

**Economic Development for Physicists from
Developing Countries**

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Trieste - ITALY

***EXPERIENCES IN SUPPORTING PATENT ACTIVITIES IN A
PUBLIC UNIVERSITY IN MEXICO***

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Technology Transfer in Mexico Status and Future Challenges



IOP Workshop

“Economic Development for Physicists from Developing Countries”

Trieste, Italy

November 29th, 2006

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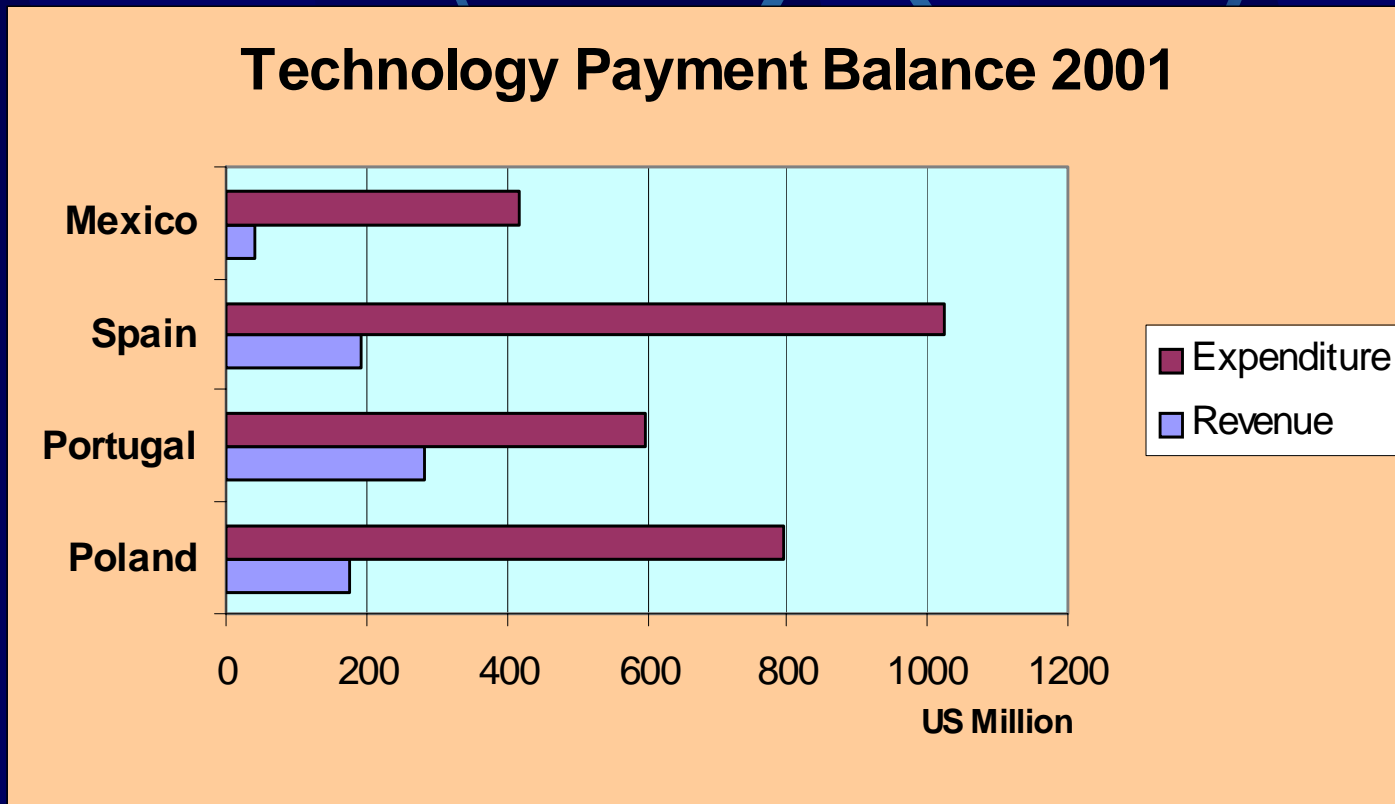
Some Facts About Mexico



- ❑ A population of nearly 105 million people
- ❑ Mexico and Brazil are the driving economies in Latin America
- ❑ Ranked as the 10th exporting economy in terms of GDP and the 12th economy in the world
- ❑ Exports to the US of more than 165 billion dollars
- ❑ Leader in commercial treaties with other countries

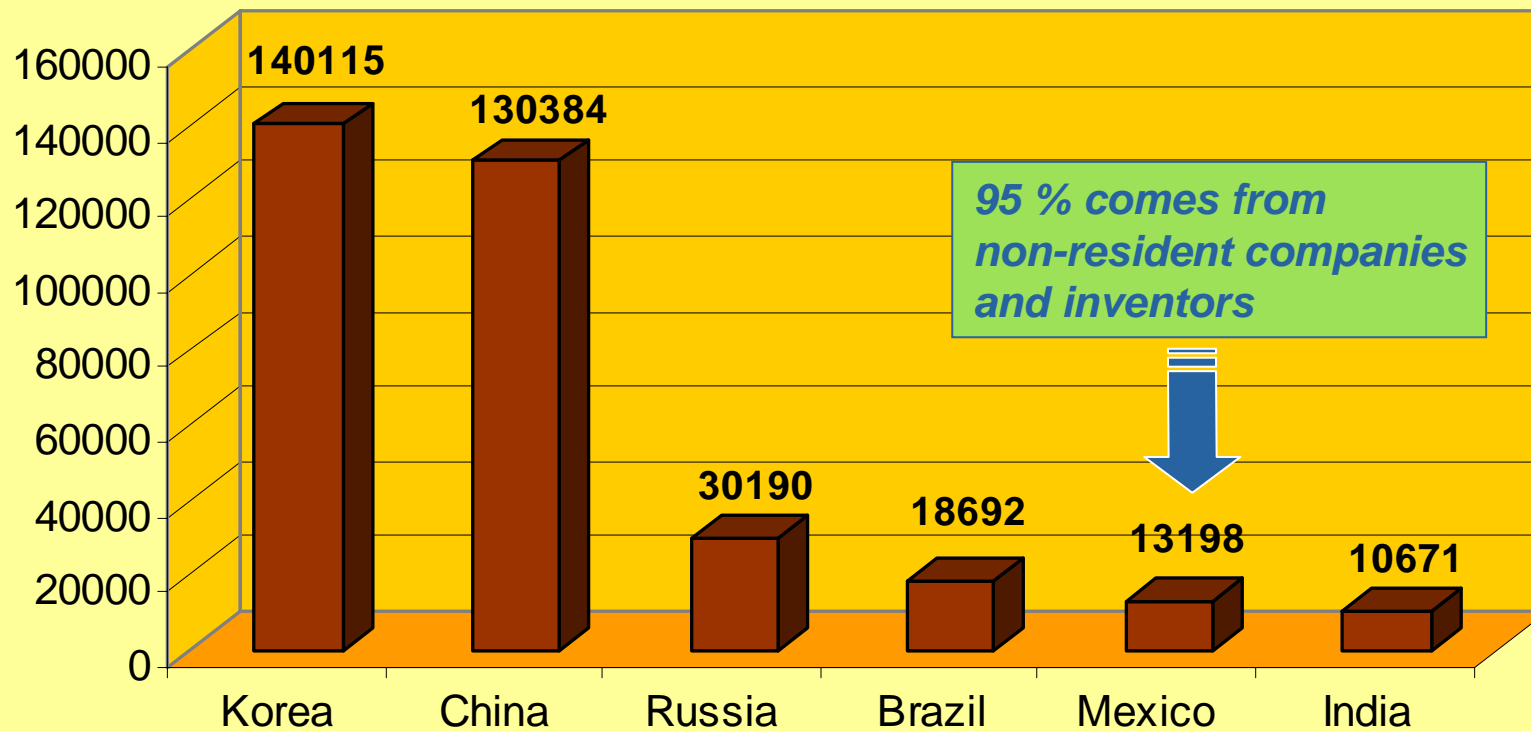
Some Facts About Mexico

Technology Balance of Payments (TBP). Currency input and output regarding industrial property right transactions:



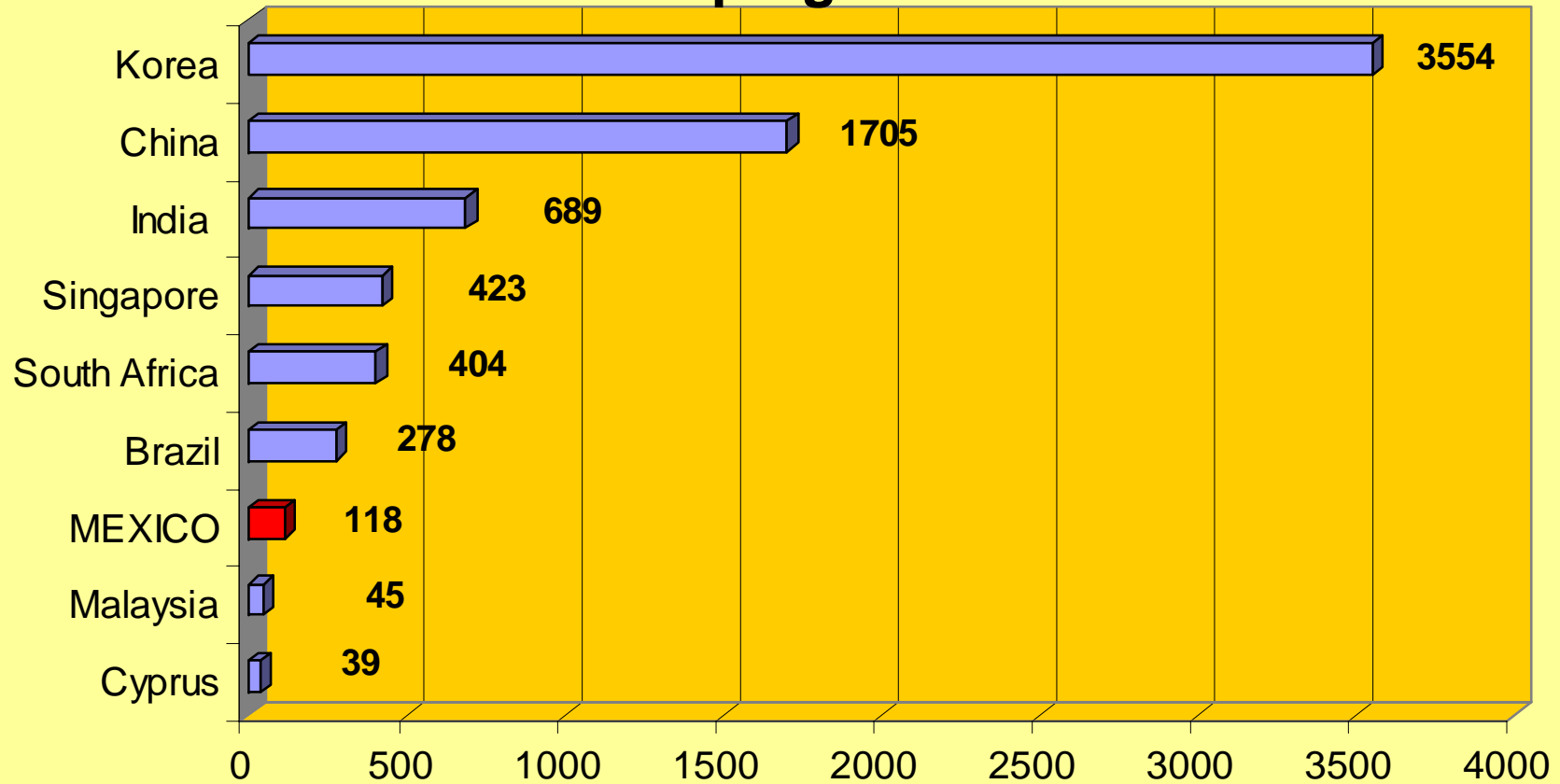
Some Facts About Mexico

Patent Applications by Office 2004



Some Facts About Mexico

PCT Patent Applications 2004 Developing Countries



Some Facts About Mexico

National Researchers' System (SIN)

- ❑ Created in 1984 to acknowledge researchers on scientific and technological knowledge production**
- ❑ An economical bonus is given to researchers based on their knowledge production**
- ❑ Until recently, patents have deserved more attention by researchers (more points and more bonus)**
- ❑ “Publish or perish”**

Some Facts About Mexico

Most of innovation initiatives are proposed by researchers more than being a result from a defined policy line in technological development

Historically, universities and research centers have shown a stronger linkage with government entities than with private industry

Some Facts About Mexico

In spite of above facts, ...

Mexican inventors, scientists and innovative companies are strongly creative, having a high-level of education, and gradually being recognized as a reliable source of technological knowledge

Innovation in Mexico

A sustainedly driven innovation-promoting strategy is mainly required in order to:

- Encourage innovation activities in Mexican companies and institutions***
- Promote IP and technology transfer as an important source of profit for companies and institutions***

What is Mexico doing to encourage technology transfer and patent activities?

1. PROMOTE INSTITUTIONS LINKED TO TECH TRANSFER

2. PROMOTE TECHNOLOGICAL INFORMATION

3. INTRODUCTION OF OTHER INCENTIVES

Available Infrastructure for physicists in Mexico

Infrastructure is not a limiting issue for technological Innovation in Mexico

Institute of Physics (UNAM) and other smaller institutes in regional universities



REGINA. Nanoscience Research Network, created in 2003

Public Research Centers: About a dozen relevant centers with R&D activities in areas of physics. Some of them:

CIMAV. Center on Advanced Materials Research

- **Material Science**
- **Environmental Technology Science**
- **Advisory on patents and IP**



CIO. Center on Optics Research

- Computer vision and artificial intelligence
- Holography and photosensitive materials
- Physics and engineering of laser



INAOE. National Institute on Astrophysics, Optics and Electronics

- Astrophysics
- Computer Science
- Operating the Large Millimeter Telescope (LMT)

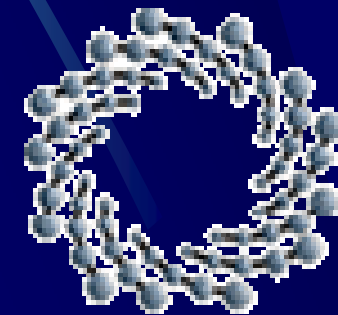
CINVESTAV. Center on Research and Advanced Studies from IPN. Department of Physics



- **Solid State Group**
- **High Energy Physics Group**
- **The Pierre Auger Project**
- **Statistical Physics Group**

IPICT. Potosino Institute of Scientific and Technological Research

- **Advanced Materials**
- **Molecular Biology**
- **Geosciences**



IPICT

Some developments in physics from Mexico

(12) **United States Patent**
Landgrave et al.

(10) **Patent No.:** US 7,111,937 B2
(45) **Date of Patent:** Sep. 26, 2006

(54) **SPECTACLE LENSES INCORPORATING ATORIC SURFACES**

(75) Inventors: **Enrique Landgrave, León (MX); Antonio Villalobos, Ensenada (MX); Criseida González, Ensenada (MX)**

(73) Assignee: **Augen Opticos SA de CV, Baja California (MX)**

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: 11/015,081

(22) Filed: Dec. 16, 2004

(65) **Prior Publication Data**

Jun. 22, 2006

2006.01)

351/177; 351/176

Search 351/176,

351/177

See application file for complete search history.

(56) **References Cited**

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Primary Examiner

Assistant Examiner

(74) *Attorney*

Meagher &

(57) **ABSTRACT**

An atoric surface is formed such that the surface coordinate lines are parallels with the shape of off-set curves of the trajectory curve of a swept surface, and meridians with the shape of the section curve of such swept surface. The lines of curvature of the surface coincide with the coordinate lines, so that the surface cylinder axis at any point P of the atoric surface is tangent to one of the two coordinate lines that passes through P. Atoric surfaces with lines of curvature in the form of meridian and parallel curves are highly suitable for astigmatic surfaces in spectacle lens design. The atoric surface design methodology provided herein is used to generate a broad range of surfaces from this class, thereby providing substantial flexibility over prior methods.

45 Claims, 6 Drawing Sheets

Mexican researchers from CICESE and CIO

A Mexican world-class ophthalmic lens manufacturer

Some developments in physics from Mexico

(12) **United States Patent**
Urquidi

(10) **Patent No.:** **US 7,049,828 B1**
(45) **Date of Patent:** **May 23, 2006**

(54) **CAPACITIVE SENSOR FOR DETERMINING
LINEAR OR ANGULAR POSITION**

(75) Inventor: **Carlos A. Urquidi**, Chihuahua (MX)

(73) Assignee: **Delphi Technologies, Inc.**, Troy, MI
(US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **11/071,941**

(22) Filed: **Mar. 4, 2005**

(51) **Int. Cl.**
G01R 27/26 (2006.01)

(52) **U.S. Cl.** **324/662; 324/515; 324/658;**
324/660; 324/663

(58) **Field of Classification Search** 324/662,
324/515, 514
See application file for complete search history.

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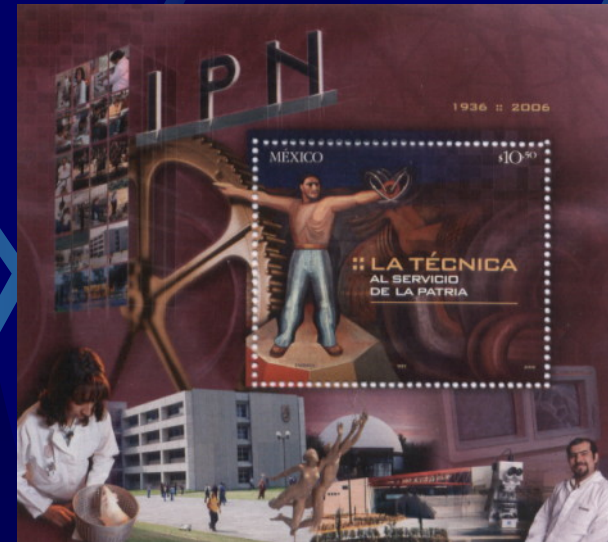
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by examiner
Primary Examiner—Anjan Deb
Assistant Examiner—John Zhu

A large multinational corporation in parts for automotive industry

A capacitive sensor includes an electrode member with two spaced-apart electrodes and an air gap therebetween. A position reference plate, which can be straight for sensing linear position or curvilinear for sensing angular position, is disposed in the air gap, with the electrode member being attached to a moving component and the reference plate mounted on a stationary object or vice-versa. The reference plate is formed with an opening, the width of which varies throughout the length of the opening, so that the capacitance between the electrodes varies depending on the position of the plate relative to the electrode member.

18 Claims, 3 Drawing Sheets



II. EXPERIENCE OF A PUBLIC PATENTING CENTER

The reasoning behind Patenting Center's concept

- ❑ Mexico is lagged in terms of patent and technology licensing activities even compared with other emerging economies
- ❑ Universities (specially public ones) and Research Centers are the main generators of technological innovations in Mexico

The reasoning behind a Patenting Center (2)

❑ **Inventors are not clearly aware of Intellectual Property limits and benefits**

❑ **IMPI (IP authority in Mexico) has acquired a significant expertise in the last 10 years as a result of strengthening its Capabilities, then it has a contribution to make to Mexican technological performance**



*Instituto Mexicano
de la Propiedad
Industrial*

Centro de Patentamiento

What about IMPI?



In addition to handling IP files and matters, IMPI provides:

- Seminars and workshops for training on IP
- Publications (users' guides, etc.)
- BANAPAT and pymetec management
- International agreements (e.g, search authority for Spanish-speaking countries in LatinAmerica)

Centro de Patentamiento

Starting on 2002, IMPI has promoted and supported the creation of Patenting Centers within academic institutions, research centers and companies

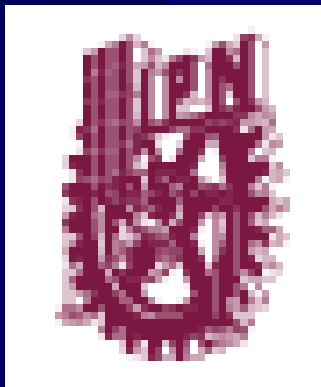


- 3 strengthened centers along 2005 (UNAM, COMECYT and IPN)**
- 5 centers under process of strengthening**

**Centro de Patentamiento
“IPN-IMPI Ing. Guillermo González Camarena”**

IPN. *National Polytechnic Institute.*

A 70 year old institution, being the largest public university with technical and technological orientation



In addition of being a key generator of technical professionals in Mexico, It is a significant provider of scientific and technological knowledge for Mexican society

Centro de Patentamiento “IPN-IMPI Ing. Guillermo González Camarena”

Created on June 2005

Purpose: Support to researchers and academic staff from IPN for:

- Training on IP basis and available IP figures
- Patent pre-filing searches
- Patent filing procedures
- Availability of IMPI’s patent examiners

Centro de Patentamiento

“IPN-IMPI Ing. Guillermo González Camarena”

Achievements in the first year in operation:

- ☐ Personalized attention for 400 researchers, professors, students and public in general**
- ☐ 6 patent applications filed before IMPI**
- ☐ 10 training courses on IP matters for IPN researchers and students**

Centro de Patentamiento

“IPN-IMPI Ing. Guillermo González Camarena”

Some supported projects through CIPN:

- ❑ Improved biomechanical arm, made of stainless, steel, aluminium and fibers
- ❑ Perspirometer. Determination of colour fastness to water and perspiration fo textiles
- ❑ Acoustic materials

Challenges regarding licensing within IPN

- Some challenges still remain mostly in adding value to the patenting activity:
- Developments should be driven by an industry/ market demand
- Researchers should be aware that licensing profits may give benefits to the whole research process
- Competences should be enhanced among staff devoted to licensing management

Patent Information for SME

PYMETEC : www.pymetec.gob.mx

- **Launched in June 2006**
- **IMPI and Secretariat of Economy funded it**
- **Free access from any place in the world**

Patent Database (1,200,000)

Discussion Forums



Patent Information for SME

- ❑ Technologies which are protected in Mexico, with possibilities to be licensed by their holders**
- ❑ Technologies susceptible of being used in Mexico**
- ❑ Technologies currently not protected in Mexico and therefore of free access**

A Success Story in the Use of Patent Information

Aromatic Matches



- Use of IPC
- A Chinese patent (*not protected in Mexico*)
- Materials Available in Herb Markets in Mexico
- Use of Faculty of Chemistry (UNAM) infrastructure
- Integration of technology development into a feasibility study

III. OTHER AVAILABLE TOOLS AND INSTRUMENTS

AVANCE Program

A Program sponsored by the National Council of Science and Technology (CONACYT)

“Last-Mile”: Supporting scientific and technological mature and feasible developments which may become into:

- high added value businesses or
- new business lines

Pre-feasibility study	US \$ 18,000
Business promotion contracting	\$ 42,000
Support for filing national patents	\$ 2,500

AVANCE Program



Entrepreneur Program: Technological projects in the step of scaling-up to production stage

Up to 20 % of initial capital for starting-up without Exceeding

US \$650,000

For a maximum of 5 years

AVANCE Program

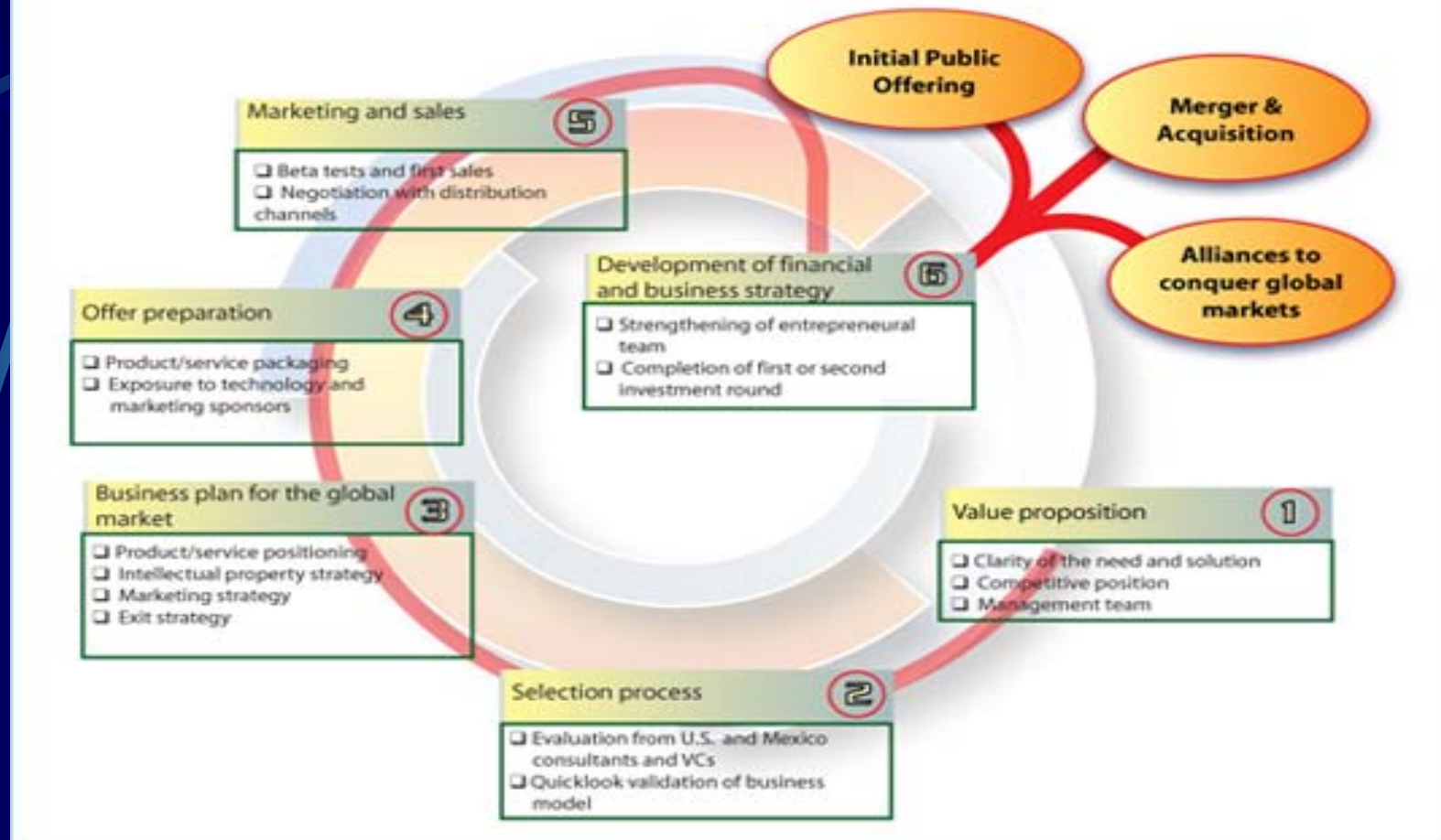


CONACYT-NAFIN Fund: Financing for working capital, machinery and equipment acquisition

- Banking loan granting for companies which develop technology-based projects
- Projects currently under commercial stage
- Money is available for fixed asset acquisition or working capital funding

TechBA Program

TechBA ACCELERATION PROCESS



TechBA Program

- ❑ **TechBA is Mexico's Technology Business Accelerator Program designed to grow and develop its premier high-technology companies for the global economy.**
- ❑ **TechBA is extensively supported by the Mexican Ministry of Economy and operated by FUMEC, The George E. Brown US-Mexico Foundation for Science.**
- ❑ **With facilities in Silicon Valley, California, Austin, Texas and Montreal, Canada, TechBA is a structured business development process that enables small and medium size companies to compete in the global economy.**

TechBA Program

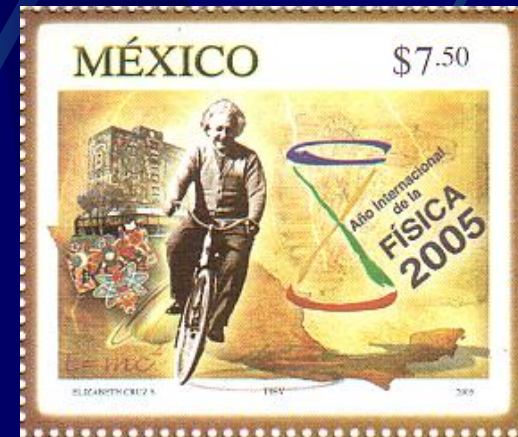
The portfolio of Mexican companies currently working in Silicon Valley includes the following services and manufacturing fields:

- Handheld devices
- Software
- Biometric solutions
- High precision instrumentation

“We were surprised and very impressed with the high caliber of companies involved in TechBA’s accelerator program”

Gadi Behar

Managing Director of Silicom Ventures



IV. FUTURE CHALLENGES

For several years, the most common limitations linked to technology transfer and patent activities in Mexico are summarized in four items:

- **Culture**
- **Policies**
- **Funds**
- **Market Knowledge**

Culture

What are we providing to potential inventors and technologists?

1. A strong clarification of what IS and what IS NOT Intellectual Property:

- IP available figures for protection**
- Basic requirements for patenting**
- Law and Regulations,**

and understanding thereof

Culture

What are we providing to potential inventors and technologists?

2. To approach to free patent databases in order to get familiar with the huge amount of information available for technology development

- **BANAPAT and pymetec**
- **Latipat**
- **EPO-espacenet**
- **USPTO**
- **WIPO**

Culture

What are we providing to potential inventors and technologists?

3. Make them sensible that IP is not only limited to play an “active” role (patenting, licensing, etc.) therein, but also in using available technological knowledge and in avoiding infringing rights from third parties

Culture

What are we providing to potential inventors and technologists?

- 4. A transition from an “isolated effort” to a “team effort” among researchers towards technology development

Policies

What are we providing to potential inventors and technologists?

- **Triggering Human Resource development in Technology Management and Intellectual Property matters**
- **Developing profit-oriented Tech Transfer policies within a win-to-win relationship**
- **Change from “science-driven” project management to “technology-driven” one (SNI)**

Funds

What are we providing to potential inventors and technologists?

Approach to AVANCE program in a pre-proposal stage:

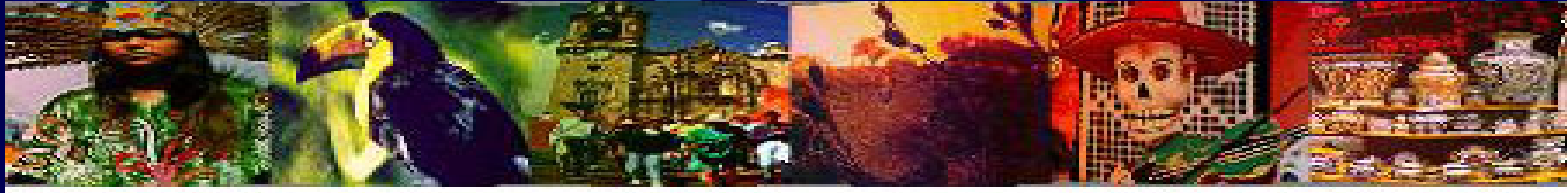
- Clarification of Program's coverage**
- Advisory in a business plan prospection**

Promoting a change in SNI's vision to give a higher premium to patenting activities

Market Knowledge

What are we providing to potential inventors and technologists?

- **An outline of business opportunities in marketplace derivated from a smart use of IP assetts**
- **Use of patent information for identification of possible investors, licensee/licensor**
- **Strengthening the linkage among R&D activities, inventors, and industry demands**



Thank you !



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Patents and Technological Innovation

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