UNIVERSIDAD DE AMÉRICA-Bogotá, Colombia

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Lateral Thinking for Lean Thinking Successful Case in Colombia June 2014

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Lateral Thinking for Lean Thinking successful case in Colombia

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CONTEXT

According to OECD:

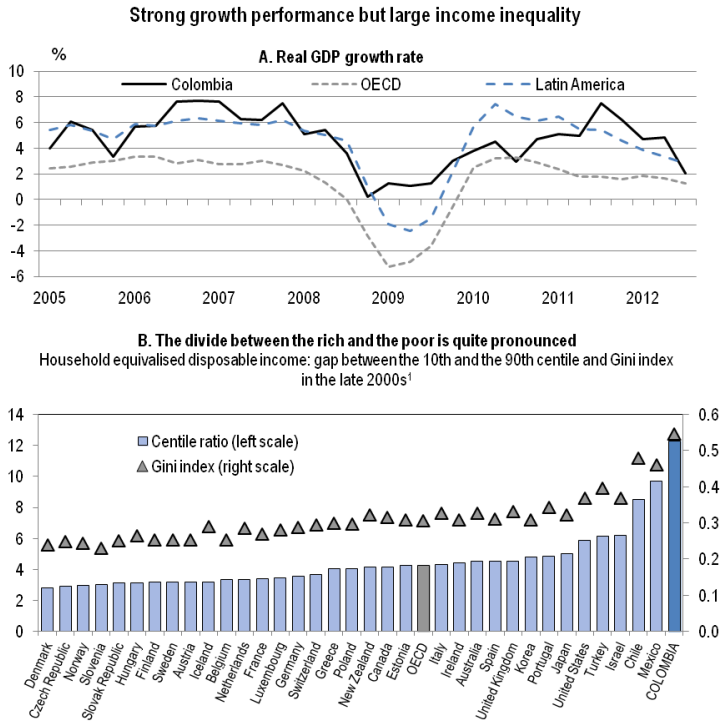
Colombia is Latin America's fourth largest economy and its short-term growth prospects remain strong by OECD and Latin American standards. Enhanced macro-economic policy settings, the benefits of a commodity boom and better security conditions have yielded strong economic growth since the early 2000s.

Colombia has made much progress in its economic and social development, underpinned by prudent macroeconomic management and an improved business environment, and a progressive opening of the economy. It has achieved high economic growth over the past decade and shown resilience during the crisis

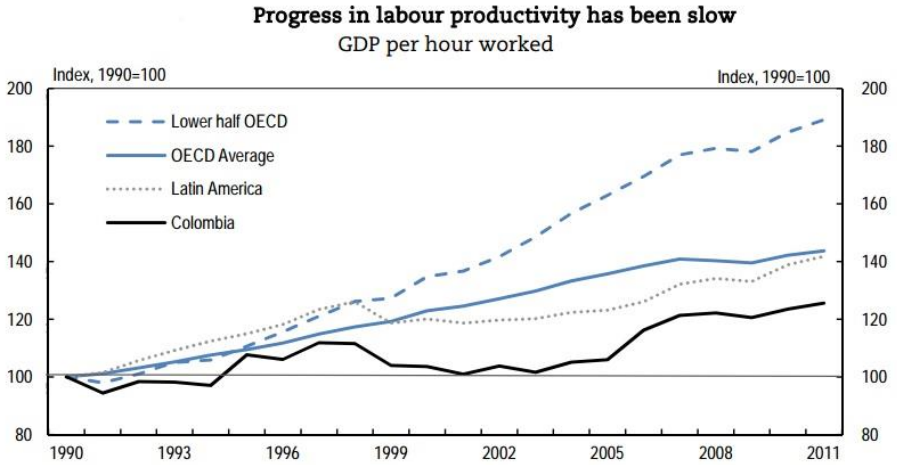
To ensure sustainable and inclusive growth over the medium-term, the Colombian authorities are faced with three key challenges:

- Adjusting to the commodity boom
- Boosting productivity growth
- Reducing income inequality

Colombia is an upper middle income country, but its income per capita is 70% below the OECD average and below many other emerging markets. Low labour productivity explains most of the gap.

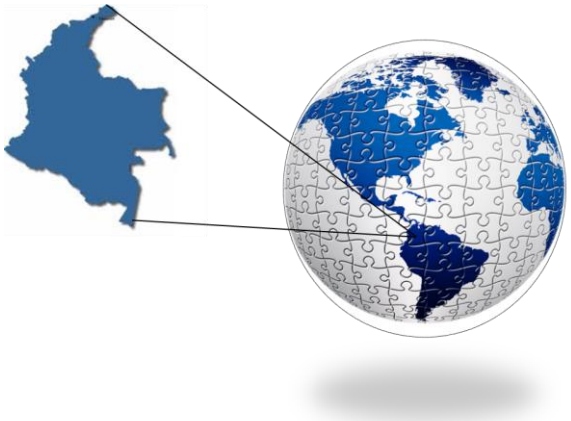


1. Data for France and Ireland refer to the mid-2000s instead of the late 2000s. Data for Colombia are for 2011
Source: OECD, Banco de la República and DANE.



Note: Lower half OECD represents the ten OECD member countries with the lowest GDP per capita in 1990. These are Chile, Czech Republic, Estonia, Hungary, Korea, Mexico, Poland, Slovak Republic, Slovenia and Turkey. Chile and Mexico are also part of the Latin America group, along with Argentina, Brazil and Colombia. Data for 2011 are estimates for all countries except Colombia.

Source: The Conference Board Total Economy Database, DANE.



For 60 Countries

Colombia - Overall Performance

Overall Competitiveness

	2010	2011	2012	2013	2014
Rank	45	46	52	48	51

Economic Performance

	2010	2011	2012	2013	2014
Rank	35	41	33	37	40

Government Efficiency

	2010	2011	2012	2013	2014
Rank	38	45	50	42	49

Business Efficiency

	2010	2011	2012	2013	2014
Rank	39	37	48	44	48

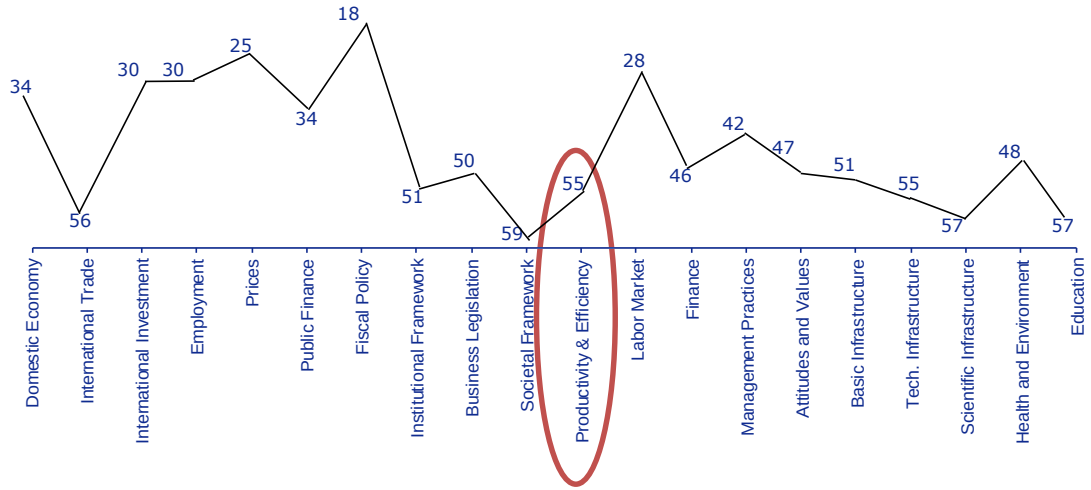
Infrastructure

	2010	2011	2012	2013	2014
Rank	53	54	57	55	56

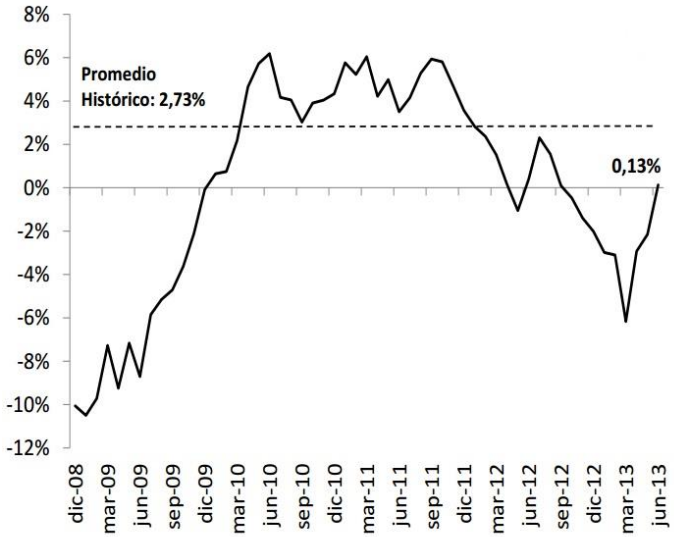
Basic Facts

	Value	Year
Population (million)	47.12	2013
Land area (km^2 '000)	1,141.8	2013
GDP ($ billion)	378.1	2013
GDP (PPP) per capita ($)	11,015	2013
Real GDP growth (%)	4.3	2013
Consumer price inflation (%)	2.0	2013
Unemployment rate (%)	9.65	2013
Labor force (million)	23.29	2013
Current account balance (%)	-3.36	2013
Direct investment		
Stocks inward ($ billion)	111.92	2012
Flows inward (% of GDP)	4.44	2013

Competitiveness Landscape



© IMD WORLD COMPETITIVENESS ONLINE 1995-2014



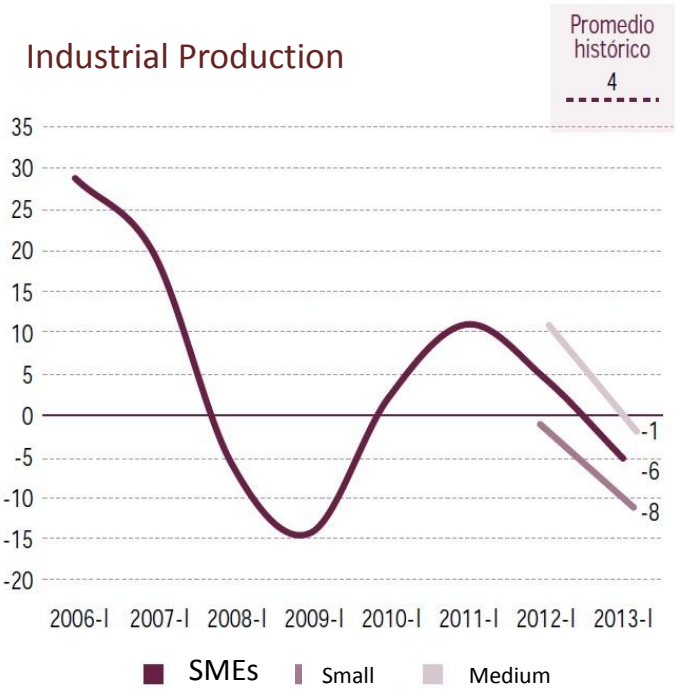
Fuente: DANE, 2013 y Cálculo Davivienda-DEEE

COLOMBIA: CRECIMIENTO ECONOMICO

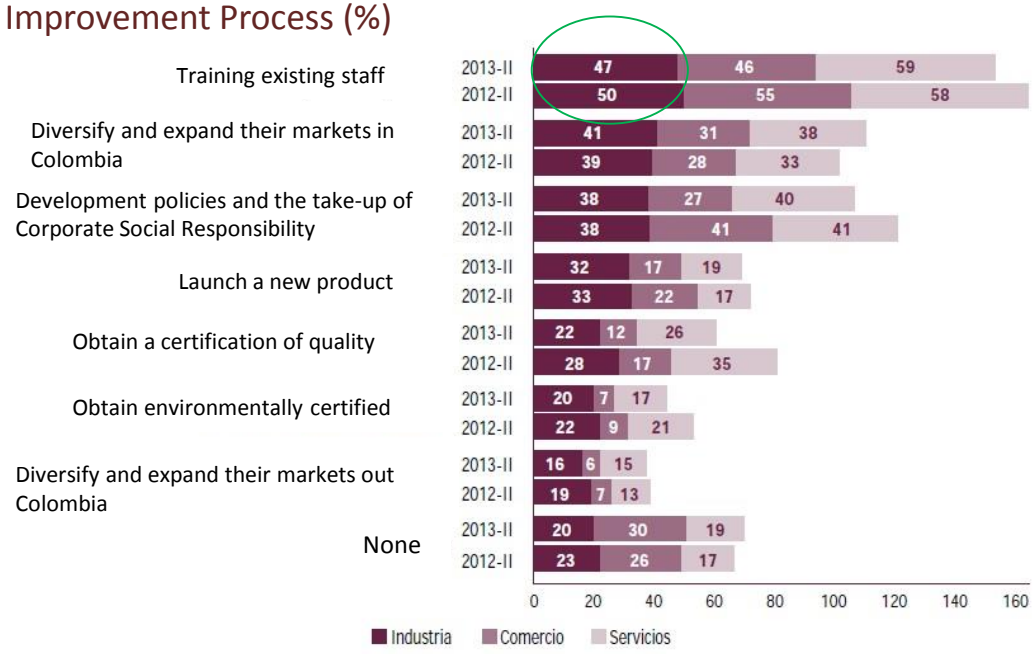
	2012	2013			
		Trim I	Trim II	Trim III	Ene-Sept
Agropecuario	2,6	4,1	7,6	6,6	6,1
Café	-2,2	15,6	31,9	41,6	30,1
Otros agrícolas	2,9	1,7	6,8	3,6	4,0
Pecuario	4,1	3,4	3,4	3,7	3,5
Madera, pesca	1,4	2,7	5,3	3,0	3,7
Minería	6,0	1,6	4,1	6,1	3,9
Carbón	3,9	-20,8	-5,6	-5,5	-10,8
Petróleo	5,5	8,0	7,5	10,3	9,6
Industria Manufacturera	-0,5	-3,9	1,3	-1,0	-1,2
Electricidad, gas y agua	3,5	3,6	4,8	2,7	4,1
Construcción	6,3	9,1	2,5	21,3	10,8
Edificaciones	5,9	9,9	7,7	24,8	13,6
Obras Civiles	6,9	8,2	-1,9	18,6	8,3
Comercio, restaurantes y hoteles	4,1	2,9	4,1	4,3	3,8
Transporte, comunicaciones	4,1	2,3	3,0	2,9	2,7
Finanzas, servicios a las empresas	5,2	3,4	4,2	4,9	4,2
Servicios sociales, comunales, personales	4,9	4,7	5,1	4,7	4,8
Gobierno	5,0	4,7	5,7	6,2	5,5
PIB Total	4,2	2,6	3,9	5,1	3,9

FUENTE: DANE, Cuentas Nacionales

Industrial Production

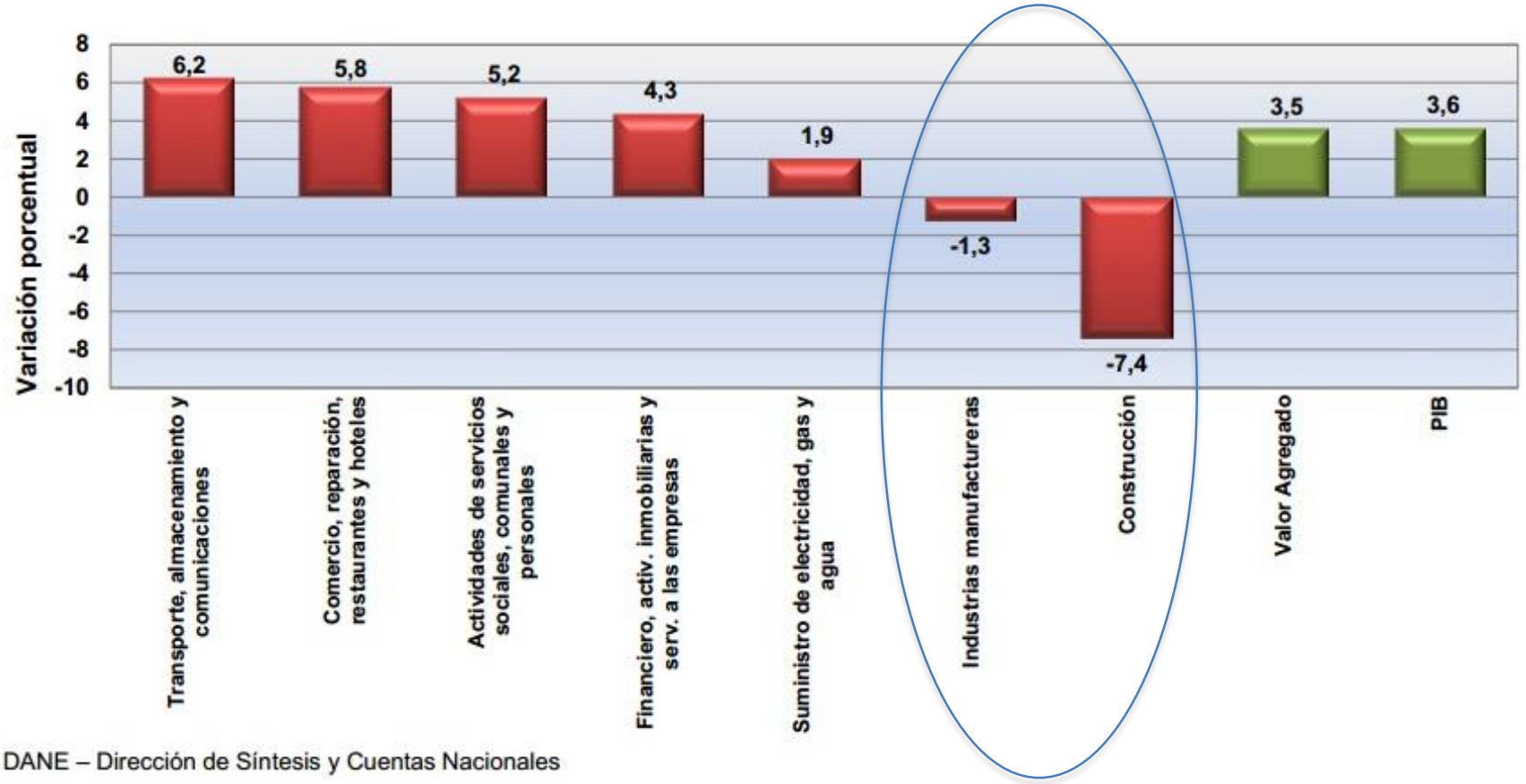


Improvement Process (%)



Source: ANIF Gran Encuesta Pyme II-2013

2013



Fuente: DANE – Dirección de Síntesis y Cuentas Nacionales

It is a huge challenge we must respond to adequately

National System of Science, Technology and Innovation (SNCT)

National Quality and Technology Industrial Development Program

Universidad de América

Industrial Engineering Educational Program

Center of Research for Business Development (CINDE) COL0041544 D-2013

Research Line of Lean Manufacturing

Cluster´s Analysis

Development and setup of new materials and products with sustainability assurance

- Prospective and Technology Forecasting
- Research and Development Model
- Competitiveness Management Model
- Total Factor Productivity (TFP)

Information Flow

Information and Communications Technology (ICT) for industry

- ERP Tools
- PLM Tools
- E-commerce

Material Flow

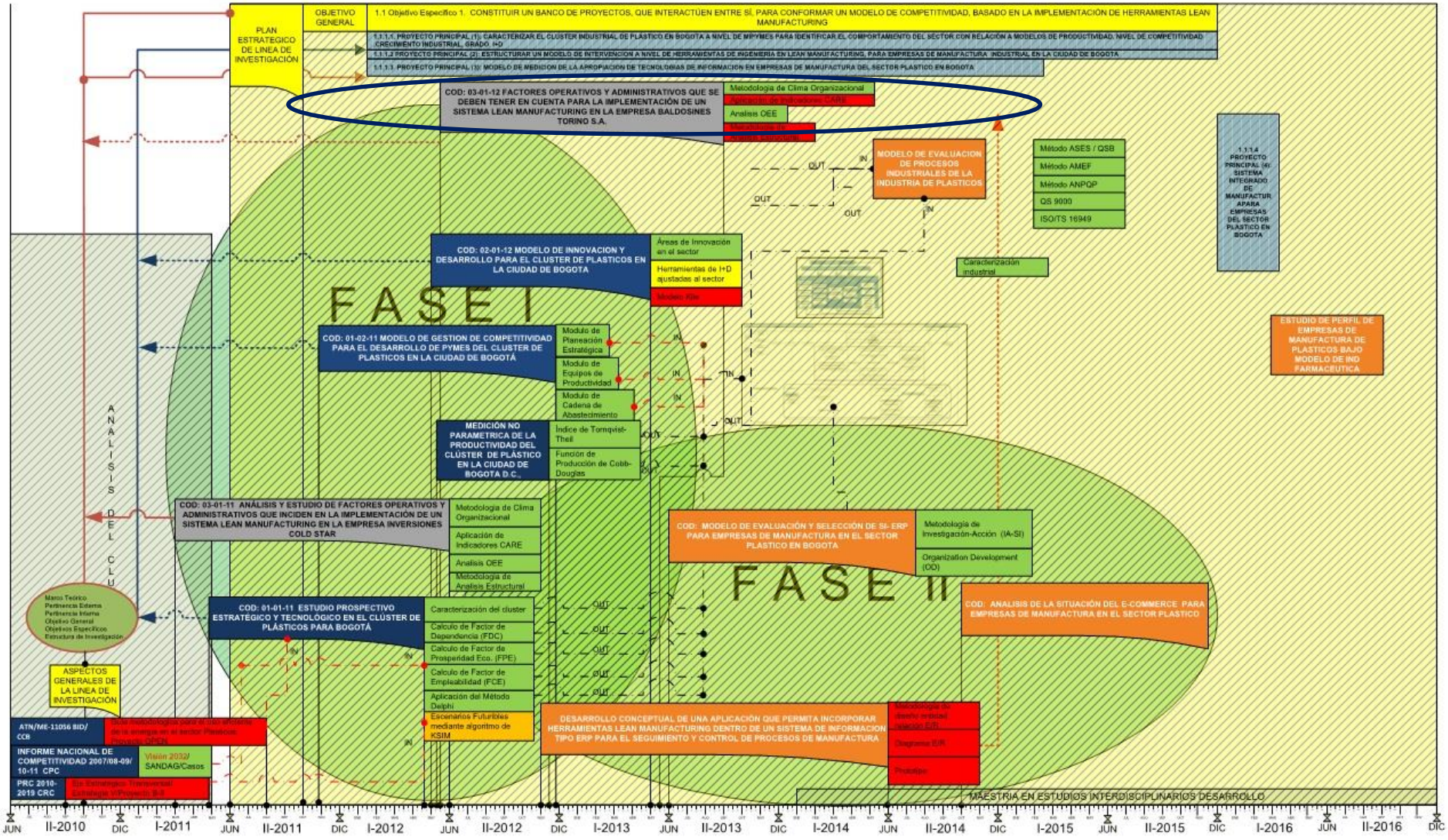
Racional use of materials and industry efficiency

- Lean Tools
- Denison© Model

Lateral Thinking

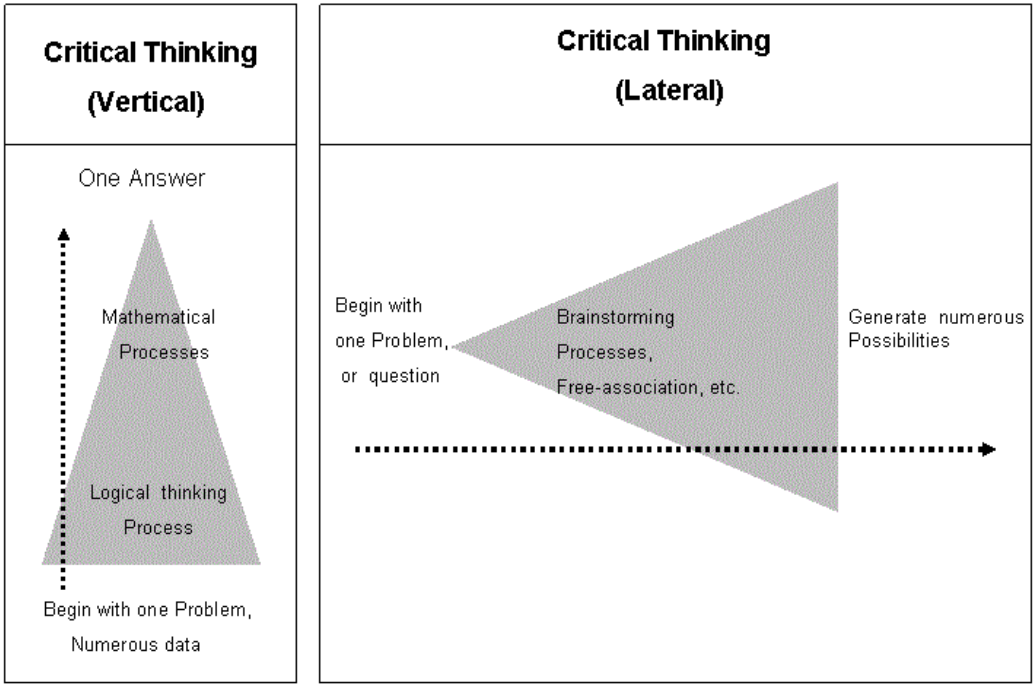
The Map Research Line of Lean Manufacturing

Project No. 030112: ***Industrial and Management Factors for Implementing Lean Manufacturing in Torino Tiles Company, through factory design under Lateral Thinking***



The project for a period of time 1.5 years, explored the relationships between improvement process under lean manufacturing through two techniques, Lateral Thinking and The Denison Organizational Culture Model.

The lateral thinking is a creative process, developed by Edward De Bono, that helps the operator build the physical design elements of the factory from the transformation operations and functional requirements the costumer, through training of a strong set of problem solving skills. This process helped the explicit understanding of factory design and lean manufacturing and make it real.



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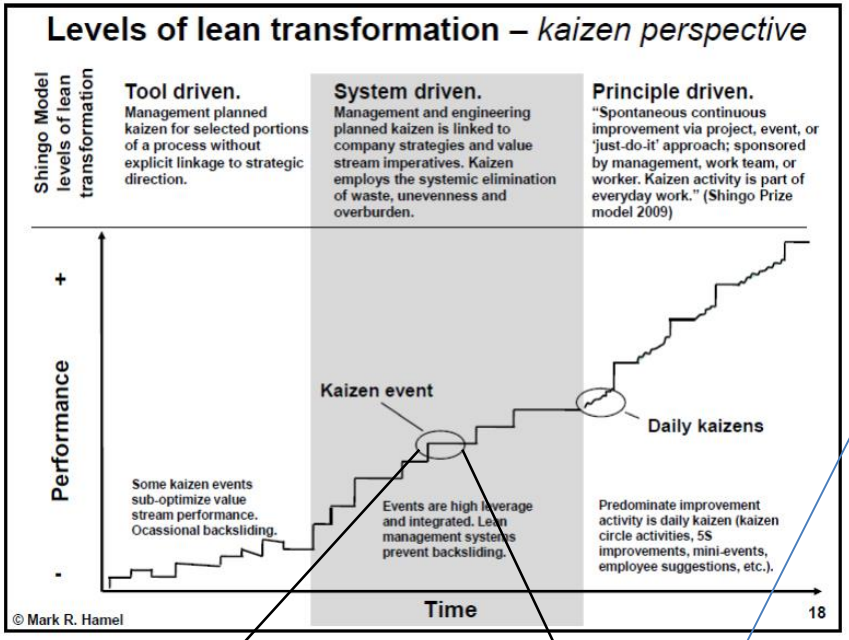


Ways to Generate Ideas (The innovator´s DNA Gregensen & Christensen)

Skill # 1: Associating

Make connections and associations across disciplines. Connect the dots, like putting wheels on a suitcase…

Skill # 2: Questioning

Questions everything: the what?, why?, how?. Create a storm of questions

Skill # 3: Observing

Watch, take pictures, take video.Explore how & why, things are done. What Works, what doesn´t work

Skill # 4: Networking

Talk to anyone and everyone, especially if they are different to you, and understand their unique insight…

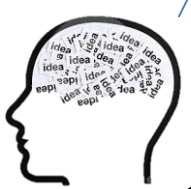
Skill # 5: Experimenting

Talk to anyone and everyone, especially if they are different to you, and understand their unique insight…

Daily Time to Experiment

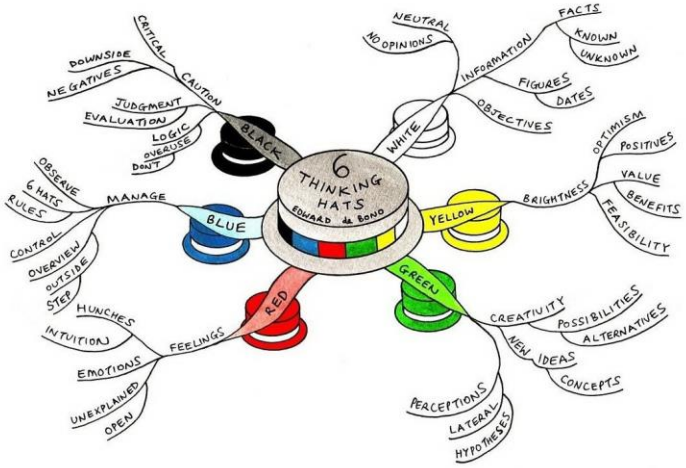
Kaizen Activities

- Define area for improvement
- Analyse and select appropriate problem
- Identify causes
- Plan counter measures
- Implementation
- Confirmation of result
- Standardisation

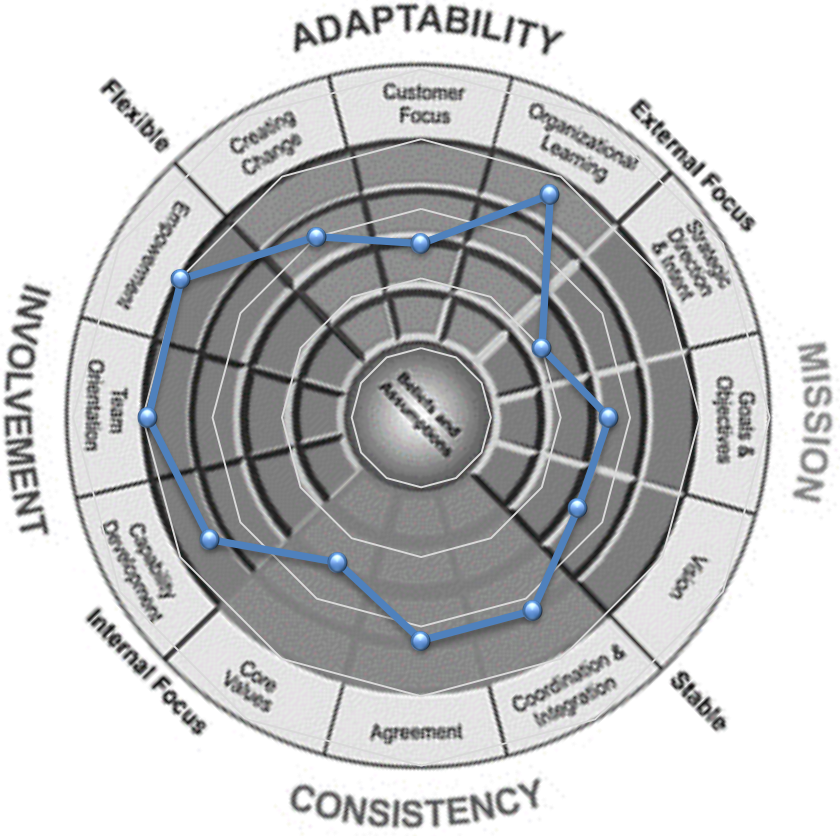


Looking at things from different perspective 6 Hats

Step 1: Present the facts of the case (White Hat))
Step 2: Generate ideas on how the case could be handled (Green Hat)
Step 3: Evaluate the merits of the ideas – List the benefits (Yellow Hat), List the drawbacks (Black Hat)
Step 4: Get everybody's gut feelings about the alternatives (Red Hat)
Step 5: Summarize and adjourn the meeting (Blue Hat)



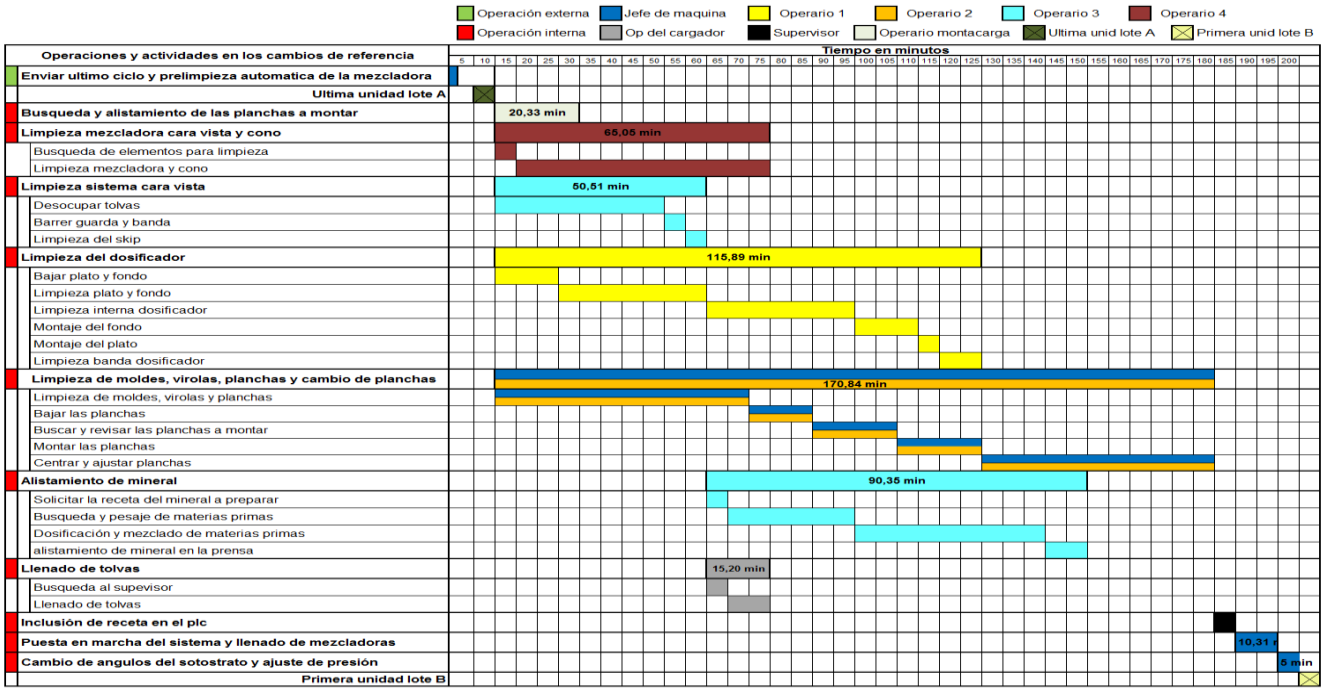
The Denison Organizational Culture Model, helped explore the essence of a lean factory, which can be summarized by the following features: independent departments through buffers and management structures, decentralized support activities to support problem solving and continuous improvement activities, and modular and scalable factory features which allow ease in continuous improvement in factory layout.



A study of organizational climate to 56 workers was conducted to determine the conditions for implementation of Lean Manufacturing Systems.

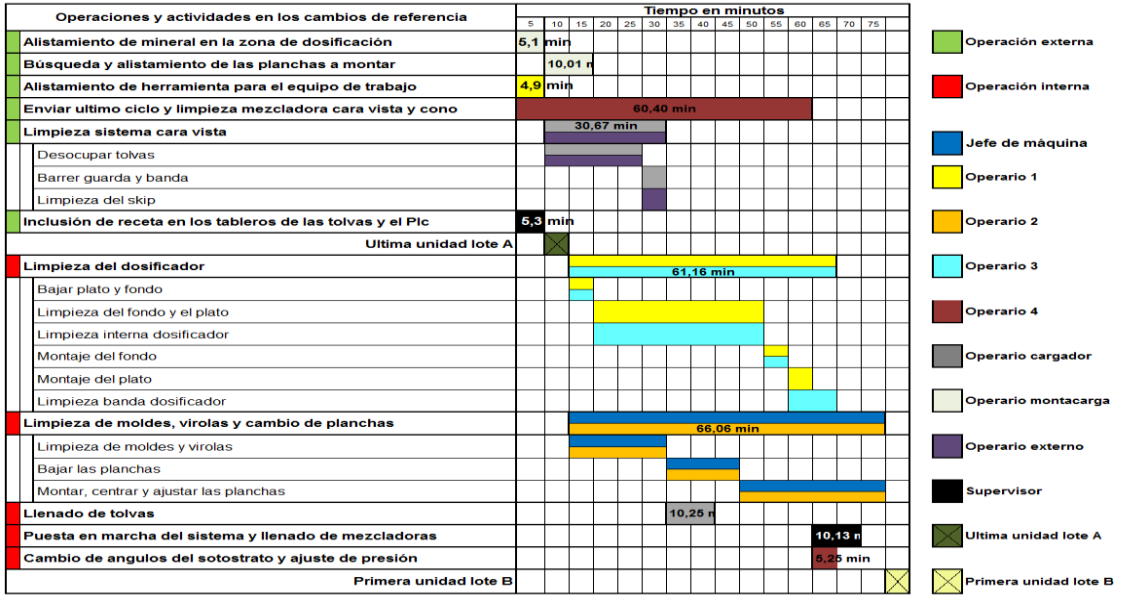
The model also explored variation reduction through the development of a strong set of problem solving skills. For this purpose was used specifically the Involvement dimensión, where the Capability Development analyzed , the Teamwork and the Empowerment, a rating extrapolated to the above aspects of 3.5, 3.92 and 3.98 over 5.0 respectively were obtained.

One Kaizen type unit, which served to incubate ideas of improvement, it became an exercise in analysis and problem solving, using 8D and 5W +1 H, where it was found that the root cause of the excessive delays in changes reference product were due to lack of Poka -Yoke devices that allow more ductile assemblies, that minimize the error of the on-site assembly and quality assurance . The intervention group decided to implement the SMED technique, which allowed a reduction in downtime caused by changes in reference in 62.22 %.

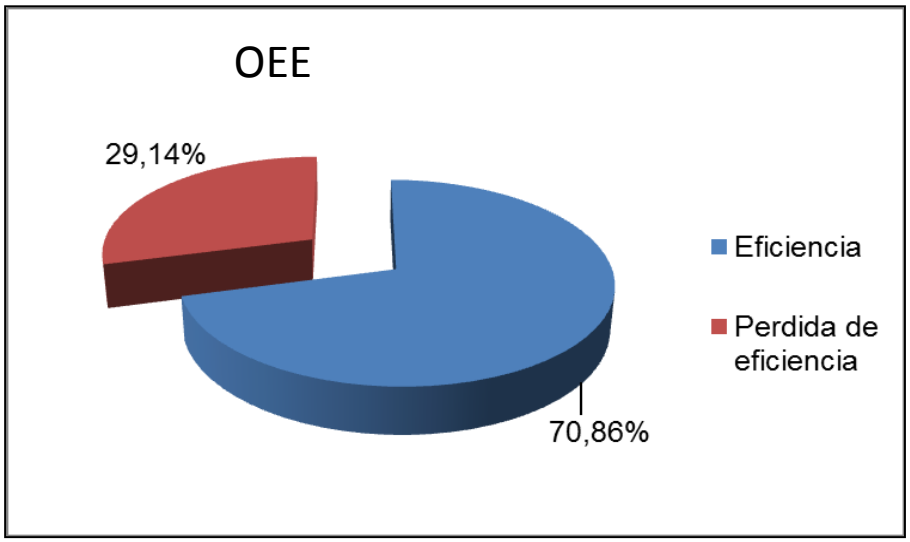


Before SMED

After SMED



Collectively, the results obtained:



Changes in the total annual production

Producción m² año 2012	Actual m²	Con mejora m²	Incremento
	450.642,0	480.899,6	6,71%

Thank you

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