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A Perspective of AI and Patents

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Abstract:

Artificial Intelligence (AI) is significantly changing the world as well as the business. The emergence of AI, AI portfolio, a timeline of AI, its usage in different sectors, the real scenario of AI with Statistical data are presented. The paper discusses the role of patent is development and protection of AI based technologies, the contribution of the sectors in filing patents related to AI. The paper studies the problems faced by businesses with AI implementation and the probable strategic solutions using patents.

Key Words Artificial Intelligence (AI), Patents, Businesses, Technologies

Introduction

AI is an integral part of the day to day activities. In every sector, technologies are being developed to integrate with the existing processes. Businesses are forced to strategize and re-engineer their organizations to adapt to the technological innovations and upgradations. Sectors which are presumed to be more human resource oriented such as Agriculture, Medical, Legal, Production, Banking, Education and others are incorporating and are integrating with AI.

Emergence of AI

The substitution of man with machines at work through Industrialization in 1800 is one of the remarkable changes in the production . It was initially with simple machines, to mechanization of the process, to automation were the past changes that have paved the way to Artificial Intelligence. The changes not only changed the production processes but have made a significant impact in the service sector. The businesses in all the sectors are exploring and adapting to the new paradigm. It's becoming inevitable for them to adapt to the change for them to "Survive". Cost cutting technologies, edge over strategies in production and in marketing using AI is driving the businesses to the dynamics. Most of the online businesses are dependent and are surviving based on the Artificial Intelligence data.

AI Portfolio

The investment portfolio of AI is diversified. The portfolio includes

- ❖ Artificial Intelligence
- ❖ Machine Learning
- ❖ Deep Learning
- ❖ Neural Networks

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A timeline of AI

1956	"Artificial Intelligence" is coined at a Dartmouth conference.
1956–1974	AI enjoys government funding in promising, logic-based problem-solving approaches.
1974–1980	Increased Interest in AI research
1980–1987	The rise of knowledge-based expert systems brought new success and a change in the focus of research and funding for AI.
1987–1993	Decline in the specialized hardware industry in 1987 was attributed to a negative approach by governments and interested parties AI, as expert systems exhibited their limitations and proved expensive to update and maintain.
1993–2011	New successes are marked with the help of increased computational power and AI becomes data-driven leading to Optimism towards AI which shows an increasing adaptation by the business.
2011 - till date	Increased data availability, connectedness and computational power allowed new directions in machine learning, mainly in neural networks and deep learning. This has led to increased investments in AI.

AI in different sectors

The different sectors that had been adapting to Artificial intelligence include Healthcare, Retail, Logistics, Professional Services, Finance, Transportation, Energy, Food/Agriculture, Construction, Education and others. It plays a significant role even in the Decision Support System. AI is used predominantly in Medicine, Games, Self Driving Cars, consumer behaviour analytics of the consumer. Majority of the e-commerce sites depend on the data analysis of the shopping pattern of the consumer, the kind of products the consumer is searching for, and the time taken in the search process. AI is taken help of in the data analysis and to understand the consumer behavior so that the goods that are mostly looked up are provided. The decisions that used to take a long time for analysis are provided with quick information using AI.

The Real Scenario

The AI statistics speak about the growing importance of Artificial Intelligence[1].

- More than 80% of customer interactions are expected to be done without human interaction by 2020.
- AI technology is used for surveillance by more than 75 Countries .
- AI usage is growing multifold over the last few years.
- AI augmentation is expected to create $2.29 trillion of value for the businesses by 2021.

AI is becoming the order of the conducting of the businesses and also for maintaining the leadership in the market. Firms are spending on AI based and are filing for the patents for a big market predominance. This would help

them to survive and sustain the increasingly dynamic market and help them to have an edge over their competitors.

Growth of AI and Role of Patents

AI based patent applications are filed by a majority of the companies and Research organizations. IBM is one of the preeminent company, holding a major share in the number of patents filed and the market share and of market revenue generated by patents[2]. Even though IBM stands to market leader in AI investment.

Another major company Google, which is a service provider has set up a separate fund for AI based research with an initial funding of $25 million[3]. In addition it is one of the major companies which has been spending on acquiring AI based startups. It is expected to spend a significant amount of $3.9 billion in 2018 followed by Amazon which has spent $871 millions[4].

Even though research organizations are involved in the development of AI based products, a major role is played by Business organizations. firms are protecting their innovations by filing patents. they are not restricted to filing patents in one territory. They are doing a perfect TOWS and PESTEL analysis to understand the commercial feasibility of their innovations globally and are filing patents in multiple countries wherever they are finding a commercial feasibility and advantage.

An analysis of AI applications filed can be analysed based on

- Application fields of AI and
- Functional applications of AI

Application fields of AI:

The major industry that has been filing patents is the transportation sector. self driven automobiles is attributing to the AI based patent filing. It is estimated that around 15% of AI based applications are filed under the transportation family as per WIPO report[5]. communication network is another field where research is done by major companies. Telecommunications sector recorded 15% of applications based on AI as per WIPO. In addition to the above the Life and Medical Sciences are attributing to 12% of the AI based applications.

Functional Applications of AI

The functional areas of AI where major research is made and patents are filed are Computer vision, Natural Language Processing and Speech Processing. 49 % of the patents are attributed to Computer Vision. 14% of the applications are filed in Natural Language Processing (NLP) which is a major area of research in the field of Computer Science. most of the search engines especially are upgrading their search engine services. one of the major aspects that they are incorporating is Speech Processing. In this field, 13% of AI Based patents are filed.

Future with AI

Doing research using AI is expected to resolve problems for the businesses that they are facing. In the due course the businesses are facing new problems. Some of the issues are

- Firms cannot spend all the related fields of AI at the same time. Phased investment would lead to loss of market share.

- The skill set of existing manpower prevailing would be different from the skill set required in the AI based business operations.
- The firms are making a huge investment in AI research.

Upgrading the firm's business process with AI needs to be done by the firms in a strategic manner.

- In case the situation involves Programmed and Structured Decisions, which are based on statistical analysis, AI based Decisions Support System (DSS) could be preferred by the firms.
- In the event of Diagnostic Analysis based decision making, AI based analysis could help the managers in better inferential decision making.
- Investing in diversified IP portfolios which might lose their significance with advancement in technology and retaining those intangible assets which might not yield the required ROI should be evaluated carefully by the top level management.
- Tie-ups with firms having a strong IPR portfolio across the territory should be preferred to have a significant global presence.
- Firms instead of funding for AI research in all areas, entering into strategic alliances, having collaborations with firms strong in AI

based technologies would help the firms to enhance their global competitiveness.

- Deployment of AI instead of human resources needs to be addressed cautiously by the firms.
- Employing more people with diversified skill sets capable of handling the new AI technologies effectively and efficiently utilizing them have to be focussed.

Conclusion

Various computer based technologies are invented to boost the business operations over a period of time. But the impact of AI is significant. AI has changed, revamped and reengineered the way that the businesses are conducting and reorganizing themselves for their survival and predominance.

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