INTRODUCTION

Joe Tidd

*Science Policy Research Unit (SPRU)
University of Sussex, U.K.*

There are two traditional narrow views of the role of intellectual property (IP) within the field of innovation management: in innovation management research, as an indicator or proxy for innovation inputs or outputs, e.g. patents or licensing income; or in innovation management practice, as a means of protecting knowledge. In this book, we argue that whilst both of these perspectives are useful, neither capture the full potential contribution of intellectual property in innovation management research and practice. The management of IP has become a central challenge in current strategies of Open Innovation and Business Model Innovation, but there is relatively little empirical work available (Tidd and Besant, 2017).

The generation, acquisition, sharing, and exploitation of knowledge are central to successful innovation. However, there is a wide range of different types of knowledge, and each plays a different role. Tacit knowledge is critical, but is difficult to capture, and draws upon individual expertise and experience. Therefore, where possible, tacit knowledge needs to be made more explicit and codified to allow it to be more readily shared and applied to different contexts. One of the key challenges is to identify and exchange knowledge across different groups and organizations. There are several mechanisms to enable this sharing and exchange, many social in nature, but supported by technology. In specific cases, codified knowledge can form the basis of IP, and these can promote or inhibit the diffusion and commercialization of such knowledge. However, care needs to be taken when using IP, as this can divert scarce management and financial resources, and can expose organizations to imitation and illegal use of IP. The current smartphone industry is a good example of such an innovation impasse.

Simplistic arguments in favour of stronger intellectual property rights, such as patents and copyright, fail to understand the evidence of their limited

effectiveness, both in terms of encouraging innovation, and in creating and capturing value from innovation. For example, whilst the number of patents granted to firms has more than doubled in a decade, the cases of legal enforcement of IP more than tripled, resulting in legal expenditures equivalent to a quarter of the R&D of the firms involved, but without any associated step-change in the levels of innovation or profitability. Conversely, proponents of open or freely-available knowledge fail to consider the need to balance the incentives, costs, risks and rewards for the generation of intellectual property.

In summary, theoretical arguments and empirical research suggest that from both an innovation policy and management perspective, the challenge is to use IP to encourage risk-taking and innovation, and that a broader repertoire of strategies is necessary to create and capture the economic and social benefits of innovation.

This book is organized around three related themes: public policies for IP; firm strategies for IP; and creating value from IP.

Public Policies for IP

Under perfect market conditions there would be little incentive for individual entrepreneurs or firms to innovate, as ease of imitation would make it difficult to achieve returns from the risky investment in innovation. Subsequently, the policy focus has been on what conditions are optimal to encourage risk-taking and innovation, but prevent monopoly positions emerging. For example, the notion of an appropriability regime, that is the conditions that influence the ability of a firm to capture value from innovation, such as the strength of formal intellectual property rights and enforcement, secrecy, ease of imitation and lead times; complementary assets, such as brand, position, distribution, support and services.

The creation and sharing of knowledge is a core role of a university, but managing intellectual property and technology-transfer presents a different mission and challenge. The role of universities in the commercialization of technology has increased significantly, due to changes in government funding and intellectual property law. However, as a result, the scientific and commercial quality of patents has fallen, and the distribution of activity has a very long tail. Measured in terms of the number of patents held or exploited, or by income from patent and software licenses, commercialization of technology is highly concentrated in a small number of elite universities, the top 20 U.S. universities accounting for 70% of the patent activity, and at the university level a very small number of key patents account for most of the licensing income, the five most

successful patents typically account for 90% of total income. This suggests that a (rare) combination of research excellence and critical mass is required to succeed in the commercialization of technology.

Most universities with significant commercial research contracts understand how to license, and the roles of all parties — the academics, the university and the commercial organization — are relatively clear. Typically, the academic will normally continue with the research whilst possibly having a consultancy arrangement with the commercial company. However, forming an independent company is a different matter. Here both the university and the scientist must agree that spin-out is the most viable option for technology commercialization and must negotiate a spin-out deal. This may include questions of, for example, equity split, royalties, academic and university investment in the new venture, academic secondment, identification and transfer of intellectual property and use of university resources in the start-up phase. In short, it is complicated. As such, universities and ‘academic entrepreneurs’ face the dilemma of trying to manage the interface between academe and industry.

This clearly demonstrates two of the central challenges associated with intellectual property. First, IP may provide some legal rights, but such rights are useless unless they can be effectively enforced and exploited, and once in the public domain, imitation or illegal use is very likely. For these reasons, secrecy is often a more effective alternative to seeking IP. Second, IP can be highly effective in some circumstances, and as we will argue later, can be used in less obvious ways to help to identify and source innovations, and to assess potential partners and competitors. However, this usually demands the application of complementary assets, such as brand, position, distribution, support and services (Denicolai *et al.* 2016).

Firm Strategies for IP

The resource-based view and dynamic capabilities approaches to strategy emphasize the central role in strategic management in adapting, integrating and re-configuring internal and external resources and capabilities within a changing environment. To be strategic, a capability must be honed to a user need (so that there are customers), unique (so that the products/services can be priced without too much regard for the competition), and difficult to replicate (so that profits will not be competed away). As a consequence, there can be no ‘best’ IP strategy, as it depends on the strategy of the organization, complementary capabilities and

assets, and the nature of the technology and markets (Tidd, 2012). However, the successful exploitation of IP incurs both costs and risks:

- Cost of search, registration and renewal.
- Need to register in various national markets.
- Full and public disclosure of your idea.
- Need to be able to enforce.

However, the management of IP, for example through licensing, can have numerous potential benefits for a firm:

- reduce or eliminate production and distribution costs and risks
- reach a larger market
- exploit in other applications
- establish standards
- gain access to complementary technology
- block competing developments
- convert competitor into defender

Creating Value from IP

There are many empirical reasons to believe that IP plays a significant, but only partial and highly-selective role in the creation and capture of value from innovation. The propensity to use, and more importantly to enforce, IP varies by sector significantly. In some industries (and countries) the IP regime is strong, such as pharmaceuticals, in others much weaker, such as information and communications technologies (ICTs). However, these differences in the strength of IP are not reflected in the rates of innovation or profitability across these sectors. In each case, other aspects, such as sales and distribution, service and support, are much more important explanatory factors. Secondly, the high variation in innovation and performance within the same sectors and within similar IP regimes indicates that other, firm-level factors are also at work. For example, in services, differences in the external linkages with suppliers, consultants, customers and other partners are associated with differences in innovation and growth.

In fact, an over-reliance on using IP for protection can limit the benefits derived from innovation. Firms need to balance the desire to protect their knowledge with the need to share aspects of this knowledge to promote innovation. This is particularly necessary for systemic innovations, which may demand externalities and complementary products and services to be successful, or

where potential network externalities exist. Network externalities arise when increases in the number of users results in reduced costs but greater benefits, like many Internet products and services. A degree of IPR is associated with network externalities. In such cases IP may indicate that there is knowledge in a codified form, which makes it easier to transfer or share within a network, and the security offered by the IPR can encourage collaboration and licensing. By influencing the shape or architecture of an emerging innovation in this way, a firm can capture a small proportion of a potentially very large pie, rather than focusing on the protection of a much smaller pie. Where imitation is likely, investment in complementary assets can result in higher returns in the longer term (Denicolai *et al.*, 2014).

References

- Denicolai S., M. Ramirez and J. Tidd (2014). Creating and capturing value from external knowledge: The moderating role of knowledge-intensity. *R&D Management*, 44(3), 248–264.
- Denicolai S., M. Ramirez and J. Tidd (2016). Overcoming the false dichotomy between internal R&D and external knowledge acquisition: Absorptive capacity dynamics over time. *Technological Forecasting and Social Change*, 104, 57–65.
- Tidd J. (2012). *From Knowledge Management to Strategic Competence*. Third edition, Imperial College Press.
- Tidd J. and J. Bessant (2017). *Managing Innovation: Integrating Technological, Market and Organizational Change*. Sixth edition, Wiley.