An Analysis of Electronics and IT Patents Granted In India Based on Applicants Origin

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Abstract

This paper Analyses the Electronics and IT Patents Granted in India based on Applicants Origin filed in the year 2005-2012 with respect to the Knowledge and Economy as an Indicators. The Database for analysis is extracted from WIPO IP Statistics Database, UNESCO Institute for Statistics and World Bank. These Electronic and IT patents were analyzed on the basis of Indicators such as Human Development Index, Expected Years of Schooling, GDP per Capita and GNI per Capita. It emphasizes the importance of Patent literature in Technology Development, New Innovations, and Knowledge of the Origin (India). It was found that patent filing activities has been increased in India, as a result of analyzing the Database.

Keywords: Patenting, Intellectual Property, Technology, Human Development Index

Introduction

This Paper Analyses the Electronics and IT patents Granted and Filed in India on the basis of Applicants origin. India is a developing Country in all the fields. The factors which influence the development of the Country are Human Resource. So there is a Connection factor between the Human resource in India and the Development achieved by India. Though Indian origin Applicant seems to file the Patent in the field of Technology related to Electronics and IT Sector shows the development in Knowledge of the Origin. The Quality of the Education directly involves in the Patent filing. Since the knowledge is directly proportional to the Outcome of technocrats in the Indian origin. Also the Economy is grown with the basis of the development of Human resource in all the Aspects. So there is an internal Connection between the Filling of Patents and the Human Resource and Economy of the Country. Here the paper deals the relationship between the Patents and Human Development Index, Expected years of Schooling, GDP per Capita, GNI per Capita.

Objective of the Paper:
To know the relationship between Electronics and IT Patents Filed and Granted in India based on the Applicants Origin with respect to the Human Development Index, Expected Years of schooling, GNI Per Capita, and GDP Per Capita.

Scope:
Obtaining the Correlation and Significance with the Different Technologies in Electronics and IT Sector with respect to the Human Development Index, Expected Years of Schooling, GNI per Capita, and GDP per Capita.

Research Methodology:
Electronics and IT patents Filed and Granted in India based on Applicants Origin has been analyzed under various Circumstances.

This Paper Analyses the Technology Patents with respect to the Knowledge and the Economy as a Prior Indicator.

Technology Patents in India- Filed and Granted Based on Applicants origin (2005-2012):
Source: WIPO Statistical Database, World Bank (World development Indicators), and UNESCO

Note: technology refers to the Subsection, Electronics and IT Sector (There are 8 Different Technologies grouped under this Section).

Searching the Database:
This data have been taken from the Website WIPO (World Intellectual Property Organization) www.wipo.int. This website contains the data set which is corresponding to Intellectual Property Rights; the search engine has been built in with this website in order to retrieve the necessary data. WIPO is the global forum for intellectual Property Services, Policy, Information, and Cooperation. IP statistics Centre provides the data is an online service enabling access to WIPO`s Statistical data. The statistical patent data is collected based on Indicator and Report Type.

The Eight Major Technologies Includes in this Study as follows:
 1. Audio-Visual technology.
 2. Telecommunications.
 3. Digital Communications
 4. Basic Communication Process
 5. Computer Technology
 6. IT Methods for Management
 7. Semiconductors
 8. Optics

These Eight major Technologies were Correlated and Regressed with the Following Indicators such as
 [1] Human Development Index
 [2] Expected Years of Schooling
 [3] GNI per Capita

[4] GDP per Capita

Analysis and Interpretation:

Table 1: Corrlation between Technology (Patents Filed) versus Knowledge and Economy Indicators

Technology	Human Development Index	Expected Years of Schooling	GDP Per Capita	GNI Per Capita
Audio-visual technology	.914[**]	.914[**]	.943[**]	.939[**]
Telecommunications	.873[**]	.819[*]	.846[**]	.849[**]
Digital communication	.962[**]	.959[**]	.974[**]	.973[**]
Basic communication processes	.930[**]	.936[**]	.953[**]	.950[**]
Computer technology	.956[**]	.953[**]	.971[**]	.970[**]
IT methods for management	.877[**]	.900[**]	.899[**]	.898[**]
Semiconductors	.833[*]	.853[**]	.868[**]	.866[**]
Optics	0.64	0.676	0.673	0.673
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

The Above Table No: 1 Depicts the Correlation relationship between the Total Number of Patents Filed in the Electronics and IT Technology sector based on Applicants Origin versus Human Development Index, Expected years of Schooling, GDP Per Capita and GNI Per Capita. There is a Significant Correlation relationship between Audio-Visual Technology, Telecommunications, Digital Communications, Basic Communication Process, Computer Technology, IT Methods for Management and Semiconductors and Human Development Index, Expected Years of Schooling, GDP Per Capita and GNI per Capita. This Correlation is significant at 0.01 Level (2-tailed). There is a Significant Correlation relationship between telecommunication and Expected Years of Schooling. This Correlation is Significant at 0.05 Level (2-tailed). There is no significant Correlation relationship between the Optics and Human Development Index, Expected Years of Schooling, GDP per Capita and GNI Per Capita.

Table 2: Regression between Technology (Patents Filed) and GNI per Capita

Variables	Regression Co-efficient	Standard Error	t- value	Sig	R^2
Constant	3191.092	108.138	29.509	.000	.947
Digital Communication	6.310	.607	10.389	.000	

Regression Fitted = Y = 3191.092 + 6.310(Digital Communication)

The final stepwise multiple regression models indicated that out of the eight variables, GNI per Capita to Digital Communication have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Filed by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Filed by Technology Based on Total count by Applicants Origin with GNI per Capita to the extent of 94%.

Table 3: Regression between Technology (Patents Filed) and GDP per Capita

Variables	Regression Co-efficient	Standard Error	t- Value	Sig	R^2
Constant	3204.811	108.679	49.489	.000	.949
Digital Communication	6.426	.610	10.528	.000	

Regression Fitted = Y = 3204.811 + 6.426(Digital Communication)

The final stepwise multiple regression models indicated that out of the eight variables, GDP per Capita to Digital Communication have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Filed by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Filed by Technology Based on Total count by Applicants Origin with GDP per Capita to the extent of 94%.

Table 4: Regression between Technology (Patents Filed) and Expected Years of Schooling

Variables	Regression Co-efficient	Standard Error	t- Value	Sig	R^2
Constant	9.850	.139	71.064	.000	.920
Digital Communication	0.006	.001	8.289	.000	

Regression Fitted = Y = 9.850 + 0.006(Digital Communication)

The final stepwise multiple regression models indicated that out of the eight variables, Expected Years of Schooling to Digital Communication have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Filed by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Filed by Technology Based on Total count by Applicants Origin with Expected Years of Schooling to the extent of 92%.

Table 5: Regression between Technology (Patents Filed) and Human Development Index

Variables	Regression Co-efficient	Standard Error	t- Value	Sig	R^2
Constant	.517	.004	122.202	.000	.96
Digital Communication	.014	.002	5.677	.002	
IT Methods for Management	.009	.001	-2.638	.046	

Regression Fitted = Y = 0.517 + 0.014(Digital Communication) + 0.009(IT Methods for Management)

The final stepwise multiple regression models indicated that out of the eight variables, Human Development Index to Digital Communication and IT Methods for Management have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Filed by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Filed by Technology Based on Total count by Applicants Origin with Human Development Index to the extent of 96%.

Table 6: Corrlation between Technology (Patents Granted) versus Knowledge and Economy Indicators

Technology	Human Development Index	Expected Years of Schooling	GDP Per Capita	GNI Per Capita
Audio-visual technology	.886**	.911**	.915**	.912**
Telecommunications	.880**	.883**	.914**	.911**
Digital communication	.898**	.901**	.932**	.928**
Basic communication processes	.842**	.796*	.878**	.874**
Computer technology	.898**	.909**	.930**	.926**
IT methods for management	.824*	.831*	.863**	.859**
Semiconductors	.811*	.839**	.835**	.831*
Optics	0.524	0.591	0.535	0.536
**. Correlation is significant at the 0.01 level (2-tailed).				
*. Correlation is significant at the 0.05 level (2-tailed).				

The Above Table No: 6 Depicts the Correlation relationship between the Total Number of Patents Granted in the Electronics and IT Technology sector based on Applicants Origin versus Human Development Index, Expected years of Schooling, GDP Per Capita and GNI Per Capita. There is a Significant Correlation relationship between Audio-Visual Technology, Telecommunications, Digital Communications, Basic Communication Process, Computer Technology, IT Methods for Management and Semiconductors and Human Development Index, Expected Years of Schooling, GDP Per Capita and GNI per Capita. This Correlation is significant at 0.01 Level (2-tailed). Exceptionally, there is a Significant Correlation relationship between Basic Communication Process and Expected Years of Schooling. There is a significant relationship between It Methods for Management and Human development Index, Expected Years of Schooling. There is a significant relationship between Semiconductors and Human Development Index, GNI per Capita respectively at the 0.05 Level (2-tailed).

Table 7: Regression between Technology (Patents Granted) and GNI per Capita

Variables	Regression Co-efficient	Standard Error	t- Value	Sig	R^2
Constant	3671.749	118.370	30.019	.000	.862
Digital Communication	11.533	1.883	6.124	.001	

Regression Fitted = Y = 3671.749 + 11.533(Digital Communication)

The final stepwise multiple regression models indicated that out of the eight variables, GNI per Capita to Digital Communication have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Granted

by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Granted by Technology Based on Total count by Applicants Origin with GNI per Capita to the extent of 86%.

Table 8: Regression between Technology (Patents Granted) and GDP per Capita

Variables	Regression Co-efficient	Standard Error	t- Value	Sig	R^2
Constant	3692.562	117.271	31.488	.000	.869
Digital Communication	11.787	1.866	6.317	.001	

Regression Fitted = Y = 3692.562 + 11.787(Digital Communication)

The final stepwise multiple regression models indicated that out of the eight variables, GDP per Capita to Digital Communication have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Granted by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Granted by Technology Based on Total count by Applicants Origin with GDP per Capita to the extent of 86%.

Table 9: Regression between Technology (Patents Granted) and Expected Years of Schooling

Variables	Regression Co-efficient	Standard Error	t- Value	Sig	R^2
Constant	10.342	.137	75.514	.000	.829
Audi-Visual Technology	.025	.005	5.397	.002	

Regression Fitted = Y = 10.342 + 0.025(Audio-Visual Technology)

The final stepwise multiple regression models indicated that out of the eight variables, Expected Years of Schooling to Audio-Visual Technology have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Granted by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Granted by Technology Based on Total count by Applicants Origin with Expected Years of Schooling to the extent of 82%.

Table 10: Regression between Technology (Patents Granted) and Human Development Index

Variables	Regression Co- efficient	Standard Error	t-Value	Sign	R^2
Constant	.541	.005	116.523	.000	.807
Digital Communication	.006	.002	5.005	.002	

Regression Fitted = Y = 0.541 + 0.006(Digital Communication)

The final stepwise multiple regression models indicated that out of the eight variables, Human Development Index to Digital Communication have significantly Contributed Positively. The analysis of variance of multiple regression models for Patent Granted by Technology Based on Total count by Applicants Origin indicates that overall significance of the model well fitted. The co-efficient of determination R^2 value showed that these variables put together explained the variations of Patent Granted by Technology Based on Total count by Applicants Origin with Human Development Index to the extent of 80%.

Findings and Suggestions

- Patents Filed (Published) and granted by Technology based on Applicants Origin shows the Positive Correlation between the Audio-Video Technology, Basic Communication Process, Digital Communication, Telecommunication, IT methods for Management, Semiconductors with the factors of human Development Index, Expected Years of Schooling, GDP per Capita and GNI per Capita respectively. But the Optics does not correlated with any of the above mentioned factor. This Shows that, In India there number of patents filed (Published) and Granted in the Optics is comparatively less and it portrait that there is a need in development in this Optics Technology.
- The Regression for the Human Development Index Versus Patents Filed by Technology based on Applicants Origin is fitted with Digital Communication and IT Methods for Management. Whereas the Regression for the Human development Index versus Patents granted by Technology based on Applicants origin is fitted with Digital Communications alone.
- The Regression for the Expected Years of Schooling Versus Patents Filed by Technology based on Applicants Origin is fitted with Digital Communication. Whereas the Regression for the Expected Years of Schooling versus Patents granted by Technology based on Applicants origin is fitted with Audio-Visual Technology Unfortunately.
- The Regression for the GDP per Capita Versus Patents Filed by Technology based on Applicants Origin is fitted with Digital Communication. Whereas the Regression for the GDP per Capita versus Patents granted by Technology based on Applicants origin is fitted with Digital Communication as previously.

- The Regression for the GNI per Capita Versus Patents Filed by Technology based on Applicants Origin is fitted with Digital Communication. Whereas the Regression for the GNI per Capita versus Patents granted by Technology based on Applicants origin is fitted with Digital Communication.

Conclusions

The Correlation between the Technology Patents reports that the Optics was the weakest Patent filed and Granted in India based on Applicants origin. This Shows that the Indian origin need to improve more knowledge in Optics. While the Regression fitting reports that the Digital Communication is a lead technology which involved in the increase in Number of patents filed and granted , the second lead is the Audio-Visual Technology and IT methods for Management. This shows that Indian origin were well knowledgeable in Digital Communication.

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