

Association for Information Systems AIS Electronic Library (AISeL)

AMCIS 2009 Proceedings

Americas Conference on Information Systems
(AMCIS)

2009

A Resource Based View of Business Method Patents

Nancy L. Martin

Southern Illinois University, nlmartin@siu.edu

David T. Green

Governors State University, david.t.green@gmail.com

Follow this and additional works at: <http://aisel.aisnet.org/amcis2009>

Recommended Citation

Martin, Nancy L. and Green, David T., "A Resource Based View of Business Method Patents" (2009). *AMCIS 2009 Proceedings*. 493.
<http://aisel.aisnet.org/amcis2009/493>

This material is brought to you by the Americas Conference on Information Systems (AMCIS) at AIS Electronic Library (AISeL). It has been accepted for inclusion in AMCIS 2009 Proceedings by an authorized administrator of AIS Electronic Library (AISeL). For more information, please contact elibrary@aisnet.org.

A Resource-Based View of Business Method Patents

Nancy L. Martin
Southern Illinois University
nlmartin@siu.edu

David T. Green
Governors State University
david.t.green@gmail.com

ABSTRACT

In recent years, patents have become widely popular for protecting software-based business methods. However, the IS literature has yet to consider the potential influence of patents in the IS-firm performance relationship. At the same time, the resource-based view (RBV) of the firm has proven to be a useful lens through which to examine the IS-firm performance relationship. In organizational strategy literature, various measures of patents are frequently utilized as proxies for components of the RBV or as the dependent variable in RBV studies. Following in this vein, the purpose of the current study is to examine whether software-based business method patents fit the definitions prescribed in the RBV and if such patents can be empirically connected to a firm's performance.

Keywords

Business method patents, resource-based view, IT strategy, firm performance

INTRODUCTION

Information systems (IS) scholars have long been interested in understanding the IS-firm performance relationship. How firms are able to leverage their strategic use of IS is still considered an underdeveloped area of research (Dehning, B. and Richardson, V. J., 2002). To address this lack of understanding, some researchers have utilized the resource-based view (RBV) of the firm as a lens through which to examine the IS-firm performance relationship (e.g. Bharadwaj, A., 2000; Santhanam, R. and Hartono, E., 2003). The RBV is based on the premise that firms compete through a unique set of resources that are valuable, rare, difficult to imitate and non-substitutable (Barney, J., 1991).

In recent years, patents have become widely popular for protecting software-based business methods. These types of patents should be of particular interest to IS scholars, since so many of them involve software-based implementations. However, the IS discipline has yet to consider the potential influence of patents in the IS-firm performance relationship.

In other academic disciplines such as economics and organizational strategy, patent data are routinely used to study various measure of firm performance. Moreover, patents have frequently been utilized as proxies for components of the RBV or as the dependent variable in RBV studies (e.g. Balkin, D. B., Markman, G. D. and Gomez-Mejia, L. R., 2000; Markman, G. D., Espina, M. I. and Phan, P. H., 2004; Silverman, B. S., 1999).

The purpose of this paper is to examine whether software-based business method patents fit the definitions prescribed in the RBV and if such patents can be linked to a firm's performance and potential sustained competitive advantage. The next three sections provide a literature review of the RBV relative to IS and patents in general, and a brief background on business method patents in particular. Following that, conceptual arguments are made for two propositions related to business method patents. The paper concludes with a discussion of the planned research methodology and options for empirical extensions.

RESOURCE-BASED VIEW IN IS

The RBV argues that firms possess a heterogeneous set of resources and that certain attributes of those resources may enable the firm to achieve competitive advantage and possibly long-term superior performance (Barney, J., 1991; Grant, R. M., 1991; Penrose, E. T., 1959; Wernerfelt, B., 1984).

Resources have been defined many ways, for example, as competencies (Prahalad, C. K. and Hamel, G., 1990), skills (Grant, R. M., 1991), and strategic assets (Amit, R. and Schoemaker, P. J. H., 1993). Barney (1991) describes resources as physical capital resources, human capital resources, or organizational capital resources. Organizational capital resources are comprised of a firm's structure and systems, intellectual property rights such as trademarks and patents, and other organization-level intangible assets.

Moving beyond the basic resource definitions, the RBV posits that resources which are valuable and rare, and whose benefits can be appropriated by the controlling firm, may provide the firm with a temporary competitive advantage. Furthermore, if

the firm is able to protect the resources from imitation, transfer or substitution, it may be able to sustain the competitive advantage over a longer period of time (Barney, J., 1991; Grant, R. M., 1991; Penrose, E. T., 1959; Wernerfelt, B., 1984).

A resource is valuable when it effectuates strategies that improve a firm's efficiency or effectiveness. Resources are considered rare when few competing firms control them. Inimitability is a measure of competitors' ability to duplicate the resource. Non-substitutability exists when competitors have no strategic equivalents of the resource (Barney, 1991).

In the IS literature, the RBV has provided a robust framework for analyzing whether and how IS may be related to competitive advantage. A number of studies have established conceptual and empirical links between IS and various complementary assets (e.g. Mata, F. J., Fuerst, W. L. and Barney, J., 1995; Powell, T. C. and Dent-Micallef, A., 1997; Ross, J. W., Beath, C. M. and Goodhue, D. L., 1996). More recently, Bharadwaj (2000) established IT capability as a firm level resource consisting of a firm's information technology (IT) infrastructure, human IT skills, and its ability to leverage IT. She was able to show that firms with high IT capability outperform similar firms in several profit and cost-based measures. Santhanam and Hartono (2003) replicated Bharadwaj's and additionally found evidence to suggest that IT capability does indeed have a sustained impact on firm performance. Wade and Hulland (2004) provide a comprehensive review of the use of the RBV in IS research.

RESOURCE-BASED-VIEW AND PATENTS

In other disciplines such as economics and strategy, patent data is commonly used to study a variety of issues from industry-level productivity to firm level innovation, financial performance, and firm market value. For example, in a panel study of nearly 300 firms, the number of patents owned was positively associated a firm's return on assets (ROA) and sales (Artz, K. W., Norman, P. M. and Hatfield, D. E., 2003). Relative to the RBV, patents are used as surrogates for firm-specific capabilities and innovativeness (e.g. Bogner, W. C. and Bansal, P., 2007) because by definition patents are only awarded to original, non-obvious designs that represent improvements over existing technology. The U.S. Patent and Trademark Office (USPTO) is responsible for granting patent protection on new, useful and nonobvious inventions. Once a patent is granted, the owner is entitled to 20 years of infringement protection from competitors. This legal protection is designed to reward inventors and to act as a stimulus to innovation.

Many studies utilize patent counts, patent citations and patent claims. A *citation* is a reference to some earlier patent. Each patent application must list references to earlier patents and other "prior art" that it is built upon. It is generally believed that the more a patent is cited, the more valuable it becomes (Trajtenberg, M., 1990). Additionally, each patent contains claims. *Claims* define the scope of the patented invention and distinguish it from the surrounding technological territory, similar to the boundaries in a deeded property. Some scholars argue that broad patents, those with more claims, are of greater value (Lerner, J., 1994), while others believe that narrower breadth leads to higher value (Lanjouw, J. O. and Schankerman, M., 2001).

BUSINESS METHOD PATENTS

One class of patents is of particular interest to the current study: business method patents. Business method patenting is a relatively recent phenomenon. The USPTO created patent class 705 specifically for business method inventions in 1997. Class 705 is a collection of more than 20 financial and management data processing areas including, but not limited to, insurance, stock/bond trading, health care management, reservation systems, computerized postage meter systems and more general enterprise functions such as electronic shopping, auction systems, and business cryptography (USPTO, 2000). Amazon.com's patent of their one-click ordering system is a well known example of a software-based business method patent. Other familiar examples of business method patents include Priceline.com's patent for "name your price" reverse auctions and Doubleclick's patent for Internet advertising.

Since the late 1990's, the number of patent applications in class 705 have been rising dramatically. Because these patents are often based on software systems, they should be of particular interest to IS scholars. A specific call for research has been made (Mykytyn, K., Mykytyn Jr., P. P., Bordoloi, B., McKinney, V. and Bandyopadhyay, K., 2002); however, to date, only one empirical study focused on business method patents has been identified in the IS literature (Boscaljon, B., Filbeck, G. and Smaby, T., 2006).

BUSINESS METHOD PATENTS AND THE RBV

Value and Rarity

According to the RBV, competitive advantage is derived from resources that are simultaneously valuable, rare, inimitable and non-substitutable (Barney, J., 1991). If a resource does not possess these four attributes, then by definition, it can be easily neutralized by competitors.

Following earlier scholars, we argue that by definition, patents are valuable and rare (Markman, G. D. et al., 2004). Granted all resources are not valuable and rare, but in our case, business method patents, by design, represent important and unique assets. We can utilize the requirements of patent law to further refine our position.

Business method patents are not awarded without proving the invention's merit. Patent law requires that four tests be met for a business method to be patentable:

1. The way of doing business must be useful;
2. It has to be new. The USPTO does not issue patents for old business methods simply converted to electronic form;
3. It cannot be so incremental that it would be obvious to a skilled practitioner; and
4. In the application process, disclosure of the innovation has to be so complete that fellow practitioners can understand it.

A patent application is filed on behalf of designs that are considered valuable by their owner. Patent rule 1 states that the method must be useful. Firms would not invest the time and capital necessary to patent designs that were not considered valuable and useful to the firm. Firms secure patents to protect the value of their IS development expenditures and their technical knowledge. Therefore patents represent firm-specific capabilities and processes to invent, innovate and discover new wealth-generating opportunities. Patents are valuable to the owner because they may confer first-mover advantages, licensing fees or other future options. Moreover, the patenting process may be accompanied by high legal fees necessary to obtain the patent, incrementally improve upon the patent and to fight patent infringements (Rivette, K. G. and Kline, D., 2000) which increase the patent's value to its owner.

Patent rules 2 and 3 establish rarity. The innovation must be new and unique to be considered for patenting. Therefore, patents are only issued to rare inventions. Furthermore, the design cannot be small or simple improvements to existing technology, but rather must be something so unique as to appear obscure to professionals in the field. Firms capable of securing pioneering patents may be able create legal monopolies over unique uses of technology that can be defended as business methods. For example, Amazon's one-click ordering system could easily be replicated using different software platforms or programming languages, but the concept of one-click ordering is protected by patent.

Inimitability

The RBV posits that a resource can only be a source of *sustained* competitive advantage if it is inimitable and non-substitutable. Barriers for imitators are created by patent protection since patents preclude competitors from using the same business method without permission from the patent owner. This feature could potentially lengthen first-mover advantages. Firms that enjoy a first-mover advantage in the form of patent protection for a business method can abate their competitors' inventive efforts for a similar design. Potential competitors can either litigate to invalidate that patent, attempt to find pathways around it, or enter licensing agreements with the patent owner.

The inimitable nature of patents is also reflected in the many examples of patent infringement lawsuits. An early example related to business method patents unfolded in 1977 when Merrill Lynch introduced its Cash Management Account (CMA) system and by 1982 had been issued a patent for the technology. Paine Webber challenged the validity of the patent but the challenge was rejected in court. In another case, Merrill Lynch sued Dean Witter for patent infringement and eventually won a one million dollar settlement. Not only was the CMA patent valuable to Merrill Lynch, but the fact that it was upheld through two court actions supports the notion that patents confer inimitability.

One way to evaluate the inimitability of patents is in the number of citations they generate. For example, in the manufacturing industry, Heely and Jacobson (2003) found that the stock market anticipates favorable performance for owners of patents when those patents are followed by a high number of internal (same firm) patent citations. In this case, it is believed that high internal patent citation counts reflect the firm's ability to build upon the patented innovation, and this, in

turn, can affect the firm's future profitability. In the case of business method patents, higher numbers of internal citations should reflect the owning firm's intention to continue to innovate around the patented business method.

Patents are inimitable by nature since imitation of patented technology is illegal. The protection provided by a patent creates a barrier that competitors must overcome if they want to remain competitive around that type of innovation. The outcome of inimitability is that competitors must spend time and capital to develop legal pathways around the protected space if they want to compete on similar terms. Therefore, we posit that the inimitable nature of business method patents will be reflected in the owner firms enjoying superior performance relative to their competitors and industries. This leads to our first proposition:

P1: Ownership of business method patents will be positively related to superior performance.

Non-Substitutability

Non-substitutability is achieved when it is too costly for competitors to develop new designs around existing patents. One way in which firms raise substitution costs for competitors is by accumulating a stock of patents. Collections of patents may form patent "thickets" or "fences" (Reitzig, M., 2004). Thickets are pools of patents surrounding a particular invention. The patents may be owned by different firms and be used as bargaining chips in licensing agreements and strategic partnerships. But when one firm owns the stock of patents and the thicket is used primarily to exclude competitors, patent fences are formed.

The value of patent fences as a strategy has been supported empirically in U.S. manufacturing firms (Cohen, W. M., Nelson, R. R. and Walsh, J. P., 2000). These authors suggest that patentees can eliminate competition in the form of substitute technologies through patent fencing. Therefore, the more legal protection granted from patents, the more difficult it should be for a competitor to create a perfect substitute. The accumulation of multiple patents may be a source of sustained competitive advantage since a set of strategic assets is much less likely to be substitutable than a single asset.

Another method of evaluating the substitutability of a patent is in the number of claims it contains. Some scholars have suggested that the number of claims is a underutilized indicator of patent value (Lanjouw, J. O. and Schankerman, M., 2001). The authors discovered that patents with more claims were more often litigated and reasoned that these patents provided a higher level of non-substitutability than patents with a lesser number of claims because if competitors could find suitable substitutes, then litigation would not be necessary.

This discussion suggests that additional patents and patents with more claims may provide greater value for firms. These features of patents represent the firm's control of its competitors' abilities to substitute for the patented invention. It is likely that firms that enjoy the protection of a collection of patents, a patent fence, will maintain a level of performance above their competitors. Moreover, if those patents are broadly claimed, they tend to be litigated more often. To the extent that a collection of patents can protect a business method from substitution, those patents will likely contribute to the owner firm's sustained competitive advantage. This argument is summarized following proposition:

P2: Ownership of a broad collection of patents will be positively associated with superior performance.

RESEARCH METHODOLOGY

To test the two propositions, dependent variables for performance can be implemented through a number of measures. Some patent studies have found success in focusing on either a firm's net income or return on assets (Artz, K. W. et al., 2003; Markman, G. D. et al., 2004). A second option for performance measure is the firm's market value (Coombs, J. E. and Bierly III, P. E., 2006).

The first proposition suggests that if firms own business method patents, they will enjoy superior performance. This proposition is intended to represent the RBV tenet of inimitability. Among firms that do acquire business method patents, it is likely that firms with a higher number of internal patent citations will outperform patenting firms with fewer or no internal citations since more internal citations reflects continued innovation around the protected business method.

To test the proposition, the independent variable will be represented by the number of citations that a firm's patents generate. Citation counts have been shown to reflect the value of the patent, i.e. higher citation rates mean greater value. A high citation rate has also been linked to exceptionally discrete inventions (Jaffe, A. B., Trajtenberg, M. and Forgarty, M. S., 2000), meaning that highly cited patents create exceptionally high barriers for potential imitators. Another potential way to operationalize inimitability is to count the number of or calculate the dollar value of litigations.

The second proposition predicts that firms with an accumulation of patents and/or with broad patents will have superior performance. This proposition represents the RBV tenet of non-substitutability. Firms that create patent fences around a technology can severely limit options of other firms to compete in that design space. This facet of non-substitutability will be operationalized by counting the number of patents, business method patents in particular, that a firm owns. A second measure of non-substitutability will be operationalized as the average number of claims contained in the firm's patent portfolio.

Data collection is underway to begin the empirical implementation of this study. We are developing a unique dataset of all class 705 patents issued through the end of 2005. The necessary patent data elements are available through the USPTO's website. Firm performance data will be collected from the COMPUSTAT dataset. Firm size and past performance will be considered as control variables in a hierarchical regression analysis utilizing the dependent and independent measures we have outlined.

DISCUSSION

Since the late 1990's, the number of business method patent applications and awards has risen dramatically and these patents have become a mainstream topic in the trade press. Since many business method patents cover implementations in software or web applications, they should be of particular interest to IS scholars. Yet, IS literature has not fully examined their effects on firm performance.

The RBV can be a powerful tool with which to explore firm-specific resources, and has been proposed as a framework through which to investigate the business method patent-firm performance relationship. Management disciplines have made extensive use of the RBV to investigate if and how certain resources impact firm performance. We have argued that patents represent a simultaneously valuable, rare, inimitable and non-substitutable resource, a true strategic asset (Michalisin, M. D., Smith, R. D. and Kline, D. M., 1997). The RBV may enable us to directly link business method patents to short term and long term competitive advantage measured in firm performance. Furthermore, a direct measure of the RBV has yet to appear in the IS literature (Wade, M. and Hulland, J., 2004), but this paper provides a first step in that direction.

CONCLUSION

Although firms control many resources, not all will be considered strategic for the purpose of creating and sustaining competitive advantage. This paper has focused on a specific resource, the business method patent, and outlined how that resource might be explored through the RBV framework. We have defended the position that patents are rare and valuable by nature and we have operationalized inimitability and non-substitutability by following the lead of management researchers (Markman, G. D. et al., 2004). Perhaps most importantly, we have designed an empirical study that may help to identify the firm performance effects of owning business method patents.

REFERENCES

1. Amit, R. and Schoemaker, P. J. H. (1993) Strategic assets and organizational rent. *Strategic Management Journal* 14, 1, 33-46.
2. Artz, K. W., Norman, P. M. and Hatfield, D. E. (2003) Firm performance: A longitudinal study of R&D, patents, and product innovation, in *Proceedings of the Academy of Management Annual Meeting*. Seattle, WA, B1-B6.
3. Balkin, D. B., Markman, G. D. and Gomez-Mejia, L. R. (2000) Is CEO pay in high-technology firms related to innovation?, *Academy of Management Journal* 43, 6, 1118-1129.
4. Barney, J. (1991) Firm resources and sustained competitive advantage. *Journal of Management* 17, 1, 99-120.
5. Bharadwaj, A. (2000) A resource-based perspective on information technology capability and firm performance: An empirical investigation. *MIS Quarterly* 24, 1, 169-196.
6. Bogner, W. C. and Bansal, P. (2007) Knowledge management as the basis of sustained high performance. *Journal of Management Studies* 44, 1, 165-188.
7. Boscaljon, B., Filbeck, G. and Smaby, T. (2006) Information content of business methods patents. *Financial Review* 41, 3, 387-404.
8. Cohen, W. M., Nelson, R. R. and Walsh, J. P. (2000) Protecting their intellectual assets: Appropriability conditions and why U.S. manufacturing firms patent (or not), National Bureau of Economic Research Working Paper No. 7552.
9. Coombs, J. E. and Bierly III, P. E. (2006) Measuring technological capability and performance. *R&D Management* 36, 4, 421-438.

10. Dehning, B. and Richardson, V. J. (2002) Returns on investments in information technology: A research synthesis. *Journal of Information Systems* 16, 1, 7-30.
11. Grant, R. M. (1991) The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review* 33, 3, 114-135.
12. Heely, M. B. and Jacobson, R. (2003) The private returns to technological capability, in *Proceedings of the Academy of Management Annual Meeting*. Seattle, WA, H1-H6
13. Jaffe, A. B., Trajtenberg, M. and Forgarty, M. S. (2000) Knowledge spillovers and patent citations: Evidence from a survey of inventors. *American Economic Review* 90, 2, 215-218.
14. Lanjouw, J. O. and Schankerman, M. (2001) Characteristics of patent litigation: A window on competition. *Rand Journal of Economics* 32, 1, 129-151.
15. Lerner, J. (1994) The importance of patent scope: An empirical analysis. *Rand Journal of Economics* 25, 2, 319-333.
16. Markman, G. D., Espina, M. I. and Phan, P. H. (2004) Patents as surrogates for inimitable and non-substitutable resources. *Journal of Management* 30, 4, 529-544.
17. Mata, F. J., Fuerst, W. L. and Barney, J. (1995) Information technology and sustained competitive advantage: A resource-based analysis. *MIS Quarterly* 19, 4, 487-505.
18. Michalisin, M. D., Smith, R. D. and Kline, D. M. (1997) In search of strategic assets. *The International Journal of Organizational Analysis* 5, 4 (October), 360-387.
19. Mykytyn, K., Mykytyn Jr., P. P., Bordoloi, B., McKinney, V. and Bandyopadhyay, K. (2002) The role of software patents in sustaining IT-enabled competitive advantage: A call for research. *Journal of Strategic Information Systems* 11, 59-82.
20. Penrose, E. T. (1959) *The theory of the growth of the firm*, Wiley, New York.
21. Powell, T. C. and Dent-Micallef, A. (1997) Information technology as competitive advantage: The role of human, business, and technology resources. *Strategic Management Journal* 18, 5, 375-405.
22. Prahalad, C. K. and Hamel, G. (1990) The core competence of the organization. *Harvard Business Review*, 68, 3, 79-93.
23. Reitzig, M. (2004) The private values of 'thickets' and 'fences': Towards an updated picture of the use of patents across industries. *Economics of Innovation & New Technology* 13, 5, 457-476.
24. Rivette, K. G. and Kline, D. (2000) *Rembrandts in the attic: Unlocking the hidden value of patents*, Harvard Business School Press, Boston.
25. Ross, J. W., Beath, C. M. and Goodhue, D. L. (1996) Develop long-term competitiveness through IT assets. *Sloan Management Review* 38, 1, 31-42.
26. Santhanam, R. and Hartono, E. (2003) Issues in linking information technology capability to firm performance. *MIS Quarterly* 27, 1, 125-153.
27. Silverman, B. S. (1999) Technological resources and the direction of corporate diversification: Toward an integration of the resource-based view and transaction cost economics, *Management Science* 45, 8, 1109-1134.
28. Trajtenberg, M. (1990) A penny for your quotes: Patent citations and the value of innovations. *Rand Journal of Economics* 21, 1, 172-187.
29. Wade, M. and Hulland, J. (2004) The resource-based view and information systems research: Review, extension and suggestions for future research. *MIS Quarterly* 28, 1, 107-142.
30. Wernerfelt, B. (1984) A resource-based view of the firm. *Strategic Management Journal* 5, 2, 171-180.