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# A Survey on Patent Analysis

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**Abstract:** In competitive business patents are crucial analytical benefit. They are determined as gold mine if it is fetched, analyzed and deploy properly. Patent search and analysis are the key step in the patent process and relevant patent may cause expensive legal consequences. In today's world patent collection is enhancing speedily, retrieval of this huge knowledge and information source has become inconvenient and exhaustive. Work mainly glance at literatures dealing with retrieval of patent text and its analysis. Literature review presents various research works that have been carried out to yield better results in patent analysis task.

**Keywords:** Patent Search, Patent Analysis, Visualization, Scientific Literature.

## I. INTRODUCTION

In today's world Patents are the critical asset for any innovative company, and business which can increase global competition, aligning in the business strategies along with the IP strategies.

Patent informatics defines the science of searching, analyzing and presenting patent information to identify relationships and trends Over the past few decades patent searching has changed dramatically from paper based access to instant online access, from library catalogue systems to internet search systems, from partially indexing to fielded and full text indexing to multi-modal indexing According to Bonino et al [1], patent analysis can be divided into following main categories:

Search Within this section there are a number of separate types of search assignments which require two types of information like patents and non-patent to be retrieved and analysis in order to achieve a particular goal/work task.

The Analysis of patents is usually performed by an agent to notify users about new incoming patent information to keep users abreast of the latest developments.

The main focus the requirements associated with the search tasks like,

- 1) *State of the Art (SOA)*: Identify patents for the purposes of a general review. Sometimes they are mention as Landscaping or/ and Technology survey.
- 2) *Novelty (NOV)*: classification of patents and non-patents may influence the patentability as an idea or an invention.
- 3) *Patentability (PAT)*: Here it gives the patent application and also ensure its novelty.
- 4) *Infringement (INF)*: recognize patents or its applications which cover the product or activity and are also force.
- 5) *Due Diligence (DD)*: analyze strengths, weaknesses and scope of IP rights.

Analysis The analysis of patents can be broken into two main types:

- a) Micro analysis of individual patents.
- b) Macro analysis of a group of patents.

The analysis is normally performed to evaluate the Intellectual Property (IP), to map and chart the IP, to introduce trends and also to recognized new areas of potential to exploit.

Literature review presents multiple different research works that have been carried out for good results in patent retrieval and analysis task or by using standard approaches at some different stages of the patent analysis process.

## II. LITERATURE SURVEY

Lupu et al. [3] give an in-depth account of current techniques for patent retrieval. Whereas it also contain the approach like Visualization to retrieval, it does not cover the entire range of visualization approaches to patent analysis.

Yang et al. [2] review only commercially available text

Mining as well as visualization approaches for patents analysis. We have decided to exclude these from this survey, the main reason for this being that available information about them is scarce.

Börner [5] focuses on mapping approaches, i.e. specializations of scientific communities often based on citation data. She provides a comprehensive overview including hand-drawn examples. Our focus, in contrast, is broader, comprising all types of visualization methods that provide benefits for the analysis of scientific documents and patents.

Alok Khode et al [6] considering the various techniques and frameworks available and their limitations, there is a lot of scope in the field of patent retrieval techniques which makes room for further research to be taken up in this domain.

Longhui Zhang ET AL [7] introduces the recent development in the field of patent mining, it is still far away from being explored in research area. To assist patent analysts and attentive readers gain an over view of patent mining, it thus provide a detailed summary of present research done along this direction. This survey, outline the different technical trend in patent mining.

Chan et al. mention about that Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model and Glosten, Jagannathan and Runkle's (GJR) model can be used in time-varying volatility of patent ratio. Simultaneously, they use four countries as research objects, are Canada, France, Germany and Japan. The experiment results provide some evidence to support the impact that between these four countries to exist the presence of interdependent in the conditional variance of the patent growth rate [12].

Paolo Federico et al. [13] review interactive analysis and visualization approaches of patents analysis. Scientific articles, which explore different tools for sophisticated mining methods. The bottom-up approach is categorized into two aspects: first aspect includes **data type** like text, citations, authors, metadata, and etc, whereas second aspect is **task** this mainly include finding and comparing single entities, seeking elementary relations, finding complex patterns.

Table: - Various patent analysis techniques and approaches

Techniques:	Query formulation. Query expansion. Summarization. Relevance feedback.
Models:	Vector Space Model (VSM). Semantic Based Processing. Latent Semantic Analysis(LSA). Language Model. Weighting Techniques. Probabilistic Model etc.
Others:	Bibliometric methodology. Data Mining. Text Mining. Database Management Tools like OLAP. Citation Analysis.

### III. CONCLUSION

Patent analysis and patent technology indicators topics that is established to be one of the most essential and viable data sources, which should be a fundamental part in educational strategic like undergraduate (UG) as well as postgraduate (PG) and curriculums' plans. In this survey literature review of different author's in the area of patents analysis, patents technology indicators, and its applications are elaborated in this paper. Literature was able to identify many potential research gaps, which worth for further investigation.

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