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Licensing Teams: An Organizational Approach to Technology Licensing Process

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Abstract

Licensing Teams: An Organizational Approach to Technology Licensing Process

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Licensing is an increasingly strategic activity that corporations carry out (Zuniga and Guellec, 2009). Researchers inquired the motivations that stem at the origin of technology licensing with a particular focus on patents characteristics (Kim and Vonortas, 2006), contractual forms (Somaya et al., 2011), knowledge flow among parts (Agrawal, 2006), and the creation of technological standards (Joshi and Nerkar, 2011). Recently, scholars enhanced their attention on organizational traits that influence technology license with a special interest on firms? size (Gambardella et al., 2007), licensee and licensor?s absorptive capacity (Ceccagnoli and Jian, 2013), and the organizational structure of R&D units (Arora et al., 2013).

From an organizational standpoint, what still remains hidden is the role of IP units and their internal dynamics with other parts of the organization during the process of technology licensing. Yet, previous research analysed the role of internal IP department in the process of patents generation or enforcement (Reitzig and Wagner, 2010). Given these limitations, this study takes the IP department?s perspective and examines through a group dynamics theoretical lens (Forsyth, 2014) the following research question: how can in-house IP units successfully manage the licensing process?

I conducted an exploratory study using an inductive methodology based on in-depth multiple cases study (Eisenhardt, 1989).I collected data from November 2012 to August 2013 from 18 large sized companies with an internal IP department. Sampling followed the saturation logic and included 4 cases in the healthcare industry, 8 in the ICT, 6 in the manufacturing and 2 in the pharmaceutical industry. I interviewed 24 key informants who were notably Heads of in-house IP unit, executives of R&D departments and senior patent attorneys. Interviews lasted one hour and were triangulated with personal notes, and archival data.

The study lets emerge the existence of two distinctive types of licensing teams that manage licensing process in large organizations. Findings show that propensity to license is higher for those organizations that have fixed licensing teams and tend to be lower in presence of ad-hoc licensing teams. Information flow and leadership are keys to disentangling the dichotomy. On one side, licensing teams based on fixed membership manage licensing process through both internal and centralized information flow and leadership. On the other side, licensing teams based on ad-hoc membership manage licensing process through internal and external decentralized information networks and shared leadership. Thus, fixed licensing teams emphasize the preliminary seeking for information and its accuracy to detect competitors and technologies that could be licensed; furthermore, they align team?s actions towards the maximization of monetary returns from licensing.

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Licensing Teams: An Organizational Approach to Technology Licensing Process

Introduction

There is an increasing attention on technology licensing. Recent statistics demonstrate that the number of licensing agreements rose from the mid-1990s (Zuniga and Guellec, 2009) and generates a sustained amount of revenues: the estimates report that the annual value of transactions ranges from $25 to $35 billion in the United States, while the average global amount leverages $35-$50 billion (Arora et al., 2001). In parallel, researchers inquired the motivations that stem at the origin of licensing behavior with a particular focus on patents characteristics (Gambardella et al., 2007), expectations from commercialization (Nerkar and Shane, 2007), contractual characteristics (Anand and Khanna, 2000; Oxley, 1997; Somaya et al., 2011), knowledge flow among parties (Agrawal, 2006; Oxley and Wada, 2009).

Recently, scholars enhance their attention on organizational traits that might influence the decision to license technology. A first dimension that has been inquired is firms' size. Small firms with limited production capabilities are more likely to license than large organizations because through licensing they benefit from royalties while they have inadequate possibilities for commercial exploitation (Kollmer and Dowling, 2004). Gambardella and colleagues (2007) provided further confirmatory evidence for small firms, while they reported that large organizations are more averse to license-out their technologies. However, in a recent OECD survey, Zuniga and Guellec (2009) showed that both small and very large companies are willing to license their patents, while medium-sized enterprises are reluctant. Therefore, the trend of technology licensing for large organizations is not univocal, since empirical evidence on the impact of firms' size on technology licensing seems to depict unsystematic and complex patterns. One way to disentangle ambiguity would be understanding how the organizational traits of in-house management of intellectual property rights influence licensing process. Recently, scholars enhanced their attention on licensee and licensor's absorptive capacity (Laursen et al., 2010; Ceccagnoli and Jian, 2013), and the organizational structure of R&D units (Arora et al., 2013).

What still remains hidden is the role of IP units and their internal dynamics with other parts of the organization during the process of technology licensing. Yet, previous research analyzed the role of internal IP department in the process of patents generation and maintenance (Somaya et al., 2007; Reitzig and Puranam, 2009). However, research on the impact of the management of in-house units upon licensing process is generally underexplored. Given these limitations, this study takes the IP department's perspective and examines the following research question: how can in-house IP units manage the licensing process? To answer to this question, I conduct an exploratory study based on in-depth multiple cases of 18 large and very large sized companies that have an internal IP department. Case studies are well suited for this type of research because they can address questions about processes and organizational contexts that lead the decision to license (Kline, 2003).

The results of this study enrich our understanding on the relevance of organizational traits as antecedents of technology licensing. I provide evidence of the existence of two types of licensing teams and explain a dichotomy in the organizational structure of licensing process. Jointly with the emergence of licensing teams within IP departments, other factors appear to be particular important for the management of licensing process: leadership and communication among members of the organization. My study helps to develop market for technology literature (Arora & Gambardella, 2010) and its understanding of organizational antecedents of licensing by providing an internal perspective on the processes, mechanism and roles of licensing process. Furthermore, I am extending literature on strategic management of intellectual property (Somaya, 2012) by enlarging our knowledge on the capabilities and internal dynamics of in-house IP departments and their attitudes in the management of patents.

Conceptual background

Licensing is an important strategic activity that corporations carry out in order to commercialize their technologies, to pre-empt their technological domain and block illegal use of innovation from competitors (Arora and Fosfuri, 2003; Ceccagnoli, 2009). Important antecedents that drive the decision to license technology

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may be encountered at the patent level. On one side, the size of patent portfolio (Kim and Vonortas, 2006) and its innovative characteristics (Nerkar and Shane, 2007) enforce the probability to license proprietary technology. On the other side, lapses in timing to grant patents augment uncertainty on potential exploitation of portfolio (Popp et al., 2004). Thus, pending patents are less likely to be licensed out (Gans et al., 2008).

The expected appropriation of the economic rents (Arora and Fosfuri, 2003) is another important antecedent that stimulates the decision of licensing an IP. Bargaining power of licensor towards the licensee could foster the probability of establishing arm's length relationships with direct rivals and leveraging the technological leadership in order to gain from royalties and fees, despite the possibilities of using exclusively the technology in the downstream market (Gallini, 1984). However, the licensor needs to find an optimal numbers of licenses that grant economic royalties without eroding business profits and allowing competitors to enter into the competitive space (Fosfuri, 2006). Given these economic motivations, contingencies may moderate licensing attitude. Literature showed that market volatility (Fosfuri, 2006) and information asymmetry between licensor and licensee have a negative impact on propensity to license (Anton and Yao, 2002; Kale and Singh, 2009).

Finally, organizational characteristics are important pre-conditions of licensing agreements. Literature focused on firm size as organizational trait that could drive licensing decisions. Small firms are more likely to license than large organizations because they benefit from royalties and fees, given the limited production capabilities for commercial exploitation (Kollmer and Dowling, 2004). However, subsequent research found miscellaneous results for large corporations. On one side, Gambardella and colleagues (2007) found for an extensive European sample that large organizations establish license agreements less frequently than other types of firms, but among those large organizations just few that were willing to license in the end establish the agreements to externally commercialize the technology. On the other side, Zuniga and Guellec (2009) found for 600 European firms and 1600 Japanese firms that small and large organizations are both willing to license while middle-sized firms are more conservative. Thus, empirical evidence seems to depict complex patterns, which suggest that in addition to firm size other organizational dimensions might influence propensity to license.

On one side, a recent research stream (Laursen et al., 2010; Ceccagnoli and Jiang, 2013) draw form absorptive capacity literature (Cohen and Levintal, 1990) and showed that propensity to license is enhanced by licensee's stock of knowledge and its influenced by the capability of previously exploring and monitoring complimentary technological domains respect to the patent portfolio. On one side, if licensee has high absorptive capacities, it is more prone to license-in the technology because of its awareness of potential exploitations (Laursen et al., 2010). Ceccagnoli and Jian (2013) recently complemented these findings and claimed that licensor develops knowledge transfer capabilities. Indeed, when the licensee has weak absorptive capacity it might not be able to recognize potentials disclosed in the licensed technology, and in turn likelihood to license technology might decrease. To avoid such compelling situation, licensor leverages its competences in establishing licensing transactions gather through past experience in the industry.

Leveraging an emergent research stream on organizational structure of innovation and R&D activities (Argyres and Silverman, 2004; Miller et al., 2007; Arora et al., 2011), Arora and colleagues (2013) recently developed an argument on the benefits and drawbacks of either the centralized or decentralized structure of R&D units and the management of technology licensing. They formalized that centralized R&D headquarters are more prone to establish outbound licensing agreements because monetary incentives from licensing fees generally counterpoise searching costs for potential licensees. On one side, even if centralized headquarters have less information concerning the competitive outcomes in the downstream market, they tend to license aggressively and for revenues-oriented deals to counterbalance the risk of accepting value-destroying agreements or rejecting favorable ones. On the other side, business units have more complete and extensive information on profitable opportunities. In spite of that, decentralized subsidiaries chronically under-license because they fear losing their market share (rent dissipation) and they slant towards total production benefits and long-term rewards from business profits rather than licensing fees.

Although this foregoing contributions identify absorptive capacities and R&D organizational structure as reasons that stem at the origin of licensing propensity, it is still missing an adequate recognition on the

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contribution of the internal members of IP department. Nevertheless, scholars recognized the role and competences of in-house IP members in the process of patents generation (Grindley and Teece, 1997; Somaya et al., 2007; Reitzing and Puranam, 2009) or the enforcement of intellectual property rights (Reitzing and Wagner, 2010). Yet, the perspective of IP departments in the licensing process is still poorly understood. Indeed, in a seminal paper Pitkethly (2001) found that on average IP staff is mostly dedicated to patent filing activity and just a minority of IP members are acquainted to either litigation, patent information management or licensing contracts. Thus, research seems to suggest a potential correspondence between the capabilities and the composition of in-house IP members. Yet, we are still missing an holistic empirical insights. Therefore, there is reason to believe that it would be worth deepen our knowledge and understanding on the tasks and roles of in-house IP members and their departments in licensing process.

My study expands on these insights by examining how in-house IP units manage the licensing process through interactions and internal dynamics among their members. A key to understanding the impact of micro-patterns of IP unit on licensing process is found in its teams' dynamics, which are the actions and interrelations that occur within and between its members (Brown, 1988). Teams interact through communication networks, which can be described as the patterns of channel linkages through which individual members of a group transmit and receive messages (Fischer, 1974). During interactions, leadership emerges, since one member might guide the rest of the group throughout the accomplishment of the various actions (Vroom and Yetton, 1973). However, group members might experience interpersonal turmoil contrasts. Therefore, cooperative mechanisms should be implemented in order to maintain the relationship (Shaw, 1976;). If we transpose these arguments into in-house IP unit, this latter might be seen as a group that interfaces with other organizational units – scientists or business managers- during licensing process. Furthermore, even in the same IP unit it might be possible identifying multiple sub-groups that need to interact in the licensing process. Because little is known about how IP department manage the licensing process through their internal teams' dynamics, when I began this study I choose to pursue my investigation inductively, relying on a qualitative interpretative approach.

Method

In order to grasp a more practical view on the research question and to familiarize with the language and mentality of people involved in IP management and licensing, I performed a series of preliminary pilot interviews with IP managers of large corporations and IP experts. These cases were chosen according to three criteria. Firstly, the corporations must be highly active in patenting, so the management of intellectual property is a relevant issue within the corporate and business governance. Secondly, patenting strategies and IP management logics might differ from industry to industry. Therefore, for understanding the emergence of different behaviors and strategic approach on patenting I selected firms that registered their innovation in the following fields: medical technology, electrical machinery, digital communication, measurement, organic chemistry, pharmaceutical, biotechnology, and engines (EPO, 2013). The heterogeneity among technological fields for patenting allows inspecting for possible industry patterns and facilitates generalizability. Finally, corporations need to present a complex organizational structure in terms of R&D centers, units responsible for patenting, geographical locations and business lines. The complexity of the organizational structure allows questing for organizational differences in the way IP strategy and licensing are developed within the firms in the sample. Seven companies took part in the preliminary study. Data were gathered through semi-structured interviews.

Once the pilot cases determine the general outline of the phenomenon, a multiple case study design has been chosen to deepen the understanding on the relationship between organizational structures of IP departments and licensing process. Indeed, each case enables replication logic to confirm or disconfirm the patterns of evidence depicted in the other instances, providing compelling results and associations of facts at multiple levels (Eisenhardt, 1989; Siggelkow, 2007). In this research I employed 18 cases to depict the emergence of organizational aspects of IP management influencing the licensing process. The final number of cases derives from 6 initial cases and other 12 adjunct organizations. The selection of cases for the final sample follows the saturation logic (Yin, 2009). A first dimension that drives the sampling construction is technological domain of IP portfolio. Since each industry might be affected by its own peculiar logics, the comparison of cases that operate in heterogeneous technological fields might be weak in providing stable patterns. In order to strengthen

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this aspect, I enlarged the preliminary pilot sample to have at least pair-wise comparisons among the IP portfolios of organizations. From an industrial classification, those organizations are active in the pharmaceutical, manufacturing, healthcare and IT sectors. A second dimension through which I developed the theoretical sampling is organizational structure of IP departments. Indeed, the pilot study showed that the IP departments could either work at centralized or decentralized level. I used this specification for comparing and combining polar cases within the technological domains. As a result, companies included in the theoretical sample are multinational, multi-business organizations, with comparable IP portfolios and active players in technology licensing. To access insider knowledge about how IP departments manage the licensing process, I secured an independent expert. The data access started in June 2013 and it lasted until August 2013. Table 1 summarizes selected cases and highlights their relevant dimensions.

TABLE 1

Interviews were the major source of data. My principal informants were Chief Technology Officers and Heads of intellectual property divisions. Indeed, persons in charge for the mentioned role have senior positions, which allow them to have a broad view of the overall initiatives that concern intellectual property rights (IPR) – i.e. the filing, prosecution, protection and monetization of IPRs. For each selected organization, interviews were conducted in person or, when it is not possible, over the phone, always using an interview guideline. Interviews were tape-recorded and then fully transcribed. Notes taken during the interviews were be transcribed within 24 hours.

To ensure that the theoretical sample includes the most knowledgeable informants, I used a "snowballing technique" (Eisenhard and Graebner, 2007). I asked to the focal interviewees to introduce another crucial colleague who usually takes part in licensing. Often persons that cover these roles are senior patent attorneys and they have both technical and legal background. Having multiple interviewees from the IP department allowed me to juxtapose and compare stories and impression on licensing process and IP management, minimizing biases in respondents' perception. An interview protocol was designed. Finally, some respondents were contacted a second time for a follow-up. Second-order interviews are useful to deepen some aspects and mitigate cognitive biases (Huber and Power, 1985). In the end, I interviewed 24 in-house IP managers. Interviews lasted approximately one hour.

*** TABLE 2***

During the data collection it became clear that the participating organizations would not allow me to interview everybody at will, as people's time was considered a scarce resource. Furthermore, the pilot study indicated that licensing decisions usually are made by a very small set of people, typically the senior members of the IP departments and eventually other key executives or board members. This pattern reflects the sensitive nature of licensing and it is consistent with other prior evidence that awareness of organization's strategy declines rapidly below the core management teams (Soutaris, Zerbinati and Liu, 2012). Thus, when I was neglected to interview two principal informants, I agreed to access a second member via e-mail to confirm my finding and to minimize single informants bias (Locke and Velamuri, 2009).

External and internal documents are another important source of information and data triangulation. For this purpose, I collected conferences presentations and contents from corporate web pages of the 18 cases. Moreover, I searched on the database Nexis for business press related to both IP management and license agreements of cases.

Analysis

Following exemplar inductive studies (Graebner and Eisenhardt, 2004; Soutaris, Zerbinati and Liu, 2012) and analytical techniques to move from raw data to theoretical framework (Gioia et al., 2012), I progressed through a three-step process (Figure 1).

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First, I compiled separate cases for each IP department embedded in the observed organization. The within-case histories were the basis to develop constructs and relationships to describe the licensing process experienced by each single IP departments. Thus, examining all interviews transcripts I identified patterns and variance in descriptions of IP management and licensing process using open and in-vivo coding (Locke, 2001). For example, I identified several data segments related to "negotiation" and "team". I then reviewed the data to countercheck whether assigned codes fit with chunks of texts: when the match was poor or weak, I revised or abandoned the first-order concepts (Silverman, 2006).

I proceeded in the analysis by consolidating categories, which became more theoretical and abstract. Particularly, I looked for links among first order concepts, so that categories could be grouped into second order themes (Locke, 2001; Gioia et al., 2012). For instance, I noticed that the theme "seeking for information" consolidates issues concerning the means and tools, roles and timing of activities accomplished to gather information for licensing process.

Finally, I moved from a within to a cross-case comparison (Eisenhard, 1989) and I looked for relationships and similarities in second-order constructs among cases (see Figure 1). Similar second-order themes were grouped into aggregate dimensions, which either refer to established constructs in the literature ("communication network") or to abstracted concepts ("licensing teams"). Aggregate dimensions that emerged formed the ground for the theoretical framework. Finally to assess reliability of the model (Figure 2), I showed this latter to an independent expert (Miles and Huberman, 1994).

*** FIGURE 1***

*** FIGURE 2***

Variations in the organizational structure of IP departments

During cross-case analysis, I observed that IP departments tended to cluster into two main groups depending on the functions they want to pursue. As we may see from Table 3, in all cases IP departments cover the patenting function, which consists in the systems of activities that are necessary to harvest innovation and guarantee the right level of legal protections. Consistently with previous studies (Somaya at al., 2007), I found that members involved in patenting function are grouped into patenting teams depending on technological background and generally assist scientists in harvesting innovation. However, evidence highlights that in eight cases IP departments introduce other functions respect to patenting and create dedicated teams for the exploitation of strategic activities of IP management. For instance, Company 1 mentions that IP department is formed by three main groups: a patenting team, litigators and a licensing team. The same evidence is observable in both the IT and manufacturing industry. For instance, an IP representative of Company 16 explained that: *"*We have these 10 patent units and we call them patent development parts. Then, there is one group working *with licensing (…), they are about 10 people."* (Company 16). Therefore, in all those cases licensing emerges as a relevant function that organizations decide to maintain separate from the patenting activity and to enforce through a focalized attention. Moreover, empirical evidence shows that licensing groups maintain a certain level of integration within the rest of the IP unit. For instance, the Chief IP counsel of Company 2 explains that *"We have a corporate team for patenting and licensing (…), we are separate but I call them "sister organizations"* within corporate headquarter. We work very closely*."*). Thus, data suggest that licensing group is not a stand-alone entity within the main IP unit, but organizations that implement the division of functions want to capitalize on synergic interactions between the two groups that preside the patenting and licensing functions.

*** TABLE 3****

In the eight cases with a dedicated licensing function, licensing teams are usually formed by a limited number of in-house members, who might be structured according to geographical areas or technological streams. The focus on specific countries helps to have coherence with the environment and full control and understanding

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on market dynamics. For instance, the IP representative of Company 13 reports that: *"From countries point of* view, we have a team just for China, so we have four persons in Shanghai that take care of Chinese market and it is completely necessary, because licensing in China is completely d*ifferent"*. (Company 13). Generally, the members of IP licensing team are extremely knowledgeable on the technical field and able to understand specific technicalities. However, licensing members need to have also an in-depth knowledge on both patenting law and business strategy, as explained as follows by one interviewee: *"*You certainly need some appreciation of the business side: you need to understand what the organization needs from a financial point of view over the year *(...)* because when you write a license agreement you might write things in various way that have financial *implications"* (Company 4). Licensing team performs the competitive analysis of IP portfolio, the disclosure of technologies that might worth licensing out, the identification of the potential licensees and then the negotiation process. Therefore, licensing members need to combine in a unique group different expertise that should manifest in interrelated actions. However, all the members of the team should demonstrate negotiating capabilities in order to be effective in dealing with the counterpart during licensing process. It is the reason why in Company 16 all the licensing members *"are strong negotiators"*. Thus, licensing team from a dedicated licensing function could be defined as *negotiators' team*.

Evidence shows the existence of a second type of licensing group within the IP departments that are mostly dedicated to the accomplishment of patenting function. For those ten cases, licensing teams are generally created ad-hoc, depending on the particular requirements related to the licensing decision and the number of internal IP members available in the IP department. The causes for the formation of ad-hoc licensing teams are various –e.g. the dismissal of the technology, or willingness to establish a new technology in the business. The constituent member of the ad-hoc licensing team is generally the head of IP unit, who then selects and incorporates members of the IP unit that worked on the development of the licensed technology. Apart selected IP members from the patenting function, ad-hoc licensing team might be supported by core scientists that help in disclosing technological issues, internal lawyers from the legal department to help in the drafting of the agreement, and by finance members that support the economic estimation. For instance, the head of the IP department of Company 8 describes the formation of the licensing team as follows: *"We do not have any specific* licensing competence in the patent department. But if we have to negotiate a license with the competitor, the team set up and the role of the top manager is typically of the CEO or the R&D head, the head of the legal department and one of the people in the patent department. So, it is an ad-hoc set-*up."* The scope of ad-hoc licensing team consists in providing a first hint on the feasibility of the agreement and on potential scenario in which the licensing negotiation might develop. In executing these tasks, ad-hoc team prepares a series of comments on the technology that could be licensed and starts the preliminary conversation with the counterparts. Then, ad-hoc licensing team needs to integrate the preliminary analysis with the perceptions of executive managers. Indeed, the IP representative of Company 11 reports: *"The typical set up is that we have a framework discussion and (...) the governance in this situation is as for the (IP) strategy, with the pr*esident of Company 11 and the CEO and president of the Holding*."*

Variation in the Propensity to License

In conducting cross-case analysis, I observed that IP departments can be clustered according to their propensity to license. Propensity to license is a construct that emerged from data and was measured[3] by the intensity of specific actions taken by IP departments to promote licensing process. For instance, actions that foster licensing process concern the estimation of prospective numbers of licensing deals and the contemplation of licensing initiatives in the business model. I integrated these assessments with another construct, that is propensity to license, which assessed the likelihood[4] of the IP department towards technology licensing. When

[3] See the study of Graebner and Eisenhardt (2004) for another example on how to build constructs by assigning points to codes related to the appearance of actions.

[4] It is important to recall in their large-scale empirical study Gambardella, Giuri and Luzzi (2007) did not find any selection bias between firms that were willing to license are those that effectively established the license agreements. They reported that *"The licensing opportunities seem to be in good part anticipated by the seller in her decision to license"* (Gambardella

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IP departments had both a strong strategic focus on licensing and they were willing to start negotiation, willingness to license was intended high. When IP departments were nor prone nor focused on technology licensing, willingness to license was coded as low. In intermediate cases, I ascertained the existence of (neutral) willingness to license.

TABLE 4

Data seem to suggest that high willingness to license is associated with the presence of negotiators' teams. Meanwhile, organizations that deal with the licensing process through ad-hoc licensing teams demonstrate both neutral and low willingness to license. The emergent dichotomy between IP departments with either negotiators or ad-hoc licensing teams in intriguing. On one side, it is not possible observing a unique and typical pattern of how IP departments organize licensing process. Moreover, empirical evidence could not be explained by organizational structure theory of licensing units (Arora et al., 2013), according to which centralized R&D units are more prone to license their technology. Indeed, I found that willingness to license is high for both centralized and decentralized R&D organizational structures. Consequently, I went back to the field to explore the conditions that disentangles the dichotomy.

Communication Networks

Depending on the discrepant internal composition of negotiators' and ad-hoc licensing teams, we might observe different forms of information sharing during licensing process.

Negotiators' team leverages three forms of information flow during licensing process. The first flow of information is horizontal and connects licensing team with a dedicated internal business intelligence that analyzes the IP portfolio respect to competitors through an on-going process. Furthermore, the integrated business intelligence defines the critical technologies that might be licensed, collects information about financial situation of potential licensees and then transmits all the information to licensing team. One of the IP representatives of Company 4 comments: *"*We have business intelligence in my organization and we know the companies that are active in certain technology fields, certain innovation. So, we know the companies, we can *find them and we can approach them"*. On the basis of this internal information, members of the negotiators' team prepare a framework to approach the licensees. Furthermore, there is a second horizontal flow of information that connects the licensing team with the patenting teams. Indeed, licensing team might ask patent attorneys about specific consultation on certain technologies, which might be too specific to disentangle for the negotiators' team. Indeed, the IP representative of Company 16 comments on the internal communication network between licensing and patenting team as follows *"*Licensing people need to have inf*ormation (…) when* they negotiate and they are at the meetings with other companies, they also need information on patents and *technology that they are licensing"*. Furthermore, the IP representative claims that *"it needs time"* to prepare such information, that is why having strong and close ties helps at promptly transmitting the required instructions. Finally, there is a third channel of information flow, which is vertical and involves the negotiators' licensing unit and a dedicated steering committee. The steering committee for licensing function collects information from the various licensing units on the proceedings of the negotiations, helps at homogenizing information and provides commentaries and recommendations. For instance, in Company 1 the steering committee is represented by a group of senior managers who are familiar with all the entire scope of on-going licensing projects and informally share information through monthly meetings.

Ad-hoc licensing teams are formed by members who belong to patenting function and by other complimentary affiliates, which contribute by providing information to ground the preliminary assessment of licensing. Thus, licensing team establishes a direct parallel flow of information with the patenting function to obtain a technical audit on patents. Very often information derive from revision of patent portfolio, when patenting function decides the crucial areas where to strengthen legal protection. For instance, the IP

et al., 2007: 1179). Thus, most of the explanatory effects need to be found in the decision to license and so in the licensing process..

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representative of Company 6 reports that: *"*During the meetings when we check the patent portfolio we check the list of patents that are used to protect the products that are on the market or will be on the market. In fact, we have a list of patents that are very important because they are protecting the existing products or products that have being developed. So, for those patents it is important knowing what is happening and of course we do not *license out those patents. But for all the others there is a plan for licensing"*. Furthermore, ad-hoc licensing group establishes a second parallel flow of information with multiple parts of organization such as finance, R&D and sales' units. Indeed, the head of IP department might ask to those external units to provide figures on products' sales, estimates of competitors' financial situations, and expected technological trends. Information is combined with the technical analysis provided by the patenting function and forms the preliminary framework to evaluate whether to license or not. Finally, a third channel of information flow is vertical and connects the executive management of the organization with the head of IP department in charge for leading the executive tasks of licensing. Licensing team needs to inform the executive management of the preliminary licensing framework and in turn receives feedbacks and instructions on how to proceed in the decisional process. For instance, the IP representative of Company 14 comments on the last two information flows: *"You start the draft* of the negotiation by asking to sale people and R&D people some assistance for building like a case study and *then, once you draft the case, you start the discussion on the top level"*.

Licensing Team and Leadership

Cases demonstrate that negotiators' team tends to operate independently while ad-hoc licensing teams self-directed teams led by a senior IP member, who covers the role of business negotiator with the counterpart and coordinates the internal discussion among licensing members. Given the two types of licensing teams, two distinctive leadership styles emerge among cases.

Negotiators' teams are led by a senior IP member, who has experience in the business field. Thus, team leaders are knowledgeable about the environment in which licensing process develops. Moreover, negotiators' team leaders are sustained in their role by an internal supply of information concerning technology or legal terms. Therefore, licensing leaders have the rational capacity to guide the team throughout the set of actions that should drive to the establishment of the licensing contract. For instance, one of the IP representative of Company 4 defines the role of leader for a negotiators' team as follows: *"For each technical area there would be a project* leader; so, you have discussions with the IP managers on how to work out, who you should approach over the next year, what targets are there, what people you have available to work with and then forming up team of *people and then going out and doing the licensing."* Thus, negotiators' leaders embody a task leadership, which is the aptitude to optimally assist the group in the execution of its actions (Vroom and Yetton, 1973). However, negotiators' team leader needs also to monitor the internal preferences and the feelings of both its team members and the steering committee on the deal. In fact, one of the IP representatives of Company 4 reported that during a negotiation the counterpart offered to pay fees either in five or in two tranches with a small discount. The licensees were reasoning that the negotiators' leader would have taken a more certain and quicker payment in two rounds respect to a diluted streams of revenues. As the team leader consulted with the other members of its team, the leader understood that general feeling was more directed towards the largest amount in a longer time frame because IP unit was considering also some benefits from operating accounting schemes. In doing so, negotiators' leaders qualify as consultative guide. Consultative leadership is a socio-emotional activity performed by directive members of the group through which leaders elicit feelings and sensitive information from the other members involved in the decision making (Vroom and Yetton, 1973).

Leadership in ad-hoc licensing teams is not associated to a single member of the group. Yet, it is possible observing the emergence of a dual leadership. On one side, the Head of IP unit has the major responsibility of producing the preliminary framework into which prosecuting the licensing negotiation. This activity requires to carry out a series of tasks, which involve skilled members, consolidate different sources of information and end with a preliminary contact of the counterpart. Thus, the head of IP unit is the biggest participator in the task-oriented process of providing a first opinion. However, as the preliminary framework is ready, the head of IP needs to interface with executive management to understand the general feeling on the licensing option. For example, the head of IP Department of Company 6 reports: *"Especially for licensing out: it*

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is always strategic, so we have to take care a lot, but all the decisions have to be approved at their early stage because we are not able to contact any party prior to be sure that all the top management is aware of what will *happen"*. Therefore, a consultative leadership emerges in the ad-hoc licensing team and decentralizes the process through which team members organize and support licensing. For instance the Head of IP unit of Company 5 comments consultative leadership as follows: *"We consult with the R&D and we consult with the business leaders. (…) we want to get a* sense of whether there would be enthusiasm on the license." Therefore, the shared consultative leadership is designed to make sense of the general feasibility of licensing with parts external to the IP unit and to pay attentions to other instances that come from the organization.

Corporate Main Goals

The definition of corporate goals influences the design of both licensing and patenting functions and affects ways through which licensing teams exploit their actions in licensing process.

Cases that settle a dedicated licensing function endeavor to establish a surrounding corporate main objective that contextualizes and homogenizes the actions of the negotiators' team. Indeed, corporations with a dedicated licensing function frame licensing with a strong orientation towards the maximization of economic returns. For instance, one of the IP representatives in Company 2 reports patenting and licensing functions preliminary settle common financial targets in order to gather an overarching alignment among licensing teams and other corporate divisions. He explains "We have a complete set of licensing targets which are given out to the business units and agreed by all the business units as well as our organization, so everyone is working on the same set of financial targets." The focus on the economic corporate objectives that could be reached through licensing generates a shared understanding among licensing team, patenting team and other parts of the organization that might be involved in licensing process. Therefore, the activity of negotiators teams acquires an important recognition within the organization. For example, the general counsel of Company 3 reports that economic returns are generally prioritized respect to peculiar and contingent discontents that might emerge form business units, because money would be totally returned to the unit that generated the technology to cover the investments form research and the costs for patent filings. Thus, negotiators' teams are aware of the impact of licensing fees on corporate budget and the alignment to the main economic targets is a paramount during licensing process. Indeed, one of the IP representatives of Company 4 stressed the importance of maintaining a constant attention on the economic aspect of the agreement during licensing process and comments *"We spend a* lot time at looking carefully on how money is recognized, after having an understating of the typical business *thing"*.

Cases that do not present a dedicated licensing function do not associate licensing teams with specific corporate monetary targets. Since ad-hoc licensing teams do not have such primary objects, they needs to understand case by case whether licensing would make sense within the overall corporate aspirations. As the head of IP department of Company 12 claims *"It is not the number itself of the license agreements (…) the* objective of our function is to create freedom to operate, is what we are doing and we do that through both *patenting and licensing."* To assess the congruence of licensing with the main corporate goals in organizations with ad-hoc licensing teams, the head of IP department needs to ask for the endorsement on the licensing framework by the executive management that jointly controls the patent portfolio and assists the definition of patenting strategies. The IP representative of Company 12 in the healthcare industry asserted that the co-participation of the same members –that is, the CEO and president of the holding company- pledges a straight consistency in licensing process, patenting strategies, and corporate goals: *"It is their decision whether in this* context is the right thing to do with that particular company we want to out license to. So, we are consolidating *all the interests in the group."*

Discussion

The main purpose of this study was to better understand how IP departments can successfully manage technology licensing process. Research on the role of in-house IP units on licensing process is scarce, so I followed an inductive approach on 18 cases to elicit the main conceptual categories through which technology

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licensing process is managed in large organizations. The findings of this study provide a starting point for that theoretical development by explicating the presence of two types of licensing teams, the existence of which stemmed from the recognition of an ancillary and autonomous role of licensing respect to patenting activity. If licensing activity is assumed as a separate and adjuvant function with dedicated corporate targets respect to patenting function, then IP departments manage the licensing process through fixed licensing teams that systematically perform licensing projects. If autonomy of licensing respect to patenting function is not acknowledged, in-house IP units do not dedicate specific resources into licensing, which is managed through ad-hoc licensing groups that are appointed by necessity. The two types of licensing teams demonstrate to manage licensing process through distinctive communication networks and leadership styles. Furthermore, IP departments that manage the licensing process through fixed licensing teams demonstrate a higher willingness to license their technologies respect to in-house IP units that refer to ad-hoc licensing teams.

Insights into the specifics of the two types of licensing teams and their role in licensing process begin with an understanding of their composition. In both cases, licensing teams have diversified and complementary knowledge on technology, business and IP law. Thus, licensing teams are formed by members specialized in each of those aspects, so that they can integrate their reciprocal capabilities and being effective in dealing with the tasks related to licensing process. Heterogeneity among team members is an important trait that might foster the productivity among members and determine higher performances in the accomplishment of the task (Magjuka and Boldwing, 1991). Therefore, heterogeneity in both licensing teams would make both of them effective in manage the licensing process. However, literature on group dynamics (Brown, 1988) demonstrated that teams formed by members with a fixed composition and a prolonged collaboration are more effective in the execution of tasks respect to teams formed with representatives newly matched any time. The rationale for the discrepancy is a higher intergroup contact and cohesion for the fixed-member group, so that cooperation in the execution of tasks is higher. We could transpose the argument to licensing teams. Despite the fact that both types of licensing groups are heterogeneous in their composition, negotiators' teams are formed on fixed members, so they benefit from an higher internal cohesion, which in turn sustains the execution of tasks during licensing process.

A second observation on how licensing teams manage licensing process concerns communication network. Evidence demonstrates that negotiators' teams develop three communication networks internal to the IP unit: a first network is between negotiators' team and the business intelligence; the second communication network brings into operations the licensing and patenting teams; the third network involves the licensing unit and the steering committee. All these three networks closely connect the licensing team with the IP unit, so that the licensing team develops a centralized communication network. Indeed, in a centralized communication network the focal member tries to minimize the numbers of communication linkages with third parties (Bavelas, 1969). Meanwhile, ad-hoc licensing teams develop three networks: the first one is between the ad-hoc licensing team and the patenting group. The other two networks expand throughout the boundaries of IP unit and connect the licensing team to other parts of the organization: legal, finance, R&D and top management. Therefore, following Bavelas (1969), in ad-hoc licensing team information flow is dispersed more evenly. According to Shaw (1976), teams that integrate information through decentralized networks are more effective than those which adopt a centralized system of links; in facts, teams that use a centralized communication network fear to be overloaded of information. Thus, at a first sight ad-hoc licensing teams might integrate better than negotiators' teams the sources of information, because those latter are overwhelmed by data, reports and communications. However, it is important also considering the motivations that stem at the origin of information exchange among teams. On one side, negotiators' teams continuously seek for information with an on-going process that involves both business intelligence and patenting team in order to detect potential licensees and position the IP portfolio respect to competitors. On the other side, ad-hoc teams do not have such continuous dedicated stream of information, yet they communicate through a decentralized communication network after that patenting team has identified a licensing opportunity during the revision of IP portfolio. Therefore, we can observe that negotiators' team gives higher priority respect to ad-hoc teams in seeking for information. According to Thompson (1991), the more the seeking for information, the better is the accuracy of judgment, because the chain reaction of information exchange permits to better focalize important issues. Thus, we might

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infer that negotiators' teams could provide a better judgment on licensing process. A more informed judgment on licensing process might convey into clearer assumptions and estimation on potentialities that arise from licensing.

A third insight bears upon leadership. Evidence from cases shows that leadership is centralized in negotiators' team and appertains to the senior IP member, who is responsible for coordinating the licensing tasks, monitoring the feeling of IP unit on operations and negotiating with the licensees. A crucial issue concerning centralized leadership refers to the risk that leader assumes biased decisions, which drive team into misleading actions (Brown, 1988). However, team members that justify and concerns about the evaluation and preference by others are more likely to accomplish rational choices because threat to be evaluated de-biases the decision-making (Simonson and Nye, 1992). In the case of negotiators' teams, centralized leadership is moderated by the presence of an internal steering committee that gives feedbacks and homogenizes operations. Thus, we might infer that negotiators' leaders tend to provide rational contributions during licensing process because they are accountable for the outcome and they fear a negative assessment from the steering committee. Therefore, accountability of senior IP member could foster rationality and accuracy in licensing process. Evidence further displays that in ad-hoc licensing team leadership is shared between the head of IP unit and a pool of executive members that intervene in the licensing process to estimate the feasibility of the agreement. Shared methods of leadership are well-suited to groups that rely on small teams formed by distributed and relatively independent members (Vroom and Yetton, 1973). Indeed, groups with shared leadership can capitalize on different perspectives within the team and identify better solutions. Thus, shared leadership in ad-hoc licensing team might enforce licensing process.

A final insight on how licensing teams manage licensing process refers to the role of corporate goals in aligning actions and intensions. Negotiators' teams manage licensing process with a preliminary framework established in accordance to specific financial targets, which have been agreed at the corporate level. The establishment of super-ordinate goals fosters cooperation among different groups, because the attention is towards the maximization of the joint outcome (Brown, 1988). Thus, the establishment of corporate financial targets for licensing function decreases concerns from other organizational units on licensing. Indeed, licensing fees are shared among different parts in the organization depending on certain parameters and these gains are prioritized respect to singular instances from business or research sides. Thus, a pre-ordinate consensus on the relevance of financial targets fosters licensing process. Furthermore, the establishment of reference points in negotiations is important, because the outcomes are coded and compared respect to them (Neale and Bazerman, 1992; Kahneman, 1992). Thus, negotiators' teams benefit from ex ante established targets, because during licensing process they can constantly align their actions in the respect of the main corporate target assigned to licensing. A greater awareness on the main objectives and increased judgment capabilities might positively influence the management of licensing process. Ad-hoc licensing teams do not associate licensing process with a dedicated main financial corporate target. Yet, ad-hoc licensing teams need to assess case by case whether the objects pursued through licensing process are compatible with the general goals of the organization. The lack of super-ordinate goals increases competitiveness and the appearance of internal conflicts among groups (Brown, 1988). To lower the risk of intergroup competition, ad-hoc licensing groups involve top management in licensing process. The harmonization of licensing scope with corporate goals through the intervention of top management avoid that singular concerns undermine licensing process.

Results originated from this study complement previous research on market for technologies (Pitkelhy, 2001; Arora et al., 2013) and answer to a call (Arora and Gambardella, 2010; Conti et al., 2013) for more reasoning on organizational antecedents. The study demonstrates the existence of two types of licensing teams that distinctively manage licensing process in large and very large organizations. On one side, licensing teams based on fixed membership manage licensing process through both centralized information flow and leadership. Those licensing teams emphasize the preliminary seeking for information to detect both competitors and technologies that could be licensed; furthermore, they are oriented towards the maximization of monetary returns from licensing. On the other side, licensing teams based on ad-hoc membership manage licensing process through decentralized information networks and shared leadership. The presence of fixed licensing teams is

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associated to higher propensity to license. Furthermore, my study challenges previous research in some ways. Indeed, scholars claimed that propensity to license in large corporations varies according to centralized or decentralized organizational R&D structure (Arora et al. 2013). According to Arora and colleagues (2013), IP units in centralized organizational R&D structure should be more prone to license because they better assess the economic gains of the deal, while IP departments in decentralized business units benefit from more information but are threaten by blocking actions from business managers, who fear to lose market share. Findings from my research show that propensity to license is high for those organizations that have fixed licensing teams and tend to be lower in presence of ad-hoc licensing teams independently from the centralization or decentralization of IP organizational structure. Thus, data seem to suggest that the presence of a certain type of licensing team drives propensity to license. Further research could try to extend these finding: instead of the structure of organization, future studies can juxtapose to licensing teams other organizational traits in order to see whether other elements influence propensity to license.

The study complements previous research on organizational traits of in-house IP units (Somaya, 2012). Indeed, previous research on organizational traits of IP departments focused on knowledge proximity of IP members respect to scientists involved in innovation (Somaya et al., 2007), on the cross-specialized capabilities that reside in IP department to obtain patent protection (Reitzig and Puranam, 2009) Thus, this research contributes by introducing a behavioral approach on the study of IP departments shading lights on leadership and interactions in the IP decision making process that relates to licensing.

From a normative perspective findings from this research could be thought for reflection for organizations that are incurring into a re-structuring of their patenting function and want to leverage their IP strategies through IP monetization via licensing. Indeed, those organizations could reflect upon the IP staff they might require if they want to start a licensing program and on the internal process and dynamics that a dedicated licensing structure might require to work effectively.

It is worth mentioning some limitations that affect the present research. Firstly, the study matches the presence of certain types of licensing teams with willingness to license. Willingness to license assesses the propensity to incur into a licensing process and it has been widely used in studies on antecedents of technology licensing (Gambardella et al., 2007; Zuniga and Guellec, 2009; Pitkethly, 2001). However, results would be strengthening if propensity to license would be matched and analyzed together with the number of successfully established deals. Indeed, the combined observations of both willingness to license and the number of established deals would provide a deeper understanding on the relative performances of the fixed and ad-hoc licensing teams and detecting whether one type outperforms the other one. The limitation of this research could be untangled in future inquiry and could leverage scales on team effectiveness (Cohen and Bailey, 1997). Furthermore, in order to preserve the parsimoniousness of the model research omits to consider patents characteristics and the nature of the counterpart involved in the licensing process as well as the presence of contingent elements like patent pools or standards (Joshi and Nerkar, 2011). Again all these aspects could open the door to further research potentially based on larger and quantitative evidence.

Conclusions

The 18 cases provide insights into the mechanisms and dynamics through which IP department manage licensing process through the intervention of licensing teams. The study suggests that in large organizations either fixed or ad-hoc licensing teams intervene in the management of licensing process. A key to explaining the existence of those two types of licensing teams is the recognition of an autonomous role to licensing respect to patenting activity and the establishment of dedicated corporate targets on licensing. Differences in team composition, leadership styles and communication networks emerge throughout the inductive study and either foster or limit effectiveness in the execution of tasks with related effects on willingness to license.

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Figure 1: data structure

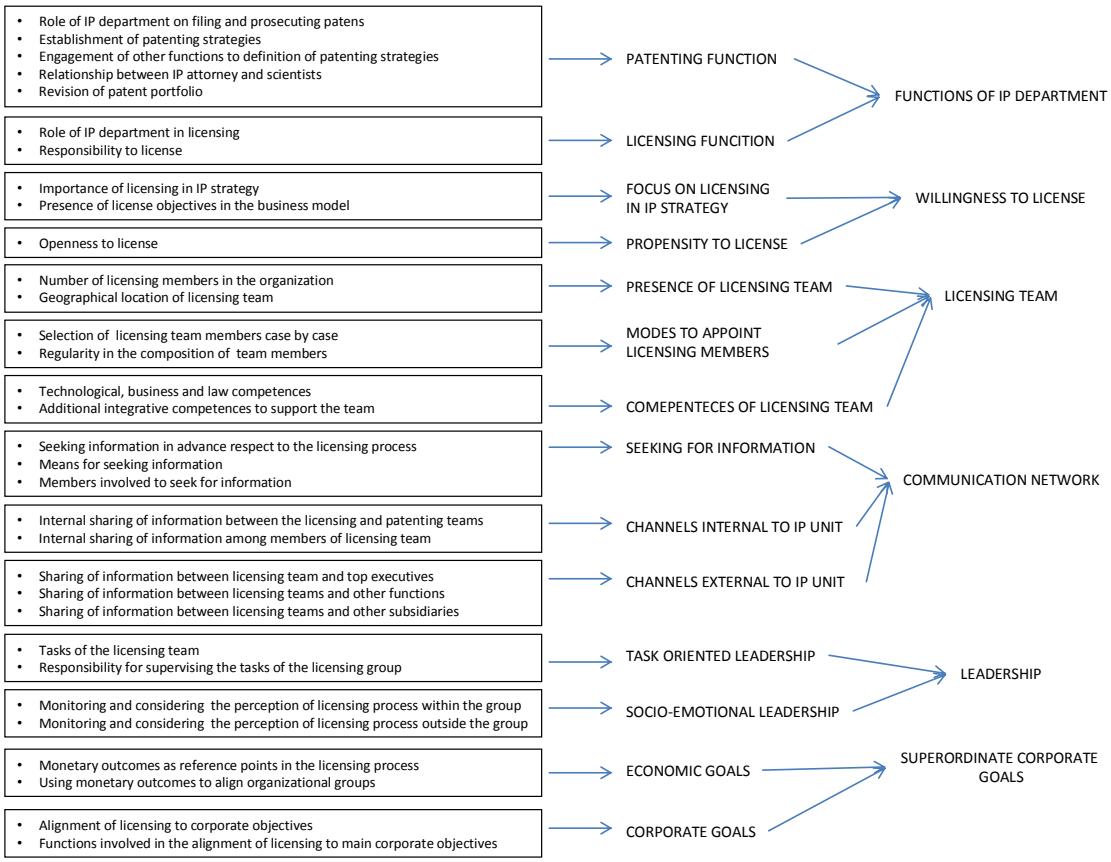

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Figure 2: the model of the role of licensing teams

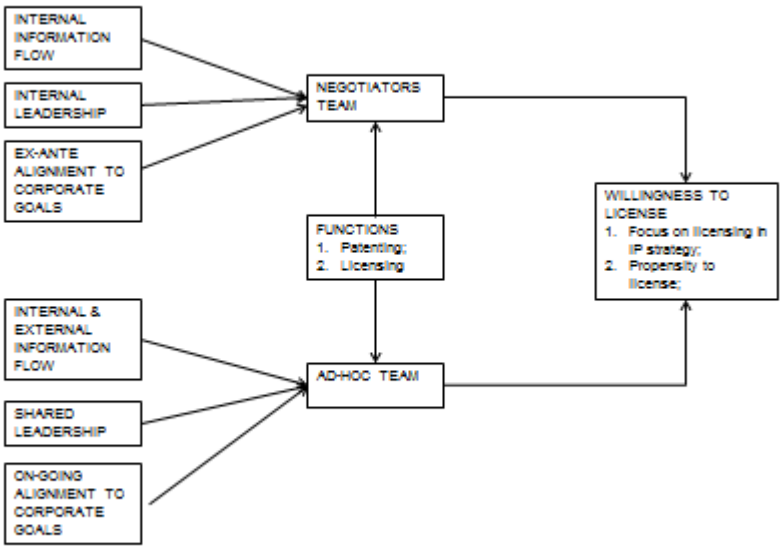

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Table 1: Summary of the cases

Company #	Industry	Organizational size	Geographical origin of company	Geographical origin of the parent company	Structure of IP department	Structure of R&D
3	healthcare (medical technology)	very large	Europe	USA	decentralized	hybrid
8	healthcare (medical technology)	large	Europe		centralized	centralized
11	healthcare (medical technology)	large	Europe		centralized	centralized
12	healthcare (medical technology)	very large	Europe		decentralized	decentralized
2	IT	very large	USA		centralized	centralized
7	IT	very large	Europe		centralized	hybrid
14	IT	large	Europe	Japan	decentralized	hybrid
15	IT	very large	USA		centralized	decentralized
16	IT	very large	Europe		centralized	decentralized
17	IT	very large	Europe		decentralized	decentralized
4	manufacturing (electrical machinery and apparatus)	very large	Europe		centralized	decentralized
18	manufacturing (electrical machinery and apparatus)	large	Europe		centralized	centralized
5	manufacturing (food and healthcare)	very large	USA		centralized	hybrid
6	manufacturing (food and healthcare)	very large	Europe		centralized	centralized
9	manufacturing (household and industrial)	very large	USA		centralized	centralized
13	manufacturing (household and industrial)	large	Europe	USA	decentralized	decentralized
1	pharmaceutical	very large	Europe		centralized	hybrid
10	pharmaceutical	very large	Europe	Europe	decentralized	decentralized

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Table 2: Interviews

Company #	Industry	Organizational size	structure of IP department	structure of R&D	Key informants	Confirmatory informants
3	healthcare (medical technology)	very large	decentralized	hybrid	Senior IP counsel (2 interviews)	
8	healthcare (medical technology)	large	centralized	centralized	Head of IP Department (1 interview)	
11	healthcare (medical technology)	large	centralized	centralized	Head of IP Department (1 interview)	
12	healthcare (medical technology)	very large	decentralized	decentralized	Head of IP Department (1 interview)	
2	IT	very large	centralized	centralized	1) General Counsel of IP (2 interviews); 2) Director of IP Strategy (1 interview)	
7	IT	very large	centralized	hybrid	1) Head of legal IPR (1interview); 2) Group IP manager (1 interview)	Senior IP attorney
14	IT	large	decentralized	hybrid	Head of IP Department (1 interview)	
15	IT	very large	centralized	decentralized	Senior IP attorney (1 interview)	
16	IT	very large	centralized	decentralized	Director, Patent Strategy and Portfolio Management (1 interview)	
17	IT	very large	decentralized	decentralized	Director, Legal & Intellectual Property, Device Concepts & Technology (1 interview)	Senior IP attorney
4	manufacturing (electrical machinery and apparatus)	very large	centralized	decentralized	1) head of IPR (1 interview); 2) senior licensing attorney (2 interviews)	Senior IP attorney
18	manufacturing (electrical machinery and apparatus)	large	centralized	centralized	Head of IP Department (1 interview);	Senior IP attorney
5	manufacturing (food and healthcare)	very large	centralized	hybrid	1) Head of IP Department (2 interviews) ; 2) VP, IP Department (1 interview)	Senior IP attorney
6	manufacturing (food and healthcare)	very large	centralized	centralized	Head of IP Department (2 interviews)	
9	manufacturing (household and industrial)	very large	centralized	centralized	Head of IP Department (1 interviews)	
13	manufacturing (household and industrial)	large	decentralized	decentralized	Head of IP Department (1 interview)	Senior IP attorney
1	pharmaceutical	very large	centralized	hybrid	1) Head of IP Department (1 interview) ; 2) VP, IP Department (1 interview)	
10	pharmaceutical	very large	decentralized	decentralized	1) Senior licensing manager (1 interview); 2) Senior patent attorney (1 interview)	Senior IP attorney

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Table 3: Functions of IP departments

		Organizational Structure		Functions	
Company #	Industry	structure of IP department	structure of R&D	patenting	licensing
3	healthcare (medical technology)	decentralized	hybrid	x	
8	healthcare (medical technology)	centralized	centralized	x	
11	healthcare (medical technology)	centralized	centralized	x	
12	healthcare (medical technology)	decentralized	decentralized	x	
2	IT	centralized	centralized	x	x
7	IT	centralized	hybrid	x	
14	IT	decentralized	hybrid	x	
15	IT	centralized	decentralized	x	x
16	IT	centralized	decentralized	x	x
17	IT	decentralized	decentralized	x	x
4	manufacturing (electrical machinery and apparatus)	centralized	decentralized	x	x
18	manufacturing (electrical machinery and apparatus)	centralized	centralized	x	
5	manufacturing (food and healthcare)	centralized	hybrid	x	
6	manufacturing (food and healthcare)	centralized	centralized	x	
9	manufacturing (household and industrial)	centralized	centralized	x	
13	manufacturing (household and industrial)	decentralized	decentralized	x	x
1*	pharmaceutical	centralized	hybrid	x	x
10*	pharmaceutical	decentralized	decentralized	x	x

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Table 4: Willingness to license and licensing teams

		Organizational Structure		Functions		Licensing teams			Propensity to license	
Company #	Industry	structure of IP department	structure of R&D	Patenting	licensing	negotiators team	ad-hoc team	very high	high	low
3	healthcare (medical technology)	decentralized	hybrid	x			x		x	
8	healthcare (medical technology)	centralized	centralized	x			x		x	
11	healthcare (medical technology)	centralized	centralized	x			x	x		
12	healthcare (medical technology)	decentralized	decentralized	x			x		x	
2	IT	centralized	centralized	x	x	x		x		
7	IT	centralized	hybrid	x			x		x	
14	IT	decentralized	hybrid	x			x		x	
15	IT	centralized	decentralized	x	x	x		x		
16	IT	centralized	decentralized	x	x	x		x		
17	IT	decentralized	decentralized	x	x	x				
4	manufacturing (electrical machinery and apparatus)	centralized	decentralized	x	x	x		x		
18	manufacturing (electrical machinery and apparatus)	centralized	centralized	x			x			x
5	manufacturing (food and healthcare)	centralized	hybrid	x			x			x
6	manufacturing (food and healthcare)	centralized	centralized	x			x		x	
9	manufacturing (household and industrial)	centralized	centralized	x			x			x
13	manufacturing (household and industrial)	decentralized	decentralized	x	x	x		x		
1*	pharmaceutical	centralized	hybrid	x	x	x		x		
10*	pharmaceutical	decentralized	decentralized	x	x	x		x		

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