New Emphasis on the Analytical Approach of Apportionment
In Determination of a Reasonable Royalty

James E. Malackowski, Justin Lewis and Robert Mazur

Recent court decisions have raised the bar with respect to patent damages calculations. A key element of these decisions has involved the request for a more rigorous apportionment of value and/or profit to the various features (both accused and non-accused) included within complex feature rich products. This paper will discuss one means of achieving an apportionment based on an objective and replicable methodology which examines the products’ underlying technology through the use of patent citation analysis.

The Analytical Approach, a variation of the Income Approach looks to compare and/or apportion the profits of the patented product between patented and unpatented elements. Application of the Analytical Approach can be premised on the theory that the value of patented elements may be measured by comparing the profits of products incorporating the patents to otherwise equivalent but non-accused products or to some company or industry norm, or as the U.S. Court of Appeals for the Federal Circuit in the *Lucent v. Gateway* (“Lucent”) matter, stated: “describ[ed] the analytical method as “calculating damages based on the infringer’s own internal profit projections for the infringing item at the time the infringement began, and then apportioning the projected profits between the patent owner and the infringer.”

This Analytical Approach is often considered within or in conjunction with the traditional hypothetical negotiation and the *Georgia-Pacific* fifteen factor analysis or alternatively it can be used independently without the *Georgia-Pacific* factors to directly determine a reasonable royalty rate. While not as common as the approach laid out in *Georgia-Pacific*, the Analytical Approach (or “analytical method” as described in *Lucent v. Gateway*) has been deemed an acceptable approach for the determination of a reasonable royalty independent of a *Georgia-Pacific* analysis and a direct application of the Analytical Approach was made in the *TWM v. Dura* (“TWM”) case.

While accepted by Courts, use of the Analytical Approach has not been as widespread as the *Georgia Pacific* factor analysis, which is likely due to the unavailability of key data, since parties to litigation often do not produce information on other non-accused patented features embodied in the product or similar but non-accused products.

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1 James E. Malackowski is the Chairman and CEO of Ocean Tomo, LLC; Justin Lewis is a Managing Director of Ocean Tomo, LLC responsible for the firm’s Risk Management Business Unit. Robert Mazur is a Director of Ocean Tomo, LLC.


4 “Based on the case facts available, the analytical approach may be an overriding consideration in the determination of a reasonable royalty, or it may be one of several considerations, such as the consideration of the Georgia-Pacific factors… (“Economic Damages in Intellectual Property.” Edited by Daniel Slottje. John Wiley & Sons, Inc., 2006. p. 184).

5 The analytical method is synonymous with the Analytical Approach and is referred to as the Analytical Approach throughout this article.
Using the Analytical Approach to Value an Incremental Feature

Early case law such as *Georgia-Pacific* and *TWM* involved asserted patented technologies which were deemed to contribute virtually the entire incremental difference in profits between the accused and non-accused products. In such instances, a further apportionment was not needed. In situations where there is more differentiation between accused and similar non-accused products, if the data was available, the simplest Analytical Approach would evaluate two products with identical features except for the feature valued, as follows:

![Figure 1: Single Incremental Feature](image)

Need for Further Apportionment of Incremental Profits

The concept of apportioning profits to a patent’s relevant contribution has long been established in patent law which requires that the fact finder award a reasonable royalty based on the patentee’s contribution over the prior art at the time of infringement. Over a century ago, in *Garretson v. Clark*, the Court expressed the need to properly apportion a defendant’s profits between the accused and non-accused elements.

With today’s feature rich products this single feature Analytical Approach is rarely the case. Recent case law has recognized that it is often the case in today’s complex litigation where there are a multitude of non-accused incremental features which contribute to the generation of profits for an accused product. Under these circumstances a further apportionment of the incremental profits is necessary. A comparison

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8 *Garretson v. Clark*, 111 U.S. 120, 121 (1884).
9 Cite date picker case.
of similar products with multiple differences can be utilized to simplify the evaluation. After the incremental profit for the accused product has first been determined, these profits need to be further apportioned to the various new features included in the accused product. The following figure illustrates the application of the Analytical Approach to determine the incremental profits that may be attributed to multiple differences between two similar products:

**Figure 2: Analytical Approach Methodology**

A Method to Apportion Profits

Depending on the data available in a particular case, there are several ways which one can apportion profits in feature rich products. One method is to apportion profits to significant technology groups/features within a product based on the density of the relevant patent landscape. This is accomplished by selecting patents, including those owned or licensed by the accused infringer, which are representative of the features contained within the accused product. These representative patents are then used in a multi-generational citation analysis to identify the patents relevant to each of the identified features. The relevant patents surrounding the product features form a patent landscape that can then be used to apportion a reasonable portion of the total product profits to the accused features.

First, an allocation of the incremental profits on the accused product between patented and non-patented features including know-how, engineering, technical, brand value and other items that the alleged infringer has contributed to the product and/or process at issue should be made using established valuation approaches often starting with the entire profit on the accused product (see Figure 3 below):

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10 In Intellectual Property: Valuation, Exploitation and Infringement Damages, Gordon Smith and Russell Parr advocate the use of an enhanced version of the Analytical Approach that considers the various contributions from all inputs to a product to indicate the economic contributions of the intellectual property.
Once profits associated with the incremental set of features has been determined, identification and a relative assessment of the features related to the incremental profits should be made. This can be determined by technical experts, fact witnesses, survey results, third-party research and/or contemporaneous product marketing and specification documents.

Next, once the additional patented features included in the accused products have been evaluated, an assessment of their relative importance can be made. It is important that the apportionment not only focus on the patent owner’s and the alleged infringer’s use of the alleged infringing patent, but must also consider and assess the relative importance of the benefits derived from other patent groups that are utilized in the product.

To determine the relative importance of the features in a particular accused product across all the patented groups, a feature-level apportionment based on the “patent density” of each individual feature can be utilized. Patent density simply refers to the number of U.S. patents related to the feature, weighted by the degree of their relevance to the feature. A product feature for which weighted patent density is high indicates that companies found the feature important enough to incur the cost of research and development, patenting and maintenance of the patents. These areas of high patent density are also likely to be areas where multiple claims of infringement may be made as these features may be the result of significant incremental improvement.

To determine the patent density for a feature based on a patent citation relevance analysis, it is necessary to first identify a set of patents reasonably representative of the feature. These representative patents are selected by technical experts who are typically of ordinary skill in the art or company representatives familiar with the product development as representative of the technology and features that are present in
the accused products. These representative patents need not be embodied in the product, but should be closely related to the functionality provided by the feature.11

Once these patents have been selected, a statistical citation analysis is performed to generate the landscape of relevant patents, referred to as the “patent landscape” for that feature. The citation analysis includes both backward (earlier patents that the patent being examined references) and forward citations (subsequent patents referencing the patent being examined).12 The multi-generational citation analysis is repeated for each feature and these feature level landscapes are combined and further analyzed in order to determine the patent landscape for the accused product including all features being evaluated.

Once the patent landscape for the product has been determined the final step of the methodology apportions the incremental profit to the groups that were determined previously based on the densities of each feature in the patent landscape. This ultimately yields the apportioned value related to each technology feature, which would equate to the indicated reasonable royalty amount, assuming the patents-at-issue represent the embodiment of the feature. The table below illustrates the application of the Apportionment methodology related to ten incremental factors related to a $50 profit premium:

<table>
<thead>
<tr>
<th>Feature Name</th>
<th>Weighted Patent Density</th>
<th>Relevance Weighted Feature Allocation</th>
<th>Per-Unit Incremental Profit Attributable to Patents</th>
<th>Per-Unit Apportioned Incremental Profit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incremental Feature 1</td>
<td>1,500</td>
<td>15.0%</td>
<td>$50.00</td>
<td>$7.50</td>
</tr>
<tr>
<td>Incremental Feature 2</td>
<td>1,450</td>
<td>14.5%</td>
<td>$50.00</td>
<td>$7.25</td>
</tr>
<tr>
<td>Incremental Feature 3</td>
<td>1,300</td>
<td>13.0%</td>
<td>$50.00</td>
<td>$6.50</td>
</tr>
<tr>
<td>Incremental Feature 4</td>
<td>1,275</td>
<td>12.8%</td>
<td>$50.00</td>
<td>$6.38</td>
</tr>
<tr>
<td>Incremental Feature 5</td>
<td>950</td>
<td>9.5%</td>
<td>$50.00</td>
<td>$4.75</td>
</tr>
<tr>
<td>Incremental Feature 6</td>
<td>700</td>
<td>7.0%</td>
<td>$50.00</td>
<td>$3.50</td>
</tr>
<tr>
<td>Incremental Feature 11</td>
<td>650</td>
<td>6.5%</td>
<td>$50.00</td>
<td>$3.25</td>
</tr>
<tr>
<td>Incremental Feature 12</td>
<td>600</td>
<td>6.0%</td>
<td>$50.00</td>
<td>$3.00</td>
</tr>
<tr>
<td>Incremental Feature 7</td>
<td>450</td>
<td>4.5%</td>
<td>$50.00</td>
<td>$2.25</td>
</tr>
<tr>
<td>Incremental Feature 8</td>
<td>400</td>
<td>4.0%</td>
<td>$50.00</td>
<td>$2.00</td>
</tr>
<tr>
<td>Incremental Feature 9</td>
<td>375</td>
<td>3.8%</td>
<td>$50.00</td>
<td>$1.88</td>
</tr>
<tr>
<td>Incremental Feature 10</td>
<td>350</td>
<td>3.5%</td>
<td>$50.00</td>
<td>$1.75</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>10,000</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>$50.00</strong></td>
<td><strong>$50.00</strong></td>
</tr>
</tbody>
</table>

In conclusion, there are several methods accepted by the courts for the determination of a reasonable royalty in litigation. The methodology described in this article addresses recent court decisions indicating the need to further apportion profits between infringing technology and other non-infringing technology as well as other features found in an accused product. The methodology described above is objective and

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11 This process works because the citation analysis will find similar relevant patents, so the initial representative search patent need not be exactly on-point. It also holds true that there could be multiple patents which best represent a single feature; the analysis can also work with multiple representative patents being selected.

12 The use of patent citations to determine the relative value of an invention has been the subject of research studies for over forty years and the research in the field of patent citations suggests that “the location and analysis of groups of highly cited patents can provide a valid indicator of patent areas of technical importance.” Ocean Tomo’s patent citation relevance metric represents an example of one tool that may be used to generate a relevant patent landscape for each incremental feature based on a weighted patent density as determined by citation references to representative patents.
similar to a patent citation analysis that was recently accepted by the courts.\textsuperscript{13} While the data necessary to complete this feature level analysis is not always available, the contribution of any particular patent or feature should be considered in the context of the often vast patent landscape that is relevant to the product as well as the contribution of the other product features.

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\textsuperscript{13} In \textit{Oracle v. Google}, the Court accepted an apportionment method used by Oracle that follows a methodology similar to the one described above and that was based on a patent citation analysis. In order to apportion value to the patents-at-issue in that case, Oracle engineers first identified patents that would have been part of the licensing negotiations for the accused product at the date of a hypothetical negotiation using keyword searches for specific terms and inventors to search patents by reviewing titles, abstracts, inventors, application dates, specifications and claims to select a starting group of patents. As part of that process, Oracle narrowed the number of relevant patents from over 1,300 to less than 600 which it then categorized into 22 technology groups. Then, using a weighting based on a three point scale (presumably a high, medium and low ranking), patents within the groups were ranked in order of importance to determine a ranking for each group, resulting in an identification of the top three groups, from which slightly more than 20 patents, including several of the patents-in-suit, were identified as the most important patents. Finally, the dollar value of the now-ranked patents was determined based on the use of patent-value studies, including a study based on patent citations, that assigned the bulk of the value to the top group of patents with the remaining value being apportioned to the over 540 remaining patents (\textit{Oracle v. Google}. Order Granting in Part and Denying in Part Google’s \textit{Daubert} Motion to Exclude Dr. Cockburn’s Third Report filed March 13, 2012, pp. 3-8.)
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