

Comprehensive Overview of the Implementation of the Patent Cooperation Treaty (PCT): Processes, Challenges, and Global Impact

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Summary;

Considering that the Patent Cooperation Treaty (PCT) involves about 130 countries and, over 100 national and regional patent offices along, with the World Intellectual Property Organization (WIPO) it's impressive how smoothly the system runs and keeps growing stronger every day. The systems real power seems to stem from the range of systems, languages and national customs that make up the PCT. Although the system has worked to align approaches effectively it has also had to adapt to the aspects of national laws and procedures at times. The PCTs skill, in finding a ground between these factors stands out as an achievement of the system. Looking ahead this also emerges as a hurdle, for the development of the PCT .

Keywords; Patent Cooperation Treaty (PCT), International applications (IAs), PCT operation in the field of biotechnology.

Introduction:

The Patent Cooperation Treaty (PCT) known by its acronym in all languages worldwide was established in Washington in 1970 and came into effect among an beginning group of 13 Contracted States on Jan 24th of 1978 after, over seven years of preparations, for its enforcement and officially took effect from June 1st of the same year with a current total of 40 Contracted States involved.

The widespread adoption of the PCT is evident when considering the 40 Contracting States involved in its implementation encompassing nations from geographical regions, like east and west or north and south. Simultaneously in 1978, on June 1st. an additional significant global treaty concerning invention protection The European Patent Convention (EPC). Took effect among cluster of nations. The PCT run by the World Intellectual Property Organization (WIPO) helps patent seekers with filing patent applications in countries. The initial step, for a PCT application is entering the phase where an International Search Authority (ISA) evaluates the application and creates an ISA report (commonly called a search data) determines the patentability of the implementation without making final decisions on granting patents .After given the ISA data the candidate chooses which patent organization to seek patents, from. In the step of the process called the phase is when specific patent offices decide on whether to grant patents or not for applications submitted to them directly in a direct application process.

The Development of PCT

The treaty was changed on October 2nd in 1979 in relation, to parts of Chapter 5 (Administrative Provisions). It was then revised again in Feb 1984. Came into effect on January 1st in 1985 regarding the duration required before national offices could review or evaluate the implementation (specifically, under the framework of the pct Articles 22 and 39).

The statute, within the PCT underwent revisions for the time before being enforced in April 1978 and in October (1). While some of the changes were merely related to adjusting fees listed in the schedule of fees attached to the PCT statue on instances modifications, to the statute themselves were approved by the PCT Assembly.

The main goal, behind making changes was to simplify the process and enhance safety for applicants ensuring they do not inadvertently lose their applications due, to unforeseen circumstances. When an applicant doesn't follow all the rules outlined by the PCT. The issue isn't related to the criteria, for receiving an globally filing date and the aspirant makes the necessary corrections, within the deadline set by the receiving office where the application was submitted.

The receiving office takes care of fixing issues and applicants don't need to worry about correcting physical defects as long as the international application can be published uniformly worldwide. Additionally if a correction is made after the deadline but before the office decides to allow it or not the time frame, for making that correction may even be extended by the office itself (1). The graph below showcases an more straightforward representation of applications filed since 1978 as show in Figure 1. In 1987 most of the applications were submitted from twelve countries, each, with, over 100 applications as shown in Figure 2.

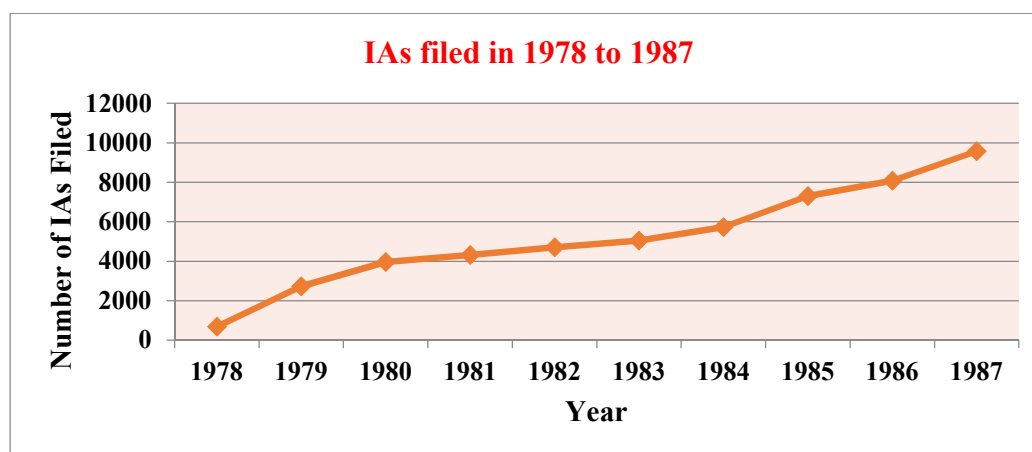


Figure 1 : IAs filed in 1978 to 1987

Year	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
Number	686	2733	3957	4320	4714	5049	5732	7304	8081	9563

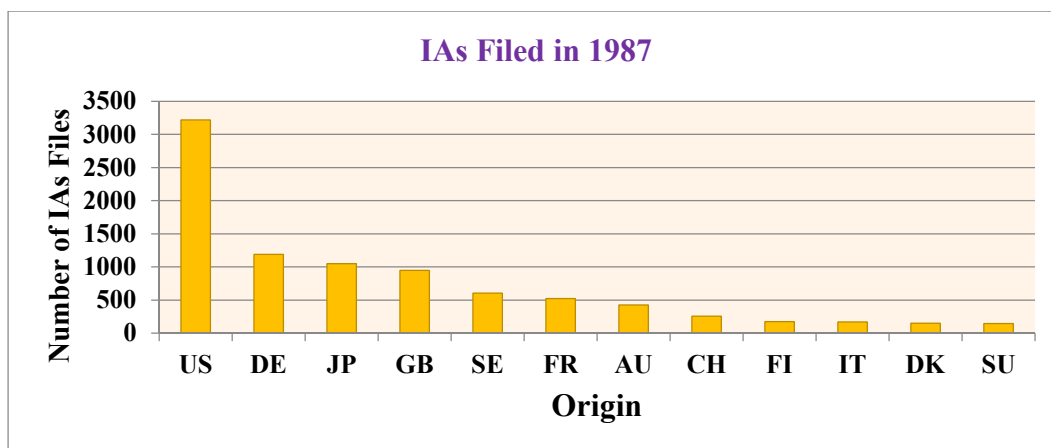


Figure 2 : IAs Filed in 1987

Origin	US	DE	JP	GB	SE	FR	AU	CH	FI	IT	DK	SU
Number	3218	1188	1047	949	604	520	428	259	173	171	151	144

The initial PCT brochure came out in October 1978. By the conclusion of 1987 a grand total of 43 121 brochures had been issued. The majority of the time the PCT brochure includes the search report, along, with the application. In cases where the worldwide search report is not provided in

English, so the English translation is also included in the PCT brochure.

International applications are typically published in languages such, as Japanese, French, German, English , and Russian. It is evident that the majority of these publications are, in English.

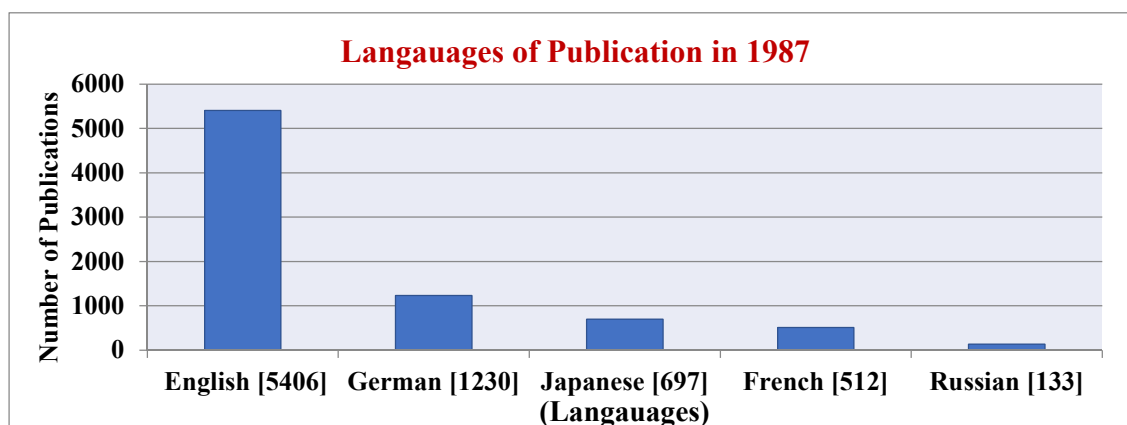


Figure 3 : Langauages of Publication in 1987.

Documenting PCT information.

The changes, in PCT minimum documentation between 1920 and 1985 are illustrated in Table 1 for each country following the PCT guidelines. For a comparison between countries patent grants data, during this period is crucial as some nations had just begun the practice of publishing both the application and the granted patent in the 1960s. According to Table 1 the growth of industries since 1950 has led to a rise, in patent applications, over time.

As mentioned earlier on the subject discussed earlier on the matter, in this context here several countries around the globe have implemented laws that lead to the publication of numerous documents. which are part of the minimal documentation required by the PCT system This development has led to a notable increase, in the overall number of documents falling under the PCTs minimal documentation category. resulting in challenges related to storage space search ability and document management In June 1987 an approximation was made regarding patent documents released in 1920 that are mentioned in the PCT minimal documentation requirements with a total count reaching 15 961 000. The allocation of those records, to publishing bodies is outlined in Table 2.

Table 1: PCT minimal attestation / amount of patent documents (1)

Publish Office/ Organization	1920	1930	1940	1950	1960	1970	1980	1985
France (FR)	18949	23999	9649	17799	34999	26116	28079	24194
Germany (DE)	14451	26736	14808	2382	19605	12886	20187	19377
Japan (JP)	2160	4975	6715	4271	11251	30878	46105	50099
Soviet Union (SU)	-	6087	2538	10003	10484	32465	94581	74589
Switzerland (CH)	4138	7098	4865	8727	7268	17574	5960	6276
UK (GB)	14190	20887	11452	13508	26774	40994	23803	20879
US	37079	45225	42322	43128	47169	64426	61826	70375
Austria (AT*)	-	-	-	-	-	1197	1226	1044
Australia (AU*)	-	-	-	-	-	650	819	608
Canada (CA*)	-	-	-	-	-	1460	1449	2091
Europe (EP+)	-	-	-	-	-	-	17504	33747
WO+	-	-	-	-	-	-	2896	7094
OA+	-	-	-	-	-	305	303	-
Totals	90967	116207	92349	99818	126110	228951	304738	310373

The significant rise, in the volume of patent filings over the decade or two is currently being balanced out by the impacts of both global agreements according to Table 1 data analysis indicates that in 1985 there were a total of 40,843 applications filed under the EPC and the PCT combined These filings seem to have replaced approximately 303,154 applications filed at a national level as, per recently released information. As a result of this situation, in 1985 there were patent documents published. Around 250000 less than there would have been without regional and international agreements in place, during that time period .it is anticipated that this cost saving measure will likely increase further in the years.

Now lets talk about the final factor that helps identify the documentation, for non patent literature in the PCT system. During discussions on this matter among experts it became apparent that a rigorous selection process was vital to create a manageable list of periodicals. The criteria for a periodical to be added to the list involved having an amount of articles that are valuable, in patent research and examination purpose.

Table 2 PCT minimal attestation (1)

Publishing office / organization	Documents from 1920
AIPO (Africa)	5000
AU (Australia)	40 000
AT (Austria)	23 000
CA (Canada)	9000
EPO	110 000
Former Reichspatentamt (Germany)	453 000
France (INPI)	1 800 000
DE (Germany)	2 700 000
International Bureau of WIPO	40 000
JP (Japan)	4 300 000
SU (Soviet Union)	950 000
CH (Switzerland)	590 000
United Kingdom	1 600 000
United States of America	3 340 000
Total	15 961 000

Exploring the Trends, in Filed Patent Applications for PCT

Figures 4 display the patent operation statuses of improved nations submitted via PCT. The USA , EPC member countries exhibit growth trends in their PCT patent filings while Japan is steadily increasing its submissions over time. In Figure 5 presents the percentage change, in PCT patent applications filed compared to the preceding year; Japan experienced a developing rate of 42% in 1996 with a single exception of negative growth seen in 1992. Japan has experienced an increase, in growth in years with its PCT applications showing a positive change of over 15% from 1995 to 2005. This upward trend is also evident in the EPCs PCT applications which ranged from a high of 20 24 % in 1995 to a low of around 13 % in 2003. On the other hand the USA saw fluctuations with a peak positive change of about 27 % in 1990 and a dip of approximately 5 %, in 2003.

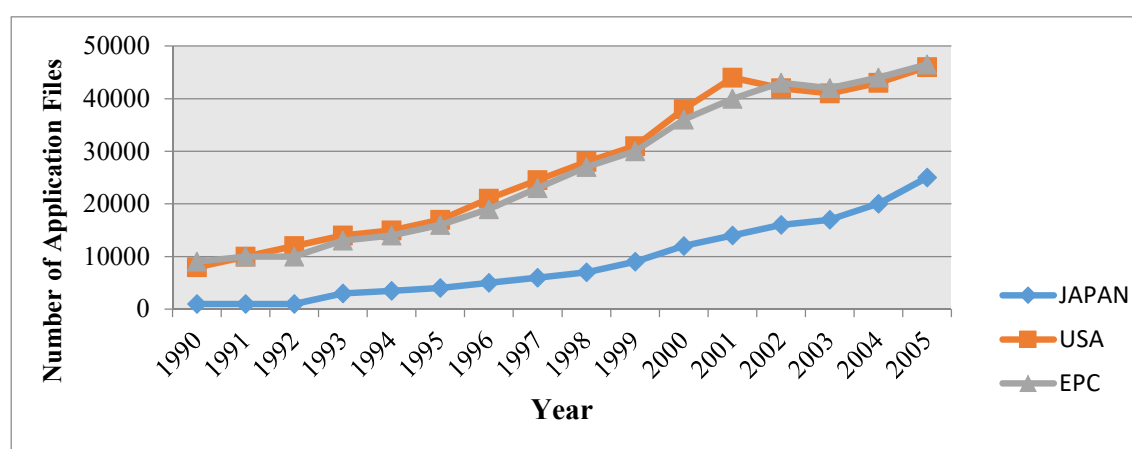


Figure 4 : PCT patent implementation filed in evolved countries (Rank 1-3).

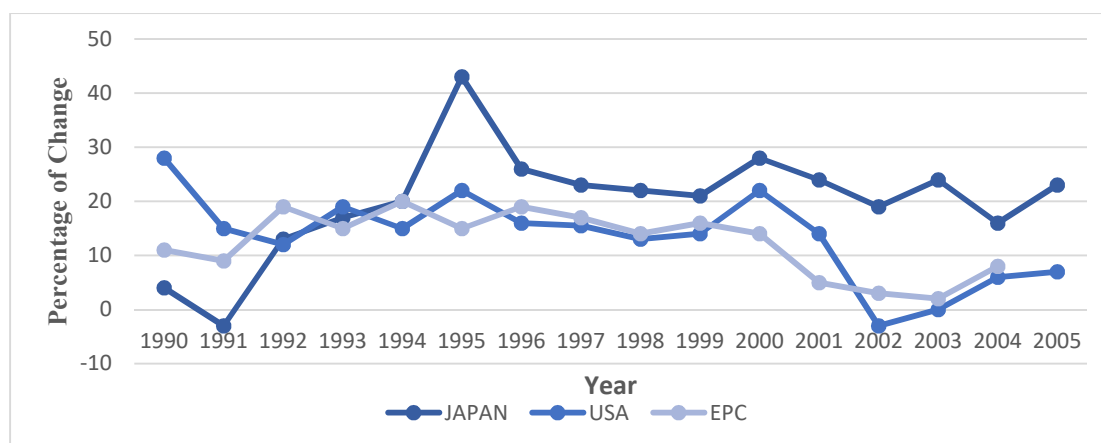


Figure 5 : The Chance of Change Over former Time (PCT operation Filed) (2).

Figure 5 displays the count of PCT patent applications submitted by developing nations between 1995 and 2005 in comparison, to their patent application numbers, during that period of time. Singapore and India initiated their PCT filings from 1992 with four and one patent applications whereas Mexico and China began the process in 1991 with two and one patent applications each.

In 1997 and, beyond South Korea witnessed an increase in patent applications filed each year up to 2000 with a peak growth of 81.6%. China saw a rise, in PCT applications commencing from 1991 with a growth of 120.8%. Experienced a decline of 41.2 % in 2002.

India began to see an increase, in PCT applications after joining the treaty from 1997 with a increasing rate of 225% reaching a peak of 621/5 % in 1999 before experiencing a decline, in both 2005 and 2006.

Patent Applications, in Biotechnology

Latin America is now facing the need to deal with challenges related to the advancement and commercialization of innovations by focusing on important progress and factors, like public perception and intellectual property protection methods as well as establishing regulatory guidelines and other aspects stemming from these endeavors . Latin America aims to explore fields like nanotechnology within biotechnology; however the impact of research and commercial activities in this area remains limited, in the region.

Patents serve as a way to safeguard inventions. There are initiatives working towards creating a proper legal structure to reach agreement regarding the standardized procedure, for acquiring them. While the current patent regulations are better suited for developed nations due to their advancements, in this field developing countries can utilize these tools to safeguard and promote innovations.

The connection, between a countrys growth and its ability to foster innovations can indeed be seen. However in developed economies the emphasis on preserving inventions varies across fields of knowledge. In Latin America specifically the progress in patents is regrettably lacking compared to regions, with robust innovation activities. The United States is a leader, in

patent creation due to investments in risk capital that have led to market dominance. The study of patents filed under the PCT has proven valuable, for technology analysis despite challenges arising from varying criteria.

The majority of biotechnology PCT applications globally are submitted by corporations according to Table 3 detailing the five companies that have filed PCT biotechnology applications within the fields of medicinal plant propagation inheritable change and water treatment in 2008, to 2018. It's evident that the primary influence stems in enterprises as opposed to academic and affiliated institutions which exhibit a lesser degree of involvement, over the same study period.

Table 3 PCT Patents operation in biotechnology (5 main association in 2008–18).

Medicinal preparation containing peptides			Medicinal product contain antigens or antibodies			Biological handling of wastewater ,sewage		
No	Office	Total	No	Office	Total	No	Office	Total
1	Genentech,Inc.	4810	1	Genentech,Inc.	5421	1	Kurita Water Industries Ltd	199
2	The Reagent of the university Of California	2907	2	Novartis AG	3145	2	Mitsubishi Heavy Industries,Ltd	116
3	Human genome Science, inc	2427	3	The Reagent of the university Of California	1699	3	Kubota Corp	99
4	Eli Lilly And Company	2289	4	GlaxoSmithKline Biologicals S.A	1217	4	Ebara Corp	97
5	Novartis AG	1712	5	Pasteur Institute	821	5	Hitachi product engineering and construction co. Ltd	95

Table 4 PCT operations in biotech according to the transnational bracket In 5 named Latin US countries.

Globally classified in patent for biotechnology	Mexico	Pct	Total	Brazil	Argentina	Pct	Colombia	Total	Cuba	Pct	Total
A01h1/00	328	189	518	328	556	25	35	61	3	0	5
A01h4/00	65	22	88	133	81	5	9	13	7	0	7
A61k38/00	4580	2282	6863	4815	2641	357	644	1002	42	6	48
A61k39/00	4290	2993	7284	3232	2813	464	1072	1537	103	11	111
A61k48/00	730	309	1040	958	307	23	60	84	2	0	1
C02f3/34	35	24	60	148	23	3	12	14	3	0	2
C07g (11/00,13/00,15/00)	29	5	35	41	73	0	0	0	3	0	2
C07K (4/00,14/00,16/00,17/00,19/00)	7380	4739	12120	6385	4721	350	961	1312	84	14	97
C12m	369	285	655	695	181	21	38	62	7	1	8
C12n	8795	4192	12988	8320	6124	492	891	1384	107	7	115
C12p	2247	1341	3589	3836	1861	235	292	528	31	3	33
C12q	2258	1124	3383	2359	1133	72	167	242	21	1	20
C12s	36	6	43	193	87	3	8	12	2	0	1
G01n27/327	33	16	50	40	11	0	0	0	0	0	0
G01n33(53*,54*,55*,57*,68,74,76,78,88,92)	1143	1143	3364	2417	1034	52	208	261	13	2	15

WIPO (World Intellectual Property Organization) categorizes information into sections, with potential subsections as outlined below.

Developing plant species or methods to acquire them including plant regrowth, through tissue culture process.

Making for dental purposes may include products used for hygiene or health care needs. Treating water or managing waste water and sewage falls under the category of ³ treatment of water and waste substances, in a sense.

Compounds classified are substances, with composition such, as sulfonated fats or oils whose exact makeup is not known.

Apparatus used for studying enzymes or microorganisms in a laboratory setting is denoted.

Microorganisms or enzymes are used for cultivating and preserving microorganisms, in culture media through methods, like mutation or genetic engineering.

Measuring , testing processes related to Enzymes nucleic acids or microorganisms are covered under C12Q category while G01N category involves investigating or checking materials based on their chemical or physical properties.

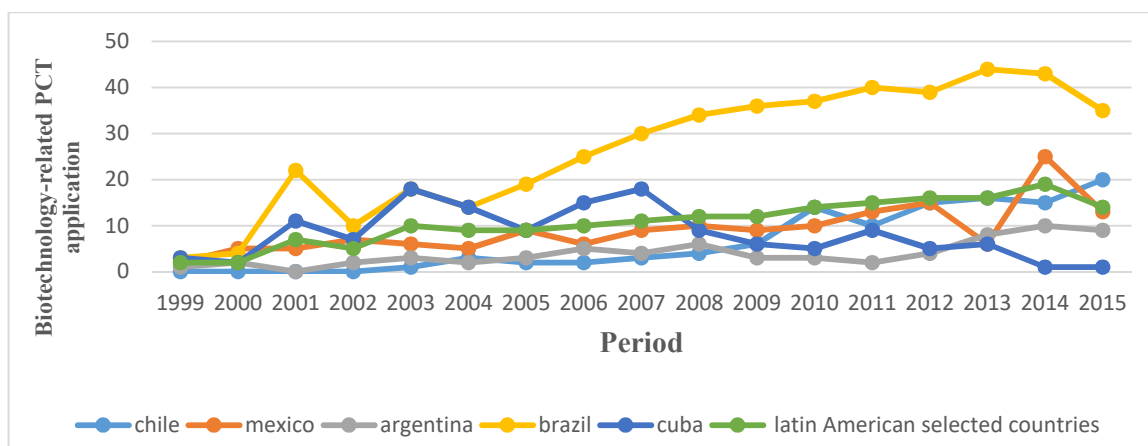


Figure 6 : Development of biotechnology-related PCT operation by aspirant's place of hearthstone

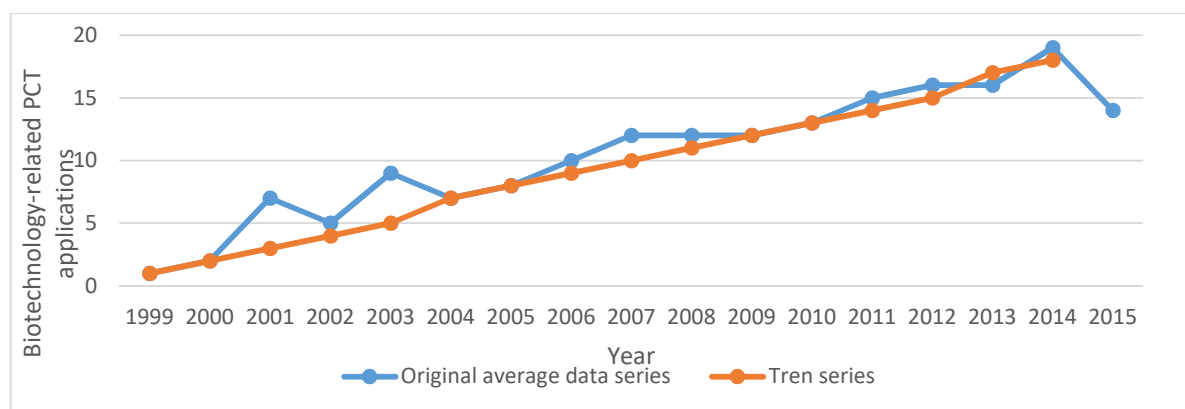


Figure 7. Growing and trend in biotech related PCT operation by aspirant's place of hearthstone.

Approaches

The initial phase involved choosing the five economic factors, in Latin America for examining the development and patterns linked to biotech related PCT implementation from 1999 to 2015. The countries chosen include chile, mexico, argentina, brazil and cuba. These selections were made based on factors, like their size, performance metrics and the presence of data related to PCT applications regarding where applicants reside and when they applied. In the biotechnology field of PCT applications several American countries showed periods with no reported activity.

The Organisation, for Economic Cooperation and Development (OECD) uses counting in their country indicators for each year. To track the trend of PCT applications in these nations between 1999 and 2015 accurately. The yearly average of the five countries, during that period was analyzed using a function. In the case of Argentina specifically. PCT applications are permitted under the article of the PCT.

Conclusion

The yearly count of PCT applications has surged from 1990 in 19 808 to 135 601, in 2005. The average developing rate per year from 1990 to 2000 stood at 16.8% however the pace has slowed to under 10 percent since 2001. Those submitting applications from member states of the EPC constitute the group with applicants from the United States of America following behind. Notably there is an upswing, in PCT filings originating from North East nations. In Japan and the Republic of Korea filings are rising by 22.1% while in China they're increasing by 46 L%.

The latest research indicates fluctuations, in the rate of patent applications related to biotechnology through PCT over time – a mix of advances and setbacks have been noted in this field. Nevertheless on the whole there has been an gradual rise in these applications with a linear pattern observed among the countries included in the study. In light of this situation it is crucial for all involved parties to take actions not to enhance patent creation domestically but also to facilitate their global commercialization prospects, for the future.

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