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The Inter-American Centre for Knowledge Development in Vocational Training



# ***Vocational training prospective: occupational trends and new demands***

**Application of the  
SENAI Prospective Model**

**Panama, 19 October 2011**



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## The importance of long-term vision

- The new economic, technological and organisational order has posed great challenges to professional profiles in different fields and, consequently, to vocational training institutions.
  
- Needs of the vocational training institutions
  - Internal management and planning structures that enable them to gain a strategic position in a specific future time horizon.
  - Methodology and tools for presenting and analysing the adaptation of professional profiles to the economic, technological, organizational and educational context.





## The importance of long-term vision

### ***Skill needs in Europe: Focus on 2020 (CEDEFOP, 2008)***

- Prospective studies have shown that up to the year 2020 there will be an increase in knowledge-intensive jobs and that Europe needs to have strategies to satisfy the demands of this type of jobs.

### ***Keys for the future: Developing key technologies, their reflection on society and their impact on human skills (2003)***

#### **New professions**

- **Bioelectronics Designer** (plans devices in the intersection of biotechnology and electronics)
- **Bioinformatics Professional** (works with genetic information and acts as a link between scientists and the persons working on drug design and the development of clinical techniques).
- **Nanotechnology Consultant** (provides organisations with advice on the adaptation of nanotechnology devices)





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# The importance of long-term vision

## MAIN ISSUE

How can vocational training institutions contribute to increase the economy's productivity?

- By reducing structural mismatches of the labour force supply and demand.
- Identifying the excess or lack of skilled labour is important for enterprises, workers, governments and vocational training institutions.
- Premise: “the longevity of the SENAI System depends on the ability of its actions to influence the growth of industrial productivity”





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## Future studies on vocational training

From the point of view of vocational training institutions it necessary to define:

- Demand for vocational training (which results from the levels of employment associated to household consumption, government spending, investments, imports and exports)
- Target group (interest and aptitude)
- Significant legislation
- Strategies of methodologies for attracting and retaining youth, adult workers and unemployed workers, and improving their learning experience and entry into working professional life.



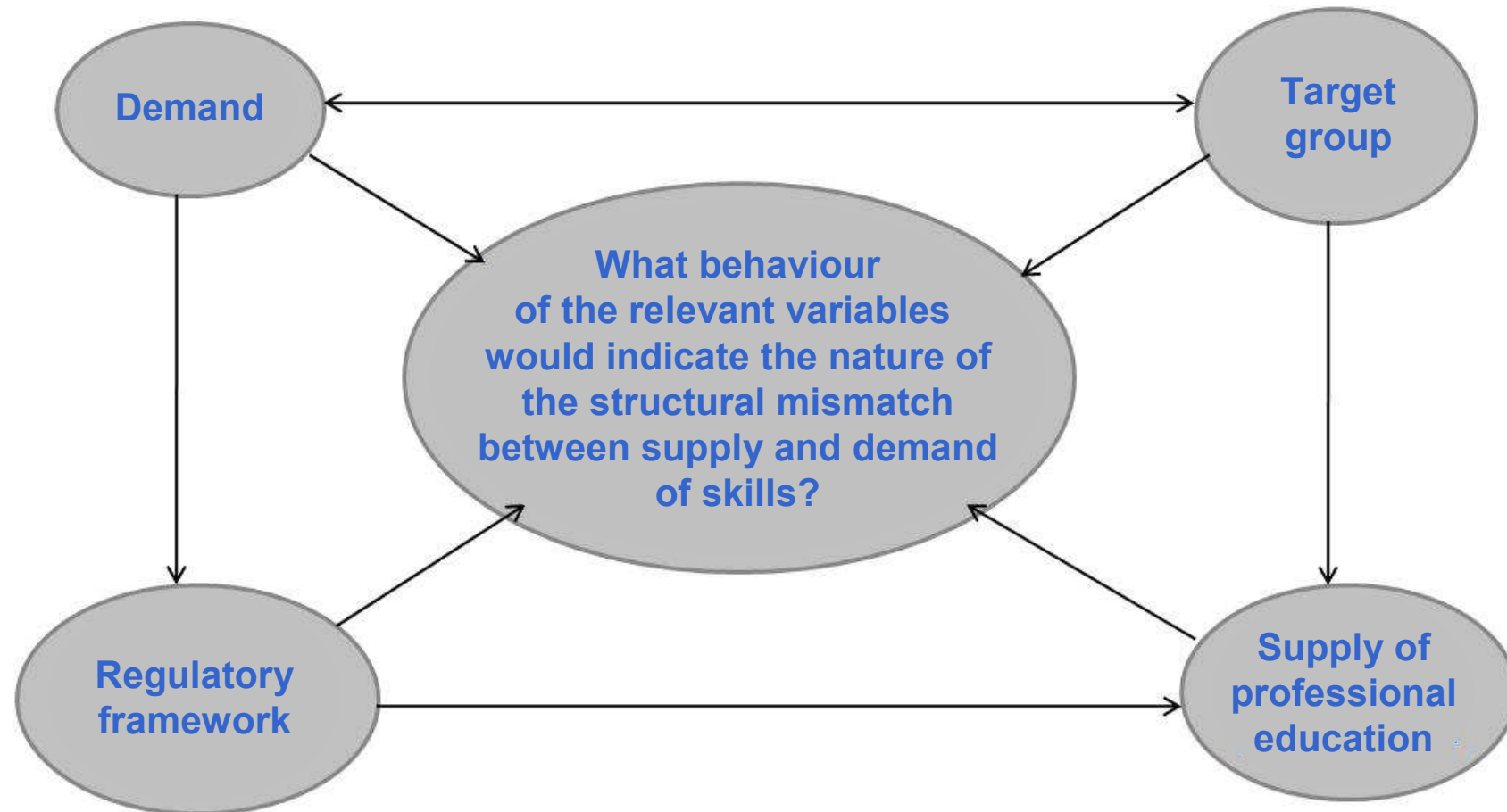


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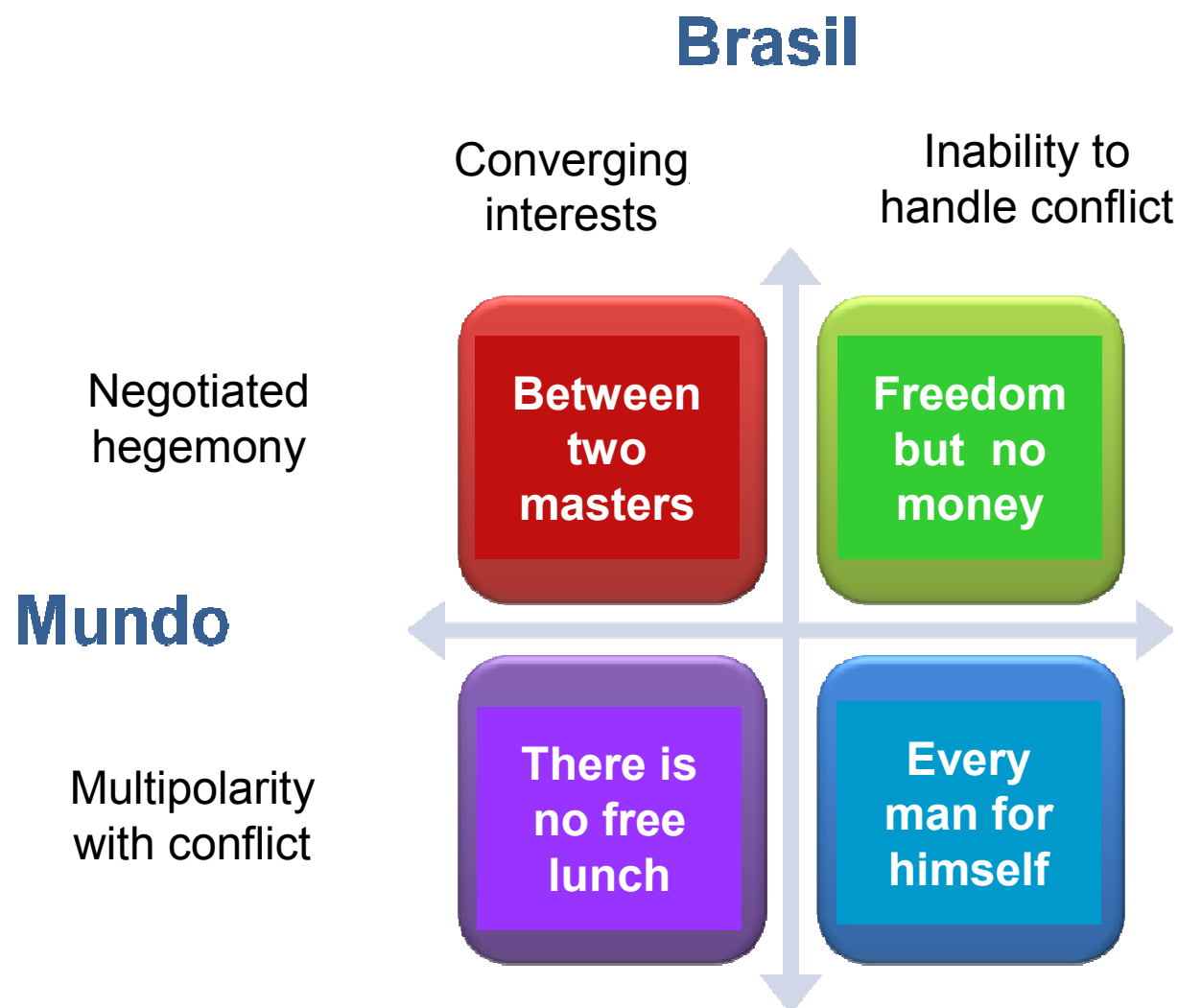
# **Prospective scenarios for Vocational Training and Technical and Technological Services 2010/2014**







## Four scenarios







## Strategic recommendations

SENAI has defined adequate strategies for this set of scenarios and has developed a process of options for selecting the most urgent and striking features of each scenario:

- Defining systemic actions in Vocational Training and Technology to maximise SENAI's contribution to industrial competitiveness.
- Defining strategies for the improvement and flexibilisation of Vocational Training and Technology based on the current and future demands of the productive system.
- Measuring and communicating the impact of all Vocational Training and Technology actions in terms of their contribution to industrial competitiveness.





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# SENAI Prospective Model





## SENAI Prospective Model

- The **SENAI Prospective Model** has been designed to respond to the following issues: how many workers should be trained in the future and with what professional profile, in order to reduce possible structural mismatches of labour force supply and demand.
- The Model provides for prospective actions (delphi investigations prospective studies of technology and organisations, experts panels) and trend analyses (econometric modeling) in the fields of Vocational Training and Technological Services.



**MONITORING**

**Technological  
Foresight**

**Organisational  
Foresight**

**Analysis of  
Occupational  
Impacts**

**Analysis of  
Occupational  
Trends**

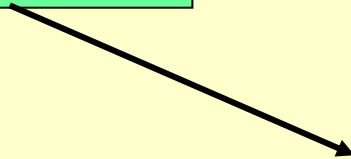
**Analysis of  
Educational  
Trends**

**THEMATIC  
ANTENNA**

**MONITORING**

**MONITORING**

**MONITORING**





## Definitions

- **Emerging technologies** with the greatest chance of dissemination in the next 5 or 10 years in a specific sector or industry in Brazil
- **Organizational trends** with the greatest chance of dissemination in the next 5 or 10 years in a specific sector or industry in Brazil
- **Educational trends** in the evolution of skills of SENAI's target group and the identification of educational gaps in that group, in view of the possible dissemination of emerging technologies
- **Occupational trends** in jobs for the sector or industry in a 5-year time horizon, in view of the possible dissemination of emerging technologies
- **Occupational impacts** that might result from the dissemination of emerging technologies and the consolidation of organisational trends
- **Thematic Antenna:** the moment when Recommendations are produced by connecting and putting into context all the previous stages.



Application of the SENAI Prospective Model generates information products aimed at different interest groups.

- **Recommendations**
  - **Map of industrial work**
  - **Map of technology**
  - **Map of education**
  - **Newsletters**
  - **Studies and research**
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- Publications produced: in the period 2004 - 2011 (1st quarter) the SENAI Prospective Model prepared **166 publications**.
  
  - Publications distributed: in the period 2004 - 2011 (1st quarter) **73,300 publications** were distributed to Regional Departments, companies and other actors of the Brazilian industrial sector.

# Use National Sectoral Technical Commissions

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- Diesel motor mechanic
- Industrial automation technician and technologist
- Construction technician
- Electro and electromechanical technician
- Electronics technician
- Mechanical manufacturing technician and technologist
- Shipbuilding technician
- Chemical technician
- Environmental technician
- Sugar and alcohol technician
- Tanning and leather technician



## Use: Recommendations (Machines and Equipment)

- **Emerging Technology with likelihood of dissemination:** Virtual Reality
- **Affected occupation:** mechanical and mechanical manufacturing technician
- **Occupational Impacts**
  - *New knowledge:* CAD, computing, simulation software and advanced mathematics
  - *New skills:* Abstract thinking, the ability to work and connect in multi-functional groups
  - *New attitudes:* Adapting to change and having a more holistic view of the process
- **Educational gaps**
  - Prerequisite: Problem solving by recognising graphs of exponential functions (3rd year of high school)
- **Work forecast for the next five years (annual mean)**
  - 500 to 999 jobs/year
  - The dissemination of technology does not impact the jobs forecast



## Use: Recommendations (Machines and Equipment)

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### Curriculum Innovation

- The updating of technical courses in mechanics by including content on **basic IT associated to knowledge of applied software.**

### Supply of courses

The supply of specialisation courses in:

- **Sector specific Information Technologies**
- **CAES, CAD and 3D software**



## Observation of technology

Industries	Number of fairs visited	Number of participating companies	Number of participating SENAI Professors/technicians	SENAI workshops for dissemination of Technology
Machines and Equipment	7	101	83	6
Foundry	2	30	15	1
Civil construction	4	184	76	5
Food (meats)	5	50	48	1
Footwear	2	10	15	1
Naval	1		2	
Automation	1		4	
<b>Total</b>	<b>22</b>	<b>375</b>	<b>243</b>	<b>14</b>

## **Observation of education**

- Following the changes in the significant legislation for vocational training.
- Promoting discussions for the positioning of leaders in the face of changes

## **Observation of Occupations**

- Monthly follow-up of the evolution of employment by industry and by job
- Production of updated employment forecasts on the basis of significant reversals in economic trends
- Informing leaders about such changes



## Industries studied

- Textile industry
- Petrochemical industry
- Machines and Equipment industry
- Telecommunications industry
- Civil Construction industry (buildings)
- Footwear industry
- Food industry (meats)
- Foundry industry
- Shipbuilding and repair industry
- Industrial automation industry





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*"We must have dreams and be willing to take on risks  
with new ideas and work methodologies."*

*Mr. Juan Somavía, 2009,  
ILO Director-General*

**TRABAJO DECENTE**

**Un mundo mejor comienza aquí.**



**Thank you for your  
audience**



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