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Analysing IOT patents in India with Machine Learning

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***Abstract*— IOT is a buzzword today, soon we will be in an era all surrounded by smart objects. With the growing number of smart devices in surrounding, it is important to protect these innovations under Intellectual Property Rights. India in last five years has witnessed lot of smart devices flourishing technological market. The number of patents registered under IOT has also increased in last five years. In this paper I will be using Machine Learning Algorithm to predict whether there will be an increase or decrease in the number of patents filed under IOT in coming years.**

***Keywords*— IOT ,Patents, Machine Learning, Linear Regression, PR**

I. INTRODUCTION

The industrial and consumer sectors have been completely transformed by the Internet of Things (IoT). More and more companies are recognising the IoT's potential to increase productivity and reduce risks by tying together devices for real-time data and insights.

India has seen a tremendous increase in IoT patent filings over the past few years. Around 5,000 IoT-related applications were submitted between 2014 and 2019, according to a new survey by the National Association of Software and Service Businesses. The majority of these patents are related to the healthcare industry, even if Industry 4.0 can be credited with more than 80% of them. The IoT in India is anticipated to reach 2 billion connections and generate up to $11.1 billion in revenue over the next two years, according to published industry statistics.

The interoperability of devices, which highlights the usage of standardised technology, is another significant component of IoT inventions. The patenting of these, however, seems to be anti-competitive and might prevent the IoT industry's overall growth. Standards-setting organisations therefore play a significant role in balancing the rights of patent holders and promoting the development of IoT inventions while designating such patents as standard-essential. In order to ensure that a balance can be struck between the interests of patentees and the torch bearers of IoT, a well-devised legal framework built around the goals of FRAND terms is urgently required.

By using Machine Learning we can predict the growth in the number of patent filings in coming years. Linear regression is one of the easiest and most popular Machine Learning algorithms. It is a statistical method that is used for predictive analysis.

II. IOT

We now live in a technologically advanced, digitalized environment. Internet of Things is one of these technological developments (IoT). IoT's potential for the future is paving the way for a smarter world.

The idea of linking any gadget to the Internet and other linked devices is known as the Internet of Things, and it may be applied to any device . The Internet of Things (IoT) is a vast network of interconnected devices and people. As part of this network, data on how these devices are used and their surroundings is collected and shared.

Sensor-equipped devices and items are linked to an Internet of Things platform, which combines data from the many devices and applies analytics to share the most useful information with applications created to address particular needs.

These robust IoT solutions can precisely identify which information is helpful and which may be safely disregarded. This data can be used to identify trends, generate recommendations, and identify potential issues before they arise.

III. IPR

> Inventions, literary and artistic works, as well as symbols, names, images, and designs utilised in business are all examples of intellectual property (IP), according to the World International Intellectual Property Organization.

Simply put, intellectual property is a product of human knowledge or thinking. Intellectual property can be thought of as a type of property right that is similar to physical property in that it can be purchased, sold, financed, traded, and licenced. Only when the creators of intellectual property are granted rights (about its usage) is intellectual property protected. National governments grant inventors, writers, and other individuals intellectual property rights with the help of law provisions.

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Here is a list of the four primary categories of intellectual property.

Patents are used to safeguard novel concepts, ideas, or methods. Government renewal costs must be paid on a regular basis by patent owners. A granted patent has an expiration date. Learn more about the Indian Patents Act.

Copyrights: They safeguard ideas; examples include written works, music, and visual art.

Trademarks are used to protect various designs, words, phrases, sounds, and other elements.

Trade secrets - A company's trade secrets could include strategies, processes, formulas, or other proprietary information that gives them a competitive edge in the market.

IV. BACKGROUND

A. LINEAR REGRESSON

An algorithm for machine learning based on supervised learning is linear regression. It carries out a regression task. Based on independent variables, regression models a goal prediction value. Finding the connection between variables and forecasting is its main use. The type of link that different regression models take into account between the dependent and independent variables, as well as the quantity of independent variables utilised, are what make them different.

The dependant variable in a regression analysis goes by many names. It may also be referred to as a regressand, an endogenous variable, an outcome variable, or a criteria variable. The exogenous variables, predictor variables, or regressors are several names for the independent variables.

B. DATA COLLECTION

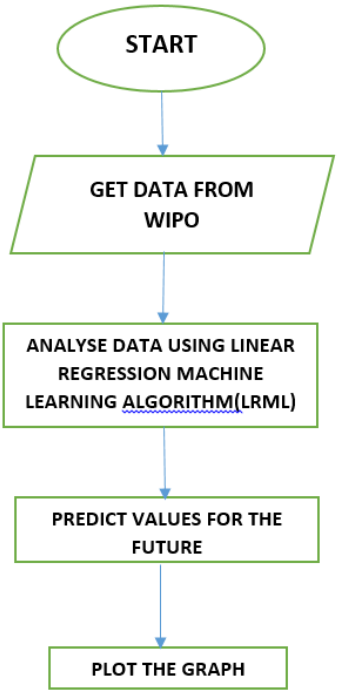
The system needs data from past years' iot patent filled data to estimate an increase in the number of iot patent filings. The information is gathered throughout the course of 5 years, from 2018 to 2022. The system uses this data to process and forecast tiot patent fillings. The information is gathered from the https://patentscope.wipo.int website. In order to train the system, data for different parameters and states are gathered. This information is utilised to create an equation that forecasts an increase in the number of Indian iot patent filings.

V. METHODOLOGY

A..TABLES

year	patents
2014	14
2015	59
2016	83
2017	191
2018	418
2019	976
2020	954
2021	1257
2022	2654

B. FLOWCHART



VI. ANLAYSIS

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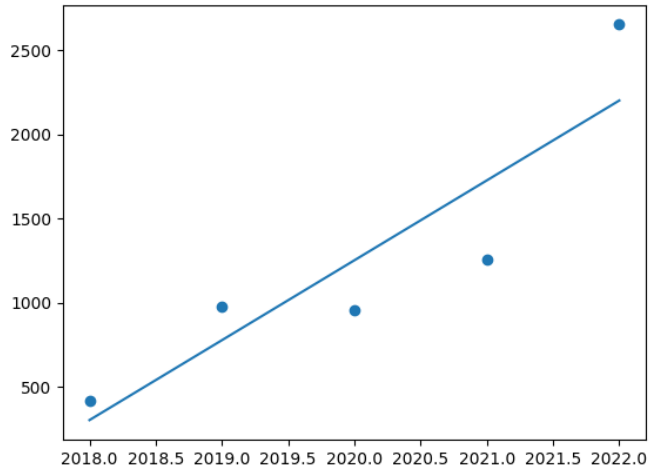
We have used stats.linregress() of python to predict values



Forecast results:

year	**2023**
patents	**2677.70000000007**
slope	**475.3**
intercept	**-958854.2**
r	**0.8940649566826477**
p	**0.040725753162853436**
std_err	**137.48501736552979**
Multiple R-squared	**0.7994**
Adjusted R-squared	**0.7325**
F-statistic	**11.95 on 1 and 3 DF**
p-value	**0.04073**

CONCLUSION

By using linear regression machine learning algorithm, future number of iot patents fillings are predicted based on past values. These predicted values are near similar to the exact values with slight variations at certain time.

The values predicted by model states that there will be an increase in the number of patents filled in coming years

REFERENCES

[1] J. G. Agrawal, Dr. V. S. Chourasia ,Dr. A. K. Mittra , State-of-the-Art in Stock Prediction Techniques, International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering,Vol. 2, Issue 4, April 2013

[2] A.Schneider et.al, Linear Regression Analysis, Deutsches Arzteblatt International, Scientific Publications, Dtsch Arztebl int 2010,107(44):776-82

[3] R. Samuel Selvaraj and Raajalakshmi "Statistical Method of Predicting the Northeast Rainfall of Tamil Nadu", Universal Journal of Environmental Research and Technology. Volume 1, Issue 4: 557-559.

[4] Lin Yu, A study of English reading ability based on multiple linear regression analysis, Journal of Chemical and Pharmaceutical Research 2014 6(6): 1870-1877.

[5] Deroski, Saso and Bernard Enko. "Is Combining Classifiers with Stacking Better Than Selecting the Best One?", Machine learning, Vol. 54(3), pp. 255-273, March, 2004