business Strategy

Organization
- structure
- processes
- people

Info Systems

IT infrastructure

IM Strategy
(Build/ Acquire)

HOW
- Architecture
- Systems Develop.
- Make/ Buy
- Outsourcing

Organization
- structure
- processes
- people

Info Systems

IT infrastr.

Implementation and operations

EXECUTION
- Change mgmt.
- Operations
- Risk
- Security
- Auditing

Organization
- structure
- processes
- people

Info Systems

IT infrastr.

Tools:
- Technology scanning
- Technology assessment
- Investment evaluation
- Systems planning
- Process Modeling
- Sys. Dev. tools
- Project management
- Quality assurance