Chapter 4 – Technology Acquisition

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Introduction

- By its nature, technology acquisition is a technology transfer, with transaction costs associated with the various stages of the acquisition process.
- Technology can be acquired in a number of ways like
  - Internal research and development
  - Joint ventures, subcontracting, alliances, joint R&D and industry-university collaboration
  - Organizational change
  - Project management
  - Licensing
  - Technology transfer
  - Technology insertion

Technology Acquisitions

In its most simple form, technology acquisition requires:

- Identification of attractive technologies or partners with technological capabilities;
- Assessment of these opportunities, selection of the most promising ones and consideration of the terms of the acquisition;
- Negotiation of the terms of acquisition between acquirers and sellers;
- Transfer of the technology to the acquirer, if these negotiations have been successful.

Acquisition Context

- A structured approach will help to reduce the complexity of all the possible scenarios and ensure that those involved remain objective and focused on the most important questions.
  - Why do we want to acquire the technology?
  - Who are we going to acquire the technology from?
  - How mature is the technology and how might this affect our acquisition options?

Acquisition Context (Cont.)

Why do we want to acquire the technology?

- **Organization's motives for wanting to acquire a technology affects the kind of technology they are looking for. These motive may be of four types:**
  - **M1: Developing new technological capabilities**
  - **M2: Increasing strategic options**
  - **M3: Gaining efficiency improvements**
  - **M4: Responding to the competitive environment.**

M1: Develop Technological Capabilities

Is acquisition sought to:

- Fill gaps in firm's own R&D base or capabilities?
- Fill holes in an existing product line?
- Create and establish a new product for the firm?
- Overcome technology exhaustion?

M2: Increase Strategic Options

Is acquisition seen as:

- An opportunity to increase capabilities in light of changes in the firm's environment?
- Away of overcoming internal technological constraints in order to enhance strategic flexibility?
- A means to access the best available technology in the future?

Gain efficiency Improvements

Is the acquisition seen as a means to:

- **Reduce development time?**
- **Reduce costs?**
- **Increase customer interest (particularly in periods of rapidly changing demand)?**

Respond to the Competitive Environment

Is acquisition important because:

- Technology markets are emerging?
- Environments are more hostile?
- There is rapid technological change?
- There are fast-moving competitors in the market area?

Who are we going to acquire the technology from?

- **Technology can be acquired from a number of different kinds of sources including private companies, universities and government agencies.**
- **Potential Partners**
  - **Universities**
  - **Start-up companies**
  - **Consortia**
- **It is very important to understand the characteristics of your potential partner(s) as these will determine their expectations and behaviour during collaborations.**

How mature is the technology and how might this affect our acquisition options?

- **The maturity level – and the amount of work needed to bring it up to the level your firm requires – are obviously highly significant factors to consider in the context of any acquisition.**
- **How to Measure Technology Maturity Levels?**

STAM (Science, Technology, Application, Market) Model.

- **Science (S):** Development of understanding of scientific phenomena (and/or underpinning technology platform)
- **Science/Technology transition (S/T):** Demonstrating the feasibility of a scientific phenomenon (and/or underpinning technology) to support a new market-directed technology platform, showing the feasibility of the supporting science and technology to be integrated into an application-specific functional technology system.
- **Technology (T)** Technology emergence. Improving the reliability and performance of the market-directed technology to a point where it can be demonstrated in a market-specific environment.
- **Technology/Application transition (T/A):** Developing the technology and application to a point where commercial potential can be demonstrated through revenue generation.
- **Application (A):** Improving the price and performance of the application to a point where sustainable business potential can be demonstrated.
- **Application/Market transition (A/M):** Translating price-performance demonstrators into a market with mass growth potential.
- **M= Market** Marketing, commercial and business development leading to sustainable industrial growth.

Useful questions to ask

- What types of organizations could be considered as a source for the technology?
- What are their key characteristics?
- What are their motivations in selling/giving the technology to us?
- What alternative partnering options could we consider?
- What degree of maturity characterizes the technology currently?
- What degree of maturity will the technology have at the end of the acquisition?

Acquisition Evaluation

- Once the technology is identified you need to thoroughly assess whether the proposed acquisition is likely to meet your needs. Three main factors:
  - Your company's ability to absorb and use the technology
  - Compatibility of you and your potential partner
  - Suitability of the technology for your needs

A Firm's Absorptive Capacity

- Its level of technical knowledge concerning the technology to be acquired.
- Its level of experience in acquiring technology and its own R&D capabilities.
- Its stock of intellectual property (IP) relating to the technology to be acquired.
- Its willingness to accept new ideas and technologies from outside the organization.
- The 'not-invented-here' (NIH) syndrome is a risk for acquisitions when external ideas and technologies are rejected by in-house engineers and managers.
- Its flexibility in adopting new routines.
- Internal support.
- Sharing knowledge with external partners.
- Applying acquired technology in new products.
- Exploitation of the technology.

Partners: how compatible are those involved?

- **A shared strategic vision on alliance aims.** Do the partners understand each others motives and what they stand to gain from the transaction?
- **Compatible alliance and corporate strategies.** Will the alliance work in ways compatible with the needs of those involved?
- **Shared view of the strategic importance of the alliance.** Is the alliance equally important to the partners?
- **Mutual dependence.** Are the partners mutually dependent on each other for the alliance to succeed?
- **Potential for the alliance to add value for clients or partners.** Will the alliance meet the needs and expectations of other stakeholders?
- **Market acceptance of the alliance.** Will customers, competitors or government bodies see the partnership in a positive light?
- **Technical capability.** Does the potential partner have the necessary technical capability to make the partnership a success?

Technology: is it suitable?

- Does the acquisition meets set objectives?
- Potential commercial value?
- Uncertainties surrounding the transaction
- Intellectual Property
- Know-how: the skills of employees and the ability to make use of these skills.
- Know-what: specific technical and market knowledge relating to the technology, including technical details, procedures, manuals.
- Know-who: the knowledge and understanding of technically expert contacts and organizations along the supply chain who can make the technology work.

Acquisition Options

- Future technology development
- Contracts and relationships
- Ownership of intellectual property (IP)
- Technology exploitation
- Rights to use a technology
- Exchange 'currency'
- IP protection

Future Technology Development

- Internal development
- External development
- Co-development
- Outsourcing R&D
- Technology licensing & transfer
- Technology purchasing

Future Technology Development

- Contracts and relationships
- Contractual relationships
- Contractual options
  - short-term contracts for R&D services
  - joint venture or merger/acquisition
  - Corporate Venture Capital

IP Protection Clauses

- *Parties changing their minds*
- *Knowledge leakage*
- *Lack of good faith*
- *Underperformance*
- *Procrastination and delays in reaching agreements*
- *Third parties' rights*

Ownership of Intellectual Property

Ownership can take one of three different forms:

- Individual Ownership: The IP can belong to one party only
- Joint Ownership: The IP can be shared between the parties who collaborated to develop it.
- Public Ownership: The IP can be owned by everyone and is donated to the public. In this case nobody has the legal right to exclude others from using the IP.