Patent Valuation and Knowledge Sourcing

Peder Veng Søberg (pvs@mp.aau.dk)
Aalborg University, Department of Materials and Production

Abstract

The paper links the patent valuation literature with the knowledge sourcing literature. The paper suggests "the shortness of claims method" for identifying new knowledge suppliers. The method is developed by comparing some of the most valuable patents in history with less valuable patents. The method can identify valuable patents earlier than existing patent analysis methods can and hence identify interesting knowledge suppliers. Unlike existing methods, the present method thereby enables identification of the most promising knowledge suppliers before the knowledge of these potential knowledge suppliers has become outdated and redundant.

Keywords: Patent value, Knowledge Sourcing, Patent Evaluation

Introduction

"We can afford to lose money, but not time" (internal slogan at a globally leading packaging company mentioned by a young R&D manager of the company during an interview).

Companies want to stay ahead of their competitors. The above slogan indicates that the loss of money is often admissible as long as time is not lost that can be used to stay ahead of the game. Many companies have given up maintaining all the capabilities needed to satisfy their customers and users. Instead, they source knowledge from the best knowledge suppliers they can identify. Companies can make use of external knowledge in many ways (Han and Bae, 2014), but first, they need to identify where this knowledge is available.

Many factors influencing the outcome of strategic alliances have been investigated (Sambasivan et al., 2013), yet how to find the right knowledge suppliers initially have received little attention in the literature. When attempting to identify new knowledge suppliers, most companies tend to make use of their "know who" (Harryson, 2006) as opposed to other types of available sources. The use of existing social capital to identify new knowledge suppliers will often leverage good results, and it does not necessarily require much time. However, since diversity often benefits creativity (Beeby and Booth, 2000), it is beneficial to consider knowledge suppliers beyond the personal networks of the company. The potential for better innovative outcomes improves when companies look beyond their existing social capital.

For companies, which wish to team up with excellent knowledge suppliers, it is important to identify such promising knowledge suppliers continuously. Companies that can create valuable inventions are more interesting collaboration partners, than

companies that are unable to do so. Inventions are heavily documented in patents. Small companies increasingly file patents, which makes the patent literature relevant for big companies to search for smaller collaboration partners. That is if the tools needed to do so are available.

Patents function strategically as both a major appropriability mechanism and as a performance indicator for innovation (Cohen et al., 2000). Within the fields of innovation management and international business, the patent literature is often used in studies where it is relevant to evaluate innovative activity. It may also be relevant to make use of the patent literature to identify potential knowledge sourcing partners (Jeon et al., 2011; Geum et al., 2013).

Not only does the patent literature contain a lot of technical information, which is publicly available only in the patent literature. The patent literature also contains implicit assessments of the quality and value of this information, and thereby of the quality of the knowledge, and the skills of those contributing this information in filed patents. It can, therefore, serve to identify and assess potential knowledge suppliers. These implicit assessments are made by patent granting institutions, but also by other inventors filing patents. The patent literature is, therefore, a shortcut to multiple perspectives on potential knowledge suppliers.

The existing methods for evaluating the value of patents require a large time span before the evaluation methods can be applied, and they are therefore of little use for practitioners (in line with the initially mentioned slogan). This means that often the existing methods for evaluating the value of patents can only be used once the implicit knowledge behind the patents has already become more or less outdated. Thereby those filing such patents are most often no longer relevant knowledge suppliers. This does not mean that the patent literature is useless to identify knowledge suppliers. However, it is necessary to develop methods whereby the most valuable patents can be identified earlier on than existing methods for evaluating the value of patents can do. Therefore, this paper sets out to investigate aspects of patent value that can be used to identify potential knowledge suppliers as soon as a patent is published. Whereas existing methods can only evaluate the value of patents many years after they were originally filed, this paper provides a method, which can evaluate the value of patents much earlier than existing methods.

This paper suggests a method for estimating patent value that delivers sooner evaluation than existing methods. The relatively few patents that have value (Giuri et al., 2007) are likely cited in other patents (Harhoff et al., 2003; Fabry et al., 2006; Davis, 2008; Ernst and Omland, 2011; Giuri et al., 2007). A drawback of using patent citations to estimate patent value is that normally publication happens 18 months after filing. Therefore, normally patent citations refer to patents that are already at least three years old. Using citations enables identification mostly only of patents that used to be valuable. The companies developing such technology may no longer be technology leaders and no longer relevant collaboration partners or knowledge suppliers. To find valuable patents sooner than that requires new methods able to find valuable young patents.

Existing methods evaluating patent value disregard the claims. Milanez et al. (2017) suggest claims-based indicators for monitoring technological advances but disregards value evaluation based on patent claims. The patent claims are closely related to the value. In a patent claim, being wordy (i.e., describing things at length) increases the risks of mistakes in the wording that reduces the value of the patent.

Theoretical framework

Claim scope and claim validity are natural enemies (Goldstein, 2013). Claims define the scope of the rights granted to inventors resulting from filed patents. Intuitively inventors should want their patent claims worded in the broadest possible way. However, patent legislation around the world requires every aspect of a patent claim to be inventive. Any overlap with prior art invalidates the entire claim. Prior art concerns any documentation or anything that exists and is, or has been publicly available anywhere at the time a patent application is filed. So the inventor needs a claim that is as broad as possible without overlapping with the prior art. The challenge is then to word patent claims accordingly.

Valuable patents have claims below average in length when compared to other patents in the same reference group. The longer the patent claim, the more likely it misses the balance between validity and scope that maximizes its value. Patents can be too long and thereby excessively increase the scope of the patent, but wordy descriptions may also include details that against the intention over-specifies the patent and excessively reduces its scope. An excessively lengthy patent is difficult or costly to defend. Increasing the scope of a patent entails opportunity costs. An inventor may get away with getting a patent that has a broad scope that overlaps prior art, however, in case of litigation this will likely be exposed and result in no profits to the inventor, but instead only filing costs for the inventor and litigation costs for everyone.

Methods other than relying on forward citations are needed if we want to find valuable patents sooner than three years after their publication. It is true that the relatively few patents that have value (Giuri et al., 2007) are likely cited in other patents (Harhoff et al., 2003; Fabry et al., 2006;Davis, 2008; Ernst and Omland, 2011; Giuri et al., 2007), but this happens only a long time after they have been published. Usually, a patent is only publicly available 18 months after it was originally filed. Another 18 months pass before publication of a patent citing another patent. Therefore, patent citations refer to patents that are already at least three years old. It is likely to take many years before it is clear which patents are particularly cited in other patents.

The relatively few patents that have value (Giuri et al., 2007) are likely cited in other patents (Harhoff et al., 2003; Fabry et al., 2006; Davis, 2008; Ernst and Omland, 2011; Giuri et al., 2007), but only long time after they have been published. The number of forward citations in a patent is relevant regarding evaluating the value of the patent. A drawback related to using patent citations is that it takes a long time before a patent is cited. Usually, a patent is only publicly available 18 months after it was originally filed. Therefore, patent citations refer to patents that are already at least three years old. It is likely to take many years before it is clear which patents are particularly cited in other patents. Other methods are needed than relying on patent citations as an indicator to find valuable patents sooner than that.

Much technology is outdated after three or more years, and the companies that are developing such technology may no longer be technology leaders within their relevant fields. Hence, these companies are no longer interesting collaboration partners or knowledge suppliers. Therefore, to use the patent literature to identify promising knowledge suppliers, new methods for evaluating the value of patents are needed. Such methods should enable search in newly published patents as opposed to old patents only.

A common denominator of the existing methods for evaluating the value of patents is that they largely disregard the claims. As the words indicate, the patent claims outline what is claimed in the patent. The claims are thereby closely related to the value of the patent. The notion that the shorter the claims are, the more valuable is the patent has so

far received no scholarly attention. In a patent claim, being wordy (i.e., describing things at length) often means being too specific and thus allowing too many opportunities for subsequent inventors or other practitioners to work around the invention in the patent.

On the other hand, the patent needs to be specific enough that it does not focus on something that is already known in the prior art. If a patent claim overlaps with prior art, it is invalid. If a claim is only partly new, the entire claim is invalid.

Patent scope and broadness is related. Claim validity and claim scope are natural enemies. A broad scope may catch many infringers but is also subject to being invalidated if prior art overlaps with the claim. This is negative for the value of the patent. Patent practitioners are aware of this and attempt to avoid too much specificity in the claims. However, the patent examiners, that grant or reject patents, force patent applicants to be specific if existing prior art (existing inventions or information which is or has been publicly available) necessitates that the scope of a patent is narrowed. Such narrowing of claims often lengthens the claim sets.

Therefore, this study sets out to explore the notion that the shorter the claims the higher the patent value, and hence the more relevant a potential knowledge supplier is behind the patent. This is because short claims are related to higher value of the patent, and most likely, the more relevant is the inventing company as a knowledge supplier, as illustrated in Figure 1.

Figure 1: The link between the length of patent claims, patent value, and relevance as knowledge supplier of the inventor

Patents that have been successfully defended in court have proven their value. However, only few of the overall number of patents are ever subject to litigation. Therefore, other metrics of patent value are more relevant.

The patent literature is relevant to identify potential knowledge sourcing partners (Jeon et al., 2011; Geum et al., 2013). Text mining can be used for this purpose (Jeon et al., 2011). However, it usually precludes distinguishing between valuable and less valuable patents. Most patents are not worth anything. It is very important to use search methods that distinguish between valuable patents and patents that are not valuable due to the number of patents available to search in. If this is not done, the amount of patents it is necessary to peek through becomes excessive and not feasible for practitioners because it takes too much time. Methods for evaluating the value of patents are relevant to identify which companies file the most valuable patents, and thereby implicitly constitute the most promising potential knowledge suppliers.

Companies that wish to find companies working within the same or related fields as themselves can look in the patent literature for co-citation linkages, which exist when two patents are both cited in a single subsequent patent (Breitzman and Mogee, 2002). Co-citation linkages are thus relevant to identify companies that are active in similar areas. However, companies having complementary capabilities may constitute better and more relevant knowledge suppliers. Therefore, it is relevant to look beyond co-citation linkages when attempting to identify new knowledge suppliers, using the patent literature.

The hypotheses follow from the arguments outlined previously in the theoretical framework:
Hypothesis 1: *the shorter the claims, the more valuable the patent.*
Hypothesis 2: inverse length of patent claims better predicts patent value than does patent citations

Implications

If shorter claims predict patent value has received no scholarly attention. If too much time needs to pass from patent filing until its value can be assessed, in the mean time one can be left with only knowledge about what was or could have been valuable because technology has since changed and the value is gone. The findings of this paper are relevant to get more value out of patent data in general. It allows better indications of patent value sooner than existing methods. The findings of this paper make patent databases relevant as a source for identifying potential knowledge suppliers when they are still at the cutting edge.

Conclusion

Existing methods of patent value analysis enable search for knowledge suppliers only in patents published many years ago. The knowledge of such potential knowledge suppliers is thereby often outdated when they can be identified using existing patent value analysis tools. The shortness of claims method enables identification of knowledge suppliers using recently published patents. Some valuable patents may be overlooked when disregarding patents having relatively longer claims when compared within the same subgroup of the IPC system. However, reading all new patents is however not feasible for most companies, that wishes to identify new knowledge suppliers, using the literature of recently published patents. The shortness of claims method outlined in this paper can serve as a tool to limit the number of irrelevant patents to look through before relevant patents and inventors are identified when searching among recently published patents. Put simply, when searching for the best and newest prince on the market, (best knowledge supplier whose knowledge has not already decayed), the shortness of claims method helps to reduce the number of frogs kissed in the search process.

Acknowledgments

The author is grateful to the support provided by the Danish Industry Foundation (Industriens Fond) in relation to the project System Suppliers as Generators of Growth (Systemleverandører som vækstaccelerator). The author is also grateful for the support provided by Sino Danish Research Center (SDC).

References

Beeby, M. and Booth C. (2000), "Networks and inter-organizational learning: a critical review", *The Learning Organization,* Vol. 7, No. 2, pp. 75-88.

Breitzman, A. F. and Mogee M. E. (2002), "The many applications of patent analysis", *Journal of Information Science,* Vol. 28, No. 3, pp. 187-205.

Cohen, W., Nelson R. and Walsh J. (2000), *Protecting their intellectual assets: Appropriability conditions and why US manufacturing firms patent (or not),* National Bureau of Economic Research Cambridge, Mass., USA

Davis, L. (2008), "Licensing Strategies of the New "Intellectual Property Vendors"", *California Management Review,* Vol. 50, No. 2, pp. 6-30.

Ernst, H. and Omland N. (2011), "The Patent Asset Index – A new approach to benchmark patent portfolios", *World Patent Information,* Vol. 33, No. 1, pp. 34-41.

Fabry, B., Ernst H., Langholz J., et al. (2006), "Patent portfolio analysis as a useful tool for identifying R&D and business opportunities—an empirical application in the nutrition and health industry", *World Patent Information,* Vol. 28, No. 3, pp. 215-225.

Geum, Y., Lee S., Yoon B., et al. (2013), "Identifying and evaluating strategic partners for collaborative R&D: Index-based approach using patents and publications", *Technovation,* Vol. 33, No. 6–7, pp. 211-224.

Giuri, P., Mariani M., Brusoni S., et al. (2007), "Inventors and invention processes in Europe: Results from the PatVal-EU survey", *Research Policy,* Vol. 36, No. 8, pp. 1107-1127.

Goldstein, L. M. (2013), *True Patent Value: Defining Quality in Patents and Patent Portfolios* True Value Press (Selfpublished)

Han, S. Y. and Bae S. J. (2014), "Internalization of R&D outsourcing: An empirical study", *International Journal of Production Economics,* Vol. 150, No. 0, pp. 58-73.

Harhoff, D., Scherer F. M. and Vopel K. (2003), "Citations, family size, opposition and the value of patent rights", *Research Policy,* Vol. 32, No. 8, pp. 1343-1363.

Harryson, S. (2006), *Know Who Based Entrepreneurship: From Knowledge Creation to Business Implementation,* Edward Elgar Publishing Cheltenham.

Jeon, J., Lee C. and Park Y. (2011), "How to use patent information to search potential technology partners in open innovation", *Journal of Intellectual Property Rights,* Vol. 16, No. 5, pp. 385-393.

Milanez, D. H., Faria L. I. L. d., Amaral R. M. d., et al. (2017), "Claim-based patent indicators: A novel approach to analyze patent content and monitor technological advances", *World Patent Information,* Vol. 5064-72.

Sambasivan, M., Siew-Phaik L., Abidin Mohamed Z., et al. (2013), "Factors influencing strategic alliance outcomes in a manufacturing supply chain: Role of alliance motives, interdependence, asset specificity and relational capital", *International Journal of Production Economics,* Vol. 141, No. 1, pp. 339-351.