MISSION

- INTI is a national network of innovation, support for quality improvement, technological development for the industry. A decentralized governmental organization within the scope of the Ministry of Production

- As a certifying body of standards and technical specifications, INTI ensures the quality of the processes, goods and services produced

- As the National Metrology Institute, INTI secures and keeps the patterns of national measurement units
STRATEGIC OBJECTIVES

Strengthening SMEs through:
- Development of innovative solutions for the industry.
- Supplier development holistically, from design and quality to improvement of processes and products.
- Service offering for productivity and quality growth, and capacity for continuous improvement.
- Metrological reference for quality system.

TECHNOLOGICAL OFFER

- Research & Development
- Certification of Processes and products
- Analysis and Tests
- Calibrations
- Technological Auditing
- Product Innovations and Improvement of processes
- Training of specialized technical staff
MIGUELETE TECHNOLOGICAL PARK

R & D Centres

Tecnologías para la Salud y la Discapacidad
Física y Metrología
Diseño Industrial
Química
Ambiente
Energía
Electrónica e Informática
Micro y Nanotecnología
Procesos Superficiales
Celulosa y Papel
Aeronáutico y Espacial
Agrícolas y Ganaderos
Carnes
Biotecnología Industrial
Mecánica
Caucho
Construcciones
Envases y Embalajes
Textiles
Plásticos
Lácteos
HUMAN RESOURCES

Agents by gender

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<thead>
<tr>
<th>Total Agents</th>
<th>Men</th>
<th>Women</th>
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<tr>
<td>3,022</td>
<td>1,755</td>
<td>1,267</td>
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<tr>
<td>58%</td>
<td>42%</td>
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Level of development:
- High
- Intermediate
- Low

More than 100 INTI MT Consultants
- 30 Certified Consultants
- 1 Coordinator (Buenos Aires)
- 4 Specific Coordinators
  - Technical Consultancy
  - Training
  - Research & Development
  - Institutional Relations

About the MT Network
About the MT Network

<table>
<thead>
<tr>
<th>Case 1</th>
<th>Trained Advisors per year</th>
<th>Level of Commitment</th>
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<th>Level of Commitment</th>
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</table>

- Papers - Articles
- Study Cases
- Meeting Network coordination
- Development teaching aids
- Development of new tools

- Seminars – Workshops - Training
- Strategic Partners -
- National and International Projects

- Enterprises assessment
- Consultant Certification system
- New consultants
- Awards (5S)
Research and Development

On Job Training

Training course

Enterprise assistance

International network

Projects
- Nicaragua
- Colombia
- Mozambique
- Venezuela
- Ecuador
- Uruguay
- El Salvador
- Etiopia

111 participants in third country training courses
International projects developed

Third Party Countries Training Course: 111 participants -

International project (training/technical consultancy)
## HUMAN RESOURCES
### Distribution by area

<table>
<thead>
<tr>
<th>Area</th>
<th>Percentage</th>
<th>Count</th>
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<td>R&amp;D Centres</td>
<td>63%</td>
<td>1,904</td>
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<td>Management and Presidency</td>
<td>37%</td>
<td>725</td>
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<tr>
<td>Technical Management</td>
<td>8%</td>
<td>393</td>
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<td>Programmes and Projects</td>
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## HUMAN RESOURCES
### Country Distribution

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<th>Location</th>
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<td>MTP – Buenos Aires</td>
<td>70%</td>
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<tr>
<td>Regional Centres</td>
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</table>
Schedule

- Network creation
- Objectives
- About Management Technologies
- About MT Network
- Network coordination and management
- Activities and joint projects
- New nodes creation
- International projects
- Certification process
Network creation
2004 – Study on Revitalization of SMEs in Argentina

- Developed in 4 locations: Rafaela, Rosario, Córdoba and Buenos Aires
- Mentored by a group of Japanese experts

Objectives:
- Improve the competitiveness of SMEs
- Train INTI staff in providing MT consultancy

Results:
- New training courses designed
- Consultants trained in Japan
- New nodes development
- INTI Management Technologies Network creation (2006)

Network creation
2004 – Study on Revitalization of SMEs in Argentina

Difficulties that emerged after the project:
- Small number of consultants as compared to the number of SMEs
- Qualification differences between nodes
- More nodes development required

INTI made a request to JICA concerning technical cooperation for construction of an efficient and effective MT diffusion methodology.
Network creation

2009 – Management Technologies Diffusion Plan

- Developed in 6 cities: Neuquén, Villa Regina, Concepción del Uruguay, Paraná, Buenos Aires and Mar del Plata
- Mentored by a group of Japanese experts
- Network operation study

Objectives:
- Train INTI staff
- Propose a MT diffusion plan

Recommendations:
- New MT development
- Practical training system implementation
- Consultants qualification certification system

Network creation

~ 600,000 SMEs
~ 80 MT consultants from INTI

Consultants qualification certification system

- Certify the qualification of MT consultants (INTI/external)
- Train and certify new consultants (INTI/external)
Network creation

Consultants qualification certification system

Objectives:
- Certify the qualification of MT consultants
- Improve the quality of the technical consulting services
- Increase the scope of the network
- Reach more SMEs

Requirements:
- Theoretical training (3 training modules)
- Practical training (4 months)
- Work experience (providing MT technical support to SMEs)
- Written examination
- Oral examination
Objectives of the network

General Objectives:

✓ Improve SMEs (small and medium enterprises) competitiveness
✓ Disseminate and encourage the implementation of management technology tools
✓ Encourage the creation of a culture of continuous improvement in SMEs
✓ Contribute to the national industry development

Specific Objectives:

✓ Provide training and technical support to SMEs
✓ Contribute to the study and development of methods to improve efficiency of enterprises
✓ Develop new MT teams along the country, in order to increase the network scope
✓ Develop national and international projects to disseminate the application of MT in SMEs and other organizations
What are the MT?

Management Technologies are tools used to increase companies’ productivity through organizational improvement and efficient use of the available resources.

- Throughout the implementation of MT companies are expected to reduce costs, improve production efficiency levels and increase profitability.

- **7 Wastes**
- **5S Methodology**
- **Kaizen**
- **SMED**
- **Industrial Engineering Tools**
- **7 Basic Quality Tools**

Technical Consultancy

**Stages of the consulting process**

- **Diagnosis**
  - Preliminary survey
  - Problems
  - Requirements

- **Action plan development**
  - Objectives
  - Activities
  - Schedule
  - Indicators definition

- **Technical consultancy**

- **Action plan implementation**

- **Final Report**
  - Evaluation of the consulting process (indicators)
  - Recommendations

- **Final Report**
Technical Consultancy

Important tips

✓ Company managers must get involved
✓ Team work between consultants and company employees is necessary
✓ The consultant should guide and lead the team
✓ Aim to transfer the MT tools to the company
✓ Teach the companies on how to solve their own problems using MT
✓ Use indicators to measure the improvements

What are the MT?

✓ Management Technologies are used for the first approach to SMEs

- Lab tests
- Calibrations
- Products or processes developments
- Training requirements
- Other requirements

Through the MT diagnosis, other industry requirements can be identified
### About the MT Network

#### 2016 Indicators

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<tbody>
<tr>
<td>Performed diagnoses</td>
<td>208</td>
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<tr>
<td>SMEs advised</td>
<td>129</td>
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<tr>
<td>Written articles</td>
<td>33</td>
</tr>
<tr>
<td>Hours of training (given)</td>
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</table>

#### 2013-2016 Indicators

- 698 Performed diagnoses
- 459 SMEs advised
- 102 Written Articles

### About the MT Network

**Network management**

- **Online data base used to...**

  **Storage information** about:
  - Diagnosed/advised companies
  - Diagnoses (diagnostic reports)
  - Technical consultancy (periodic reports and final reports)

  **Get information** about:
  - Frequent problems found in SMEs
  - Network indicators (hours of given consultancy, number/type of companies advised)
  - Network activity evolution
  - Other...
About the MT Network

Network management

MT Network Activities

- Network meetings
- Technical articles development
- New Nodes development
- International training
- International consultancy projects
- Other joint projects
  - New training material design
  - MT Manuals
  - Self diagnosis
How the new Nodes are created?

Consultants from developed nodes travel to the region in which the new node will be created to train their personal

✅ Aspects to be considered during project formulation:
- Number of trainees
- Number of consultants needed (trainers)
- Trainers (can be from different developed nodes)
- Class and number of companies (3 for each trainee)
- Project duration (1 year)
- Needed resources
- Financing

How the new Nodes are created?

✅ Project activities

- Theoretical training of the new consultants
- Seminar to explain project scope and activities
- Companies pre selection
- Diagnosis
- Diagnostic report for each company
- Companies selection
- Action plan development
- Technical consultancy
- Final report for each company
- Closing seminar
How the new Nodes are created?

Work tips

Diagnosis:

✓ Trainer visits the companies with the trainees in order to identify the main problems (1 or 2 visits are needed)
  • Marketing
  • Human Resources
  • Production and Quality
  • Administration
  • Finances

✓ Trainees prepare the diagnostic reports, guided by the trainer
✓ Both prepare an action plan for each company

How the new Nodes are created?

Work tips

Selection criteria (examples):

✓ Managers commitment
✓ Company’s organizational structure
✓ Qualification of company staff
✓ Type of company (product, process, size)
✓ Improving potential
✓ MT to be applied
✓ Unions activity
How the new Nodes are created?

Work tips

Technical consultancy:

✓ Trainees visit each company every week, supervising the activities described in the action plan

✓ Trainers travel every month to: check the action plan advance, evaluate trainees performance and guide them on how to continue with the consultancy process

Node development example – Jujuy

- Trainers: 2 consultants from INTI Management Technologies and INTI Mar del Plata.
- Financing: Palpalá Industrial Association / Ministry of National Production
- Objectives:
  - Improve the competitiveness of metallurgical and metal-mechanic companies from Palpalá
  - Create a new node in Jujuy
How the new Nodes are created?

Node development example – Jujuy

Most of the companies that make up the Palpalá Industrial Association are engaged in manufacturing metal products and in the provision of services to the regional industry. Many of these establishments were created after Altos Hornos Zapla privatization (first steelworks center of Argentina).

How the new Nodes are created?

Node development example – Jujuy

Activities schedule

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<th>Month</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<td>X</td>
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</tbody>
</table>

* Trainers trip
How the new Nodes are created?

Node development example – Jujuy

Results

- 9 advised SMEs
- 3 new consultants trained
- 1 new node

International projects developed

Third Party Countries Training Course

Argentina

Ministerio de Relaciones Exteriores y Culto República Argentina

INTI

Japan

JICA

Third Party Countries
International projects developed

Third Party Countries Training Course

At the end of the Course, each participant is expected to:

✓ Have acquired general knowledge about MT implementation
✓ Have acquired the necessary theoretical knowledge for INTI’s Consultants Certification System
✓ Use the acquired knowledge to give support to SMEs in their countries
✓ Be part of the International MT Network

International projects developed

Third Party Countries Training Course

✓ Aimed at countries from Latin America, the Caribbean and Africa
✓ Duration: 4 weeks
✓ Language: Spanish
✓ Financed by JICA and Argentina
✓ Activities:
  • Lectures about MT
  • Visits to big companies (Yazaki, Yamaha, Toyota)
  • Visit to SMEs
  • Diagnosis practice in a company
  • Action plan development
  • Cultural activities
✓ 6 Editions (2012-2016)
International projects developed

Example - Nicaragua

- 2 projects developed with National Engineering University of Managua (UNI)
- 7 work trips by INTI consultants
- Participating nodes:
  - INTI Mar del Plata
  - INTI Management Technologies
  - INTI Entre Ríos
  - INTI Rafaela
- 40 trainees (in 2 training courses)
- 20 diagnosed SMEs
- New MT specialization at UNI
- Technical consultancy about:
  - Layout improvement
  - 5S implementation
  - Production planning
  - Inventory management

Other joint projects

Training methodologies development

- Games developed by different nodes
- Used to teach MT tools
  - 5S
  - Costs management
  - Work study
  - SMED
  - 7 Quality tools
  - Production management
- They Improve knowledge transference
Other joint projects

Manuals

Objectives

- Provide companies with trained consultant with technical competences vouched by INTI
- Establish a process of continuous improvement in the quality of technical consultancy services.
- Establish a link between professionals in management technologies (MT) and companies or other organizations that require this service to develop productivity and efficiency.

Consultant certification process in Management Technologies
Experience
The applicant’s experience as a consultant in MT will be evaluated through presented documentation. This documentation is a verifiable product of the applicant job.

Technical knowledge
Technical competence and analytical skills will be evaluated through the application of problem solving techniques such as those related to quality improvement, lead times reduction, cost reduction, productivity improvement, and those derived from modern manufacturing systems (TPS, lean production).

Performance
The applicant’s performance will be evaluated through his experience on courses and seminars, in company personnel training, work references, etc. At this point, interpersonal and attitudinal competences applied to shared tasks or objectives will be taken into account.

A file is prepared containing the complete documentation of the applicant
The Certification Committee receive and evaluate the documentation
This file is sent to the Qualification Committee to approve the admission

Admission to certification process

Entry 1

Hours in diagnosis and technical consultancy

Theoretical training

Practical training

WRITTEN EXAM

ORAL EXAM

Certification
Certification

Consultants in Management Technologies, certified according to INTI Protocol
Base updated to March 2017
The certified consultant’s name will be published on INTI’s official website

The validity of the certificate is 4 years

<table>
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<tr>
<th>Apellido y Nombre</th>
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Supervision

Two years after certification the committee evaluates the following aspects:
- Work continuity
- Given and received training

Recertification

At the end of the 4 year period the renewal of the certification can be carried out with or without examination.
Identify which problems the organisation has.
Priorize them.
Establish a feasible issue to tackle down.
Establish an Action Plan for implementation.
Working group presentation

Communicate as clear as possible witch is the objective to all organisation if it’s possible.

Participation conditions of by the company

Complete information from the survey in case any data or clarification is missing

Do you know monthly Production?

How long does the finished product stock last?

Is the cost of your product competitive?

Do you know the fixed and variable cost of production?

What is the delivery time of your products?

What is the competition time?

What is the percentage of defective products?

Do you file complaints and product returns
What is important to look?

Productive diagnosis (Simplified)

Company Tour (Gemba Walk)

Productive areas and warehouses: are they tidy, clean and marked?

Productive areas and warehouses: are they tidy, clean and marked?

What is important to look?

Are the machines and facilities in good working order?
Are there spills of liquids (oil, water, etc.)?

Are there materials / objects that do not correspond to the ongoing process around / on the machines?
Are there loose or hanging cables?

Are the tools and devices identified and ordered?
Close Meeting and first impressions

>>Important!

✓ At the end of the day, a close meeting should be carried out.
  • It is normal that the people who accompany us during the day expect a feedback from us. Be careful...
  • Give a brief resume of facts you saw in the plant raid, some about the easy/difficult way they get the info you requested.
  • ASK witch topics are the SME interested to tackle.

Diagnosis report

✓ The final diagnostic report may have two formats that favor its disclosure.

**WRITTEN REPORT**
- Ordered data you collected.
- Scientific support for your conclusions

**PRESENTATION**
- It’s a complement to written one
- Can be use to show briefly to the leaders in a meeting.
PRODUCTIVE DIAGNOSIS

**WRITTEN REPORT**

**Introduction**: brief on the consultancy project, its objectives, scope and the diagnosis that will be presented below.

**Applied methodology**: synthesis of the steps performed for the diagnosis

**Data collected**: the data obtained grouped by topic in tables and if possible graphics that facilitate comprehension.

**Interpretation of data and their possible relationships**: clarifying the previous chapter and anticipate some findings

**Conclusions and recommendations**: Final conclusions of the consultant and recommendation of possible steps to follow

---

**PRODUCTIVE DIAGNOSIS (Simplified)**

- We normally use first 3-4 “Execution” meetings to go deeper in those points we consider important because of the topic selected.

- At this point, the SME should provide us all data we ask for, in order to be able to pass from “sensations” or “experience” to facts.

**We´ll expand this in “execution” chapter**
Frequent mistakes when performing a diagnosis:

- Omit those aspects in which you have no knowledge or experience
- Be influenced by the symptoms and subjective expressions of the employer
- Focus on highlighting the “negative face”: "what is being done wrong", instead of presenting it as future challenges.

**Real Case – SME Diagnosis**

**FILTERS FACTORY**

- Branch: Manufacture of air filters and separators
- Employees: 7
- Market: 100% local
- Founded in 1955
During the interview, the owner of the factory commented this:

"When a customer requests a product and we don’t have it in stock, two units are manufactured, to be able to have these products in the warehouse previously and thus respond more quickly to future orders from customers."

"In the same way, at the moment of acquiring raw materials, we bought in an amount greater than necessary to avoid missing time".
Pics taken during the plant visit. Working stations

Pics taken during the plant visit. Shelves
Pics taken during the plant visit. Lathes

Let’s think about what we just saw…

What conclusions can you draw from the comments of the entrepreneur?

And the plant tour?

Can you relate the sayings of the entrepreneur to what is observed in the factory?
Specific planning, targets to be obtained

• Keep in mind the objective of the company and the restrictions imposed by the organizational culture. (Matrix problem can be done)

• How to select these issues?

  >> That its resolution has a high impact for the company
  >> A chronic problem that affects the attention of customers
  >> That has visible results in a relatively fast time
  >> That brings benefits for the company and also for the personnel involved.
  >> That is executable in the time available for the technical advice.

• Know what resources we could count on and if there are restrictions, to propose a reality-based plan.

This tentative work plan should be agreed with the employer on a 2nd visit.
• Agree on the objectives to be achieved.
• How the implementation progress will be checked (indicators).
• The estimated time for the technical consultancy will be measured.
Most of the time working with SMEs, it is necessary to consider the training needs

Role Play Activities

- 5’S training/play
- Q Control play
- Q Circles formation
- SMED/ Lot Size
- Kanban
Execution

- We have an **objective**, but do we know the initial situation? Do we have an ideal situation?

- Sometimes 3 or 4 visits from “execution” time is used to check/process data available, or generate checksheets to collect it.

- Distinguish between opinions and facts.

    ![Diagram showing data analysis and decision-making process]

If we have an objective, make it clear

- Reduce welding defects in assembly process
- Reduce setup time of dialyzer
- Improve bending accuracy in process for chassis manufacturing
We know the initial situation, and we have an ideal situation. We have a gap? Now we have a problem(s)

A “problem” is the gap between the present situation and the ideal situation or objective.
Problem evaluation charts

Evaluation charts
INDICATORS

Now we just selected the problem(s) to work with and set objectives, we need tools to measure our work.

COST  SALES  SECURITY  HUMAN RESOURCES

PRODUCTIVITY  QUALITY CIRCLES

DELIVERY TIME  EFICIENCY  SERVICES

QUALITY

1. Select problem to attack
   - Identify priorities
   - Examine state of control
   - Find areas to improve
   - Pareto Diagrams
   - Control Charts
   - Histograms

2. Understand situation & set targets
   - Initial situation
   - What? By what? By how much?
   - ICE table activity plan

3. Plan Activities
   - Bar chart, Gantt, etc.

4. Analyze Causes
   - Organize relationships of causes & results
   - Check data
   - Pareto Diagrams
   - Check correlation
   - Examine temporal changes

5. Consider & Implement Countermeasures

6. Check Results
   - Initial situation
   - Countmeasures
   - Final Situation

7. Standardize & Establish Controls

When there is no effect
The results of the consulting work will be summarized in a final report where should also mention the people who were involved in the task. Advisable to use graphs & numbers to make it visual.

The document but should be socialized within the company formally at a scheduled meeting. (Report presentation)

1. Introduction
2. Study of the initial situation
3. Proposals and implementation of improvements
4. Evaluation of the improvement result
5. Conclusions
6. Future topics and recommendations
7. Annexes
• In order to “close” the work done, we perform a final seminar, where all SME’s involved in the process, show their advances by themselves.

• They study their improvement cycle, and get ideas from other SME’s for future implementation in own plant.
Once the consulting process is finished, it is advisable to make an evaluation to know if the consulting style and the intervention methods were effective and contributed to the achievement of the expected results.

Questions oriented as far as possible to think about:

- Competence and aptitude
- Flexibility
- Behavior
- Creativity
- Availability
- Spirit of Service and Other Qualities
Plus 6 month visit

After a few months (4 or 6 months later), he / she will visit the company free of charge and be able to observe the state of affairs, walk the plant, relieve difficulties, news, new needs, give some suggestions or recommendations, prepare a brief report of the visit.
¡Thank you!