

Innovation as a management process

The fact is coming up with an idea is the least important part of creating something great. The execution and delivery are what's key.

(Sergey Brin, Co-founder of Google, quoted in *The Guardian* (2009))

The statement by Sergey Brin, co-founder of Google, confirms that we need to view innovation as a management process. The preceding sections have revealed that innovation is not a singular event, but a series of activities that are linked in some way to the others. This may be described as a process and involves:

- 1 a response to either a need or an opportunity that is context dependent;
- 2 a creative effort that, if successful, results in the introduction of novelty;
- 3 the need for further changes.

Usually, in trying to capture this complex process, the simplification has led to misunderstandings. The simple linear model of innovation can be applied to only a few innovations and is more applicable to certain industries than others. The pharmaceutical industry characterises much of the technology-push model. Other industries, like the food industry, are better represented by the market-pull model. For most industries and organisations, innovations are the result of a mixture of the two. Managers working within these organisations have the difficult task of trying to manage this complex process.

A framework for the management of innovation

Industrial innovation and new product development have evolved considerably from their early beginnings outlined above. We have seen that innovation is extremely complex and involves the effective management of a variety of different activities. It is precisely how the process is managed that needs to be examined. Over the past 50 years, there have been numerous studies of innovation attempting to understand not only the ingredients necessary for it to occur but also what levels of ingredients are required and in what order. Furthermore, a study by the Boston Consulting Group reported in *Business Week* (2006) of over 1,000 senior managers revealed further explanations as to what makes some firms more innovative than others. The key findings from this survey are captured in Table 1.7. While these headline-grabbing bullet points are interesting, they do not show us what firms have to do to become excellent in design (BMW) or to improve cooperation with suppliers (Toyota). Table 1.8 captures some of the key studies that have influenced our understanding.

Table 1.7 Explanations for innovative capability

Innovative firm	Explanation for innovative capability
Apple	Innovative chief executive
Google	Scientific freedom for employees
Samsung	Speed of product development
Procter & Gamble	Utilisation of external sources of technology
IBM	Share patents with collaborators
BMW	Design
Starbucks	In-depth understanding of customers and their cultures
Toyota	Close cooperation with suppliers

Table 1.8 Studies of innovation management

	Study	Date	Focus
1	Carter and Williams	1957	Industry and technical progress
2	Project Hindsight – TRACES (Isenson)	1968	Historical reviews of US government-funded defence industry
3	Wealth from knowledge (Langrish et al.)	1972	Queen's Awards for technical innovation
4	Project SAPPHO (Rothwell et al.)	1974	Success and failure factors in chemical industry
5	Minnesota Studies (Van de Ven)	1989	14 case studies of innovations
6	Rothwell	1992	25-year review of studies
7	Sources of innovation (Wheelwright and Clark)	1992	Different levels of user involvement
8	MIT studies (Utterback)	1994	5 major industry-level cases
9	Project NEWPROD (Cooper)	1994	Longitudinal survey of success and failure in new products
10	Radical innovation (Leifer et al.)	2000	Review of mature businesses
11	TU Delft study (van der Panne et al.)	2003	Literature review of success and failure factors

This chapter so far has helped to illustrate the complex nature of innovation management and also identified some of the limitations of the various models and schools of thought. Specifically, these are:

- Variations on linear thinking continue to dominate models of innovation. Actually, most innovation models show innovation paths, representing a stage-gate type of activity, controlling the progress from idea to market introduction, rather than giving insight into the dynamics of actual innovation processes.
- Science is viewed primarily as technology orientated (physical sciences) and R&D is closely linked to manufacturing, causing insufficient attention to be paid to the behavioural sciences. As a consequence, service innovation is hardly addressed.
- The complex interactions between new technological capabilities and emerging societal needs are a vital part of the innovation process, but they are underexposed in current models.

- The role of the entrepreneur (individual or team) is not captured.
- Current innovation models are not embedded within the strategic thinking of the firm; they remain isolated entities.

Innovation needs to be viewed as a management process. We need to recognise that change is at the heart of it. And that change is caused by decisions that people make. The framework in Figure 1.9 attempts to capture the iterative nature of the network processes in innovation and represents this in the form of an endless innovation circle with interconnected cycles. This circular concept helps to show how the firm gathers information over time, how it uses technical *and* societal knowledge, and how it develops an attractive proposition. This is achieved through developing linkages and partnerships with those having the necessary capabilities ('open innovation'). In addition, the entrepreneur is positioned at the centre.

The framework in Figure 1.9 is referred to as the 'cyclic innovation model' (CIM) (Berkhout et al., 2010); a cross-disciplinary view of change processes (and their interactions) as they take place in an open innovation arena. Behavioural sciences and engineering as well as natural sciences and markets are brought together in a coherent system of processes with four principal nodes that function as roundabouts. The combination of the involved changes leads to a wealth of business opportunities. Here, entrepreneurship plays a central role by making use of those opportunities. The message is that without the drive of entrepreneurs there is no innovation, and without innovation there is no new business. Figure 1.9 shows that the combination of change and entrepreneurship is the basis of new business.

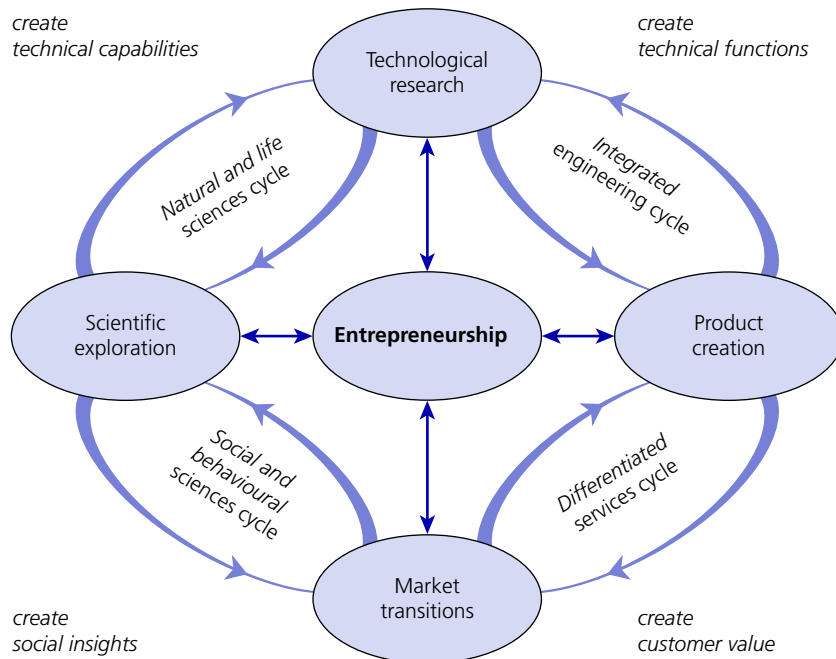


Figure 1.9 The cyclic model of innovation with interconnected cycles

Source: Berkhout et al. (2010).

Adopting this approach to the management of innovation should help firms as processes should not be forced into simple one-way pipelines, but rather be organised by interconnected cycles with feedforward and feedback connections: from linear to non-linear thinking. In that way, a dynamic network environment is created in which the social and behavioural sciences are linked to engineering, and where the natural and life sciences connect with market goals (Berkhout, 2000). This is what is captured in the proposed innovation framework. Supported by today's powerful communication technology, serial process management along a linear path is replaced by parallel networking along a largely self-organising circle. Vital decisions in innovation do not occur in the gates of a staged project management pipeline, but do occur on the innovation shop floor itself; or in the nodes of the cyclic networks. In my experience, young people like to work in such an environment. Moreover, according to Salkowitz (2010), young entrepreneurs around the world are blending new technologies and next-generation thinking, building radically new kinds of organisations adapted to a flat and crowded world (see Illustration 1.6).

The cyclic innovation model is the result of a combination of analysis of theory and practical evidence, based on many years of experience within industries that work with scientists to develop valuable new products and services. Furthermore, evidence has been gathered from Delphi, a science-industry consortium that consists of a large number of international companies within the field of geo-energy (Berkhout et al., 2010).

The most important feature of Figure 1.9 is that the model architecture is not a chain but a *circle*: innovations build on innovations. Ideas create new concepts, successes create new challenges and failures create new insights. Note that new ideas may start anywhere in the circle, causing a wave that propagates clockwise and anti-clockwise through the circle. In an innovative society, businesses are transparent and the speed of propagation along the circle is high, resulting in minimum travel time along the innovation path. Today, time is a crucial factor in innovation. Indeed, when it comes to managing the process within the firm, the stage-gate approach dominates practice. This is because the project management advantages tend to outweigh the limitations it poses to the innovation process. This can be illustrated within Figure 1.9; here the central position in the innovation circle is frequently occupied by a manager, who adopts a stage-gate approach and culture, rather than an entrepreneur; having an entrepreneur in the centre enhances the innovation process.