

A new method for Monitoring Competitors' Innovation Activities.

Creating Competitive Patent Maps Based on Semantic Anchor Points

Lena Kronemeyer lena.kronemeyer@innovation.uni-bremen.de

University of Bremen, Institute of Project Management and Innovation

Kathi Eilers kathi.eilers@innovation.uni-bremen.de

University of Bremen, Institute of Project Management and Innovation

Michael Wustmans m.wustmans@ilr.uni-bonn.de

University of Bonn, Chair for Technology and Innovation Management in Agribusiness

Martin G. Moehrle moehrle@uni-bremen.de

University of Bremen, Institute of Project Management and Innovation

The movements of competitors, their innovative endeavors and the targets of their efforts provide necessary information for the business intelligence of a company. Giving answers to the questions arising from these tasks is one of today's specific challenges in product and innovation management. Observing competitors' publications and websites or existing products can answer some questions, but can offer future oriented insights only to a limited degree. In contrast, the patenting behavior is one future-oriented indicator for competitive innovation activities and thus can be used as a proxy data for monitoring processes (Peeters and de la Potterie, 2006). The early availability of patents and their structure confirm the advantage of patents. Usually, research and analysis of competitors' patents are done manually. For sure, this leads to qualitative information, but quantitative information could be used to measure and visualize what competitors really do.

For this purpose, we will adapt and develop further an approach based on a method introduced by Moehrle and Passing (2016) and Passing (2017) for the analysis of technological convergence. The primary idea behind this approach is to use semantic analyses to take the unstructured data of patents into account. To introduce this approach for monitoring competitors and their innovation activities, we use four design decisions. Beginning with the operationalization of the competitive environment in design decision 1, we develop semantic anchor points in design decision 2. In design decision 3, we measure semantic similarities between selected patents and the semantic anchor points. Finally, in design decision 4, we analyze the data in different ways and show the competitive landscape of the analyzed companies.

In detail, in design decision 1 a competitive environment has to be chosen and the relevant competitors for the analyses identified. For each competitor a database of patents has to be generated.

Considering design decision 2, we develop semantic anchor points using the previous generated databases. We use semantic analyses to identify characteristic textual corpora in the unstructured parts of the patents. For the development of anchor points, three points

have to be considered: The selection of the relevant parts of the patents, the extraction of the semantic elements and the prioritization of the characteristic semantic elements.

In design decision 3 the similarities between the developed anchor points and the patents in the generated databases are measured. The similarity is measured based on the accordance of semantic elements.

The results of the similarity measurement are used in design decision 4 to generate competitive patent analyses. For instance, using RadViz (Nováková and Štěpánková, 2011) to position the anchor points and the patents in the competitive map, we are able to present the competitive landscape. The distance between a patent and an anchor point gives an evidence about the similarity between those.

To test the approach, we consider a case in the automotive industry. This industry combines competitors and suppliers from different regions and is a patent-active technology field. Since we expect a strong competitive environment, we select suppliers within the automotive industry and choose the technology 'gearing'. This technology has to deal with upcoming challenges considering the change from combustion engines to alternative power units and therefore seems to be an interesting technology field for our analyses. We identify Aisin AW, BorgWarner, Jatco and ZF Friedrichshafen as competitors in the US-market. We use granted US-patents from the years 2001 to 2015 in the IPC-class 'F16H'.

As stated before, monitoring the innovation activities of competitors is the main subject of this approach. With the generated patent maps we are now able to investigate technological movements of companies over time, identify relevant research topics of all or selected competitors and identify those patents giving an evidence of new research topics of selected competitors.

From a theoretical perspective, our approach offers quantitative information about the technological position and movements of competitors. They could be related to other characteristics, which describe the competitive landscape, such as market shares or product introductions. The same information can be used from a managerial perspective, enabling analysts to use an adaptable and robust method.

Cited References:

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