A Study of Patent Cooperation Treaty (PCT) and the Impact of E-Technology

B. K. R. Naik1[1]*, Sudhir K. Jain[1] and Surendra S. Yadav[1]

ABSTRACT

The well known proverb 'Knowledge is Power' has its roots from the beginning of human life on the earth and it was rewarded at every stage of the human civilization. The protection of intellectual property was started way back in 1474 (Venetian Statute of 1474 – the first patent law). From that time, the protection of inventions started in all fields of science and technology. We have now entered the era of knowledge economy, where intellectual property is playing a vital role. The human intellect is being utilized more and more to exploit potential creative instinct for inventing new technologies towards making the life more comfortable. In this process of innovation explosion, patents have emerged as great protection tools for the innovators to protect their inventions from unlawful usage. The Patent Cooperation Treaty (PCT), which provides a simplified system for international patenting, has become a major route for filing patent applications in a large number of member states. With the advent of internet technology, the prior-art and patent search has become simple and it has saved significant time for patent grant. This paper analyses the trend of international patent filing under the PCT system in developed as well as developing countries under different technical fields as per international patent classification (IPC) by subclass and the impact of internet as well as the e-filing which was introduced in 2003. It is found that the density of patent applications filed have substantially increased in the post-internet era.

Keywords: Patent Cooperation Treaty (PCT), Patents, International Patent Classification (IPC), e-Filing, Internet

1. Introduction

During the ancient period (B.C) and the medieval period (up to the first half of 15th century A.D.) people were not very much aware of the potential of inventions. They always worked for betterment of life and never thought about rights on intellectual property. They were proud to serve the society and thus there were no legal rights for the protection of intellectual property. The protection of inventions started in the medieval period. The history of patents and patent laws is generally considered to have started in Italy with a Venetian Statute of 1474. In general, a patent is the remuneration or incentive that the state grants to the inventor for his contribution for solving a problem in technology or industry. In the process of safeguarding patents, the Patent Cooperation Treaty (PCT) was signed at Washington on June 19, 1970. The PCT system for international patent filing has been in place since 1978 and use of the system has increased rapidly since then. The number of member states of the PCT is 133 countries as on 1st October 2006.

[1] Department of Management Studies, Indian Institute of Technology, Delhi, Hauz Khas, New Delhi – 11001, India
* *Corresponding Author:* (Email:, bkrnaik_iitd@yahoo.co.in, Telephone: +91-9871329423)

In the process of technological evolution, internet was started in 1995; then onwards the change took place drastically in science and technology. Since then e-technology has made the patent search faster and the recent trend of e-filing saves time, cost and material (paper).

2. Literature Review

Analysis of patent related data has long been considered to be an important method of assessing various aspects of technology change. Most have used patent statistics as a tool for studying either the relationship between technological development and economic growth (Penrose, 1951; Taylor and Silberstron, 1973), or in order to assess the research and innovation process in a national and international context (Bosworth, 1984; Schiffel and Kitti, 1978). Some studies, however, have analyzed it from the perspective of company policy for assessing the level of technology development in a particular sector, taking patent statistics as a technology indicator (Aston et al., 1989; Mogee, 1991; Liu, 1997). Patent analysis has also served as a basis for analyzing a firm's policy with regard to research, development and exploitation of foreign markets (Shipman, 1967). Intellectual property is important in all forms – whether it is a paperback novel used to escape the world or recent research used to change the world – it is part of our every day life. Several studies on patent information suggested that its use for R&D and technology development, R&D policy and management, Science & technology policy, Inventors' productivity in a publicly funded R&D agency and royalties, evolving patent rights, and the value of innovation. A study of IPR protection in developing countries has been carried out by Dawn Mc Laren of North Carolina State University in November 2003.

In India, a study has been carried out on an analysis of Indian patents and its implications by Moitra and Abraham (2003). Using patent statistics as a measure of "technological assertiveness", Bhattacharya and Nath (2002) have compared China and India. A study has also been done by Korn and Heinig on public versus private ownership of scientific discovery: legal and economic analyses of the implications of human gene patents, academic medicine the legal and economic rationale for supporting and opposing on human gene sequencing patents (2002). Patents in a small developing economy: a case study of Sri Lanka by Amaradasa and Pathirage (2002). In the similar lines, a study has also been carried out on intellectual property rights and innovation in SMEs in OECD Countries by Burrone (2005). Ganguli (2003) has conducted a study on creating and embedding an intellectual property rights policy in an educational or publicly-funded research and development institution. James (2004) has done an extensive study on "copyright law of India and the academic community". King (2002) has studied the "value of intellectual property, intangible assets and goodwill".

3. Trend Analysis of PCT Patent Applications Filed

Table 1 and Exhibit 1 show the patent application status of developed countries filed through PCT. United States of America (USA) and European Patent Convention (EPC) States show tremendous growth and Japan is moving with a smooth increase in its PCT patent applications filed.

Table 1 and Exhibit 2, show the percentage of change of PCT patent applications filed over previous year, Japan has shown a growth rate of 42.1% during 1996, except in 1992 (a negative growth over previous year) Japan has recorded a positive growth rate over previous years; from 1994 to 2005 its PCT applications percentage of change over previous years has been recorded greater than positive 15%.

EPC has a positive growth of PCT applications filed over previous years with a maximum of 20.4% change in the year 1995 and a minimum of 1.8% in 2003, where as USA shows a maximum of (27.4%) change over previous year in 1991 and a minimum of (-4.1%) in 2002.

Table 1: Number of PCT Applications Filed by Developed Countries (Rank 1-3) during 1990-2005

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
EPC*	8650	9575	10317	12201	14061	16927	19564	23217
% change		10.7	7.7	18.3	15.2	20.4	15.6	18.7
USA**	7718	9836	11359	12685	14951	17113	20828	24190
% change		27.4	15.5	11.7	17.9	14.5	21.7	16.1
JAPAN	1748	1810	1740	1967	2305	2775	3942	4965
% change		3.5	-3.9	13	17.2	20.4	42.1	26
Year	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
EPC	27060	30664	36003	40663	42447	43205	44011	47294
% change	16.6	13.3	17.4	12.9	4.5	1.8	1.9	7.5
USA	27952	31255	38007	43055	41294	41026	43342	46019
% change	15.6	11.8	21.6	13.3	-4.1	-0.6	5.6	6.2
JAPAN	6102	7473	9587	11904	14063	17414	20263	24815
% change	22.9	22.5	28	24.4	18.1	23.8	16.4	22.5

Source: WIPO Statistics Database, **%:** Percentage of change over previous year.

* European Patent Convention
** United States of America

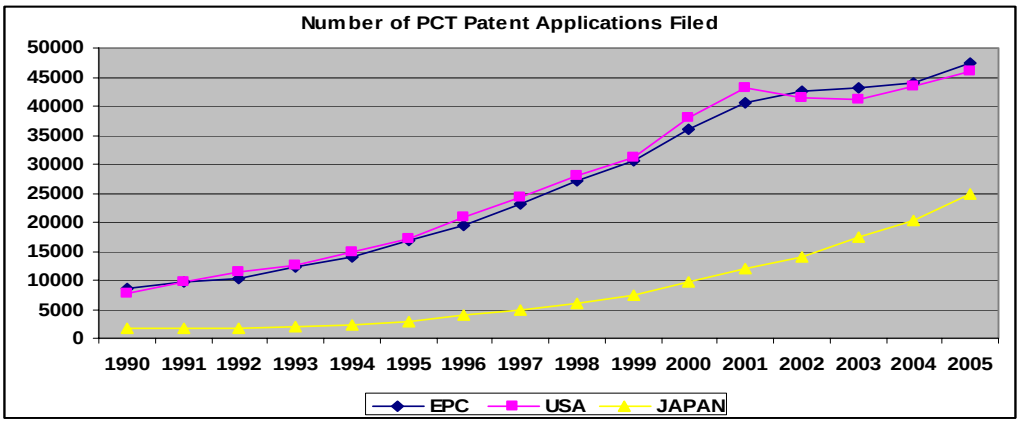

Exhibit 1: Number of PCT Patent Applications Filed by Developed Countries (Rank 1-3)

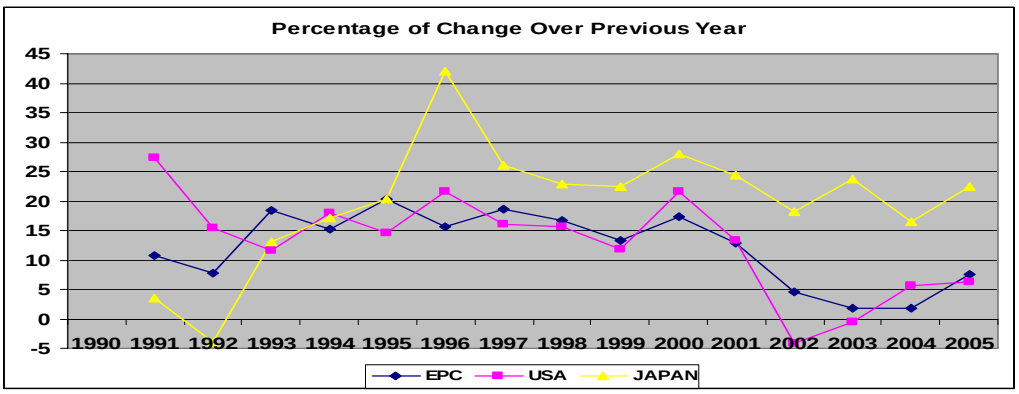

Exhibit 2: The Percentage of Change Over Previous Year (PCT Applications Filed)

Table 2: Number of PCT Application Filed by Developing Countries (Rank 1-7) during 1990-2005

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
Rep. Korea	24	37	84	128	192	196	306	305
%		54.2	127	52.4	50	2.1	56.1	-0.3
China	0	1	0	2	103	103	123	166
%						0	19.4	35
India	0	0	1	0	1	0	4	13
%								225
South Africa	1	5	7	6	30	42	72	84
%		400	40	-14.3	400	40	75	16.67
Singapore	0	0	4	11	3	26	35	80
%				175	-63.6	766.7	34.62	128.6
Brazil	22	30	20	46	47	67	72	95
%		36.36	-33.3	-130	2.17	42.55	7.46	31.94
Mexico	0	2	1	0	3	11	31	46
%						233	181.8	48.39
Year	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
Rep. Korea	510	870	1580	2324	2520	2949	2556	4683
%	67.2	70.6	81.6	47.1	8.4	17	20.6	31.7
China	348	277	784	1731	1018	1295	1705	2500
%	109.6	-20.4	183	120.8	-41.2	27.2	31.7	46.6
India	14	101	190	295	525	764	723	678
%	7.69	621.4	88.12	55.26	77.97	45.52	-5.47	-6.22
South Africa	114	317	387	419	384	357	411	358
%	35.71	178.1	22.08	8.27	-9.11	-7.03	15.13	-12.89
Singapore	125	168	222	288	330	282	432	441
%	56.25	34.4	32.14	29.73	14.58	-14.55	53.19	2.08
Brazil	113	115	178	173	201	219	279	280
%	18.95	1.77	54.78	-2.81	16.18	8.96	27.4	0.36
Mexico	66	55	73	104	132	131	118	140
%	43.49	-16.7	32.73	42.47	26.92	-131.73	-9.92	18.64

Source: WIPO Statistics Database, **No.:** Number; **%**: Percentage of change over previous year

Table 2 and Exhibit 3, shows the number of PCT patent applications filed by developing countries. The rank is given with respect to the total number of patents applications filed by the respective country during 1995 to 2005. India and Singapore has started their PCT filing in 1992 with one and four patent applications respectively, where as China and Mexico, started in 1991 with one and two patent applications respectively.

Except in 1997, the Republic of Korea has recorded a positive growth of patent applications filed over previous years, in the year 2000 it has recorded a maximum of 81.6% of change over previous year. China's growth of PCT applications started in 1996 with 19.6% of change over the previous year and it has shown a maximum of 120.8% of change over the previous year and a negative growth of 41.2% in the year 2002.

India's growth of PCT applications was started soon after its accession to the treaty in 1997 with a growth rate of 225% change over the previous year and it has recorded a maximum of 621.4% of change in the year 1999, it has a negative growth in 2004 and 2005.

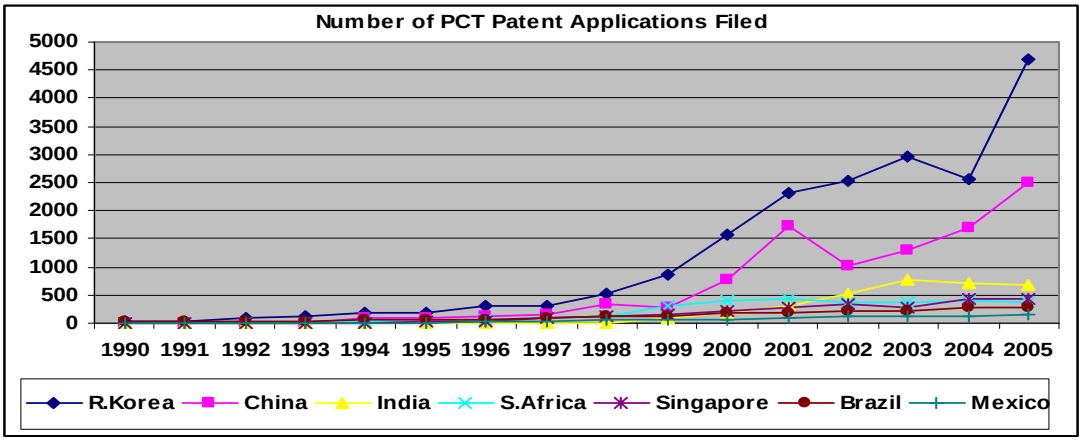

Exhibit 3: Number of PCT Application Filed by Developing Countries (Rank 1-7) during 1990-2005

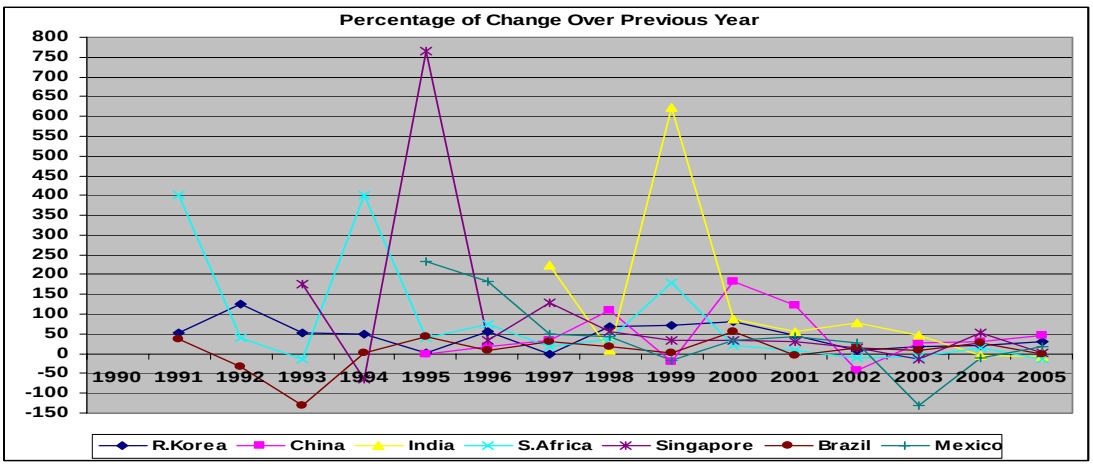

Exhibit 4: Percentage of Change Over Previous Year

South Africa has a positive growth throughout the period, except in the year 1993 it has a negative growth of 14.3% over the previous year. Singapore has recorded a maximum growth of 766.7% in the year 1995 and has a maximum negative growth of 63.6% in the year 1994. Brazil has had a maximum growth of 54.78% in the year 2000 and has a maximum negative growth of 33.3% in the year 1992. Mexico has shown a maximum growth of 233% in 1995 and a maximum negative growth of 131.73% in the year 2003.

In the year 1995 and 1999, the growth of PCT applications filed has shown a positive curve, except the countries Brazil and Mexico. In the year 1995, Singapore has shown a tremendous growth and in the year 1999 India has a maximum growth among all the countries. In the years 1993 and 2003 has recorded a maximum negative growth by Brazil and Mexico respectively. In the year 2004 and 2005 no country has crossed a growth of 50% (Exhibit IV). Republic of Korea has recorded with a maximum of 46.94% of PCT patent applications filed. China with a percentage of 24.75 stands in the second position among the developing countries for the period 1990 to 2005. India, South Africa, Singapore, Brazil and Mexico, all together has recorded 28.31% of PCT patent applications filed.

4. Trend Analysis of PCT Application Published

The analysis was carried out for the period 1990-2005, which was published with their IPC Subclass. The ranks of these technical fields were given on the basis of the cumulative number of patents filed by the respective fields during the period.

Table 3: Total Number of PCT International Applications Published According to Technical Fields Top 1-15 (IPC Code at the Subclass Level) for the Period 1996-2005

IPC	1990	1991		1992		1993		1994		1995		1996		1997	
Sub-class	No.	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A61K	614	840	36.8	1113	32.5	1322	18.8	1697	28.4	2218	30.7	2796	26.1	2898	3.6
G06F	214	284	32.7	316	11.3	380	20.1	421	10.8	758	80.0	1028	35.6	1365	32.8
C12N	363	496	36.6	552	11.3	717	29.9	893	24.5	1141	27.8	1375	20.5	1595	16.0
C07D	273	467	71.1	774	65.7	888	14.7	1062	19.6	1220	14.9	1350	10.7	1596	18.2
G01N	443	569	28.4	619	8.8	629	1.6	737	17.2	824	11.8	1052	27.7	1160	10.3
H01L	192	222	15.6	293	32.0	273	-6.8	301	10.3	389	29.2	573	47.3	799	39.4
H04L	64	96	50.0	129	34.4	162	25.6	180	11.1	308	71.1	395	28.2	634	60.5
A61B	275	292	6.2	382	31.0	505	32.2	625	23.8	737	17.9	860	16.7	921	7.1
C07C	259	426	64.5	492	15.5	510	3.6	648	27.1	675	4.2	849	25.8	925	8.9
H04N	197	311	57.9	248	-20	245	-1.2	276	12.7	427	54.7	538	26.0	718	33.5
A61F	163	264	62.0	251	-4.9	363	44.6	429	18.2	547	27.5	688	25.8	753	9.4
B65D	234	298	27.3	398	33.6	447	12.3	530	18.6	615	16.0	716	16.4	778	8.7
H04Q	41	50	22.0	40	-20	62	55.0	73	17.7	294	303	430	46.3	658	53.0
H04B	84	148	76.2	172	16.2	186	8.1	243	30.6	292	20.2	374	28.1`	499	33.4
C12Q	152	193	27.0	253	31.1	267	5.5	286	7.1	349	22.0	388	11.2	486	25.3

IPC	1998		1999		2000		2001		2002		2003		2004		2005	
Sub-class	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
A61K	3595	24.1	4150	15.4	4746	14.4	5284	11.3	6082	15.1	7071	16.3	6768	-4.3	6449	-4.7
G06F	1745	27.8	2360	35.2	4013	70.0	8018	99.8	7993	-0.3	6951	-13	6428	-7.5	5784	-10
C12N	2227	39.6	2667	19.8	3028	13.5	3963	30.9	3494	-12	2547	-27	2197	-13.7	1905	-13
C07D	1731	8.5	1797	3.8	2029	12.9	2479	22.2	2563	3.4	2612	1.9	3110	19.1	3173	2.0
G01N	1423	22.7	1621	13.9	1877	15.8	2359	25.7	2746	16.4	2922	6.4	2857	-2.2	2848	-0.3
H01L	1027	28.5	1309	27.5	1725	31.8	2129	23.4	2651	24.5	2921	10.1	3092	5.9	3097	0.2
H04L	868	36.9	1197	37.9	1732	44.7	2646	52.8	3078	16.3	2958	-3.8	3088	4.4	3425	10.9
A61B	1159	25.8	1471	26.9	1633	11.0	1960	20.0	2089	6.6	2391	14.5	2561	7.1	2633	2.8
C07C	1074	16.1	1111	3.4	1278	15.0	1508	18.0	1412	-0.1	1501	6.3	1476	-1.7	1476	0.0
H04N	876	22.0	1070	22.1	1295	21.0	1771	36.8	1783	0.7	2030	13.9	1871	-7.8	1915	2.4
A61F	894	5.4	976	9.2	1138	16.6	1326	16.5	1263	-0.1	1511	19.6	1520	0.6	1566	3.0
B65D	819	5.3	900	9.9	1049	16.6	1143	9.0	1138	-0.4	1339	17.7	1373	2.5	1356	-1.2
H04Q	1065	61.9	1239	16.3	1346	8.6	1479	9.9	1447	-2.2	1406	-2.8	1396	-0.7	1444	3.4
H04B	694	23.0	856	23.3	1077	25.8	1457	35.3	1516	4.0	1545	1.9	1505	-2.6	1434	-4.7
C12Q	599	23.3	806	34.6	1002	24.3	1295	29.2	1502	16.0	1615	7.5	1464	-9.3	1137	-22

Source: WIPO Statistics Database, **No.:** Number; **%**: Percentage of change over previous year

A61K: Preparations for Medical, Dental, or Toilet Purposes; G06F: Electric Digital Data Processing; C12N: Micro-organisms or Enzymes; Compositions thereof; C07D: Heterocyclic Compounds; G01N: Investigating or Analyzing Materials by Determining their Chemical or Physical Properties; H01L: Semiconductor Devices; Electric Solid State Devices not Otherwise Provided for; H04L: Transmission of digital information, e.g. Telecommunications; A61B: Diagnosis; Surgery; Identification; C07C: Acyclic or Carbocyclic Compounds; H04N: Pictorial communication, e.g. Television; A61F: Filters Implantable into Blood Vessels; Prostheses; orthopaedic, Nursing or Contraceptive Devices; B65D: Containers for storage or transport of articles or materials, e.g. Bags, boxes, cans, cartons, etc. ; H04Q: Selecting; H04B: Transmission; C12Q: Measuring Or Testing Processes Involving Enzymes Or Micro-Organisms

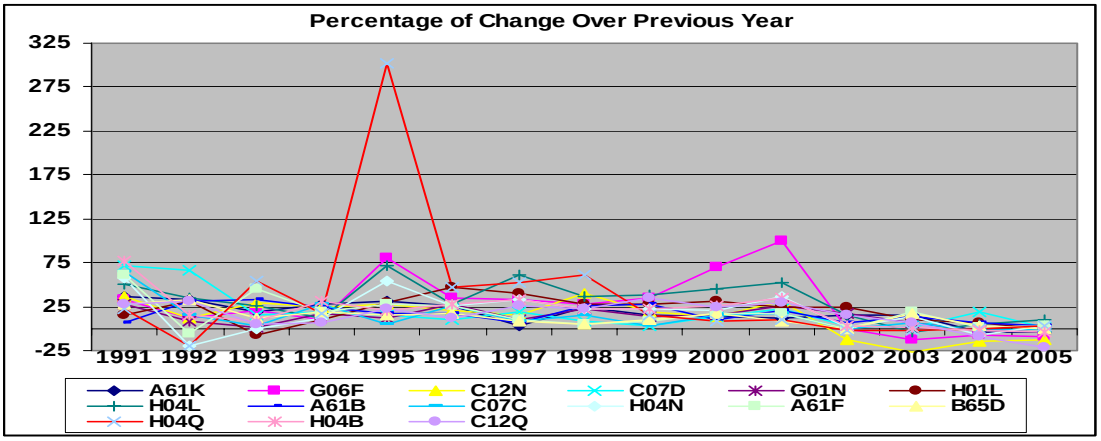

Exhibit 5: PCT Applications published according to technical field (IPC Code at the subclass level) (rank 1-15)

From the table 3 and exhibit 5, year 1992, 1993, 2002, 2003, 2004 and 2005 has recorded a negative growth rate and remaining all the years it has shown a positive growth rate. Year 1995 has recorded a maximum growth rate of 303% (H04Q) and the year 2003 has recorded a maximum negative growth rate of 27%. When it comes to the technical fields, after 2002, all the fields are recorded less growth of applications published in the respective fields.

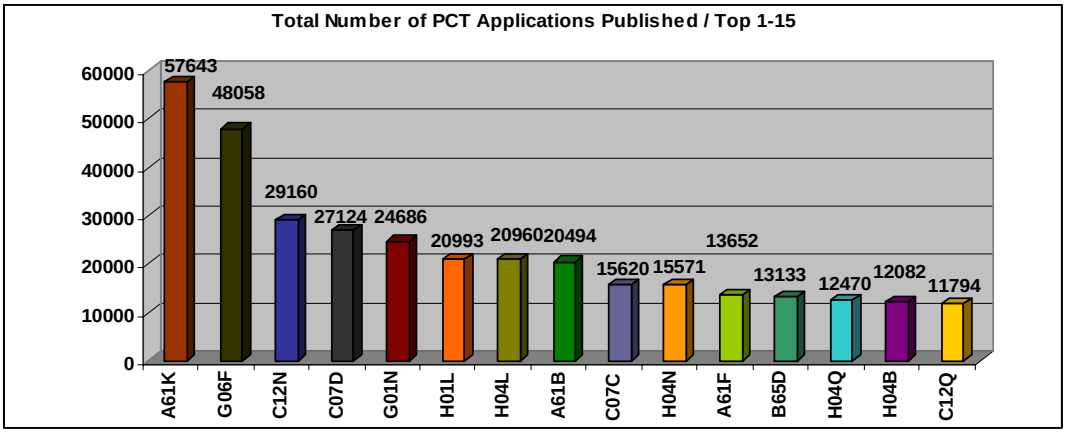

Exhibit 6: Total number of PCT applications published according to technical field for the period 1990-2005

From the table 3, it is clear that A61K subclass has recorded a maximum number of patent applications published, during 2001and 2002 G06F (Electric digital data processing) has shown a maximum growth over all the rest. All the 15 technical fields have shown a growth over the period 1990 to 2005. For the year 2005; A61K, G06F and C12N (top 3) have shown a negative growth and the remaining all fields have recorded a positive growth of patent applications published.

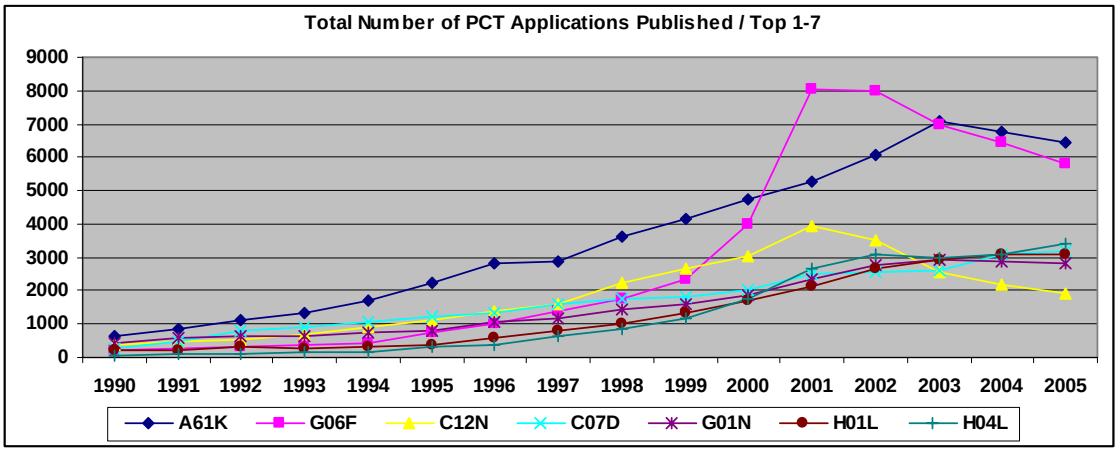

Exhibit 7: Total number of PCT applications published according to technical field IPC subclass level

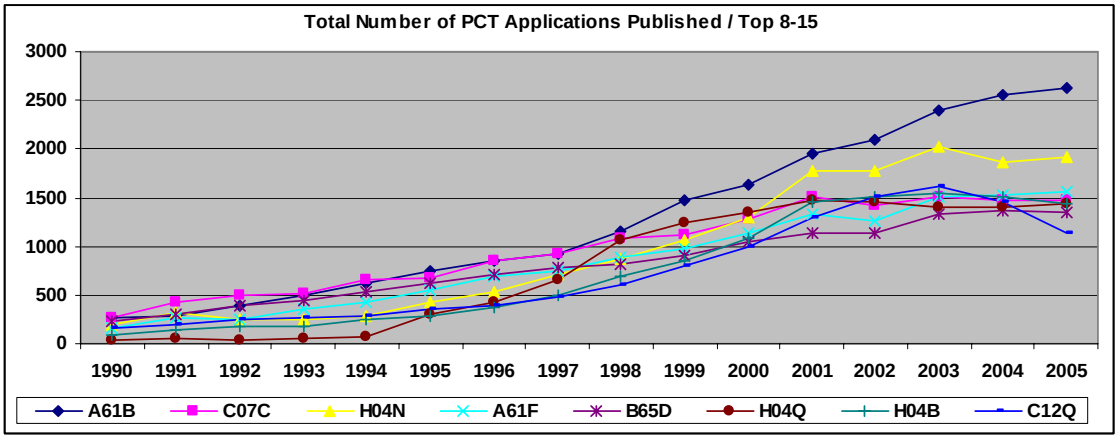

Exhibit 8: Total number of PCT applications published according to technical field IPC subclass level

5. Analysis of Various PCT Patent Filing Methods

Patent application filing was started way-back in 15th century. With technological advancement it has changed its face from paper to softcopy to e-filing. In recent past the e-filing system was started in few countries. The 1st e-filing application was received in 2002 and subsequently, the percentages of e-filing patent applications are gradually increasing. The following exhibit shows the sudden growth in the e-filing system of patent applications and the falling of the traditional paper filing method.

Table 4: Number of PCT patent applications filed under different methods

	Paper			**Paper + Easy Filing**			**E-Filing**		
	No.	%	%*	No.	%	%*	No.	%	%*
2002	65181		59.04	45208		40.95	3		0.01
2003	62389	-4.28	54.20	51672	14.30	44.90	1138	37833.30	1.00
2004	62685	0.47	51.20	42608	17.50	34.70	17331	1422.90	14.1
2005	62798	0.18	46.00	37965	10.90	27.80	35739	106.21	26.2

Source: WIPO Statistics Database, **No.:** Number; **%**: Percentage of change over previous year; **%*:** Percentage of patents filed in that year (in particular category)

Internet all the way had an impact on patenting activity in the form of online patent search, online filing (e-filing) of patent applications etc. The following pictures shows the patent filing under various methods, paper filing and paper+easy filing methods had a fall after 2003 and subsequently e-filing is increasing rapidly, which indirectly shows the impact of e-technology. E-filing saves time and resources.

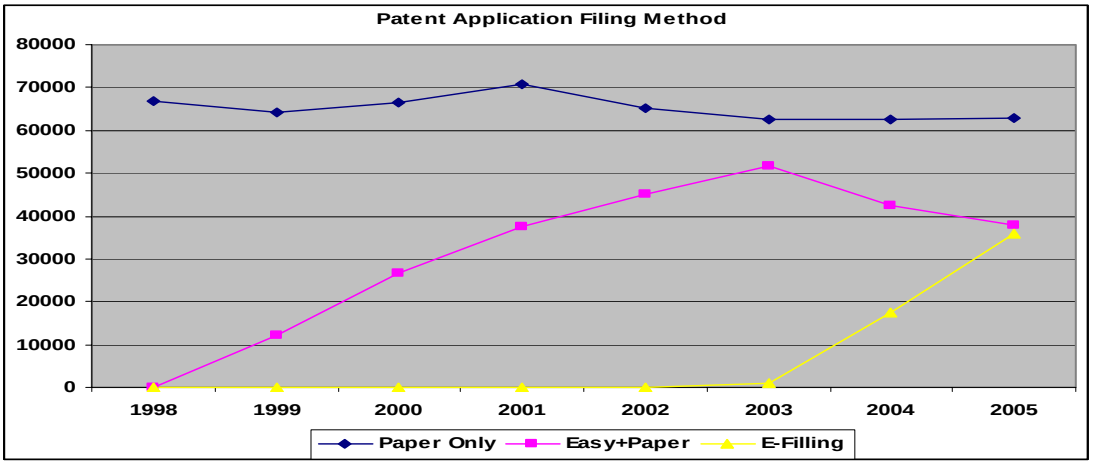

Exhibit 9: PCT applications filed under different methods

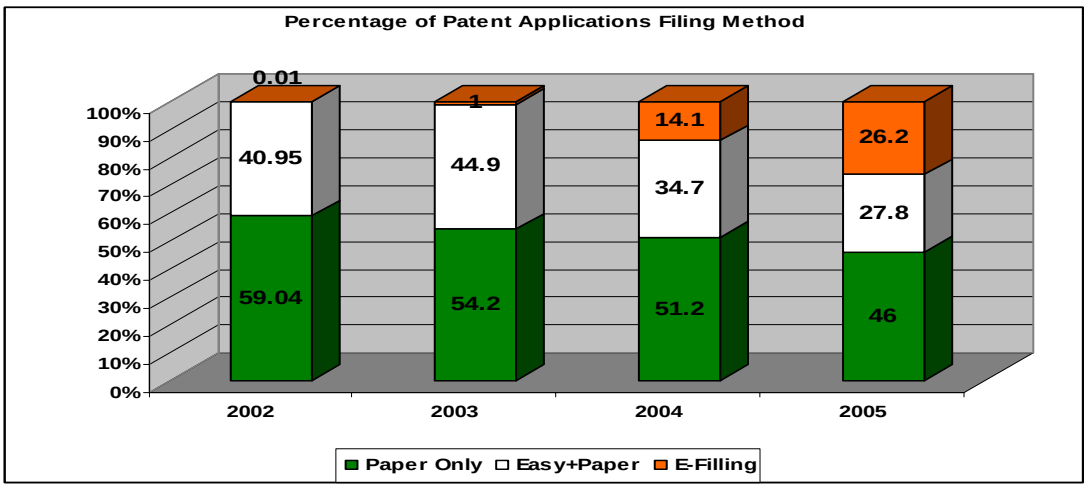

Exhibit 10: PCT applications filed under different methods

From the exhibit 9 and 10, it is clear that paper filing and paper+easy filing methods have come down and subsequently there is a gradual increase of e-filing method. In the year 2003, e-filing has shown a drastic change of 37833.30% of patent applications filed over the previous year, i.e. from 3 applications in 2002 to 1138 e-filing applications in year 2003.

6. Analysis of PCT Patent Searching Authorities

Patent search is the main activity, which takes the maximum time in the whole process of patent system. After 1995 with the advent of internet technology (e-technology), the main patent offices have uploaded

their patent databases on internet, which saves the time for prior-art search on a particular technology to the inventor and as well as the searching authorities.

Table 5: Number patents searched during the period 1990-2005

Year	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**
EP	8633	10685	13441	14441	17107	19836	24363	29273
JP	1561	1720	1621	1767	2059	2539	3346	4313
US	3956	6750	7260	7683	8431	9253	11573	12352
SE	1517	1758	1771	1991	2372	2913	3653	4113
AU	594	593	693	729	882	951	1045	1041
Year	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**
EP	34693	36568	51491	52765	61907	63134	62111	65075
JP	5023	6078	8417	10653	12128	15390	17946	22801
US	12718	13503	16158	17645	18860	22324	18566	22742
SE	4278	3956	4280	4105	4170	3678	3114	3411
AU	1103	1223	1762	1990	2142	2194	2361	2565

Source: WIPO Statistics Database

Today the main patent offices in developed and developing nations are maintaining their online databases, which are accessible to everyone and are available on payment.

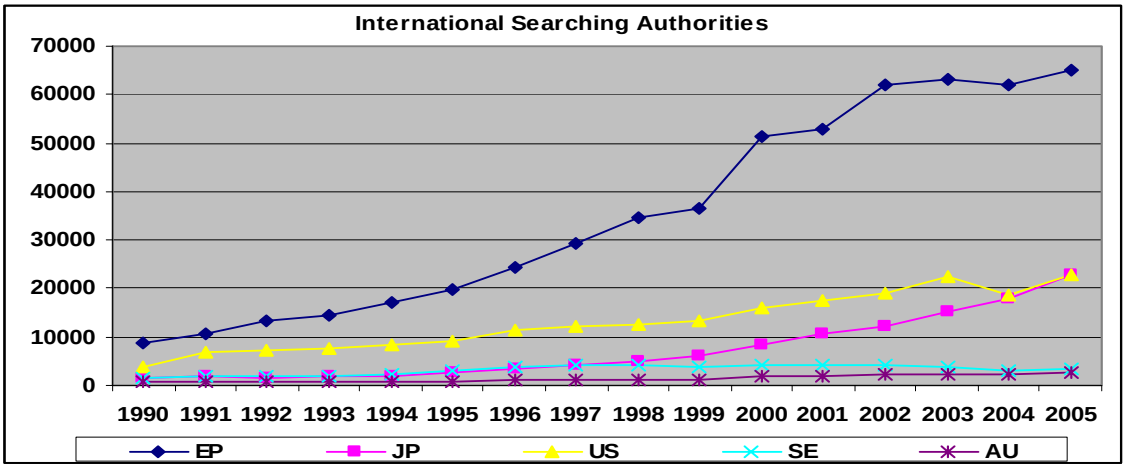

Exhibit 11: Number of patents searched by different searching authorities

European patent office accounts the maximum number of searching reports every year. Japan and United States patent offices account for an equal number of search reports in the year 2004 and 2005. The following exhibit shows the trend of growth in patent report search every year.

7. Summary and Conclusion

The number of PCT international applications filed per year has grown from 19,809 in 1990 to 135,602 in 2005. The average annual growth rate between 1990 and 2000 was 16.8%, and the growth rate has slowed to less than 10% since 2001. Applicants from the member states of the European Patent Convention are the largest group of filers of PCT international applications, followed by applicants from the United States of America. The number of PCT filings from North-East Asian countries is increasing rapidly. Filings from Japan, the Republic of Korea and China are increasing at 22.4%, 24.4% and 46.8% respectively. Japan has

recorded a positive growth rate over previous years, its PCT application percentage of change over previous years has been recorded greater than 15% over the previous years from 1994 to 2005.

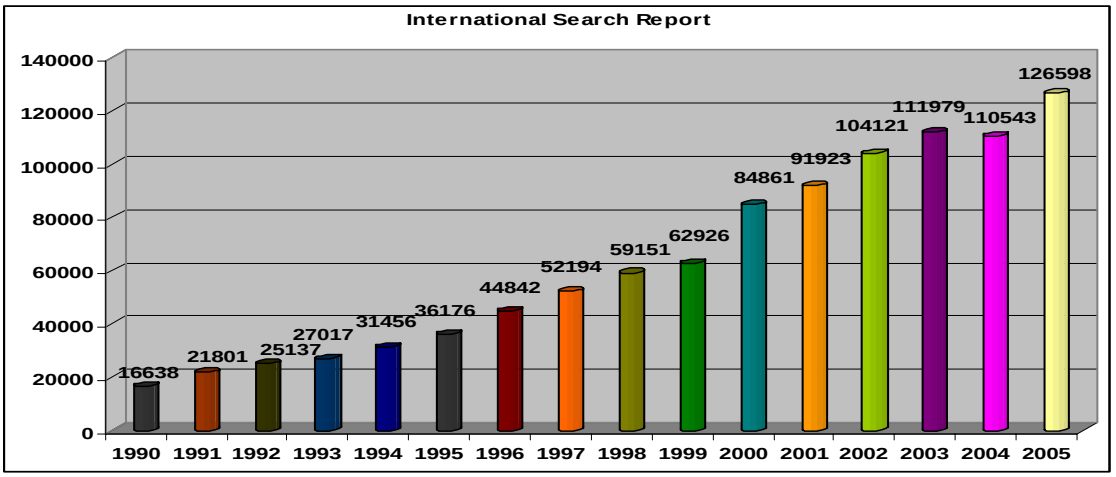

Exhibit 12: Total Number of patents searched by EP, JP, US, SE and AU

EPC has almost positive growth of PCT applications filed over previous years with a maximum of 20.4% change in the year 1995 and a minimum of 1.8% in 2003, where as USA shows a maximum of (27.4%) change over previous year in 1991and a minimum of (- 4.1%) in 2002. Except in 1997, Republic of Korea has recorded a positive growth of patent applications filed over previous years, in year 2000; it has recorded a maximum of 81.6% of change over previous year. China's growth of PCT applications started in 1996 with 19.6% of change over the previous year and it has shown a maximum of 120.8% of change over the previous year and a negative growth of 41.2% in the year 2002. India's growth of PCT applications started in 1997 with a growth rate of 225% change over the previous year and it has recorded a maximum of 621.4% of change in the year 1999, it has a negative growth in 2004 and 2005. South Africa has a positive growth throughout the period, except in the year 1993 it has a negative growth of 14.3% over the previous year. Singapore has recorded a maximum growth of 766.7% in the year 1995 and has a maximum negative growth of 63.6% in the year 1994. Brazil has a maximum growth of 54.78% in the year 2000 and has a maximum negative growth of 33.3% in the year 1992. Mexico has shown a maximum growth of 233% in 1995 and a maximum negative growth of 131.73% in the year 2003.

Year 1995 has recorded a maximum growth rate of 303% (H04Q) and the year 2003 has recorded a maximum negative growth rate of 27%. When it comes to the technical fields, after 2002, all the fields are recorded less growth of applications published in the respective fields. Internet all the way had an impact on patenting activity in the form of online patent search, online filing (e-filing) of patent applications etc. In the year 2003, e-filing has shown a drastic change of 37833.30% of patent applications filed over the previous year, i.e. from 3 applications in 2002 to 1138 e-filing applications in year 2003.

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About the Authors

B.K.R. Naik received B.Tech. (Chemical Engineering) degree from Andhra University, MBA from University of Hyderabad and is pursuing his full-time Ph.D. on Intellectual Property Management at I.I.T. Delhi. He has presented research papers at national/international conferences on Intellectual Property and R&D Management.

Sudhir K. Jain obtained Ph.D. degree from I.I.T. Kanpur. His teaching and research areas include Managerial Economics, Management of Intellectual Property Rights (IPRs) and Entrepreneurship Management. He co-authored one book "Managerial Economics" published by Pearson Education and has published over 100 research papers in reputed national and international journals and conference proceedings.

Surendra S. Yadav received B. Tech. degree from I.I.T. Kanpur, MBA from University of Delhi and Ph. D. in Management from University of Paris. He teaches Corporate Finance, International Finance, International Business and Security Analysis & Portfolio Management. He has been visiting professor at University of Paris. Prof. Yadav has published nine books. He has published about ninety papers in research journals and conferences.

Appendix

WIPO Statistics - PCT Contracting States (133 countries on 1 October 2006)

AE United Arab Emirates	GE Georgia	MY Malaysia
AG Antigua and Barbuda	GH Ghana (AP)	MZ Mozambique (AP)
AL Albania	GM Gambia (AP)	NA Namibia (AP)
AM Armenia (EA)	GN Guinea (OA)	NE Niger (OA)
AP[1] ARIPO GQ Equatorial	GR Greece (EP)	NG Nigeria
Guinea (OA)	GT Guatemala	NI Nicaragua
AT Austria (EP)	GW Guinea-Bissau (OA)	NL Netherlands (EP)
AU Australia	HN Honduras OA4 OAPI	NO Norway
AZ Azerbaijan (EA)	HR Croatia	NZ New Zealand
BA Bosnia and Herzegovina1	HU Hungary (EP)	OA[4] OAPI
BB Barbados	ID Indonesia	OM Oman

BE Belgium (EP)	IE Ireland (EP)	PG Papua New Guinea
BF Burkina Faso (OA)	IL Israel	PH Philippines
BG Bulgaria (EP)	IN India	PL Poland (EP)
BJ Benin (OA)	IS Iceland (EP)	PT Portugal (EP)
BR Brazil	IT Italy (EP)	RO Romania (EP)
BW Botswana (AP)	JP Japan	RU Russian Federation (EA)
BY Belarus (EA)	KE Kenya (AP)	SC Seychelles
BZ Belize	KG Kyrgyzstan (EA)	SD Sudan (AP)
CA Canada	KM Comoros	SE Sweden (EP)
CF Central African Republic (OA)	KN Saint Kitts and Nevis	SG Singapore
CG Congo (OA)	KP Democratic People's -	SI Slovenia (EP)
CH Switzerland (EP)	-Republic of Korea	SK Slovakia (EP)
CI Côte d'Ivoire (OA)	KR Republic of Korea	SL Sierra Leone (AP)
CM Cameroon (OA)	KZ Kazakhstan (EA)	SM San Marino
CN China	LA Lao People's -	SN Senegal (OA)
CO Colombia	-Democratic Republic	SV El Salvador
CR Costa Rica	LC Saint Lucia	SY Syrian Arab Republic
CU Cuba	LI Liechtenstein (EP)	SZ Swaziland (AP)
CY Cyprus (EP)	LK Sri Lanka	TD Chad (OA)
CZ Czech Republic (EP)	LR Liberia TG Togo (OA)	TJ Tajikistan (EA)
DE Germany (EP)	LS Lesotho (AP)	TM Turkmenistan (EA)
DK Denmark (EP)	LT Lithuania (EP)	TN Tunisia
DM Dominica	LU Luxembourg (EP)	TR Turkey (EP)
DZ Algeria	LV Latvia (EP)	TT Trinidad and Tobago
EA[2] Eurasian Patent Organisation	LY Libyan Arab Jamahiriya	TZ United Republic-
EC Ecuador	MA Morocco	-of Tanzania (AP)
EE Estonia (EP)	MC Monaco (EP)	UA Ukraine
EG Egypt	MD Republic of Moldova (EA)	UG Uganda (AP)
EP[3] European Patent Office	MG Madagascar	US United States of America
ES Spain (EP)	MK The former Yugoslav -	UZ Uzbekistan
FI Finland (EP)	-Republic of Macedonia	VC Saint Vincent-
FR France (EP)	ML Mali (OA)	-and the Grenadines
GA Gabon (OA)	MN Mongolia	VN Viet Nam
GB United Kingdom (EP)	MR Mauritania (OA)	YU Serbia and Montenegro
GD Grenada	MW Malawi (AP)	ZA South Africa
	MX Mexico	ZM Zambia (AP)
		ZW Zimbabwe (AP)

[1]AP: (Botswana, Ghana, Gambia, Kenya, Lesotho, Malawi, Mozambique, Sudan, Sierra Leone, Swaziland, United Republic of Tanzania, Uganda, Zambia, Zimbabwe)

[2]EA: (Armenia, Azerbaijan, Belarus, Kyrgyzstan, Kazakhstan, Republic of Moldova, Russian Federation, Tajikistan, Turkmenistan)

[3]EP: (Austria, Belgium, Bulgaria, Switzerland and Liechtenstein, Cyprus, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, United Kingdom, Greece, Hungary, Ireland, Iceland, Italy, Luxembourg, Monaco, Netherlands, Poland, Portugal, Romania, Sweden, Slovenia, Slovakia, Turkey)

[4]OA: (Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea- Bissau, Mali, Mauritania, Niger,