

ACQUISITION

Learning objectives

After studying this chapter, you should be able to:

- 1 Differentiate between the two types of technology sourcing approaches: internal and external acquisition.
- 2 Identify advantages and disadvantages of acquisition types.
- 3 Understand the R&D capabilities and processes involved in producing new products, services and technologies.
- 4 Understand the relevance of open innovation in sourcing technology.
- 5 Learn about the variety of collaboration/alliance/network types and the process of external acquisition.
- 6 Observe the links between internal and external acquisitions.

Acquisition relates to how the company will obtain the technologies needed for its business. Acquisition might be through internal technology development, collaborative development or purchasing from external developers. Depending on the type of acquisition, exemplar processes might be a simple purchasing act, internal R&D or complicated forms of collaborations that might range from a corporate merger to a research consortium. The

This chapter focuses on the **internal** development of technologies (internal R&D capability) as well as the **co-development of technologies** with outside partners/collaborators (external acquisition capability). While the former is an in-house series of activities, the latter is based on activities involving inter-organizational relationships, popularly known as 'open innovation'. The chapter prefers to distinguish internal and

Internal acquisition: R&D

R&D encompasses a set of processes for creating a firm's technologies in-house. As its name shows, there are two main goals of R&D:

- 1 Doing research to generate new knowledge and technical ideas aimed at new and enhanced products, manufacturing processes and services.
- 2 Development activities where ideas are transformed into working prototypes and embodied in new products and services, including manufacturing, distribution and use.

In open innovation systems, the technology creation function has evolved into a broader context where both in-house and collaborative technology creation activities fall into the realm of R&D management, but as the case of Procter & Gamble (P&G) given at the end of the chapter indicates, firms organize their R&D along the lines of internal and external activities. Thus, external acquisition is discussed in the next section to accommodate all forms of collaborative means of inter-firm/inter-organizational R&D activities.

R&D processes

When technology strategy is developed, the broad goals for technologies are decided at the corporate level. These goals are transferred to the R&D department, starting a chain effect of generation and selection of projects on the basis of the general goals. The ultimate aim is to identify and deliver a portfolio of R&D projects that will satisfy the strategic needs. Once projects are identified and agreed upon, the R&D department implements them, managing the selected projects. Some of these projects might be chosen strategically to be carried out in collaboration with external partners.

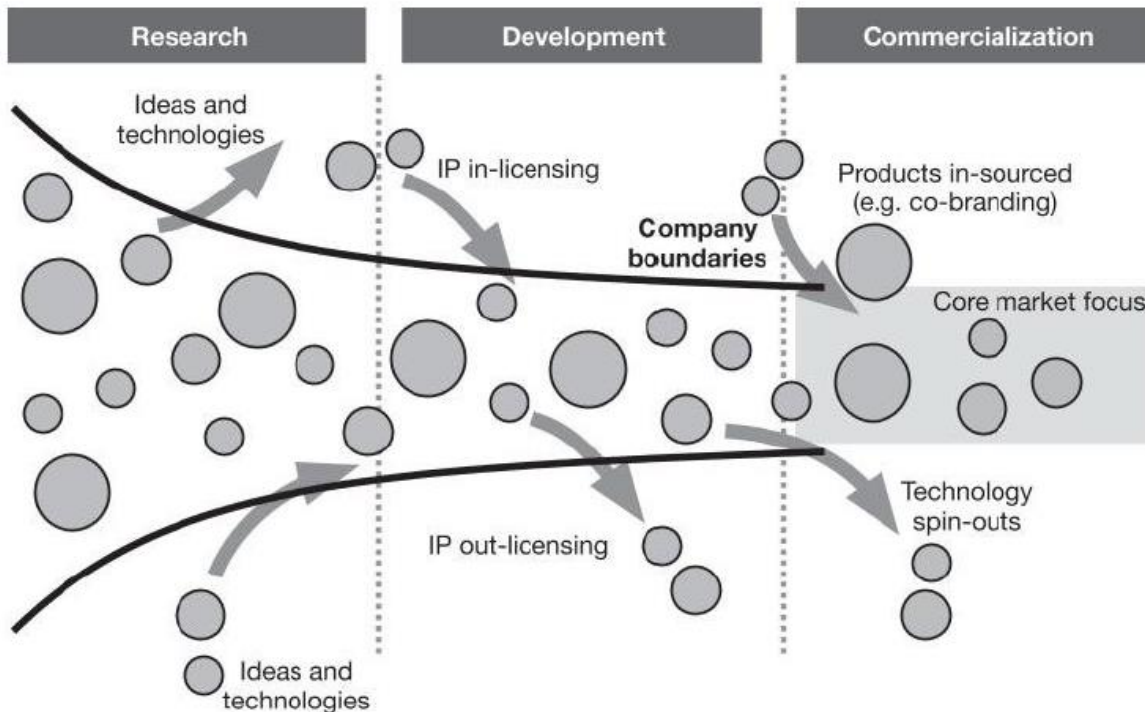
Once R&D projects are identified and feasible projects selected, their management is similar to other project management activities (Scott, 2000). However, the generation of R&D projects has characteristics different from other types of project, namely marketing projects. Because of the distinct features of R&D, this section focuses on three main processes within the R&D context:

- 1 R&D portfolio management.
- 2 New product/service development.
- 3 New process development.

The expectation from an R&D manager is to develop a set of R&D projects that will form a **portfolio**. In the finance domain, the goal of portfolio management is to decide what assets to include in the portfolio, given the goals of the portfolio owner and changing economic conditions. Selection involves deciding which assets to purchase, how many to purchase, when to purchase them and which assets to divest.

R&D needs to be carried out under a complex set of conditions

- Uncertain and changing information about technologies.
- The existence of dynamic opportunities, multiple goals and the strategic considerations of firms' managers.
- High interdependence among projects.
- Multiple decision makers from different management units.



The model of open innovation

Taguchi's methods of parameter design (for the product and process domains) and tolerance design (for the product domain).

- Design for assembly.
- Design for manufacturing.
- Design for serviceability.
- Design for testability.
- Design for environment.
- System engineering.
- Value analysis and value engineering.

External technology acquisition

An enterprise can either develop its technological products, processes or services internally or acquire them externally. Technology acquisition might range from buying skills and know-how to embedded technologies in components and products. It includes the use of external sources not only for well-defined technology needs but also emerging technology external technology acquisition consists of 'buy' and 'collaborate' options.

In general, companies might prefer to acquire technologies because of limited internal resources, time pressure, lack of complementary assets, diversification, influence over standards or to protect internal technologies and avoid development risks (Johnes et al.,

Sourcing technology externally demands relationships with other organizations and managers need to choose among different forms of inter-firm collaborations/**alliances**.

A basic categorization of alliance options includes

- Purchasing.
- Subcontracting/outsourcing/contracted-out R&D.
- **Licensing.**
- Alliances.
- M&A.

Purchasing/arm's-length transactions

Purchasing has clear-cut processes and the degree of collaboration is the least among the five collaboration options. After the company searches for what is available in the market, it decides whether or not to buy a technology and then negotiates on price with the supplier/vendor.

Contracted-out R&D

Contracting R&D is where a company uses the services of a contract research organization or some other party to develop a new process or product. In some cases, companies contract out R&D to individual consultants/experts/researchers in order to tap into distinct competencies that the company lacks. Contracting is suitable for those situations where the company has a low standing in the technological area.

Licensing

Licensing refers to the conventional situation where a company holds a licence for the use of a product design, a process or a marketing package or some combination of all three, on a franchise basis. The licensee company looks at what is available, deciding whether or not to buy and then negotiates on price.

Alliances

Several types of alliance are possible, ranging from ad-hoc partnerships formed to solve specific problems, through to complex alliances and joint ventures, to complete acquisitions. Ad-hoc alliances are flexible and are normally used to develop a technology that is critical to two or more businesses. Forming a consortium is another flexible alliance form, where many partners come together for pre-competitive R&D with no equity relationship involved. More complex alliance forms may be used to help two or more businesses operating in different sectors to pool their resources and generate synergy so that the companies can gain access to a critical technology in which they are weak.

M&A

Acquisition of a company is the most certain way of securing a technology and preventing others from acquiring it, although if the two companies are of roughly equivalent size, a merger may be appropriate. The goal in all M&A activity is to acquire and integrate an external entity into the existing company.

External acquisition processes

The following six phases provide a useful framework for structuring acquisition processes

- 1 Goal setting.
- 2 Finding technology suppliers.
- 3 Choosing acquisition method.
- 4 Contract preparation and negotiation.
- 5 Technology transfer.
- 6 Managing long-term collaboration.

Key Questions

- 1 What differentiates the two types of technology sourcing approaches: internal and external acquisition?
- 2 What are the advantages and disadvantages of these two acquisition approaches?
- 3 What are the R&D capabilities and processes involved in producing new products, services and technologies?
- 4 What are the major types of collaboration/alliance/network used for external technology acquisition?
- 5 What is the process of external acquisition?

Summary

Acquisition is concerned with developing technologies internally or in some form of collaboration or buying from external developers. Examination of industrial R&D activity over the past 50 years highlights two pillars of acquisition. As observed in the 1970s, connecting R&D closely with manufacturing and marketing is the first important pillar of acquisition. Trying to make R&D work with other departments has led to a more team-based innovation process and this effort linked R&D to corporate business strategy. The other key pillar of acquisition is accessing external technology, which has become popular as open innovation in the 2000s. Open innovation, as described in the case of P&G through its Connect + Develop strategy, aims to stimulate radical innovation through different management techniques and organizational patterns where external players become important. This new approach is called 'fourth-generation innovation management', emphasizing dominant design, different management practices and strong chief executive officer (CEO) leadership.

Whatever developments take place in the future, it is clear that internal and external acquisition capabilities are crucial for long-term competitive advantage. If acquisition is done through collaboration, as in virtual organizations, coordination and integration become crucial as a managerial process, since the interests of all parties involved should be aligned. On the other hand, if the technology is bought, the integration of technology becomes harder since the tacit know-how is not found in the organization. Therefore, the integration and reconfiguration of existing organizational skills are vital and they are sustained by the dynamic capabilities of the organization. In other words, with static competencies, it is hard to achieve the integration of a technology bought from a third party with the existing internal technologies. If technology is developed in-house, the requirements differ from the other two options, since know-how is developed by the company itself, which results in a shorter period of integration of the new technology. On the other hand, internal acquisition usually requires installed R&D facilities, efficient methodologies and tacit knowledge obtained through a process of learning through experience.

P&G

P&G has 8,000 researchers, 40% of whom work outside North America. Consequently, P&G pursues a 'Connect + Develop' strategy that involves the use of corporate intranet and 'smart' reporting systems for knowledge sharing, communities of practice, technology entrepreneurs, joint technology development, liberal licensing of IP, government and university capabilities and a connection-making exposition, as shown in Figure 2.3.

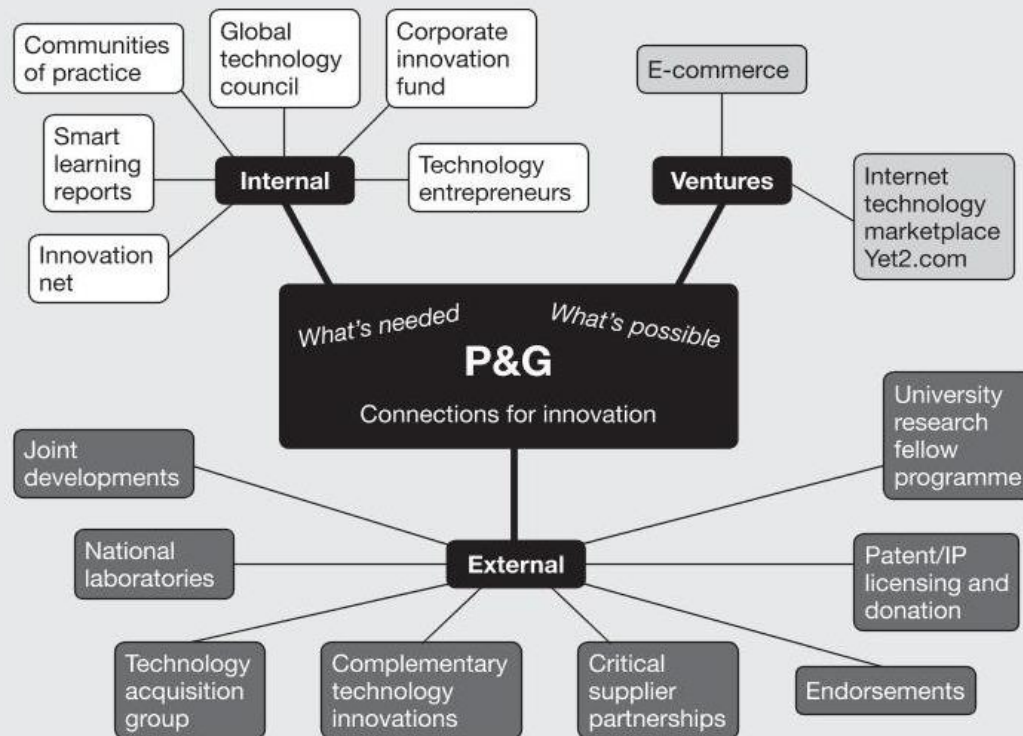


Figure 2.3 Internal and external linkages at P&G

Linking technologies in unexpected ways lies at the heart of breakthrough innovation in P&G products, packages and processes and it significantly reduces product costs, improves quality and speeds product delivery.

Examples of internal resources

P&G's Global Technology Council is made up of business unit technology directors, corporate R&D heads and key geographical R&D leaders to represent all the company competencies. This working forum explores how to leverage P&G technologies and serves as an 'incubator' for exploratory research and early-stage product development. There are 20 chartered communities of practice, sponsored by an R&D vice president appointed by the chief technology officer. Each represents a shared interest across P&G and has the budget and effective leadership to promote cross-fertilization and diffusion of expertise. Some of the larger communities of practice have full-time staff leading them. Their activities include active problem solving via email conferences, knowledge sharing via live seminars and websites, recognition for expert practitioners

and active seeking of internal and external expertise and tools for diffusion throughout the organization.

Examples of external resources

P&G employs a broad range of joint technology developments. Critical supplier partnerships are established so that staff are on site at supplier facilities, working together to develop and commercialize new chemicals, materials and mechanical processes. In effect, suppliers' R&D labs are now an extension of the company's innovating capability.

Complementary technology innovations involve joint developments with companies whose expertise is in strikingly different technical areas. The technology acquisition group actively seeks out new technologies and products. Stepping up the licensing of technologies allows P&G to access complementary technologies that would fill gaps in the IP portfolio. P&G is also actively licensing or donating P&G technologies to increase returns for the IP portfolios. P&G is a technology-rich company: 27,000 patents, 4,000 unique titles and 3,000 new patents each year. Even with a large \$1.8bn annual investment in R&D, P&G uses less than 10% of its own technologies in company products and there is a lot of value to be had in the remaining 90%.

Resources/tools

P&G has a powerful internal website called 'InnovationNet', with a target audience of 18,000 innovators across R&D, engineering, market research, purchasing and patent divisions. It hosts 600 websites for global project teams and individual problem-solving and connection-making websites for 20 communities of practice. This adds up to nearly nine million documents online and growing daily. InnovationNet has automation and artificial intelligence that tracks users' interests, suggests reading material and identifies other users with similar interests.

As a means for stimulating technology awareness and innovation, P&G organized a deal-making/technology trading expo in 2000. This three-day event showcased over 100 of P&G's most promising, cutting-edge technologies with a global audience consisting of R&D, engineering, marketing and general management. Over 5,000 P&G researchers attended the expo. P&G used the latest in webcasting and satellite technology to create an internal innovation news network, complete with news anchors, reporters and even commercials. P&G invited external suppliers to showcase their technologies at the trading expo as well, with more than 600 representatives from 50 exhibitors of non-P&G technologies. Participants included developmental suppliers, university collaborators, federal laboratories and research institutes from around the world. As a result of the expo, over 2,200 ideas for new products and important new uses of P&G and external technologies were generated and entered into the Innovation 2000 database.