

Lean IP-Management—Savings Costs for IP Management Based on a Paradigm Change in Assessing Inventions

Oliver Baldus^{1*}, Christian Heckmann²

¹Schwarz and Baldus LLP, Munich, Germany

²Hertie School of Governance, Berlin, Germany

Email: *baldus@sb-ip.de, c.heckmann@mpp.hertie-school.org

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Abstract

Conventional lean production aims at organizing and structuring a firm in a way that waste is minimized and available resources are used most efficiently while keeping overall productivity. By adopting lean strategies, firms can produce more efficiently, economically, and ecologically for their customers, thereby increasing their own profitability and competitiveness. The “lean” concept has become well-established in the domains of production and management. However, these lean strategies have never found their way to the management of intellectual property rights, like patents. This article argues that firms stand to realize significant efficiency gains by adopting lean principles when managing their intellectual property. Lean IP Management not only has the potential to reduce inefficiency in the form of wasted economic and human capital; it can also facilitate a more coherent business strategy by leveraging IP rights only where they stand to have the greatest impact.

Keywords

IP Management, Lean IP Management, IP Strategy, Strategic Patenting, Assessing Inventions, Saving Costs

1. Introduction

Lean production by conventional definition is an integrated socio-technical system whose main objective is to eliminate waste by concurrently reducing or minimizing supplier, customer, and internal variability [1]. In this context, it prescribes the elimination of all non-value-adding activities within a system, with “value” being defined as any action or process that a customer would be willing to pay for [2]. The elimination of waste and the optimal allocation of resources

are the primary goal of “lean” [3]. By adopting a lean strategy, firms can produce more efficiently, economically, and ecologically for their customers, thereby increasing their own profitability and competitiveness.

Basic ideas of lean production can be found already at the turn of the 20th century. However, the term of lean production was coined first time in 1988 by John Krafcik [4]. Afterwards lean production ideas soon became widely known and accepted [5]. Nowadays, the “lean” concept has become well-established in almost all domains of production and management.

However, lean strategies have never been applied to the management of intellectual property rights. This article argues that firms stand to realize significant efficiency gains by adopting lean principles when managing their intellectual property. Lean IP management has the potential not only to reduce inefficiency in the form of wasted economic and human capital; it can also facilitate a more coherent business strategy by leveraging IP rights only where they stand to have the greatest impact.

2. Today's World of IP-Management

A patent is a prohibition right that grants its owner the right to exclude third parties from making, using or selling a protected invention. A patent's value is a function of, and a proxy for, the underlying invention. However, a mere patent as such has no value.

Current situation in IP management is affected by an “internal view” in which most self-made inventions of the firm are protected by patents. The internal view is governed by the idea that inventions originating from own research and development (R&D) activities should be protected regardless whether they are used by the market or not. This is based on the notion that any output resulting from R&D automatically holds some sort of value. Accordingly, patents assigned to these outputs also have some sort of an inherent value.

Firms often believe their innovations have value simply because they originated from their in-house research. This is a somewhat sentimental view, however, and problematic in context of effective IP management. Nevertheless, currently most firms take this “internal view” for their business when approaching IP rights. That is to say, the standard operating policy for many firms is to reflexively seek patent protection for all inventions developed by the firm, irrespective of their relevance to the market.

One of manifold examples could be a patent for a screw made up from a new specific material that is too expensive or complicated for mass or series production—we call it for the sake of simplicity the “golden screw” patent. Although the golden screw might have better technical properties, like thermal or electrical conductivity, compared to regular screws it is too expensive for applying it in production. In this case, there is no buyer who would be willing to pay for the “golden screw” patent, since the invention is economically non-applicable. For this reason, patents for protecting golden screws are futile and have no market perspective. The “golden screw” patent stands symbolically for all prohibition

rights that protect subject-matter that is not used by the market. Other examples include pharmaceuticals that have no market approval or can easily be substituted by other substances. In fact, millions of “golden screw” patents worldwide pollute patent registers in all technical domains.

Indeed, still nowadays many firms hold large patent portfolios with prohibition rights that will never be needed because the underlying technology has no market relevance and there never will be an infringer to these patents. Accordingly, all these patents would not find a buyer who would be willing to pay for it. Since these patents incur immense maintenance costs, they hold a negative value for the firm. As such they must be considered liabilities on the firm’s balance sheet, draining valuable financial resources from the firm without causing any economic benefit. This situation runs completely contrary to the tenets of lean production—or basic business acumen—but continues due to a poor understanding of a patent’s economic properties. While the above may seem intuitive, it is a fact that most patents still protect inventions with no direct market exposure. It is estimated that currently only 15% of all patents have relevance to the market [6]. Accordingly, 85% of current IP management are waste.

3. Tomorrow’s World of IP-Management

An external view, however, is primarily based on the market perspective of inventions and considers that a prohibition right is reasonable only, if it could be potentially exerted. Without any third party for prohibiting usage of protected invention, a prohibition right gains no traction. It grants a right to prohibit something that is not being used anyway. This corresponds to a virtual prohibition right that lacks someone who is potentially willing to use the invention. This prohibition right is running on empty. This “external view” for assessing inventions constitutes a paradigm change compared to the current situation.

The “external view” of tomorrow values IP rights based on their direct relevance to the market. It foregoes the notion of inherent value of own R&D, focusing instead on the actual market impact of patent rights. In this view, if a new technology has no relevance to the market environment, there also exist little economic arguments for protecting it from third parties. Indeed, prohibition rights are of little use, if there is no actual potential for their infringement. Like a conventional product that finds no potential buyer, a patent without a possible infringer lacks monetary value.

Consequently, a value-added patent, *i.e.* a patent with a positive monetary value, can be defined as any patent that a potential buyer would be willing to pay for. It is an actual—not a virtual—right to exclude existing third parties from the market. For a value-added patent the positive monetary value is greater than the costs incurred from the patent’s granting procedure and maintenance. Value-added-patents for inventions having market relevance can be used not only for gaining license fees or monopoly power but also as mighty weapons for forcing competitors, suppliers and demanders into favorable contracts [7] [8]. In addition, exercisable patents can intensify cooperation between firms [9]. This

allows us to derive three underlying and game changing elements for implementing and guiding a successful lean IP management.

Element 1:

“Only a patent for an invention that has relevance to a market adds value to the firm”.

Element 2:

“A patent for an invention that will never be used by the market is a liability that wastes company resources, *i.e.* a value-subtracting patent”.

Element 3:

“A value-added patent can be defined as any patent that a potential buyer would be willing to pay for”.

To develop an economical approach to IP management along the lines of lean production, it is thus crucial to adopt an external view of the firm, and to concentrate solely on inventions that have market relevance. Only patents holding tangible value in the form of being able to find anyone to buy for the patent should be pursued, whereas “golden screw” patents should consequently be abandoned.

4. Understanding Patents

Patents appear occasionally as a somewhat mysterious and obscure matter to people who are not directly involved. A patent legally defines an invention in terms of its technical features. These technical features are mentioned in so-called independent patent claims. The independent claims constitute the essential core of any patent. In general, the fewer technical features are given in an independent patent claim, the broader is the patent’s scope of protection.

A patent on “a vehicle with four wheels”, for example, is a tremendously broad scope. Indeed, firms often attempt to minimize the number of technical features in their initial independent claims in hopes of maximizing the scope of their patent. The adjudicating institutions then allow firms to successively add further qualifying technical features into the independent claims—thereby reducing the scope of the patent—in order to fulfill patent granting requirements, such as novelty or inventive step. These additional technical features are usually taken from dependent claims of the application that more narrowly specify technical features already listed in the superior independent claim.

In the example of our four-wheeled vehicle, it would invariably be determined that such vehicles already exist as state of the art. An applicant is then allowed to file a new independent claim in that further qualifying technical features are added. For instance, the applicant may choose to add the technical feature of “golden” from a dependent claim in order to fulfill granting requirements. In terms of patent law, this solution could be considered as inventive because golden wheels, for example, are non-corrosive in a certain way. Thus, the emerging patent would then cover only vehicles with four golden wheels, but no vehicles

having wheels made up from different material. This demonstrates that over the course of a filing procedure, a patent application may be reduced from having a broad scope (vehicle with four wheels), to a patent having a reduced scope (vehicle with four golden wheels), with the latter being a subset of the former. This situation is depicted in **Figure 1**.

In essence, this is the very principle of every patent granting procedure. It is extremely rare for a patent to be granted on the basis of the full subject-matter as claimed in the original filing. In other words, patents have a tendency of being reduced in scope over the course of the granting procedure.

5. Value-Adding

Lean IP management relies on firms selectively pursuing only those patents that add value to the firm. To do this, they must first determine an invention's market relevance before deciding if and how to pursue or maintain a patent for it.

The above example of a vehicle having four wheels demonstrates vividly that an invention having huge market potential (vehicle with four wheels) may easily melt down to an invention having no market potential (vehicle with four golden wheels) during granting procedure. What conclusions can be drawn from this in terms of lean IP management? How can a focus on adding value to the firm be applied in context of a lean IP portfolio?

5.1. New Lean Applications

Based on the external view, patent applications for new inventions that have no relevance to the market are a waste of financial resources right from the start. Patent applications for these inventions should not be filed at all.

If the area of market usability and the scope of patent protection are visualized in **Figure 2**, the independent claim of the new patent application does not have an intersecting set, *i.e.* overlap, with the area of market usability. Since all minor dependent claims form a subset of the superior independent claim, *i.e.* lie within the scope of the independent claim, the area of market usability can never be reached.

Although market usability is shown as an area delimited by a line, it has rather to be seen as a soft transition. In addition, the area of market usability shifts or

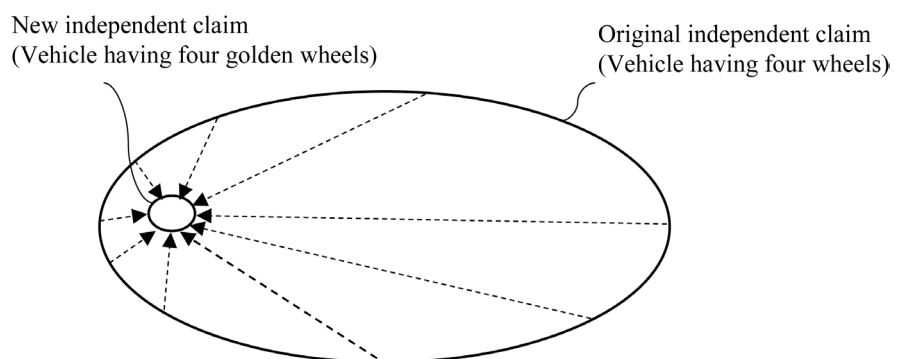


Figure 1. Shrinking scope of patent protection during granting visualized by set theory.

varies over time. This means that inventions which once overlapped with the market may no longer do so at a later point in time. An example for this could be patents for compact discs. While compact discs had much relevance to the market in previous years, their relevance has consistently decreased as technology has evolved. This fact highlights the dynamic and relative nature of a patent's value.

Patent applications that protect non-relevant inventions incur costs but do not add any value to the firm. Seeking to avoid such scenarios, lean IP management determines a patent's potential current and projected market relevance before filing an application for it. Only if it is the case that the patent stands to add significant positive value to the firm a patent application will be drafted and submitted. In the interest of maximizing effectiveness, lean IP management focuses only on those patents with reliable market potential, however, does not file patent applications for inventions that have no or doubtful market potential.

Closely related to the above situation is that though the subject-matter is based on an invention having market potential, the scope of the invention is rather small or the invention is easily bypassed by other technical solutions, as depicted in **Figure 3**. This could be the case for highly specialized products from which only few units are sold or technical solutions which are not necessarily required. In this situation, the impact of a patent as a prohibition right is also extremely low. Considering the emerging costs and possible bypasses, these patents are not adding value to the firm. Also in this situation, lean IP management deliberately forgoes filing a patent application.

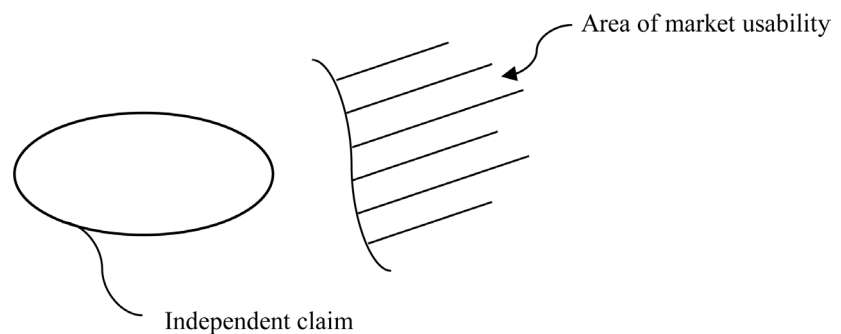


Figure 2. Scope of patent protection and market usability visualized by set theory.

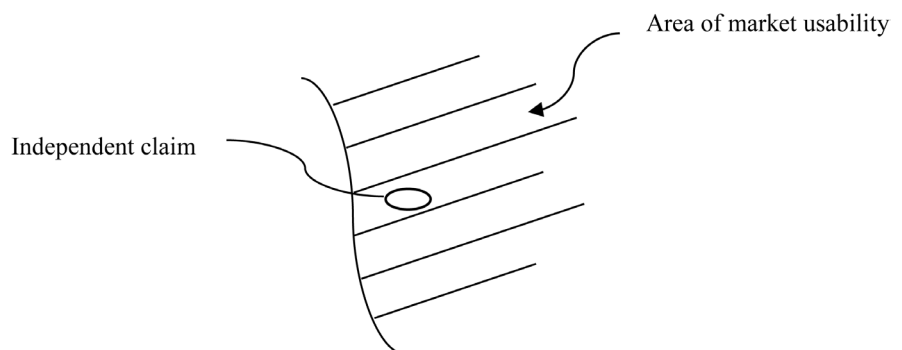


Figure 3. Minor scope of patent protection covered by market usability.

Even if the original invention involves market potential, present non-lean applications often comprise a number of dependent claims that are not arranged with respect to their market potential. To further operate with set theory, the main set defined by the independent claim includes several subsets each representing a dependent claim, as depicted in **Figure 4**. In non-lean applications, the subsets are scattered randomly within the main set of the independent claim covering the area of market usability only randomly.

These patent applications suffer from the fact that they will easily collapse to a subset during granting procedure that is not backed by any market potential, like for example dependent claim D1 yielding a “golden screw” patent. Once collapsed to dependent claim D1 during granting procedure the situation corresponds to that depicted in **Figure 2** and the patent loses any potential for generating added value. In contrast, dependent claim D2 covers a technical subset that has market relevance.

In new filings, lean patent applications differ from non-lean patent applications not only in a way that the area of market usability is covered by the independent claim as extensively as possible. But also in a way that it is considered that all dependent claims cover subject-matter that has also future market potential. To this end the market potential of dependent claims must be determined, already when elaborating the application. Further, it is considered that the dependent claims provide for a scope of protection that is as broad as possible within the main set. In this way, it can be avoided that during granting procedure applications collapse to subject-matter that has not market relevance and patents arise that provide subtracted value to the firm.

Lean IP management files new patent applications for inventions only that include a large scope of protection that is mainly backed by the area of market usability. When elaborating new filings, lean IP management concentrates exclusively on those dependent claims which are also covered by market usability to avoid shrinking onto the non-intended scope of a non-value patent in granting procedure. This situation is shown in **Figure 5**. Further, lean IP management provides for short and concise patent applications in which the invention is described as short and concise as possible to reduce costs for translating and handling¹. Lean patent applications are to be tailored to lean IP management.

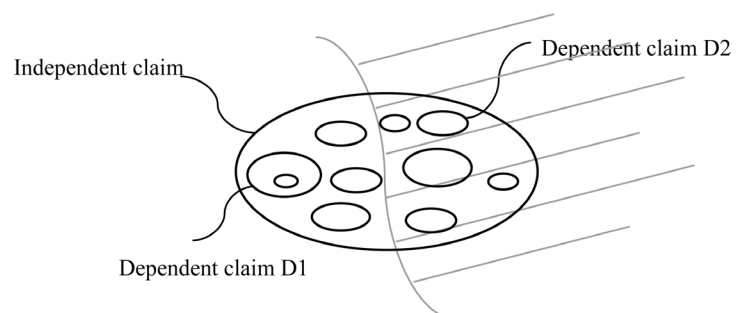


Figure 4. Scope of patent protection by independent and dependent claims of existing patent applications.

¹See Guidelines for Examination in the European Patent Office F-IV, 5.

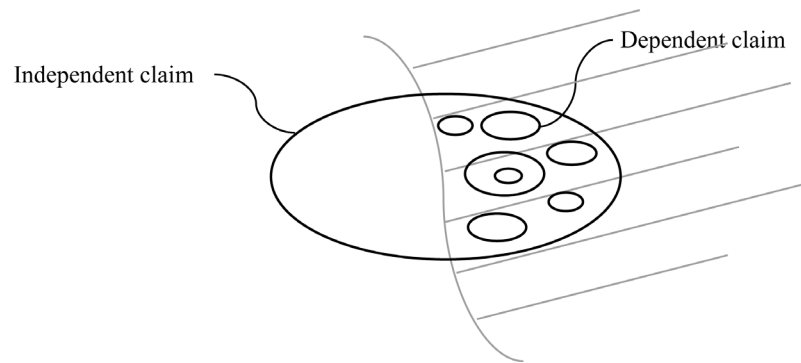


Figure 5. Scope of patent protection by independent and dependent claims of a lean patent application.

Lean IP management abdicates the current practice of further including numerous questionable technical features or inconsistent definitions in the description or dependent claims for the sake of only having a patent as such granted later. Instead lean IP management uses a strongly limited number of dependent claims which are explicitly formulated and designed to best cover possible market positions. Only if it later turns out that market usability is still given, the granting procedure is continued with restricted independent claims. Otherwise applications are abandoned immediately to reduce the effect of sunk costs.

When drafting new patent applications lean IP management concentrates on to ensure that the application contains sufficient technical information to enable a skilled person to put the invention as claimed into practice; and to enable the reader to understand the contribution to the art which the invention as claimed has made². Lean IP management forgoes all irrelevant details which are not conforming to these requirements³. In this way patent handling of applications becomes short and efficient, while costs for translating and handling the application can be kept low.

5.2. Facelififting Pre-Lean Applications

Since existing non-lean patent applications often comprise numerous dependent claims that do not cover market applicable inventions, each not yet granted patent application must be reviewed whether it might have already collapsed to subject-matter not covered by the area of market usability. If so, the introduced restriction of the independent claim causing non-coverage by market usability must be removed. If possible, the granting procedure must be continued by including other technical features which create protected subject-matter that is backed by market usability. Also, inventions defined by too many technical features in the independent claims can be easily bypassed and have very little impact.

If introduced negative technical features cannot be replaced or if the scope of protection within the area of market usability is too small, the patent application

²See Guidelines for Examination in the European Patent Office F-IV, 4.1.

³See Guidelines for Examination in the European Patent Office F-IV, 4.4.

is to be abandoned from this point of the granting procedure. **Figure 6** visualizes how the subject-matter of pre-lean applications should be handled. In the aforementioned example, the current independent claim of the pending application for a vehicle having four golden wheels could be still changed to a new independent claim vehicle having four aluminum wheels, *i.e.* from protecting an invention having no market relevance to an invention that has.

Thus, lean IP management modifies existing patent applications in a way that only patent applications for inventions having market potential are prosecuted. If this cannot be done, lean IP management abandons the patent application to save further costs.

5.3. Existing Patents

In contrast to pending patent applications, granted patents will already have legally collapsed to a certain subject-matter under a reduced scope. The scope of protection cannot be modified once a patent has been granted. Therefore, lean IP management reviews all granted non-lean patents in a firm's portfolio and determines whether they cover subject-matter that has market relevance. This review process is repeated intermittently for all granted patents in the portfolio to ensure that new technical developments have not rendered these patents obsolete and they lost their market usability in meantime. This could be caused by a shifting area of market usability. As markets and supply chains evolve, the competitive value of a patent is subject to change. Lean IP management singles out those patents that have been rendered obsolete and jettisons them from the portfolio in order to cut costs and maintain efficiency, instead of maintaining futile IP rights.

5.4. Post-Granting Procedures

The above principles also apply to post granting procedures such as oppositions or nullity procedures. In these procedures, newly found prior art documents can be used to revoke a once granted patent. However, as with the filing of new patent applications, an applicant is entitled to defending and maintaining his patent on the basis of an amended, *i.e.* restricted, scope. This means that a patent's

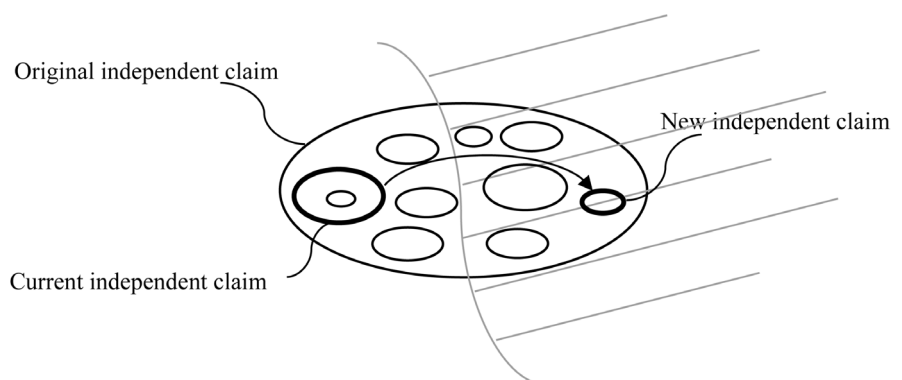


Figure 6. Shifting to protected subject-matter that is used by the market during granting procedure.

scope may also change over the course of post-granting procedures, which in turn can affect its market relevance and subsequently its valuation. The scope of the patent may shift from subject-matter covered by market usability to subject-matter that is not. When facing such motions, firms should thus choose their battles carefully, and defend only such patents that can maintain positive value under a potentially reduced scope.

Therefore, in these procedures defending of patents should be performed only if valuable market use positions can be kept. If maintaining the value-added properties of a patent is not possible, post-granting procedures are terminated by withdrawing the patent in consideration. In this way costs for defending non-value-added, *i.e.* value-subtracting, patents can be reduced and allocated elsewhere.

6. Summary

Lean IP management is a powerful tool for improving the efficiency of IP rights without losing any impact and has the potential to reduce costs by 90%. Lean IP management is based on an external view of the firm in which only those prohibition rights are maintained and prosecuted that a buyer would be willing to pay for. This is only the case when the protected invention has potential to be used by the market. Lean IP management assumes that a patent as such has no inherent value, irrespective of how much R&D costs were incurred by the underlying invention. By foregoing the internal perspective, lean IP management focuses on assessing inventions from an external market perspective. In this way, it is avoided that resources are wasted for protecting inventions with no direct market exposure.

Instead, the innovation of our research is that the value of the patent is based on the possibility of its infringement, *i.e.* third party interest in using the protected invention. Lean IP management explicitly does not pursue or maintain patents that cover inventions not requested by the market. Lean IP management thus focuses on maximizing the impact of a firm's IP rights while simultaneously minimizing wasted resources spent on non-asset inventions. It categorically eliminates all non-value-adding activities, patent applications and patents within the prohibition right production system. Patent applications within a lean IP management regime are deliberate, targeted, and involve a limited number of dependent claims that only cover inventions relevant to the market. If none of these legal positions given by the independent or dependent claims can be

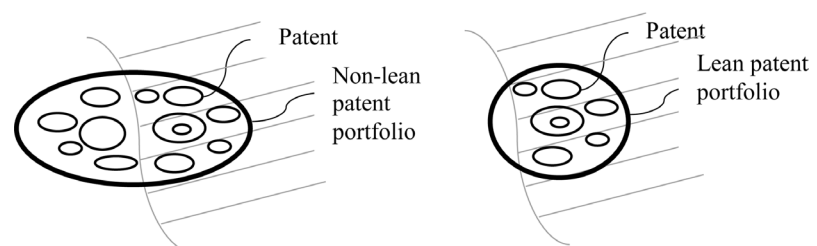


Figure 7. Comparison between non-lean and lean patent portfolios.

achieved, applications are immediately abandoned.

The rigorous application of lean IP management leads to patent portfolios that are more efficient and powerful than many of the overburdened patent portfolios currently held by most firms, as depicted in **Figure 7**. Portfolio costs are reduced dramatically since all value-subtracting patents are consequently selected out. To this end, lean IP management improves effectiveness of a firm's intellectual property situation while simultaneously freeing up bound resources and minimizing waste.

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