SOME IDEAS ON THE IMPROVEMENT OF PATENTING STATISTICS ATTENDING THEIR USES AND PRODUCTION

presented by
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INTRODUCTION

- ***STATISTICS:***

  "data systematically and orderly collected and processed,...
  provided by the State to the public,...
  to meet certain information needs".

  – Individuals and organizations (both private and public) present evolving requirements for patenting information in today's world
    - **An era of dynamic technological and economic change**
    - **Potential and actual competitors emerge frequently, often in distant geographical regions**
    - **Novel or improved satisfactors for human needs appear in diverse points of the global economy**
    - **Specific niches of demand for determined products or processes arise in diverse locations and migrate internationally**
    - **In particular, Industrial Property Rights (IPR) present a mosaic of characteristics across countries, regions and international agreements**

– At the outset of the XXI Century, most States in today's world differ from previous periods
  - New functions gain importance:
    - Promotion of national competitiveness in the world economy
      - » Markets
      - » Technology
      - » Strategic planning (private strategies, public policies)
      - » Strategic alliances
      - » Investment in science, technology and human capital
  - Larger commitment with results and impacts from government activities
    - Expanding emphasis, from administrative performance and use of human and budgetary resources, to satisfaction of citizens and their firms
  - More transparency and aperture to citizens participation
  - Adoption of improved technologies in government offices and movement towards *e-government* around the world

– How are Patenting Statistics (PS) affected by these phenomena?

– In which ways can PS be improved, attending their contemporary uses and the present possibilities for their production, both technologically and institutionally?

• The following presentation would try to provide some ideas.

EVOLVING NEEDS AND USES FOR PS

- **PS became available in a number of countries in the late XIX Century**
  - Legal context:
    - Fundamental IPR
      - Trademarks, patents, industrial designs
    - Foundations of International IP Law
      - Treaty of Paris: common basic rules and standards of protection (lenght and scope)
      - Notions of nationality, priority, infringement
  - Economic context:
    - Predominant primary and secondary productive activities
      - Considerable economies of scale
      - Deep vertical integration
    - Small number of countries playing important roles in the world economy
    - Little international trade
      - Large proportion of commodities and low degree of product differentiation
    - Foreign Direct Investment (FDI) determined by natural resources and public infrastructure projects
  - Science and technology context:
    - Slow pace of innovation
    - Slow and ineficient information flows
      - Manual, paper, mail / telegraph
    - Strong financial / technical entry barriers
    - Low degree of competition among firms
- **The setting of IPR has changed profoundly since then**
  - Legal context:
    - Wide array of IPR
      - Includingalso: integrated circuits plant varieties, supplementary patent protection
    - International Law:
      - Multiple international (regional, global) agreements with numerous rules
      - Trade related IP issues (public, private)
  - Economic context:
    - Large tertiary sector
      - Smaller economies of scale (yet network economies), less vertical integration
    - Large set of countries participating increasingly in international markets
    - Historical records of world trade
      - Considerable share of dfferentiated products
    - FDI strongly influenced by economic competitiveness and juridical security
      - Access to international markets costs of productive factors, productivity, Rule of Law
  - Science and technology context:
    - Fast and accelerating rythm of innovation
    - Large and efficient information flows
      - Telecomm, computers, info storage
    - New entry barriers, often knowledge based
    - Very intense competition among firms

CURRENT POSSIBILITIES FOR THE PRODUCTION / AVAILABILITY OF PS

- **Up to the last decade, PS had the following characteristics in many countries:**
  - Were mostly generated and published by local patent authorities (national patent offices, PO)
    - As a task separated from the underlying administrative procedures
    - With certain delay
    - In means not primarily electronic
    - Without clarity as to the purposes of PS
      - Quantitative activity levels of PO
      - National presence in international IPR issues
    - In aggregates or subdivided by exogenous technoligical / industrial categories
    - With marginal collaboration from international (regional or global) authorities
    - With limited possibilities for external users to process them flexibly for particular analyses
  - To certain extent, data concentrated on total figures of applications and grants
    - Yet, these were not adequately interconnected
    - Distinctions by nationality were mostly dichotomic (nationals, non-nationals)
    - Incipient reporting on the underlying legal framework (and scope) of IPR met
  - Data on subsequent aspects of patents granted were large ignored
    - Rights in force, links to rghts in other countries, possible different scope of related IPR abroad
- **Nonetheless, at present, technology and institutional arrangements permit that:**
  - Data can be derived in real time as by-products of administrative procedures
    - Savings of resources and time
    - Less human intervention and error
  - Information can be made available electronically from well designed data warehouses and with appropriate visual software, to general and particular users with adequately regulated access
    - To facilitate each user generate those statistical measures or indicators that best suit his (her) particular data needs
  - Interconnection of systems with other national, regional and global authorities is not only feasible, but convenient
    - Efficient use of resorces
    - Reliability
    - Consistency and comparability
  - All data pertaining a particular IPR of a determined person can be linked together, tracing their connections even internationally
    - Origin, migration of IPR among countries, differing scope of rights
    - Facilitating connection to other economic or market-related statistics?

- Very considerable progress in some of these directions has been made in the last few years
  - See, for example, WIPO´s internet site
- Nonetheless, additional efforts are called for to improve the utility of PS:
  - The route for steepest ascent *does not* seem to be in defining additional specific statistics or indicators, but rather in:
    - Facilitating interested individuals and organizations generate their *own* statistical measures
    - Constructing a *well structured database*, with the best data-warehousing design
      - international, integral and systemic
      - with appropiate regulated access for different categories of users
      - with friendly software for access and statistical manipulation

CONTEMPORARY CHALLENGES FOR PS

CONCLUDING REMARKS

- FACILITATE *STRATEGIC* DECISIONS OF MULTIPLE ENTITIES
  - For IP authorities (PO)
    - Improvement of operations, human resources and infrastructure
    - Finance and investment
    - Associations with other institutions (in IP, R&D, industry and commerce, general statistics)

USES

  - For particular actors (firms, counselors, consultants, research centers)
    - Market, technology, product and competition trends
    - Alliances
    - Nominal and effective IPR protection
    - Possible legal conflicts

USES

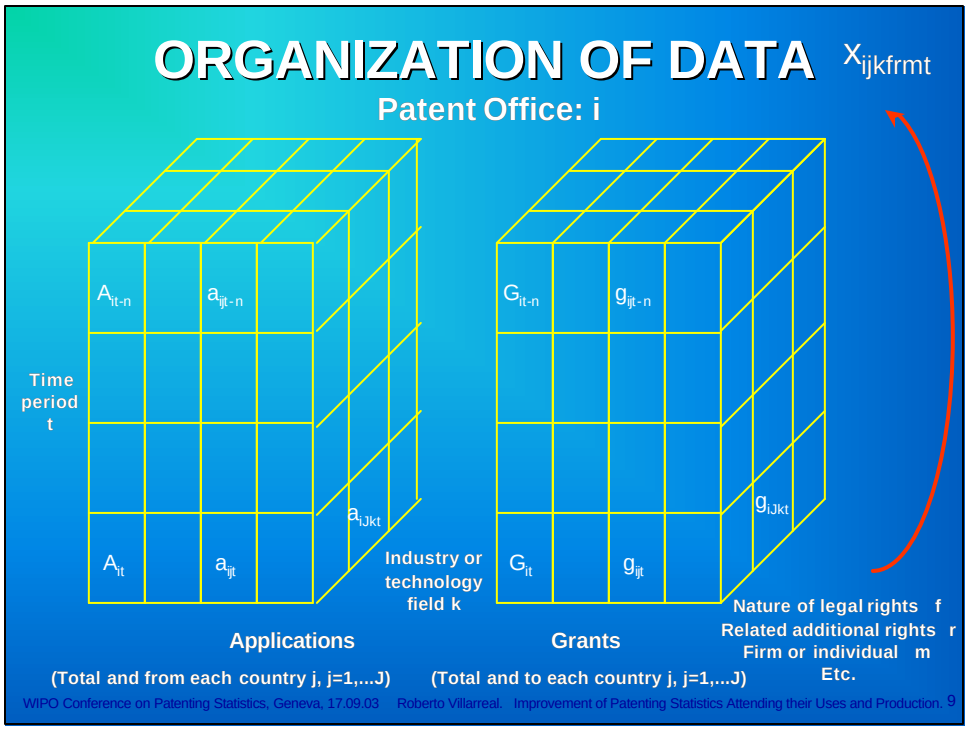
  - For national policy makers
    - Competitiveness in general
      - FDI destinations and technology flows
      - Human capital requirements
    - Possible international trade conflicts

USES

- FACILITATE INFORMATION ANALYSIS WITH *VERSATILITY*
  - PS must serve particular needs
    - PS defined by central institutions tend to be too general
    - Actual and potential users are very diverse and have innumerable needs of information
    - It is preferable to make raw data available and allow each user define his(her) own PS
  - Aggregates or ad-hoc tables imply losses of information pieces which are very valuable for potential users
    - Most users today can efficiently manipulate data with reasonable knowledge of IP and rigorous techniques of statistic analysis
  - Technology (data-warehousing and friendly access software) today make possible to adapt raw data to needs of each particular user

ORGANIZATION OF DATA

    - Authorities can open this avenue for a new era of flexible statistical production
    - Define basic standards for raw data generation by PO
    - Establish appropiate access criteria for different categories of users
    - Oversee the general availability and uniformity of data


ORGANIZATION OF DATA
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Patent Office: i
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Time period t
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Industry or technology field k
Nature of legal rights f
Related additional rights r
Firm or individual m
Etc.
Applications
Grants
(Total and from each country j, j=1,...J)
(Total and to each country j, j=1,...J)
WIPO Conference on Patenting Statistics, Geneva, 17.09.03
Roberto Villarreal. Improvement of Patenting Statistics Attending their Uses and Production.
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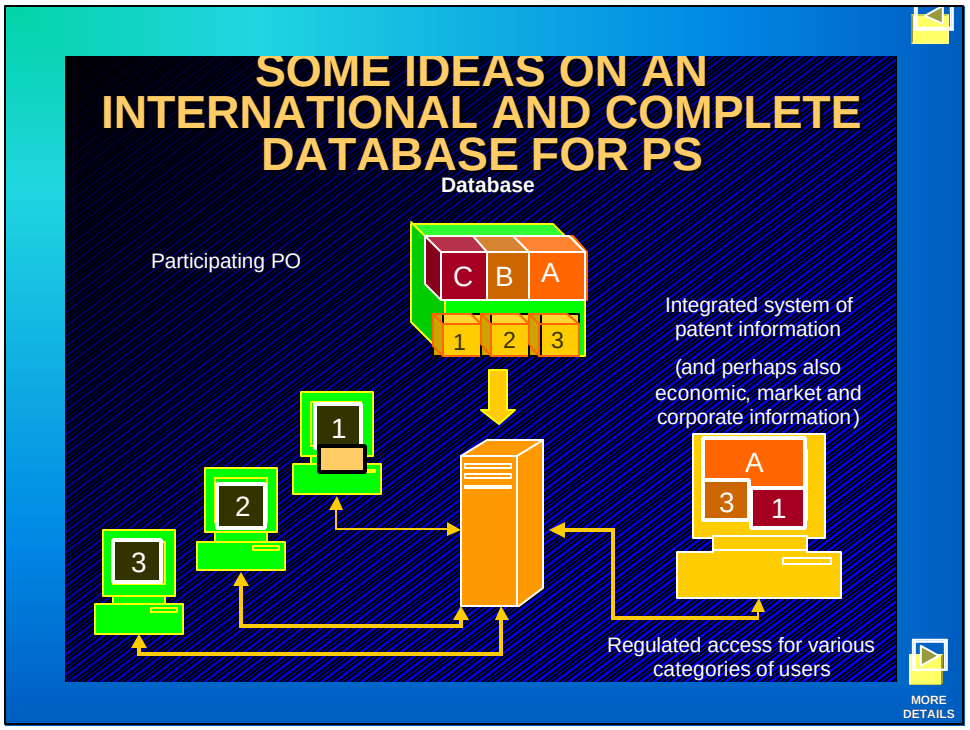
SOME IDEAS ON AN INTERNATIONAL AND COMPLETE DATABASE FOR PS
Database
Participating PO
C
B
A
1
2
3
Integrated system of patent information
(and perhaps also economic, market and corporate information)
A
3
1
Regulated access for various categories of users
MORE DETAILS

SOME FURTHER CONSIDERATIONS ON THE DATABASE

Patenting statistics based on an (a) international and (b) complete database, with regulated access for various categories of users and (c) friendly access software

(a) The database should be administered by an international institution as WIPO
- The contents and technical specifications of the database could be determined with the participation of member countries and affiliated international institutions
- The database would be fed in real-time with data flowing in via internet directly from administrative procedures in each national or regional PO
- The rules of access for variuos classes of users to the database would be determined jointly
- To avoid large up-front costs of introducing historical info into the database, this could start with new info from some determined future date and evolve naturally over time (a 20 year phase-in period)
- The database would serve a dual function:
  - It would provide the raw info for the statistics that each user would generate (PO, public policy making authorities, firms and consultants, etc.)
  - It would permit to relate aggregate statistics to specific patent-entries in the system

(b) Each patent entry into the database would be a *vector of complete relevant information*, in whose elements the following data would be introduced ,as various events occur over the patent life:
- ID data of the patent and nationality of applicant
- Country and date where first application is presented, and reference to the specific applicable legal framework (national law, determined treaty)
- Other countries in which the corresponding application is made
- Dates of grant (or rejection), as well as predictable dates of expiry, in each of those countries
- In case, supplementary protection conceded over time in each country and consequent predictable date of entry into public domain

(c) To allow for versatility, the traditional categories of industry and technological classification would be supplemented with some pertinent section of text from the patent documents abstract, description, etc.) so that each user can select and group patents according to his(her) particular criteria
- The database would be accesible by means of various tools, including friendly visual software

PS TO FACILITATE PLANNING FOR PATENT OFFICES

SOME EXAMPLES

- This category of statistics shall help transform PO...

From a traditional bureaucratic model

- autarchic organization
- almost totally integrated
- exogenous budget
- dependent on subsidies or transfers from financial authorities
- inefficient costs allocation
- overregulated by central government comptroller authorities
- relatively less centered around satisfaction of users
- partially aware of international best practices

To a competitive and service oriented model

- efficiently articulated or integrated with other PO
- considerable share of self-generated revenues
- subsidies or transfers from financial authorities focalized on target groups (inventors, small firms, universities)
- efficient and fair costs allocation
- transparent
- overseen by central government comptroller authorities
- fundamentally concerned with the satisfaction of users

Examples: Database information applied to particular needs of a PO

Sample questions for PO (I):

How do the total backlog and the backlog for technology class K compare?

What is the percentage of class K in the total backlog?

How many patent examiners in class K are required to modify that backlog?

Backlog in i at T, for all patent applications:

$$B_{i.....T} = \sum_{t=0}^{t=T} (A_{i.....t} - G_{i.....t})$$

Backlog in i at T, for patent applications in technology field K:

$$B_{i.K...T} = \sum_{t=0}^{t=T} (A_{i.K...t} - G_{i.K...t})$$

PS TO FACILITATE PLANNING FOR PRIVATE ACTORS

SOME EXAMPLES

- This category of statistics shall help firms and their advisors (legal, technological, marketing) improve their investment decissions in a competitive global environment...

From an information environment of high-cost and incomplete data

- disperse information in various patent databanks and other public files
- costly to gather and organize
- mostly on applications and grants
- not up to date
- classified in rigid industrial and technological categories
- mostly available for more industrialized countries
- uncertain as to the *effective* IPR protection in various countries

To an information environment of low-cost and rich info availability

- info well structured and organized in appropriate international / interinstitutional databanks, including economic and corporate data
- available at very low costs and with minimun time lags
- comprehending relevant info on post-grant matters
- available in flexible organizational modes to permit ad-hoc classifications
- incorporating PS from both industrialized and less developed countries
- supplemented with market data to estimate *effective* IPR protection

Examples:
Database information applied to particular needs of a private firm and / or her consultants

Sample questions for the private firm:

In which countries are there more possibilities to invest in the production of various products pertaining to industrial or technological class K?

Look at: $\min_i \{g_{ijK....}\}$ and find country i where the least patents have been granted for class K to nationals or foreigners

How important are local and foreign technologies for industry K in country i at time T ?

Compare, for some relevant n: Tot Pat Natl = $\sum_{t=T-n}^{t=T} g_{iiK...t}$ against: Tot Pat Intl = $\sum_{t=T-n}^{t=T} \sum_{j=1}^{j=J} g_{ijK...t}$

From which foreign countries does the technology most commonly used in country i procede in present time t?

Look at: $\max_j \{g_{ijK,t}\}$ and $\max_j \{a_{ijK,t}\}$ to find countries j to whose nationals the most patents have been granted or from who the most applications have been received at t for class K in country i

PS TO FACILITATE PLANNING
FOR PUBLIC POLICY MAKERS

SOME EXAMPLES

- This category of statistics shall help public policy makers improve national capacity to attain a more competitive international position:
  - Gain increasing market participation in raising industries
  - Consolidate advantages in existing markets, directly or through strategic alliances
  - Atract heading technologies and foreign direct investments
  - Rapidly adopt technologies comming into public domain
  - Reduce risks and expected costs from international trade conflicts...

From a standard macroeconomic approach with pasive IP policies

- A) Equilibrium of public finances, low inflation and open international trade policies
- B) International rules and standards for IPR

To sound macroeconomic policies with strategic IP, trade, investment policies

- A & B
- Bilateral or regional free trade agreements and investment protection agreements
- Harmonization of IPR legislation with strategic international partners
- International IP strategic linkages (inflows, outflows)

Examples:
Database information applied to particular needs of public policy makers

Questions for defining appropiate public policies in country i:

Has country J taken on average, in the last P periods, more time to process the patent applications of legal type L, in industry or technology class K, for applicants from country i than for its own nationals?

Are there technical reasons that explain the difference or should specific measures be negotiated between i and J to provide effective national treatment?

Let $D_{ijKL..T} = \sum_{t=T-P}^{t=T} [n \mid a^*_{ijKL..t-n}, g^*_{ijKL..t}] / \#\{*\}$ for all *

submitted in the last P periods. Then, is $D_{ijKL.T} > D_{iiKL.T}$?

Is the difference in average processing time statistically significant?

What factors influence an applicant of PCT to decide to enter the national phase for obtaining a patent in some countries, while at the same time deciding not to procede in other member countries?

A probabilistic multiple choice model could be estimated econometrically to answer this question, yet data in the database would have to include the history of choices made by applicants and, also, be linked to other macroeconomic and juridical data from every country considered.

CONCLUDING REMARKS

- PS nowadays must serve simultaneously a variety of needs, possed by:
  - ¬ Patent offices
  - ¬ Comptroller branches of government
  - ¬ Public policy making entities
  - ¬ Entrepreneurs and firms
  - ¬ Research institutions
  - ¬ Legal advisors, marketing and technology consultants

- To cope with these diverse needs effectively and efficiently, changes in PS may be called for in two respects:
  - ¬ The nature of the data supplied from the State to others
  - ¬ The allocation of tasks (such as processing, dissemination and analysis) to those with key comparative advantge to perform them

- All different users could gain from the efficient use of a well designed database accompanied with friendly access software
  - This way, PS could turn more useful to a large variety of users

- In particular, PO can benefit a lot from this approach:
  - In a standard manner:
    - from numerous statistics on their operations (applications, grants, backlog, etc., broken down by time periods, nationalities, legal instruments, industry and technlogy classes, etc.)
  - In more subtle ways, they could extrapolate trends, but also look at meaningful comparisons:
    - growth rates over different periods
    - comparisons to other PO
      - benchmarking
    - comparisons in industry or technology fields in countries considered as more advanced
  - Finally:
    - Database information could be used by PO to build a *scoreboard* for the integral monitoring of their operations and strategic decision making to improve efficiency and service performance

END OF PRESENTATION