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Surfing the New Wave of Open Innovation Research

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The concept of open innovation has become increasingly popular in the management literature on technology and innovation. Open innovation is a decade old and alive and kicking. Chesbrough and Brunswicker (2013) recently conducted the first large sample survey of the adoption of open innovation by large firms (sales in excess of USD 250 million). None of the respondents report abandoning their practice of open innovation and 82% report that open innovation is practiced more intensively today than three years earlier. These survey results suggest that open innovation is a practice that will continue for years, and is widely viewed as important for improving performance.

Despite the popularity of open innovation, many firms still struggle to properly manage open innovation. While open innovation poses many new challenges to firms when adopted, it is the internal organizational challenges that are perceived as most difficult to manage. Managing the journey from closed to open innovation implies several organizational changes at various levels of the firm. Making these changes happen is difficult according to the respondents. Similarly, respondents to the survey were not satisfied with their metrics for measuring open innovation.

The growing penetration of open innovation in companies is reflected in the astonishing growth of the number of open innovation related publications (see Chapter 1 for a detailed overview). However, despite the large volume of publications about open innovation, there are still many important research topics that have not been fully addressed. Open innovation has been mainly studied at the firm level, while other levels of analysis that could enrich our understanding have not been touched upon. Despite the mushrooming volume of empirical work, many hypotheses still have to be tested properly through empirical studies based on fine-grained data and more advanced empirical work. Prescriptions being proposed are often fairly general and not specific to particular contexts and contingencies.

The current state of open innovation in practice and research calls for extended research in the next decade. This was one of the major drivers for publishing this volume: each of the 14 preceding chapters is a contribution in a research area that has been understudied and deserves more attention from the research community in the next decade. One of the objectives of this volume is to shift from a debate between proponents and opponents about the benefits of open innovation towards an analysis that identifies the mediators and moderators of such benefits. Research has shown that patterns of innovation differ fundamentally by sector, firm, and strategy and thus we would expect that the mechanisms and outcomes of open innovation models would also be sensitive to the context in which they are analyzed. Instead of providing general prescriptions, the different chapters offer conceptual and empirical insights into the precise mechanisms underlying the successful implementation of open innovation research and management practice.

In the remainder of this chapter, we offer specific suggestions for the research community about how open innovation research could and should evolve in the next decade. Some are a direct consequence of ideas developed in previous chapters. Here, we integrate these ideas and crosslink them to each other. We also highlight topics that, while not covered in this book, we believe deserve more attention in future research.

The chapter is structured as follows: firstly, we discuss the need to connect (and integrate) open innovation research into mainstream management theories. Secondly, we look for possible extensions of open innovation research into new application fields, such as SMEs, low-tech firms, and non-profit organizations. Open innovation also has several implications for public policy and multinational companies. Thirdly, we elaborate on the need to examine open innovation at different levels of analysis. Fourthly, we identify the need to develop frameworks to understand how companies must change internally to successfully apply open innovation. Fifthly, we highlight how open innovation has implications for functions beyond R&D that have not traditionally been involved in implementing open innovation: such as HRM, PR, and legal. Finally, we reflect on the ongoing transformation of open innovation research and practice, and the implications for how to benefit from open innovation.

15.1 LINKING OPEN INNOVATION TO OTHER RESEARCH

The open innovation literature originated with reflections on observations about changing innovation management practices in companies (Chesbrough, 2003a, 2006a). Literature about open innovation has grown rapidly, and there is a growing need to relate or integrate it into existing innovation management research.

Firstly, we need to integrate open innovation into the broader stream of innovation literature focusing on collaboration with external partners. Such external collaboration is increasingly important to firms, and other researchers (before and since Chesbrough) have examined such collaboration from perspectives other than open innovation. Such a proliferation of perspectives and terminology has the potential to create ambiguity and confusion, while contrasting and integrating open innovation with other research should improve the precision and predictive value of both streams of research.

In our earlier book (*Open Innovation: Researching a New Paradigm*), West and Gallagher (2006b) examined the distinction between open innovation and open source. In this volume, Piller and West (Chapter 2) unravel the distinction between open innovation and user innovation, while Chesbrough and Bogers (Chapter 1) consider more broadly how open innovation relates to other forms of openness. Others have sought to integrate open innovation with prior research, as Perkmann and Walsh (2007) did for university-industry collaboration. We welcome further research on distinguishing and combining open innovation with other research on external collaboration, including user innovation, co-creation, cooperative R&D, technology sourcing, and related topics.

Another way to extend open innovation research is illustrated by Vanhaverbeke and Chesbrough (Chapter 3), who explain the differences in firm strategies by classifying them into two dimensions: open vs. closed innovation and open vs. closed business models. In the case where open innovation is combined with open business models, new strategies can be developed in which the focal company is not involved in new product development but builds an ecosystem where others are delivering technical solutions (eventually in an open innovation style) to develop the business model of the focal firm. This expanded view on open innovation offers an interesting inroad to link open innovation to innovation ecosystem thinking (Nambisan & Sawhney, 2011). One suggestion for a further expansion of the logic of open innovation is to consider new product development as a particular case of a strategic driver. Using the innovation capabilities of others to leverage the strategic drivers of its business can open opportunities even for companies selling commodities.

Open innovation between organizations fosters the emergence and growth of innovation ecosystems. The open innovation literature has been focusing mainly on bilateral relations with innovation partners viewed from a single company's (and usually technology taker's) point of view. However, more and more companies use platforms and multi-partner networks as the basis of their business model. Consequently, the open innovation literature should shift its attention beyond the one-on-one relations between innovation partners to more complex settings of partnerships to create new open business models. For example, after explicating the differences between networks,

ecosystems, and platforms, West (Chapter 4 in this volume) examines the challenges that a startup company faces in managing and funding an open innovation platform strategy.

Finally, Vanhaverbeke and Cloudt (Chapter 14) dig into the underlying assumptions of open innovation and try to clarify the phenomenon of open innovation, through use of existing management theories and theories of the firm. Although the goal is to obtain a better theoretical understanding of open innovation, the results of this chapter suggest broader applications. It is a relative straightforward exercise to investigate which theoretical assumptions are consistent or not with open innovation. The authors also suggest that open innovation challenges existing theories to rethink some of their theoretical assumptions. We invite scholars to take up this challenge, and provide a solid theoretical underpinning to open innovation that will lead to more substantive insights and conclusions. Such research will also help open innovation play a more central role in innovation studies.

15.2 EXTENDING OPEN INNOVATION TO NEW APPLICATION AREAS

Open innovation was originally conceived as a paradigm shift for large manufacturing companies. These companies were also among the first to deliberately adopt open innovation as part of their innovation strategy. Beyond companies such as IBM and Intel that were profiled in Chesbrough's (2003a) seminal book, there are numerous examples of large firms that have adopted open innovation as a direct consequence of the publication of that book. P&G, General Mills, Philips, Siemens, Lego, Natura, and DSM are good examples of companies that have embraced open innovation and systematically improved open innovation management over time.

Chesbrough himself expanded the scope of open innovation during the last decade. Firstly, he extended the focus from innovation to business models, arguing that companies could create and capture more value through open business models (Chesbrough, 2006a). Later, he introduced open innovation into services, showing how companies in a wide range of service industries can benefit from applying open innovation practices (Chesbrough, 2011). It is beyond doubt that major changes in sectors such as banking, insurance, publishing, retailing, logistics, and telecommunications will be seen as service companies start to adopt game-changing open innovation and open business models.

Most chapters in this volume provide ammunition to further broaden the scope of open innovation research. As it is impossible to mention all the possible extensions, we describe here just a few of the more interesting examples.

Open innovation in SMEs: an initially neglected research area was how open innovation and open business models can be applied in small and medium-sized enterprises (SMEs). Only later did researchers investigate the relevance and specific nature of open innovation in SMEs (see van de Vrande et al., 2009; Lee et al., 2010; Wynarczyk et al., 2013; Spithoven et al., 2013) and there is still much that we do not know about open innovation in SMEs.

In Chapter 7 of this volume, Van de Vrande and Brunswicker set the stage for future research on open innovation in SMEs. They discuss the specific nature of this context and map the field of existing research. Against this background, they propose a future research agenda and discuss four key areas of open innovation research in SMEs that have not yet received sufficient attention from researchers: IT-enabled crowdsourcing in SMEs for involving a large number of “outsiders”; the importance of different kinds of networks (personal, R&D, and value networks) when SMEs engage in open innovation; the interplay of IP management and open innovation in SMEs; and the internal dimensions of managing open innovation in SMEs.

The limited research thus far suggests that SMEs can successfully embrace open innovation and that openness contributes substantially to their innovative and financial performance. Yet, it also indicates that open innovation management in SMEs substantially differs from open innovation management in large (manufacturing) companies. We strongly encourage scholars to develop a conceptual understanding of why open innovation in SMEs differs materially from open innovation in large firms, and thus why adopting the open innovation practices of large firms is not appropriate for SMEs. Based on in depth interviews at ten SMEs that embrace open innovation, Vanhaverbeke (2012) concludes that open innovation management in (traditional) SMEs is so different from open innovation in large companies that lessons learned from good practices in large firms cannot be transferred to SMEs.

Here are some possible research topics for how open innovation might be re-conceptualized when applied to SMEs. Firstly, open innovation is inextricably linked with the strategy or business model of the firm, and so its role can only be understood within a broad strategic setting. Thus an analysis of the business model innovation would logically come first, and the usefulness of open innovation hinges on the role it plays in achieving broader strategic goals. A second research topic that should be explored in greater detail is the link between open innovation in SMEs and the role of the founder or manager of the firm. In SMEs the entrepreneur plays a crucial role in shaping the entire innovation process. He perceives and explores new business opportunities, and his personal commitment and conviction help determine the success and development of the innovation network. This suggests an opportunity to link open innovation to the entrepreneurship literature, particularly that on the attitudes and behaviors of founders. Thirdly, one approach for SMEs to utilize

open innovation might be to apply the principles of discovery driven growth theory to maximize opportunities and minimize risks (McGrath & MacMillan, 2009). Finally, we need to integrate different disciplines such as innovation management, entrepreneurship, and strategy, bridging these independent perspectives to understand the complexity of open innovation in SMEs.

Open innovation in high-tech and low-tech industries: open innovation has been mainly associated with high-tech contexts where companies develop new business opportunities based upon technology sourced from other organizations. This is not surprising because such technological breakthroughs are an important form of innovation. However, new technologies are not the only way in which firms can develop new offerings and generate competitive advantage. Product design, new market insights, customer intimacy, and business model innovation are a few examples of how firms may realize the benefits of open innovation from non-technological factors, and we suspect these drivers will be particularly important in low-tech environments.

Although not an explicit focus of this volume, we would like to see more research on open innovation in low-tech industries and on open innovation beyond technological innovation.¹ Consumer product companies such as Procter & Gamble and Matsushita were early adopters of inbound open innovation (Dodgson, Gann & Salter, 2006; Christensen, 2006), and many of the SMEs (in the studies mentioned earlier) were in low-tech industries. However, only a few papers have explicitly focused on open innovation in low-tech settings (Chesbrough & Crowther, 2006; Spithoven, Clarysse & Knockaert, 2010; Vanhaverbeke, 2012) and there is a need to systematically analyze how open innovation functions in such settings.

The open innovation practices that are effective in high-tech settings may not work in low-tech industries: with little or no internal R&D capabilities, firms in low-tech industries might not work on technological innovations themselves (including firms with poorly developed internal R&D capabilities), but they can still thrive using innovations developed by firms in other (high-tech) industries. Laursen and Salter (2006) found that low-tech firms in industries such as paper and printing had a relatively narrow search for external innovations; instead, firms in these industries tend to rely on suppliers (of capital equipment or key inputs) to provide innovation (Dosi, 1988). The strategic logic behind successful applications of open innovation in low-tech industries should be analyzed in detail and compared to open innovation practices in companies in high-tech industries. Such insights would lead to a more nuanced and predictive theory of open innovation, if the comparison leads to the conclusion that open innovation practices in low-tech industries are significantly different from those in high-tech industries.

Open innovation and not-for-profit organizations: Open innovation has largely been studied in the private sector of the economy. In recent years, the not-for-profit sector has increasingly realized that open innovation can

generate considerable potential benefits for organizations such as charities, NGOs, or government agencies. Chesbrough and Di Minin (Chapter 9 of this volume) examined case studies of three such organizations that successfully applied open innovation at the core of their strategy. They conclude that open innovation is also relevant for social entrepreneurs, non-profits, and public agencies, to support their efforts to grow their operations and establish partnerships to achieve social change. Chesbrough and Di Minin explain how the principles of open innovation can be applied in this context through a process they term Open Social Innovation.

Other examples exist of NGOs and other non-profit organizations being centrally involved in open innovation initiatives. For example, the World Wildlife Fund (WWF) established an incubator where individuals or groups outside WWF can pitch ideas that would be financed and guided by WWF. It is also interesting to follow the increasing number of collaborations between multinational corporations and NGOs using this process to develop completely new innovation ecosystems. In May 2007, Unilever became the first company to commit to sourcing all its tea in a sustainable manner. Working with the Rainforest Alliance, an international environmental NGO, Lipton and its parent company, Unilever, announced that all Lipton Yellow Label tea bags sold in Western Europe would be certified by 2010. In this case, the Rainforest Alliance certifies Lipton's tea farms in Africa. The collaboration with the NGO should guarantee consumers that the tea they are drinking contributes to incomes and livelihoods of nearly one million Africans and to the protection of the environment. The alliance provides Unilever a unique way to differentiate the Lipton brand from those of its competitors.

Yet, not only social entrepreneurs and NGOs can profit from innovations. There is a diversity of non-profit organizations that can be analyzed through the open innovation lens: universities, research labs, libraries, trusts, museums, and even regulatory agencies. Each faces considerable strategic challenges for growth and renewal, and—as with companies—open innovation may provide a way forward. As with companies, non-profit organizations are increasingly recognizing the crucial role of partnerships in implementing a successful strategy. Therefore, we strongly encourage scholars to further explore the potential of open innovation applications in the non-profit sector.

Open innovation and public policy. Open innovation has major implications for public policy. However, we did not address this topic in this volume, and thus far, only a few publications have focused on this area. In a study about the policy implications of open innovation in the European Union, Chesbrough and Vanhaverbeke (2012) argue that public policy should follow the evolution of the private sector towards open innovation strategies. This report offers a set of broad guidelines on how, by starting from an understanding of open innovation, public policy can facilitate open innovation in the European Union and create more economic growth and jobs. Their recommendations range from

action points in education and human capital development, over ideas about how to finance open innovation, to a new approach to intellectual property in government funded organizations. Other policy recommendations would facilitate open innovation by supporting startups and SMEs, which bring new ideas to market and stimulate competition by established firms. Finally, the report calls on governments to expand open government.

In sum, supporting open innovation policy means going beyond the traditional innovation policies, with new approaches that cut across different policy areas to advance and support innovation. We believe that many policy measures in developed countries were created for an era of closed innovation and have remained largely unchanged since then. As economies have entered the era of open innovation, innovation policy needs to change accordingly to remain effective. Given the limited attention thus far, we strongly encourage researchers and policymakers to develop policy frameworks that facilitate open innovation.

The geographic reach of open innovation. A recent extension is broadening the geographical dimension of open innovation. In the past, open innovation literature focused on why external knowledge is important, but rarely considered where that knowledge should be sourced. Asakawa, Song and Kim (Chapter 8 of this volume) remark that as open innovation is becoming increasingly global and global R&D is becoming increasingly open, cross-fertilization between open innovation and global R&D management literature streams is a natural direction. Connecting open innovation to R&D globalization as currently practiced by a growing number of MNEs will make open innovation more interesting and relevant for MNEs struggling with the geographical dimension of open innovation. The organization of open innovation becomes more complex because management has to source knowledge in different parts of the world, while organizing and coordinating knowledge flows internally to extract the most out of the insourced or co-created knowledge.

However, how open innovation can be coupled to global R&D management in MNEs is only one of the potential topics when we introduce the geographical dimension in open innovation. Researchers have considered the impact of differences in corporate culture upon open innovation, but not the impact of differences in national culture. Earlier innovation researchers have examined how the latter differences affect firm innovation processes, as when Shane, Venkataraman, and MacMillan (1995) found differences in innovation leadership styles between countries in a study of 30 national cultures. Thus, exploring the link between differences in culture with differences in the incidence and success of open innovation would help identify moderators and limits of open innovation.

One possible approach would be for researchers to analyze the impact of open innovation in Asian economies and compare the results with Western economies. Most cultures in the Far East are considered to favor relational

links rather than the transactional approach used in most Western economies. How do different cultures change the approach to building collaborations with outsiders? How do they impact the speed of building and dissolving relations? Are relationships in Asian economies more stable? What does this imply for the concept of trust in Asian economies? Thus far, there is preliminary evidence that open innovation works differently in northern and southern Europe, while there may also be a link between the penetration of venture capitalists in a country and the perception of open innovation.

Finally, we should also analyze the role of local clusters in determining the effectiveness of open innovation. The literature on open innovation highlights the relevance of networks of interrelated firms as a key determinant of the ability to successfully innovate (Chesbrough, 2003b; van de Vrande et al., 2010). Regional clusters can be defined as “geographical concentrations of interconnected companies and institutions in a particular field” (Porter, 1998, p.78). In our earlier book, Simard and West (2006) concluded that the benefits of open innovation may be better realized in regional clusters, which provide an improved environment for information exchange, and because collaboration among firms (and research organizations) in a cluster is a major factor in the success of such clusters. They noted the potential linkage between the relational theories of social network analysis, and the collaborative processes that lie at the heart of open innovation. While Lee et al. (2010) used such measures in their study of open innovation among Korean SMEs, we are unaware of this approach being used in studies of regional clusters. We welcome further research linking the open innovation literature to the regional cluster theory. Of particular interest is the evolving knowledge-based cluster theory, as it highlights the role of interactive learning processes and the development of relational capital as a primary source of positive cluster effects (Bahlmann & Huysman, 2008; Bathelt, 2008; Cooke, 2007; Staber, 2007; Mesquita, 2007).

15.3 ANALYZING OPEN INNOVATION AT DIFFERENT LEVELS OF ANALYSIS

West, Vanhaverbeke and Chesbrough (2006) identified the need to study the phenomenon of open innovation at different levels of analysis. In our earlier book, we outlined five levels of analysis for future research in open innovation: individuals and teams (groups), organizations, inter-organizational (networks, industry, or sector), and regional and national innovation systems. Extensive research has been done at the organizational level, but the other levels of analysis were and are still heavily underrepresented. The overemphasis of the firm level has some unsavory effects: first, open innovation is studied with

a narrow, managerial perspective that is focused on topics mainly relevant to top management. Second, a firm perspective prevents us from taking an unbiased view on collaboration between different innovation partners. A dyadic or innovation network perspective is required to understand the objective incentives of all the partners involved. Third, an analysis at the organizational level does not provide detailed information on the mechanism driving open innovation within an organization. A lack of understanding of these mechanisms will prevent us from reaching a better understanding of how open innovation should be managed and organized. Finally, the firm-level analysis may reflect the comfort zone of management scholars, pointing to the need to engage a broader range of research perspectives.

Analyzing open innovation at other levels requires inter-disciplinary research which may be harder to conduct and publish. As we discuss below, understanding open innovation management at the levels of individuals requires some understanding of HRM, IP management, team dynamics, or new product development. A good understanding of strategic alliances, the role and legal understanding of contracts, or trust development are likely to be key elements for studying innovation networks in depth. Finally, describing the role of open innovation in regional innovation systems and public policy (as recommended above) requires collaboration with specialists in policy decision-making.

Three chapters in this volume suggest some of the benefits of analyzing open innovation at different levels of analysis. Chapter 4 suggests the difficulties that young innovative firms have in building a sustainable business model when funding and other key resources are provided by ecosystem partners with divergent interests. In Chapter 5, Christensen demonstrates the increasing importance of collaboration between a firm and its environment and the opportunities that firms practicing open innovation have to enact and shape that environment. In a similar vein, there are opportunities to connect open innovation to earlier research on the emergence of technology markets (cf. Arora et al., 2001a, 2001b; Arora & Gambardella, 2010).

In Chapter 6, Vanhaverbeke and his colleagues examine a specific case of sub-firm unit level of analysis, identifying the potential benefits of researching (and managing) open innovation at the level of the R&D project. Open innovation can speed up or (slow down) R&D projects, it can lead to more technology transfers or innovations with a larger financial impact, while firms can utilize openness during part or all of the R&D project. Researchers can also consider the impact of different types of partners in an R&D project, or the contrasting impacts between openness in radical or incremental innovations. Studies of R&D projects would be even more fruitful when utilizing systematic data about the composition of (internal or external) teams and the traits of individuals working in open innovation projects.

15.4 ORGANIZING AND MANAGING OPEN INNOVATION

While the first decade of open innovation research focused on the adoption and notable successes of open innovation, less attention has been given to measuring the net benefits of open innovation. During this same period, many companies adopted open innovation on an ad-hoc basis or in a more systematic way. However, a recent survey found that most companies fail in the internal organization of open innovation (Chesbrough & Brunswicker, 2013). Examining the adoption of open innovation in large firms, the study found that while 78% of those surveyed use open innovation, their level of satisfaction with the metrics they employ to manage open innovation is low. The authors conclude that much more knowledge is needed about how to manage and organize open innovation.

Open innovation does not automatically lead to improved innovation or financial performance. There are many ways in which an open innovation strategy can go wrong. For example, firms utilizing inbound open innovation may be unable to find suitable external innovations, may fail to integrate the technology into their organization or bring it to market, or may find that the costs of external sourcing exceed the benefits (West & Bogers, 2014). Companies need the right internal organization to gain from open innovation. This includes efficiently organizing and managing collaboration with external innovation partners, as well as following through with commercialization and measuring results. If researchers look within companies to study the internal organization and management of open innovation, they may produce results that are relevant for managers, as well as help shift the direction of open innovation research towards new and interesting directions.

Mortara and Minshall (Chapter 12 in this volume) provide a potentially valuable framework for implementing open innovation that suggests how large companies organize to profit from open innovation. They distinguish between characteristics describing high-level, firm-wide tendencies of open innovation configurations on the one hand; and internal characteristics and dynamics of open innovation implementation processes on the other hand. These “macro” and “micro” characteristics of open innovation configurations by firms should be aligned with the requirements of the environment (market, industry, technology) and can be moderated (in a positive or negative way) by corporate culture, politics, internal technological capabilities, and corporate knowledge management tools and procedures. Although this framework is a promising way to structure research about open innovation implementation, we still have a long way to go and therefore invite more researchers to examine this area. We are only aware of limited publications thus far that have considered these topics (e.g., Chiaroni et al., 2010, 2011).

In other chapters of this volume, the authors focus on specific implementation issues. For that purpose, we tapped into the experience and knowledge of practitioners or experts who work closely together with open innovation practicing companies. Topics covered include: 1. How should firms be organized to work effectively with innomediaries? (Chapter 13 in this volume); 2. How should firms organize to work effectively in the inside-out mode of open innovation, specifically in establishing spin-offs? (Chapter 11 in this volume); 3. How to manage IP in the company for optimal use in open innovation? (Chapter 10 in this volume). These topics cover only a small set of the possible research topics about how to organize and manage open innovation in medium-sized and large companies.

Other questions require more investigation. For example, what is the role of top management in supporting open innovation? How should firms set up organizational, management, and communication structures supporting open innovation projects? How should they recruit, select, train, etc. for open innovation? What skills, attitudes, and personalities are needed? (see also Chapter 12 in this volume) How can firms create a corporate culture where open innovation can thrive? How can IP be used strategically to accommodate open innovation? How should the R&D department be changed to facilitate open innovation? How should employees work with an open innovation implementation team? What is the best way to evaluate the success of open innovation? What does it take to move from closed to open innovation? Many companies are struggling with such questions: in-depth investigations of these topics would help companies organize and manage open innovation more successfully.

15.5 CONNECTING OPEN INNOVATION TO FUNCTIONS BEYOND R&D

The focus of open innovation has been on the challenges it creates for the R&D department or new business development units; but the potential impact extends to many other functions within the corporation. For example, human resource management (HRM) has received scant attention in open innovation literature, even though promoting open innovation actually requires specific management practices and an appropriate organizational culture. Efforts to explain (or enable) the success of open innovation may fail without considering a firm's HR practices. For example, such practices often focus on encouraging and reinforcing individual performance and development, forming potential hurdles for an effective implementation of open innovation. Such incentives mean that employees are not encouraged to innovate outside the

bounds of their company or business unit, or are even actively discouraged from doing so.

When we began this book project in early 2012, there was virtually no literature on the relationship between HRM practices and open innovation performance. As we finish this chapter two years later, there are only a handful of publications that have addressed this topic in any depth. Based on a survey of 158 companies in innovative regions of Russia, Podmetina, Volchek, Dabrowka, and Fiegenbaum (2013) find a positive relationship between HR learning and training practices, human capital value and employee motivation on external technology sourcing—and of the first two factors on external cooperation. Van Steerthem, Delcour, and De Stobbeleir (2013) interviewed managers of Belgian organizations successfully practicing open innovation. Their study is a first attempt to develop a systematic approach on the HRM implications of open innovation, considering recruitment and selection, training and development, appraisals and assessment, and the required change in corporate culture.

Although some scholars have been pioneering the implications of open innovation for HRM, it is fair to say that the human aspect of implementing open innovation remains largely overlooked. Success in open innovation depends on the people involved and thus HRM practices and culture that support those people and the process of open innovation. Traditional HR practices that form a roadblock to such efforts must be moved aside for new, innovative approaches to HR. We encourage scholars in innovation management to team with HRM specialists to study the implications of open innovation for HRM and develop HRM practices that facilitate open innovation.

HRM is not the only corporate function that is impacted by (and impacts) a firm's approach to open innovation. Others include the legal department (as considered by Chesbrough and Ghafele in Chapter 10), and public relations (studied by Mortara and Minshall in Chapter 12). Procurement, manufacturing, quality control, support, and IT are among the functions that might also be studied by open innovation scholars.

15.6 THE TRANSFORMATION OF OPEN INNOVATION PRACTICE AND RESEARCH

Open innovation and open innovation research are not only expanding rapidly, but they also are transforming over time. Originally, open innovation was explicitly developed as a management practice for large manufacturing companies. It is now applied in smaller companies, service companies, universities, research labs, and even government agencies. In parallel, the focus

of research has been shifting and evolving, as we note in this chapter (and reviewed in detail in Chapter 1).

Several chapters nicely indicate that the practice of open innovation is still in full development and transforming over time, as indicated by how the topics have changed in the decade since open innovation was launched. Ways of managing open innovation are different, and companies have become mature in managing open innovation (see Enkel, Bell & Hogenkamp, 2011; Chiaroni et al., 2010, 2011). Open innovation practices are gradually professionalizing as illustrated by the examples of intellectual property management in Chapter 10, staged spin-outs in Chapter 11, open innovation implementation mechanisms in Chapter 12, and the professionalization of the use of innomediaries in Chapter 13. These examples show how open innovation practices are becoming more complex and that standard open innovation management will not automatically lead to a competitive advantage. Differences in the processes, structure, and people used to implement open innovation will increasingly predict differences in the ability of firms to realize sustained benefits from open innovation.

Similarly, research in open innovation is changing rapidly. Not only the number of publications is growing exponentially, but also themes are shifting. Open innovation research is no longer only about the advantages (and possible disadvantages) of open innovation. Topics now include how to balance costs and benefits, when open innovation is (or is not) beneficial, how to align and implement open innovation to gain maximum benefit, and how to measure results.

In conclusion, open innovation practices are changing continuously, and therefore open innovation research will follow this evolution. We encourage open innovation researchers to maintain the alignment of their research to open innovation practices, so that managers can benefit from academic research and so that the academic community can continue to offer theoretical and empirical insights relevant to practice.

NOTES

1. Some managers and researchers have sought to expand “open innovation” beyond innovation to any form of external collaboration (Bogers & West, 2012). We do not endorse such expansive views, and consider as an innovation any “idea, practice, or object that is perceived as new” (Rogers, 1995, p.11) that leads to improved outcomes for an organization.