Report

Workshop on Patent Quality

initiated by the EPO Economic and Scientific Advisory Board
7 May 2012, European Patent Office, Munich
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Munich, 7 May 2012

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EPO Economic and Scientific Advisory Board

While the EPO’s main focus is on its core business, it also has a strong interest in the broader economic and social ramifications of the patent system. This interest should be pursued in a collaborative way together with individuals and organisations that have shown a high level of expertise in the areas concerned. It is for this reason that the EPO set up an Economic and Scientific Advisory Board to address important economic and social issues relating to patents in a more dedicated and selective way than hitherto possible.

Mandate
The objective of the EPO’s Economic and Scientific Advisory Board is to contribute to a comprehensive analysis of the patent system in its economic and social context. The Advisory Board addresses issues that are closely related to the patent system and of significant interest to the European economy and society at large. It is the responsibility of the Advisory Board to come up with a scientifically grounded, independent assessment of these issues. The Board advises the EPO on the scope and set-up of relevant economic and social studies, provides guidance on related research projects and evaluates their impact. Using studies and analyses supplied by the EPO and other external partners, the Advisory Board is responsible for providing early warning signals on sensitive developments and issues. Moreover, it presents policy recommendations for dissemination to relevant media and stakeholders.

Composition of the Advisory Board
The EPO’s Economic and Scientific Advisory Board is composed of 11 well-known and renowned individuals (global scope with an emphasis on Europe), some of whom are economists and social scientists with a focus on the patent system, while others are practitioners with extensive experience of the European patent system. The members are nominated for a period of three years. The group is supported by a Secretary-General, whose role is exercised by the EPO’s Chief Economist.

Scope of work
The Advisory Board is independent within the scope of its mandate and is able to choose to address particular issues on its own initiative. At its inaugural meeting in January 2012, the EPO’s Economic and Scientific Advisory Board decided to hold stakeholder workshops on the following three issues:
- the role and structure of fees
- the importance of patent quality
- patent thickets

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Executive Summary

This report contains a summary of the discussion that took place at the first workshop organised by the EPO Economic and Scientific Advisory Board (ESAB) on 7 May 2012. The workshop brought together stakeholders and experts on the patent system from many fields to discuss the issue of patent quality and potential ways to improve it. The idea behind the workshop was to look at the widespread perception that patent quality has been deteriorating and that low patent quality threatens the functioning of the patent system as a whole.

In the search for a definition of the term “patent quality”, workshop participants acknowledged that there was no definitive definition of patent quality, and narrowed it down to two related concepts: the quality of the patent system and the value of a patent. The discussion brought to light a range of different factors that influence patent quality, which can be condensed into the following definition: a high-quality patent (a) satisfies the legal patentability requirements at a given patent office, (b) has been granted, (c) is likely to withstand invalidity proceedings in court or opposition/re-examination procedures carried out by patent offices and (d) enables the skilled person to put the invention into practice without further experimentation.

As regards the assessment of patent quality in practice, participants discussed the existing empirical-measurement approaches and their shortcomings. The discussion revealed the need for a more systematic approach to measuring patent quality between offices, that is one providing a sounder basis for comparison. Most of the discussion at the workshop revolved around measures that could be taken by the various stakeholders to improve patent quality. The discussion focused broadly on two stages in the life of a patent that provide scope for intervention: pre- and post-grant. Participants also raised a number of cross-cutting issues that apply to several or all of these stages. The debate also briefly addressed the question of whether more emphasis should be put on improving patent quality in the pre-grant phase or whether it is more efficient to eliminate low-quality patents post-grant. Although this debate did not result in a consensus, the proposed pre-grant measures contain an array of lesser interventions that could be easier to implement than post-grant interventions involving opposition and courtroom litigation.

Most of the suggestions made by participants concerning interventions at the pre-grant stage related to the way prior art is made available, searched, and disclosed in the patent application. This also includes information on patent assignment and the legal status of a patent. In contrast, participants did not express any particular concerns about the substantive standards for patent examination. At the post-grant stage, participants considered interventions that eliminate low-quality patents: opposition/re-examination conducted by the patent office and invalidation proceedings at a national court. Possible interventions in this respect are mostly related to the speed of such proceedings and their consistency across jurisdictions. The cross-cutting issues discussed were international harmonisation and co-operation, and support to independent inventors, small- and medium-sized enterprises (SMEs) and universities (participants emphasised the distinction between small producing entities and non-producing entities (NPEs)).
1 Introduction

There has been a steep increase in the number of patent filings worldwide (WIPO, 2011). The number of patent filings increased rapidly not only in OECD economies, but also in a number of emerging economies. More than half of the global growth in filings can be explained by an increase in the number of offices at which protection for the same invention is sought (WIPO, 2011). The increase in the number of filings and the number of different offices at which patent protection for the same invention is sought has been accompanied by numerous challenges to the patent system, the greatest of these being the concern that the average “quality” of granted patents has been declining as the number of filings across different offices has been increasing (Jaffe and Lerner, 2004; Bessen and Meurer, 2008).

The increase in the number of filings is partly driven by increasing technological complexity and interrelatedness as well as a broadening of patent-eligible subject-matter to include, for example, software or business methods. Overlapping claims that create patent thickets (Shapiro, 2001), the surge of litigation by non-practising entities often involving patents with “fuzzy boundaries” (Bessen et al., 2011: 24), as well as the “patent wars” in the information and communication industry on a global scale, are widely seen as consequences of low patent quality. At the same time, these factors also have a negative influence on patent quality in that they encourage applicants to file more patents of potentially lower quality. These developments have led to concerns that the patent system is slowing down the pace of innovation rather than promoting it, especially in industries particularly affected by low patent quality. Low patent quality, therefore, threatens the ability of the patent system to fulfil its original function to provide incentives for innovation.

Despite the prominence that has been attributed to patent quality in the recent debate about the patent system, there has been surprisingly little discussion about what constitutes patent quality and its determinants. Instead the debate has been characterised by considerable confusion about the distinction between patent quality and the related concepts of patent value and quality of the patent system. The definition of patent quality appears to be obvious: a high-quality patent is a patent that fulfils the objective of the patent system, it incentivises an inventor to come up with an invention that can be transformed into an innovation that succeeds in the marketplace. It allows the proprietor to deny others the use of the patented invention, it is visible to the public, and it discloses a sufficient amount of information in exchange for the temporary right to exclude others from using the disclosed invention. Yet, closer inspection reveals that the issue is more complex than the definition suggests.

The issue of patent quality was the subject of the first workshop organised by the EPO Economic and Scientific Advisory Board (ESAB) on 7 May 2012. The workshop’s objective was to examine carefully the various issues relating to the concept of patent quality. Prior to the workshop the EPO distributed the recently published “Handbook of quality procedures before the EPO” among the participants. In particular, the workshop set out to address five questions:

1) Is there a clear definition of the quality of a patent? And how is this perceived by the stakeholders?
2) What factors have to be covered in a comprehensive understanding of patent quality?
3) What is the role of the following factors in patent quality: subject-matter, length of protection, patent breadth, inventive step, timeliness?
4) What action can be taken to improve patent quality?
5) How can the quality of the patent system be improved?

This report provides a brief overview of the discussion that took place at the workshop and captures the main points that emanated from the discussion. The discussion summary is presented thematically rather than chronologically, and is organised into four sections. Section 2 offers a definition of patent quality. Section 3 looks at the determinants of patent quality and at how patent quality can be measured in practice. Section 4 is the core of this summary, presenting the participants’ suggestions on how to improve patent quality. Section 5 provides a brief summary and sets out the conclusions drawn at the workshop.

1 Software and business methods constitute patent-eligible subject-matter in the USA but software per se and business methods are not patent-eligible at the EPO.
2 The Definition of Patent Quality

The first question addressed at the workshop was the definition of patent quality and the factors that constitute patent quality.

2.1 Patent quality

The economics and management literature provides little guidance on how to define patent quality. It focuses instead on the strength (or quality) of the patent system. Probably the most prominent example is the patent-strength index proposed by Ginarte and Park (1997). The authors measure patent strength by constructing an index based on national patent laws capturing the following dimensions of statutory patent protection: (a) extent of coverage of patent protection, (b) membership in international patent agreements, (c) provisions for loss of protection, (d) enforcement mechanisms, and (e) duration of protection. More recent attempts to measure patent strength also take into account effective property rights protection (Hu and Png, 2012). However, as highlighted by van Pottelsberghe (2011), patent strength and patent quality are distinct concepts. A strong patent system may be more likely to produce high-quality patents, but the relation between patent strength and quality is far from clear. Van Pottelsberghe (2011: 1763) defines patent quality as the outcome of the “extent to which patent offices comply with their patentability conditions (legal standards) in a transparent way.” It is clear that this definition also hinges on statutory patentability requirements, but also on their implementation. Patent quality differs from the strength (quality) of the patent system in as much as that patent quality is based on the implementation of legal standards by the patent office in granting a patent application. As will be discussed in more detail in Section 4, a range of different factors drives a wedge between the substantive standards for patent examination and their practical implementation. This means the quality of the patent system is distinct from the patent quality, although there is a positive correlation between the two.

This distinction becomes clearer by looking at the definitions offered in the literature on patent quality. For example Wagner (2009: 2138) defines patent quality as the “capacity of a granted patent to meet (or exceed) the statutory standards of patentability – most importantly, to be novel, non-obvious, and clearly and sufficiently described.” Graf (2007: 499) defines patent quality as “how well the patent meets the statutory requirements: patentable subject-matter, utility, novelty, non-obviousness, and adequate written description and enablement.” Hall and Harhoff (2004: 991) suggest that high-quality patents are those that “describe inventions that are truly new, rather than inventions that are already in widespread use but not yet patented.” It must also “enable those ‘skilled in the art’ to comprehend the invention well enough to use the patent document to implement the described invention.” Hall and Harhoff add the requirement that there should be little uncertainty over the validity and breadth of the patent claims.

Taken together, the literature suggests that patent quality is defined as the degree to which a patent satisfies the statutory patentability requirements, leaves little doubt as to its breadth, and discloses information that enables a person skilled in the art to implement the protected invention.

Participants at the workshop largely agreed at the outset that patent quality has to be considered with regard to the specific function of a patent and with regard to specific stakeholders. In the search for a more concrete definition, participants put forward a number of suggestions. The most straightforward definition limits quality to the statutory patentability requirements, i.e. a high-quality patent is defined as a patent that meets the requirements for validity: novelty, inventive step, industrial applicability, and disclosure of the invention. In principle, these criteria are well-defined from a legal point of view and verifiable. Yet, statutory patentability requirements and their implementation differ across patent offices, which means that patent quality can only be assessed within jurisdictions relative to the corresponding patentability requirements. Participants also suggested that a high-quality patent should not only exceed the statutory patentability thresholds but also contain clear and unambiguous claims. Some participants also suggested that the claims should be narrow. While clarity in patent claims is certainly desirable, these characteristics are less well-defined than the statutory patentability requirements and no efforts were undertaken at the workshop to provide definitions of claim clarity, ambiguity, or breadth, although these issues may be at the heart of the patent-quality problem.

If a patent application satisfies the statutory patentability criteria, a patent will be granted by the patent office. This fact led some participants to define a high-quality patent as a patent that satisfies the legal patentability criteria and that has been granted. According to this definition, quality can only be
assessed once a patent has been granted and hence shifts the focus of any assessment of patent quality towards the set of granted patents.

Another element that was brought up in the discussion relates to the duration of the examination process. In particular, participants suggested a negative correlation between patent quality and pendency, that is, the longer a patent remains pending before it is granted the more likely it is to be of low quality. Hence, a high-quality patent is one that satisfies statutory patentability requirements and which has been granted within a “reasonable” period of time. No answer was provided at the workshop, however, with regard to what constitutes a reasonable amount of time.

If a patent satisfies the legal patentability requirements and has been granted, the patent should survive invalidity procedures, be they before a civil court or an administrative body, such as the opposition procedures before the EPO. This gives rise to another way of defining patent quality: a high-quality patent is one that survives litigation in the form of infringement or invalidity proceedings. The rationale is that if the holder of a patent attempts to enforce a patent, the patent is likely to be challenged. Hence, for infringement to occur, the patent has to be valid. This definition, therefore, encompasses the previous definitions and adds the requirement that a patent has to survive post-grant invalidation procedures. Such a patent can be enforced and might be easier to license. This logic has led some participants to remark that a high-quality patent should be a patent that not only fulfils all of the requirements discussed so far, but that can also be easily licensed. The definition based on revocation procedures has the drawback that patent quality can only be determined separately for each claim of a patent because validity of each (independent) claim is considered separately. A definition based on the ability to license a patent presents the problem that such information is difficult to obtain unless a patent has been licensed and even then, this information normally remains private between the parties involved.

The bottom line of this discussion is that there is no definitive definition of patent quality. Quality should be assessed in relation to the purpose that a patent is supposed to serve from the viewpoint of the stakeholder concerned. Participants suggested a number of definitions, which shared certain key features. The characteristics that determine patent quality are the legal criteria for patentability – novelty, inventive step and industrial application – and enabling disclosure. If a patent satisfies these characteristics, it will be granted by the patent office and is likely to stand up in court regardless of whether invalidity proceedings are brought before a civil court or an administrative body.

In summary, the following definition emerged from the workshop: a high-quality patent (a) satisfies the legal patentability requirements at a given patent office, (b) has been granted, (c) is likely to withstand invalidity proceedings in court or opposition/re-examination procedures carried out by patent offices and (d) enables the skilled person to put the invention into practice without further experimentation.

2.2 Patent quality and patent value

The discussion at the workshop also briefly touched upon the link between patent quality and patent value. Participants agreed that patent quality and patent value are positively correlated, yet distinct concepts. As discussed above, a granted patent that satisfies the statutory patentability requirements and that is likely to survive invalidation proceedings is likely to be valuable because it can be enforced. Yet, the existing literature indicates that patent value is determined by a much broader and diverse range of factors than patent quality². During the workshop, participants did not go into further detail with respect to the distinction between quality and value.

² Survey data from the PatVal survey (Giuri et al., 2007), for example, show that patent values differ across technology classes.
3 The Measurement of Patent Quality

In practical terms, patent quality has to be measured based on observable characteristics of patents. The definition derived at the workshop and summarised in Section 2.1 above suggests that patent quality can be measured by assessing (a) to what degree granted patents satisfy the legal patentability requirements at a given patent office, (b) grant rates, and (c) the proportion of granted patents that is invalidated in court or by an administrative body.

Measuring the degree to which patent offices adhere to their legal patentability requirements is challenging because it requires an assessment of whether granted patents comply with the legal standards on a case-by-case basis. To circumvent this, van Pottelsberghe (2011) suggests an index to measure patent quality by assessing the quality of the patent system. He evaluates the patent system by looking at legal standards as well as their implementation. Van Pottelsberghe takes four factors of the patent system into account: (a) the restrictiveness of the patent system as defined by patent-eligible subject-matter, (b) the definition of novelty, (c) the definition of inventive step, (d) and the fee structure applied by patent offices. Factors (b) and (c) are captured by several specific measures such as, for example, by whether a patent office publishes search reports, examination needs to be requested by the applicant, and whether the system offers post-grant opposition, etc. While this approach allows the quality of patent systems to be measured, it requires a substantial amount of subjective assessment. Moreover, measuring the quality of the patent system is different from measuring patent quality, as should be clear from the discussion in Section 2.1. above.

If the grant status of a patent is seen as a measure of patent quality, grant rates can be used to infer what the level of patent quality is across patent offices3. However, there are various definitions of grant rates and it is not clear which definition should be used as a basis for comparison.

If patent quality is defined as the likelihood that a patent survives invalidation procedures, an alternative approach to measuring patent quality is to assess the outcome of patent invalidation procedures in national courts and patent offices (e.g. the EPO). Allison et al. (2011), for example, find that software patents and patents asserted by NPEs are particularly likely to be invalidated, which may be interpreted as indicative evidence of their low quality. Nevertheless, while information on opposition and invalidity proceedings is potentially insightful with regard to patent quality, such information has to be interpreted with caution. Patents that reach opposition or invalidation proceedings are already a highly selected group4.

Participants expressed the need for a more systematic approach to measuring patent quality directly (instead of relying on the quality of the patent system as a proxy) based on the definition of patent quality agreed on at the workshop that can be applied consistently across the different patent offices. But no specific suggestions were put forward on how such an approach should be designed.

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3 See, for example, Lemley and Sampat (2008).
4 Opposition is initiated by interested third parties, often competitors. This means that the presumed quality of a patent needs to be the decisive factor in triggering opposition procedures. On EPO oppositions, see, for example, Harhoff and Reitzig (2004).
4 How to Improve Patent Quality

The workshop focused on the factors that determine patent quality and how they can be influenced to improve patent quality. The direct question was asked: “What action can be taken to improve patent quality?” (question 4, Introduction). Given the workshop’s focus on patent quality rather than on the quality of the patent system, (“How can the quality of the patent system be improved?”, question 5, Introduction) was addressed only to the extent that the measures that affect patent quality concern the quality of the patent system. The discussion centred broadly on the pre- and post-grant stages, where the pre-grant stage includes the pre-filing stage. Participants also raised a number of cross-cutting issues that apply to several or all stages.

The debate also briefly addressed the question of whether more emphasis should be put on improving patent quality in the pre-grant phase or whether it is more efficient to eliminate low-quality patents post-grant. This discussion concerns the trade-off between the costs associated with weeding out low-quality patents before grant and the costs engendered by the uncertainty presented by low-quality patents. Participants did not express any strong views about this trade-off. Yet, as will become clear below, the proposed pre-grant measures contain an array of lesser interventions that could potentially be easier to address, whereas post-grant intervention involves opposition and courtroom litigation which may require more large-scale interventions that could be harder to achieve in practice.

Related to this point, participants also briefly touched on the question of the interrelatedness of the different determinants of patent quality. This is relevant insofar as different interventions that affect patent quality have to be carried out in a co-ordinated way to be effective. While the importance of this issue was generally acknowledged, no specific suggestions were made.

Finally, participants also discussed who should be responsible for raising and maintaining patent quality. They concurred that the responsibility for patent quality should be divided between patent offices, applicants, legal counsellors (patent attorneys) and third parties. Ideas on how this could be achieved are discussed below.

4.1 Pre-filing and pre-grant phases

Participants discussed a range of possible interventions in the pre-filing and pre-grant phases. Most of these interventions concern the way prior art is made available, searched, and disclosed in the patent application. This also includes information on patent assignment and the legal status of a patent. In contrast, participants did not express any particular concerns about the substantive standards for patent examination, which means that they are not discussed below.

Prior-art search and disclosure
The main issue raised with regard to the pre-filing and pre-grant stages is prior-art search and the disclosure of relevant prior art. The fact that patent examiners may have to decide on the grant of a patent without having knowledge and access to the entire relevant prior art is often regarded as a key reason for the granting of low-quality patents. But applicants too face difficulties in searching for prior art, which in combination with examiners’ limited ability to retrieve prior art frequently leads to low-quality patents. Participants looked at ways to ensure that (a) applicants find all relevant prior art, (b) applicants disclose all relevant prior art in their patent application and (c) examiners can search and access all relevant prior art.

The factors relevant to (a) and (c) raised at the workshop concern both applicants and examiners. These factors include:

Title/abstract
Participants noted that patent titles and abstracts are often of little help in filtering relevant patents. Since the title and abstract do not have the same legal implications as the claims, they receive little or no attention in the grant process. Some participants suggested that examiners should pay closer attention to the title and

1 Lemley (2001) argued in favour of focusing on the post-grant stage. Wagner (2009), in contrast, argues that the uncertainty injected into the patent system by low-quality patents outweighs the cost advantage that could be gained by adopting a registration-based system.

6 There was only some discussion on the industrial applicability requirement, which was perceived to be taking a backseat in the EPO’s examination process.

7 Chakroun (2012), for example, points out that patent information is only available in electronic format for 80 offices out of 184 member states. Even for offices that make their data available, often only limited bibliographic information is available, not providing access to the claims. Information on the legal status of patents is even harder to obtain.
abstract to facilitate key-word based search. Other participants felt, however, that efforts to improve patent information would be better placed elsewhere, for example in a harmonised classification of patents.

**Classification**

Another issue with regard to prior art search is patent classification. Participants welcomed current efforts to create a harmonised patent classification for the EPO and the USPTO (the Cooperative Patent Classification, CPC). Nevertheless, there was some discussion about the role of patent classification in making patents searchable. Under the current system, patent classification primarily serves the patent office as a way of putting patents into technology-based categories that facilitate prior art search within the office. While applicants indicate the classifications to which the patent should belong, the chosen classifications have no legal implications. It might be useful to explore ways of increasing incentives for applicants to ensure patent documents are classified in a way that makes the patented invention easily identifiable.

**Non-patent prior-art references**

While prior art in the form of patents may be identified with the currently available information, participants noted the difficulty in accessing prior art in the form of non-patent literature. Not only is such prior art more difficult to search because key-word based search is not often accessible and no harmonised classification system exists/applies. The search databases available, such as Thompson Reuter’s ISI Web of Knowledge, are commercial. Costly access to such search tools may restrict the ability of SMEs and individual inventors to search the non-patent (scientific) literature. Moreover, copyright infringement of the non-patent literature could be a big issue. Participants expressed the need for centralised repositories of non-patent prior art and IT infrastructure that allows full-text search of the non-patent literature. New ways of classifying non-patent prior art would also be helpful.

**Ownership/re-assignments**

Yet another concern that was raised several times during the workshop was patent ownership. Records on re-assignments are largely incomplete. This means that in some cases it is difficult to establish who the current assignee of a patent is. The issue of patent ownership is receiving greater attention due to the increased litigious activity by NPEs. Frequently the assignment of patents by companies to NPEs is obscure. Participants expressed the view that publicly available patent registers should provide up-to-date information on the assignee of a patent. Some participants suggested that applicants should provide a tax registration number that allows them to be uniquely identified in their patent application and that this information be updated in case of re-assignment. The idea of asking assignees to provide information on the entity ultimately in control of a patent was also expressed. This however, would require the disclosure of the ownership structure of companies, which represents information that might go beyond what can be reasonably expected from patent applicants. It would also imply that whenever the ownership structure changes, the information in the patent register would have to be adapted. Participants at the workshop also expressed the concern that if full disclosure on ownership is required, it should also comprise information on exclusive licensing agreements, as exclusive licensees are also entitled to sue for the infringement of a patent. The question of how applicants could be incentivised to provide up-to-date information on ownership of a patent went largely unanswered.

**Legal status**

Like the question of ownership information, participants agreed that the legal status of a patent is a crucial piece of information for applicants. However, this information is not widely available from all patent offices in good time. In the case of some patent offices, the grant status of a patent, which cannot be inferred from the type of patent publication, is not clear. There was broad consensus among participants that this piece of information is crucial for users of the patent system to make informed decisions on the use of technologies.

**Translation**

The main issue raised in the discussion on the translation of patent documents was the translation of the claims in Chinese, Korean, and Japanese filings. The translation of these documents appears to be of particular concern to practitioners. Some participants even supported the idea that patents should be filed in English at all patent offices (possibly together with

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8 At the same time, non-patent references play a particularly important role in certain technologies in which low-quality patents are commonplace, such as software in the USA (Graf, 2007).
9 This problem is illustrated by a recent US court case where publisher Wiley sued the MBHB law firm for copyright infringement on two scientific articles that the law firm had submitted to the USPTO as prior art.
10 See the discussion on the incentives for assignees to provide such information in the USA in Footnote 60 in Graham et al. (2010).
claims in the native language of a country). This could also cut out the cost incurred by the need to translate patent filings. It is currently unclear who should bear the cost of translating patent information.

**Reporting of prior art by applicants**

Applicants naturally have an information advantage. If patent offices do not require applicants to disclose the information they possess, they may have difficulties locating all relevant prior art. A potential drawback of requiring disclosure is that applicants may choose strategically which prior art to disclose. Participants mentioned that in practice this often means that prior art held by competitors is not indicated. Workshop participants considered whether patent offices should therefore require applicants to disclose relevant prior art or whether it is nevertheless more efficient for patent offices to conduct the search “from scratch.” Of course enforcement is difficult, but participants ascertained that where deliberate non-disclosure could be proved, there should be sanctions. An alternative route is to incentivise the reporting of prior art through fee reductions. If disclosure by applicants is required, they could be asked to provide claim-specific prior art, that is, applicants would be required to indicate the prior art that is most relevant for each individual claim.\(^{11}\)

**Publication of applications**

Another issue that received attention at the workshop was the disclosure of patented technologies. The most fundamental issue considered by the participants was the publication of patent applications. The participants agreed that any patent filing that is not withdrawn within 18 months of the priority date should be published (this is already the case at the EPO). There was some discussion on whether 18 months was the optimal length of time between filing (priority) date and publication date, but participants felt that there was insufficient evidence to affirm whether a longer or shorter amount of time would have an impact on applicant behaviour. This discussion relates to the broader issue of uncertainty. Participants agreed that applicants generally value the uncertainty conferred by a patent right before grant. Some participants, therefore, argued that the patent system should allow applicants to choose the length for which a patent should remain pending. In particular, a concern was raised that if this possibility were eliminated, applicants would resort to the filing of divisionals.

**Prior-art repository**

Participants agreed that patent offices should make their prior art databases available to the public to facilitate prior-art search. Ideally there should only be just one prior-art repository in which all patent offices deposit prior art.

**Training**

Participants argued that patent offices could provide additional training for decision-makers in firms and also to university students to sensitise them to the functions and functioning of the patent system.

**Grant process**

An additional improvement could be achieved by patent offices making their guidelines and process descriptions publicly available. Another important issue raised by participants was communication between applicants (and their legal representatives) and examiners. A number of participants were of the view that increased exchange of information between applicants and examiners could improve patent quality by eliminating misunderstandings early on in the process. The main concern with regard to the possible improvements of patent quality through improved prior-art search relates to possible delays in granting a patent as better search and increased communication between applicants and patent offices is likely to increase pendency.

**Patent incentives**

Participants also raised the issue of the incentives provided by patent offices and authorities to applicants with a view to promoting quantity over quality. Specifically, participants pointed out that the publication of the names of “top applicants” in annual reports of patent offices or awards for innovation based on the number of patents may signal to applicants and third parties that the more patents an applicant files, the more innovative the applicant is. Similarly, some countries have put in place subsidies for the costs of filing patent applications, which may provide incentives to file low-quality patents by incentivising quantity instead of quality.\(^{12}\)

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\(^{11}\) This might also help to curb attempts by applicants to obscure the content of their applications. Van Zeebroeck et al. (2009) for example argue that applicants may try to hide information by increasing the complexity of patent filings by blowing up the amount of information filed in a patent specification, making it difficult for examiners and interested third parties to locate the relevant information.

\(^{12}\) See, for example, Wright et al. (2011), for the case of China.
4.2 Post-grant

Participants considered two interventions at the post-grant stage: opposition/re-examination conducted by the patent office and invalidation proceedings at a national court.

Opposition

Participants considered post-grant opposition as the most important intervention after a patent has been granted to increase overall patent quality. While opposition as provided by the EPO was considered to be useful as it allows private information held by third parties to come into play, the main issue appears to be the duration, that is that opposition procedures take too long. Participants also suggested that national patent offices should actively monitor the granting of patents at the EPO and initiate opposition proceedings in case they observe the grant of a patent that they consider to be of low quality. In this way national patent offices would be put into the driver seat and made accountable for the patents granted by the EPO (which may be validated in their respective jurisdictions).

Participants also discussed whether opposition should be limited to nine months after grant at the EPO and whether it should instead be available at any time, or whether it should be possible to re-open opposition in case of infringement proceedings. However, such unlimited post-grant opposition is already available in the UK, but hardly used. This accords with evidence cited at the workshop that most oppositions are filed on the last day of the nine-month period, which implies that if the nine-month period were abolished, there might be fewer – rather than more – opposition cases.

Invalidation proceedings in civil court

The possibility of challenging a patent in court was considered to be an important tool to eliminate low-quality patents from the system. However, litigation before court is usually a very expensive and long-drawn-out way of eliminating low-quality patents. Instead of arguing in favour of invalidation proceedings to replace opposition, participants suggested that particular attention should be devoted to lowering the costs of invalidating a patent in court and the speed of this process. The discussion also briefly addressed the merits of the different enforcement systems, in particular a bifurcated system in which different courts decide on validity and infringement separately and a system in which courts decide simultaneously on both. Another important issue that applies to the bifurcated system mentioned at the workshop is the decision of courts to stay infringement proceedings while invalidity proceedings are ongoing. Similarly, courts in non-bifurcated systems also have discretion about whether to stay proceedings in case of an ongoing EPO opposition.

4.3 Cross-cutting issues

Participants also discussed several important issues that concern both pre- and post-grant stages.

International harmonisation and co-operation

Participants discussed in detail the importance of co-operation between patent offices, in particular the EPO and the USPTO. There was a consensus that intensified co-operation, mostly to share information and achieve consistency across offices, was highly desirable, whereas mutual recognition of granted patents was seen instead as a risk to patent quality. A specific problem raised in this context is the different rules and procedures applied by the different patent offices. Some participants argued in favour of instituting uniform procedures and criteria for patentability among the most important patent offices in the world. These should aim at setting higher minimum standards and not permitting a low common denominator. Apart from co-ordinating patentability standards, participants also argued that patent offices should make better use of the collective knowledge they possess by sharing work that has already been carried out – particularly in the offices of first filing (this is related to the common prior-art repository mentioned above). International co-operation was also considered to be particularly important in the pre-grant phase in order to pool resources at a point in the life of a patent at which patent offices commonly spend more resources.

13 Workshop participants considered post-grant opposition to be a more effective tool than re-examination. This is in line with empirical findings that suggest a higher revocation rate in opposition procedures than cancellations through re-examination (Graham et al., 2002).

14 For evidence on a number of European countries see Harhoff (2009).

15 In the German bifurcated system, if there is an on-going EPO opposition case, a party that wishes to bring invalidity proceedings before the Federal Patent Court has to join the EPO opposition.

16 A specific example of this is business method and software patents, which are per se not patentable subject-matter under the EPC, whereas they are patent-eligible at the USPTO. This means that the EPO still receives patent applications that cover business methods and software and has to reject these based on an examiner’s evaluation of the subject-matter contained. While considerably more aligned, there are still differences between the national patent offices that are part of the EPC and the rules and procedures applied by the EPO.
It was pointed out that a patent can survive opposition at the EPO, but still be revoked by a civil court. According to workshop participants, in Germany this is due to the different approach applied by the EPO and the Federal Patents Court as regards claim construction.

While not discussed in detail at the workshop, the question of whether patent offices should offer subsidised search and training services or whether the provision of such services should be left to the private sector arises in this context. Participants argued that consistency should not only be increased across patent offices but also with regard to invalidation proceedings in civil courts across different jurisdictions. Since patents are national rights and even a patent granted by the EPO has to be validated nationally, so far, patents have to be enforced and invalidated in each jurisdiction in which they were granted. This can lead to different outcomes in invalidation procedures across countries. Litigating parties may exploit these differences for strategic purposes. For this reason participants welcomed current efforts to establish the Unified Patent Court in Europe. However, concerns were raised about the current draft proposal in relation to the Court. Inconsistencies between the different co-existing systems (administrative and civil courts) used to invalidate patents were highlighted.

Interaction between the applicant, general public and patent office

Another important element that came up throughout the discussion was the communication between the patent office and applicants as well as third parties. Participants suggested that applicants and examiners should be given the opportunity to exchange their opinions directly before and during the examination phase. Third parties could also be allowed to express their views and reveal their private information during the grant process instead of having to wait until after a patent has been granted to initiate opposition or invalidity proceedings.

Code of conduct

While nearly all measures discussed so far put the burden on the patent office, participants also discussed ways to shift responsibility for patent quality onto applicants and their legal representatives. An idea that was proposed is a code of conduct for patent attorneys. Representatives of the legal profession present at the workshop indicated that such codes already exist, but that enforcement is problematic. There may also be a dichotomy between the clients' wishes and what would help the patent office to produce high-quality patents.

SMEs, independent inventors, and universities

A substantial part of the discussion was devoted to SMEs and universities. Participants were concerned that SMEs, individual inventors and universities are at a distinct disadvantage with regard to their ability to search for relevant prior art. Some participants were concerned that this could lead SMEs and universities to file for lower-quality patents. They then went on to discuss the role that patent offices can play in assisting SMEs, individual inventors, and university applicants in retrieving relevant prior art. Participants acknowledged that in particular SMEs and individual inventors may lack the knowledge and resources to conduct a professional prior-art search. Possible solutions include commercial prior-art search services offered by patent offices and special training offered by patent offices. SMEs and individuals may also be affected by infringement suits differently as their lack of resources may induce them to settle rather than to attempt to invalidate a low-quality patent. This implies that SMEs and individual inventors would benefit particularly from low-cost ways of challenging the validity of a patent. Participants also warned that a distinction between producing SMEs and NPEs (which usually fall into the SME category) is needed. The business model of NPEs is obviously distinct from that of producing SMEs, and policy interventions easing the access of SMEs to the patent system and the enforcement of patents may be counterproductive when it comes to NPEs from in terms of benefit to society.

Standards and essential patents

Participants raised concerns regarding the availability of information on, and access to, essential patents. To improve the timeliness and completeness of the information on standard essentiality, participants suggested creating close links between patent offices and standard-setting associations.
5 Summary and Conclusions

The one-day workshop organised by the EPO’s ESAB discussed the importance of patent quality, its determinants and empirical measurement, as well as ways in which patent quality could be improved.

Workshop participants first attempted to find a definition of what constitutes patent quality. There was widespread agreement that there is no definitive definition of patent quality. Instead, quality needs to be defined according to the purpose that a patent is supposed to serve from the viewpoint of the stakeholder concerned. Participants nevertheless suggested a number of specific definitions, which shared certain key features. The characteristics that determine patent’s quality are the legal criteria for patentability – novelty, inventive step and industrial application – and enabling disclosure. If a patent satisfies these characteristics, it will be granted by the patent office and is likely to survive invalidity proceedings. The workshop therefore came up with the following definition: a high-quality patent (a) satisfies the legal patentability requirements at a given patent office, (b) has been granted, and (c) is likely to withstand invalidity proceedings in court or opposition/re-examination procedures carried out by patent offices and (d) enables the skilled person to put the invention into practice without further experimentation. There was also widespread agreement that patent quality has to be distinguished clearly from the related concepts of patent value and quality of the patent system.

The workshop also discussed how patent quality as defined above could be measured in practice. Existing work on the measurement of patent quality has resorted to measures of the quality of the patent system to infer patent quality. This, however, assumes that patent quality is the direct outcome of the quality of the system. Alternative measures are grant rates and the proportion of patents invalidated in court or by administrative procedures. These measures also require a number of restrictive assumptions, which make them less suitable as stand-alone measures of patent quality. This implies that adequately measuring patent quality in practice is a complex task that warrants more research.

The discussion at the workshop centred on possible measures to improve patent quality. Measures to improve patent quality concern both the pre-grant and post-grant stages. Pre-grant measures focus mostly on the availability of information on prior art and ways in which this information can be searched by applicants and examiners alike. The suggested areas for improvement include:

- Bibliographic information in the form of the patent classification, title/abstract;
- Access to non-patent prior art and the establishment of a centralised common prior-art repository;
- Information on the legal status of a patent and its current assignee;
- Translation of patent documents, above all the claims of Chinese, Korean, and Japanese filings;
- Timely publication of all applications.

Post-grant measures are invalidation procedures in the form of post-grant opposition and in-court invalidity proceedings. The possible interventions discussed in this respect mostly related to the speed of such proceedings, their co-ordination and consistency across jurisdictions. Participants also expressed concerns about the cost of invalidating low-quality patents in court. Participants also debated the merits of a bifurcated litigation system relative to a system in which invalidity and infringement are decided simultaneously by the same court.

Participants also raised a number of cross-cutting issues that affect both pre- and post-grant stages, the main ones being international co-operation among patent offices and specific problems faced by universities, individual inventors, and SMEs. Participants also indicated that most NPEs fall into the SME category and called for caution in giving them the same preferential treatment.
References


### Annex 1

**List of participants at the EPO Economic and Scientific Advisory Board’s Workshop on Patent Quality**

**Date:** 7 May 2012  
**Venue:** European Patent Office, Erhardtstr. 27, room 128, 80469 Munich (DE)

<table>
<thead>
<tr>
<th>Surname</th>
<th>First Name</th>
<th>Affiliation</th>
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<tbody>
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<td>de Russé</td>
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<tr>
<td>di Minin</td>
<td>Alberto</td>
<td>Scuola Superiore Sant'Anna</td>
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<tr>
<td>Fischer</td>
<td>Alban</td>
<td>Head Patent Division, Vice-Director-General, Swiss Federal Institute of Intellectual Property</td>
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<td>Granieri</td>
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<td>Jean-François</td>
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<tr>
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<td>Eric</td>
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<tr>
<td>Leißler-Gerstl</td>
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<tr>
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<td>Benjamin</td>
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<td>Mariagrazia</td>
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<tr>
<td>Steverink</td>
<td>Paul</td>
<td>Founding father, JPWaVe BV</td>
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<tr>
<td>Thumm</td>
<td>Nikolaus</td>
<td>Chief Economist, European Patent Office</td>
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<tr>
<td>Van Overwalle</td>
<td>Geertrui</td>
<td>Professor, Centre for Intellectual Property Rights, KU Leuven</td>
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<tr>
<td>Van Pottelsberghe</td>
<td>Bruno</td>
<td>Dean at Solvay Brussels School, CP 114</td>
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Observers from the EPO
John Beatty, Nigel Berrington, Margot Fröhlinger, Stephen Hey, Konstantinos Karachalios, George Lazaridis, Milena Lonati, Minna Nikolova-Kress, Giovanna Oddo, Heli Pihlajamaa, Berthold Rutz, Karin Terzić, Wilhelm Ungler
Annex 2

Programme of the ESAB workshop on Patent Quality

09.00  Opening and welcome addresses
Raimund Lutz, EPO Vice President
Dietmar Harhoff, Ludwigs-Maximilians University (LMU) Munich, ESAB Chairman

09.20  Plenary 1
Chair: Nikolaus Thumm, EPO

Introduction to various definitions and elements of patent quality

– Patent practitioners
Heinz Goddar, Boehmert & Boehmert

– Industry
Tony Rollins, Merck Sharp & Dohme Ltd.

– Academia
Bruno Van Pottelsberghe, Université Libre de Bruxelles

– EPO – Raising the bar
Wilhelm Ungler, EPO, John Beatty, EPO

11.00  Coffee break

11.20  Group work

How to improve patent quality? Which specific elements need to be taken into consideration?
Chair of Group 1: Geertrui Van Overwalle, University of Leuven
Chair of Group 2: Dietmar Harhoff, LMU
Chair of Group 3: Ruud Peters, Philips Intellectual Property & Standards
Chair of Group 4: Béatrix de Russé, Technicolor

13.10  Lunch break

14.15  Plenary 2
Chair: Bronwyn Hall, UC Berkeley

Presentation of group-work findings

15.30  Coffee break and group photo outside the building
<table>
<thead>
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<tr>
<td>16.00</td>
<td>Continuation of group work</td>
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<tr>
<td></td>
<td>Focus on unresolved issues, challenges, recommendations and further research issues</td>
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<td>16.45</td>
<td>Plenary 3</td>
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<td>Chair: Dietmar Harhoff, LMU</td>
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<td>Presentation of group-work findings and joint review of recommendations</td>
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<td>17.45</td>
<td>End of workshop</td>
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<td>19.30</td>
<td>Dinner at Wirtshaus in der Au</td>
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<td></td>
<td>81669 Munich</td>
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</table>
Acknowledgements
The Economic and Scientific Advisory Board would like to thank the presenters, the facilitators of the work groups, as well as the chairs (in alphabetical order):
The Economic and Scientific Advisory Board would also like to thank all those who participated in the workshop (see Annex 1) for the fruitful discussions and their valuable contributions.