

DIGITAL TRANSFORMATION

Regional Awareness Event



“Metrología para la Transformación Digital”

24 de MAYO 2023 | Bogotá D.C.
COLOMBIA

CON EL APOYO DE



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Regional Awareness Event



SIM DT REGIONAL TRIGGERS & STEPS



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May 23, 2023

TOPICS

DT Who?	SIM
DT Why?	People
DT What?	Vision
DT How?	Action



Who? SIM

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Bureau
International des
Poids et
Mesures

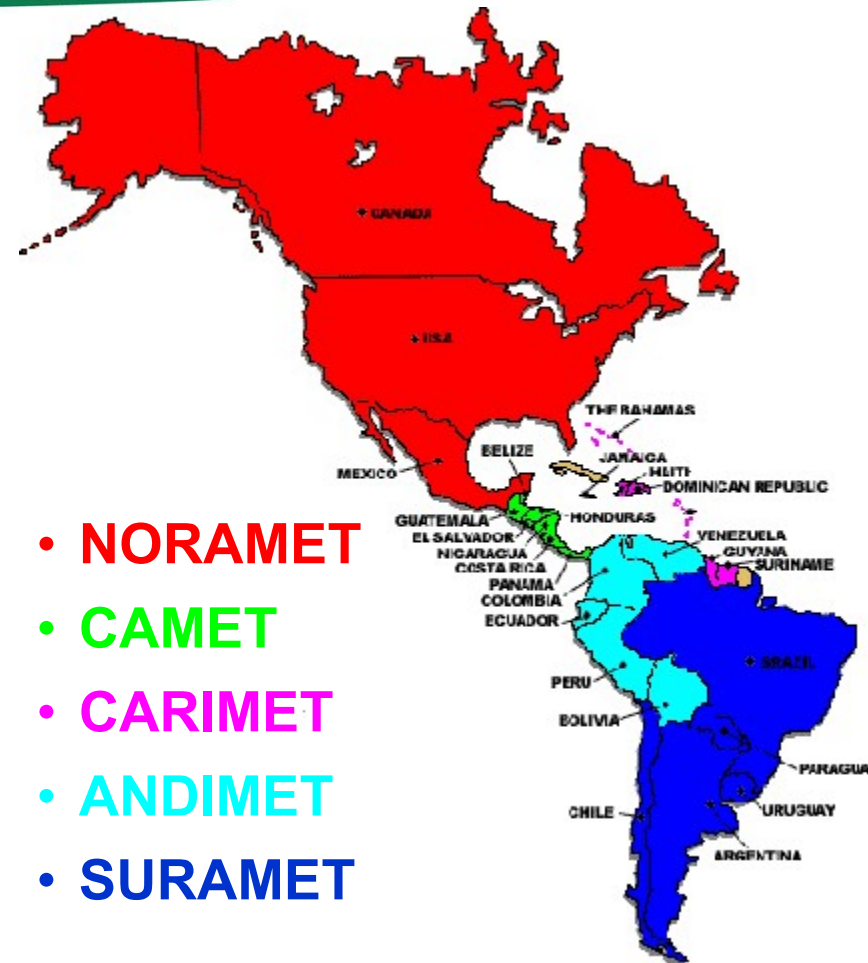


Organisation Internationale de
Métrologie Légale
International Organization of
Legal Metrology



SIM

SISTEMA
INTERAMERICANO
DE METROLOGÍA



- NORAMET
- CAMET
- CARIMET
- ANDIMET
- SURAMET



• 33 active members (NMIs) • 13 associate members (DIs)
• 3 affiliate members (IAAC, COPANT, CARICOM)

Who? SIM



14 Metrology Working Groups
16 Member Quality System Task Force

Regional Projects with Intl Organizs.

Bi or Multi Lateral Internal Projects

SIM GA: elections 2022 - New Steering Council



President
Javier Arias
CENAMEP AIP
Panama



Vice President
Claire Saundry
NIST
USA



TC Chair
Lucas Di Lillo
INTI
Argentina



QSTF Chair
Sally Bruce
NIST
USA



PDC
Rodrigo Costa-Felix
INMETRO
Brazil



ANDIMET
José Dajes
INACAL
Perú



CAMET
Fernando Andrés
LCM
Costa Rica



CARIMET
Erica Caruth
TTBS
Trinidad & Tobago



NORAMET
James Kushmerik I
NIST - USA



SURAMET
Gregory Kyriazys
INMETRO
Brazil



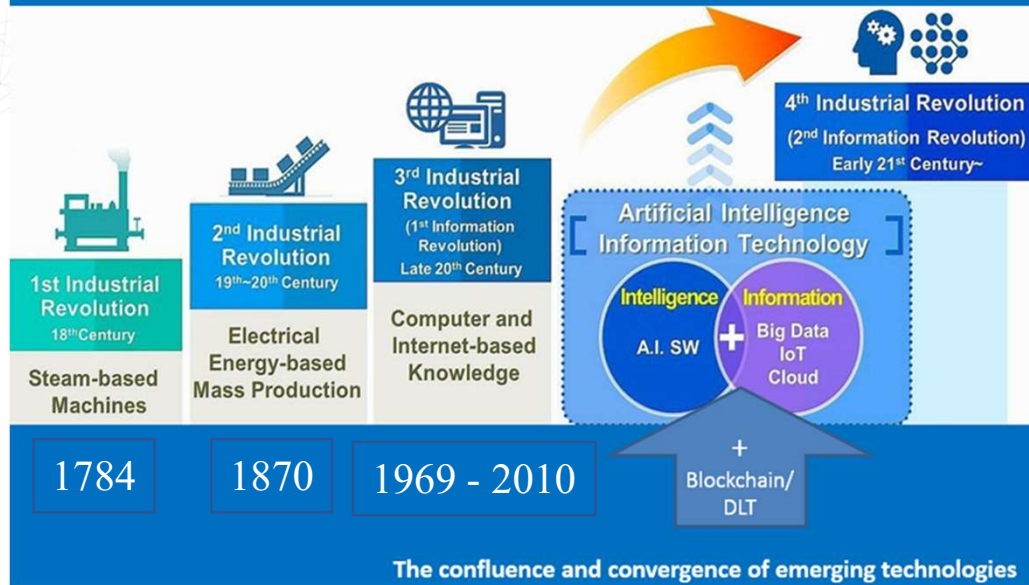
- To support the development of the measurement capabilities and QI in America
- To foster science and innovation
- To enable international recognition & support to local & regional Governments thru all our NMIs

DT Why? People

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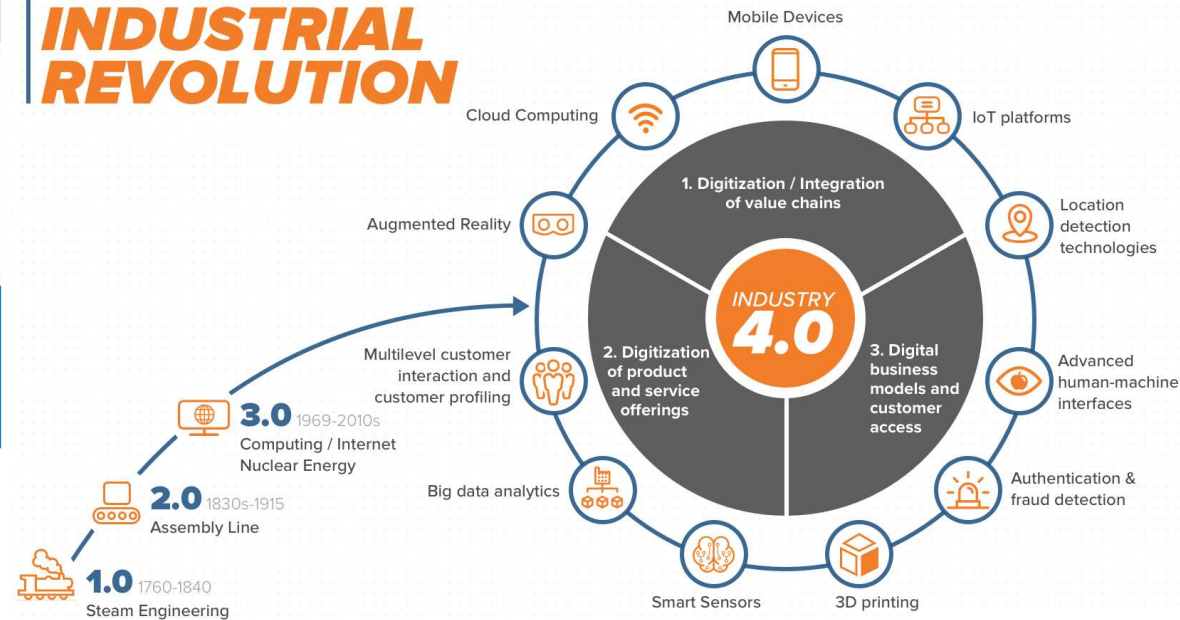
The Fourth Industrial Revolution



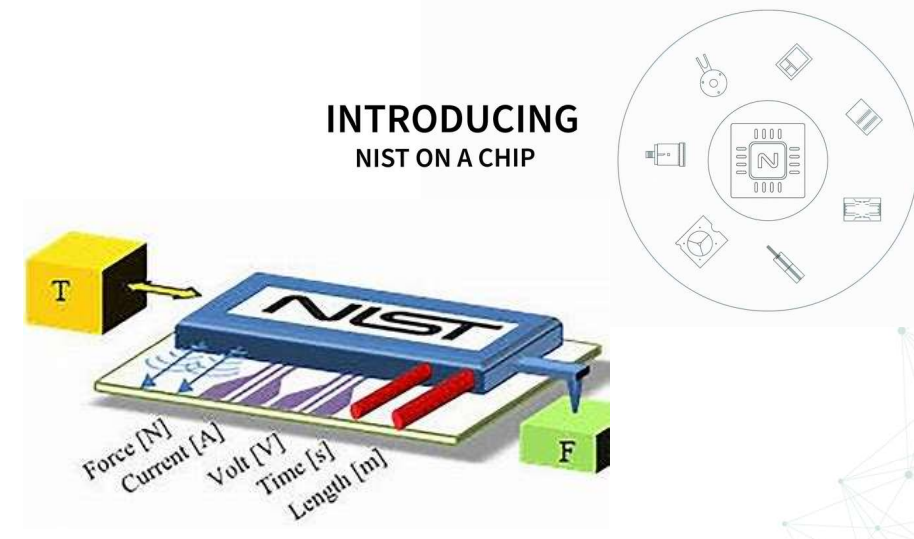
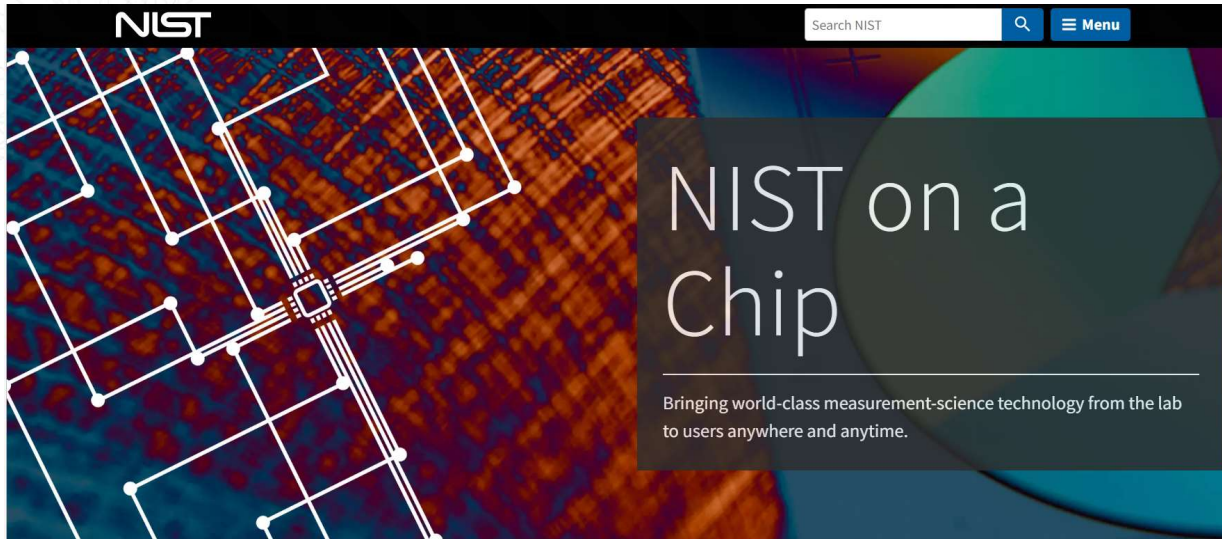
Vision of the 4th Industrial Revolution

THE DAWN OF THE **FOURTH INDUSTRIAL REVOLUTION**

Implication of the 4th Industrial Revolution
USERS are KEY



4th IR Emerging Technologies



What is NIST on a Chip?

NIST has embarked on a revolutionary program that will bring cutting-edge measurement-science technology and expertise from our labs directly to users in commerce, medicine, defense and academia. We are developing a suite of inherently accurate measurement technologies that operate according to the precise, time-tested principles of quantum physics.

2017 - 2018

DT Why? People

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SCOPE

Discuss the role of metrology, sensors and smart measurements in advanced manufacturing. Challenges and opportunities of the NMIs to support their manufacturing base in the 4th industrial revolution

VENUE

CENAM facilities
Carretera a Los Cúes km
4.5
El Marqués, Querétaro
México
C.P. 76246
www.cenam.mx

Four Blocks:

1. General context:

Challenges in metrology for advanced manufacturing.

2. Industrial sectors:

Challenges in different application fields

3. Specific metrological disciplines:

Measurement technologies with special relevance for advanced manufacturing.

4. Additional fields and disciplines:

Metrological applications, IoT, AI, Innovation Technology

JUNE 18 - 19/2019

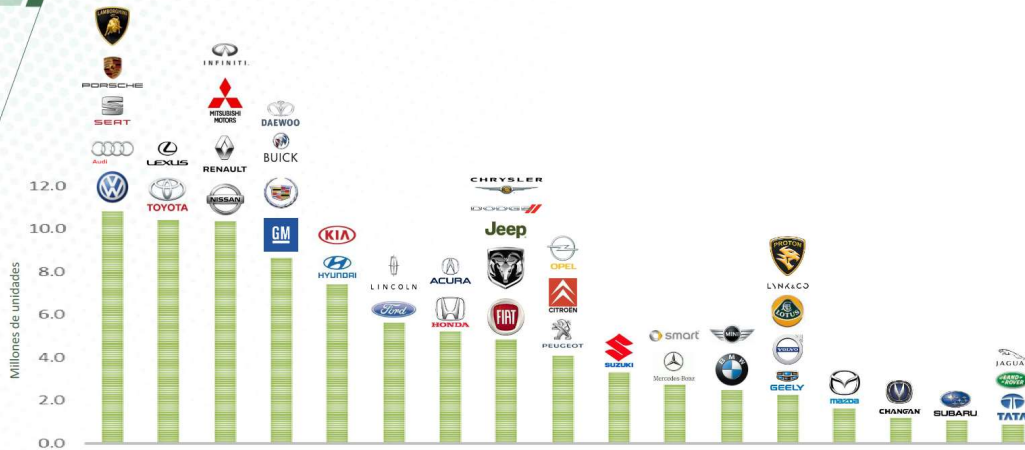
**CHALLENGES IN METROLOGY
FOR ADVANCED
MANUFACTURING AND THE
4TH INDUSTRIAL REVOLUTION**



2018 - 2019

Producción de Vehículos en el Mundo por Marca, 2018

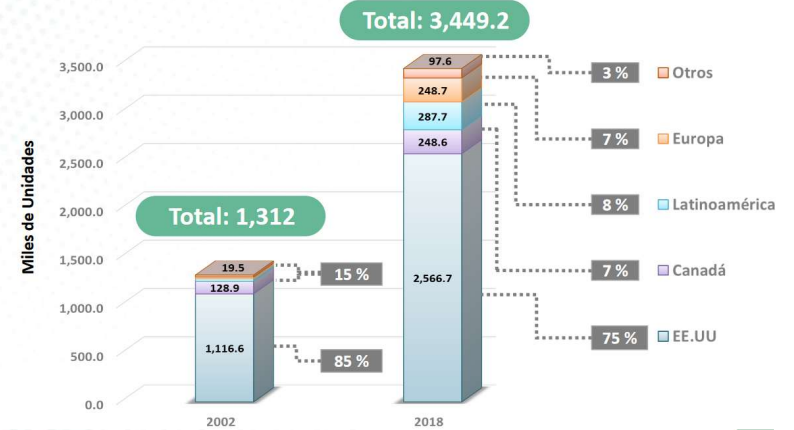
Perspectiva del Sector Automotriz



Exportaciones de Vehículos Ligeros por Región, 2002 vs 2018

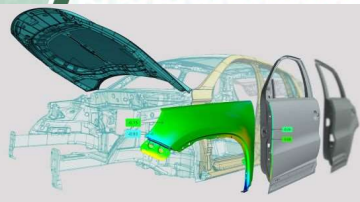
Perspectiva del Sector Automotriz

Se ha diversificado la exportación a otros mercados distintos de EUA.



Variedad de Proveedores

Perspectiva del Sector Automotriz



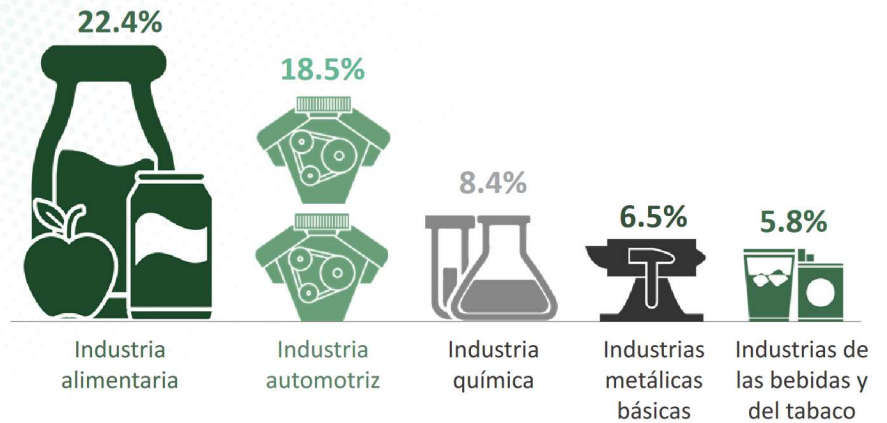
600 Proveedores T1

que abastecen y hacen cumplir a las OEM'S con sus requerimientos de contenido regional.



Aportación al PIB Manufacturero, 2018

Perspectiva del Sector Automotriz

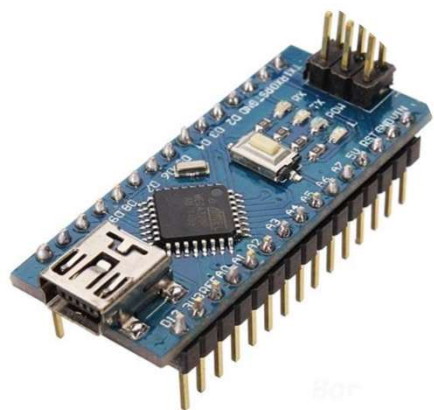


DT What? Vision

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SISTEMA
INTERAMERICANO
DE METROLOGÍA



2018
Future market
Analisis

2020
Life after
Pandemic

2022
Estrategic
Vision



DT What? Vision

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Strategic Goals & Objectives	
GOAL I: To advance SIM Members metrological capabilities	Improve the scientific & technical capabilities of SIM NMIs...
OBJECTIVE I.1: To have a 5-year capacity building plan approved & funded. The plan should be evaluated every year & updated every two (2) years	Activities I.1.1 - I.1.5
OBJECTIVE I.2: To identify the upper & lower key technical areas among SIM NMIs to help prepare the 5y plan & level up knowledge within subregions	Activities I.2.1 - I.2.4
OBJECTIVE I.3 To support the implementation of an organized M4DT plan for the the next 5 years (Based on OBJECTIVE I.1)	Activities I.3.1 - I.3.3
GOAL II: To enhance SIM international standing as an RMO and as a pillar of the regional QI	Establish SIM as a worldwide leader in metrology at the international fora...
OBJECTIVE II.1: To Promote SIM Member's participation & leadership within the SIM framework & the international arena (including the CIPM-MRA)	Activities II.1.1 - II.1.4
OBJECTIVE II.2: To raise awareness on the importance of SIM as the America's RMO & one of the 3 Quality Infrastructure Council of America's (QICA) pillars	Activities II.2.1 - II.2.3
OBJECTIVE II.3: To enhance SIM Sustainability & growth	Activities II.3.1 - II.3.5
GOAL III: To address the measurement challenges of the future	Identify the scientific & technical measurement needs that NMIs might face in the near by future...
OBJECTIVE III.1: Identify in a continuos way the challenges of the future and the needs to face them	Activities III.1.1 - III.1.3
OBJECTIVE III.2: To prepare a development plan for each identified need	Activities III.2.1 - III.2.4

2022 – 2032 SIM Strategic Plan

GOAL I: To advance SIM Members metrological capabilities

OBJECTIVE I.3 To support the implementation of an organized M4DT plan for the the next 5 years
(Based on OBJECTIVE I.1)

Resources: NIST Program, EURAMET-PTB M4DT Projects, BIPM Programs.

Responsible: PC, TC Chair, MWG # 14 Chair.



- **o ACTION I.3.1:** TC & MWG14 Chairs **will coordinate the proper organization of the new MWG for Digital Transformation (MWG # 14)**. This includes the needed subgroups, members & tasks.
- **o ACTION I.3.2:** The PC, TC Chair & MWG Chair **will forecast the DT needs & prepare** the necessary awareness sessions & training projects to consolidate the initial steps for the M4DT process within the SIM region in the next 2 years.
- **o ACTION I.3.3:** The PC, TC Chair & MWG Chair **will develop and implement a 3-year plan** to support an organized M4DT implementation process once at least 2 NMI of each subregion have adopted these new technologies.

OBJECTIVE I.1: To have a 5-year capacity building plan approved & funded. The plan should be evaluated every year & updated every two (2) years

PTB M4DT Workshop



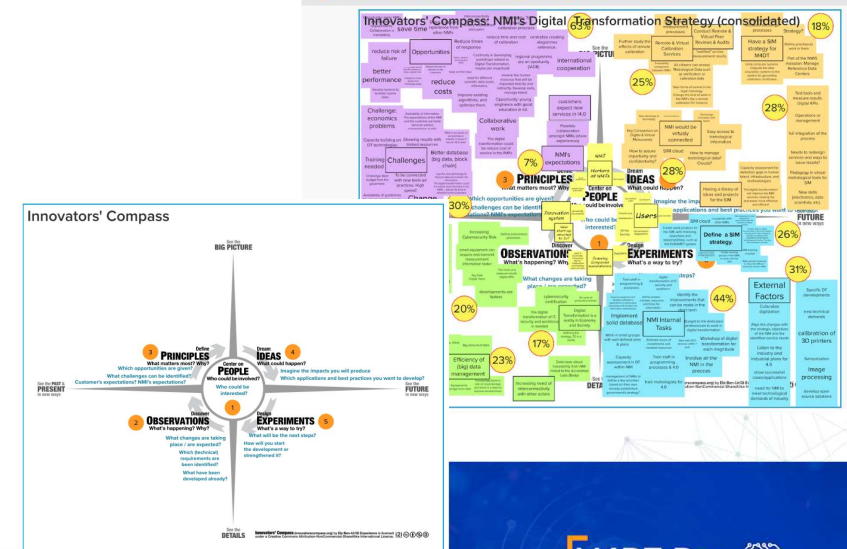
Metrology for Digital Transformation (M4DT) covers a broad range of topics. This workshop focused on the following five topics and instruments:

- Topic 1: Automation of laboratory processes
- Topic 2: Digitalization in legal metrology
- Topic 3: Digital Calibration Certificate
- Topic 4: Metrology for Industry 4.0
- Topic 5: NMI's digital transformation strategy

The objective of the workshop was to contribute to:

- a) inform on the possibilities offered by the digital transformation;
- b) organize an exchange between NMIs;
- c) improve the use of the digital transformation by the NMIs;
- d) accelerate the digital transformation of the NMIs;
- e) develop a digital transformation strategy for the NMIs.

TOPIC #5: NMI'S DIGITAL TRANSFORMATION STRATEGY



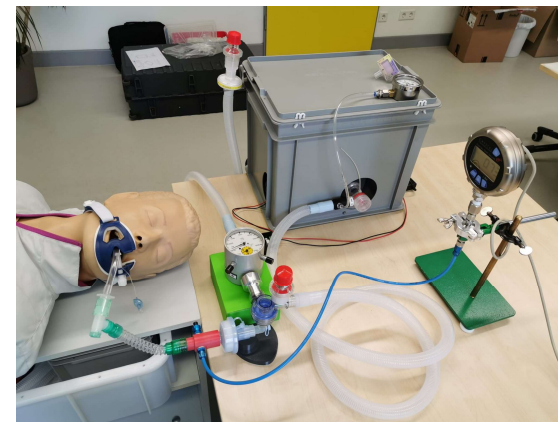
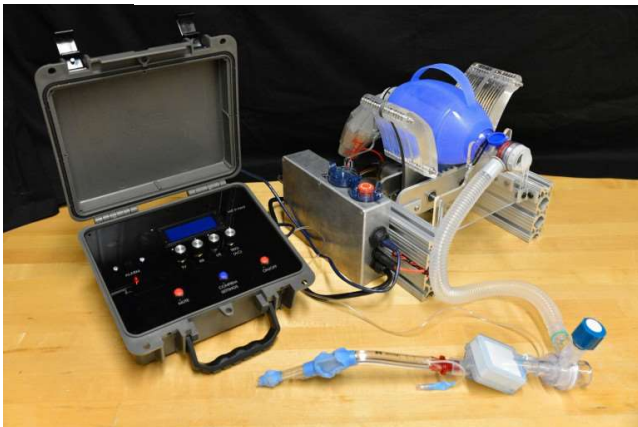
Results: DT DAY & MWG14



SIM PTB Project

Development of a basic Metrology Infrastructure to support medical testing equipment (ventilators as a priority) 2020 - 2022

- N°1: Design and development of a Low-Cost Flowmeter for mechanical ventilators.
- N°2: Design and build a Lung Simulator for the testing of mechanical ventilators.
- N°3: Improve and strengthen the micro-volume calibration processes in LNM-INEN.
- N°4: Virtual workshop: Technical exchange and knowledge transfer related to the project.
- N°5: Low pressure gas flow and low volume comparisons between NMIs.
- N°6: Workshop including presential training, SIM MWG10 meeting, and Awareness event.



Results: New Competences & development of Digital products & services

NEW PTB PROJECT

Virtual Workshop

FREE ACTIVITY

Technical exchange and knowledge transfer

COVID-19 METROLOGISTS AND EXPERTS FROM AMERICA SHARE EXPERIENCES IN THE FIGHT AGAINST A WORLDWIDE HISTORICAL PANDEMIC CRISIS

- 1 Tuesday December 2nd 2020
- 2 14:00 to 16:30 UTC time
- 3 Inscription requested <https://forms.gle/G1nh0CvEW5D3UPto8>

Activity organized by SIM with support from PTB, included in recently approved project: Development of basic metrology infrastructure to support medical testing equipment, ventilators as a priority, in Americas

SIM PTB

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SIM DT Communication

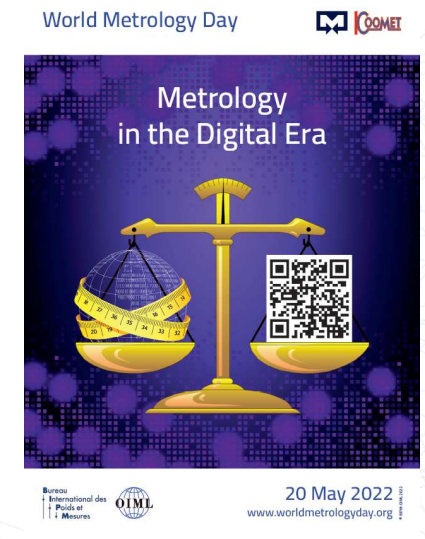
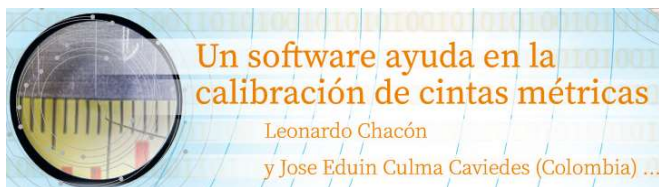
Regional Magazine (De acuerdo) & World Metrology Day (WMD)



2021 & 2022
¡De acuerdo!
magazines & the
WMD talked
about Health & DT



Mr. Hugo Gasca at a 2020 WMD virtual talk



Results: over 30 projects, papers or articles related to new DT products or services in the field of Metrology

BID Project: “Strengthening NMI in the Hemisphere, in Support of Emerging Technologies”

- The Project has four (4) Specific Objectives:
- **Promote** a climate of innovation, competitiveness and productivity by **enhancing the delivery of advanced measurement services needed** by firms for the development and adoption of digital technologies.
- **Facilitate the adoption of digital technologies** by the National Metrology Institutes of Latin America and the Caribbean (LAC) to increase their efficiency and impact.
- **Promote the mutual acceptance of measurement results** to facilitate trade.
- **Promote activities of virtual metrological control** of equipment between NMIs and industry, oriented to the development of **work methodologies for Industries 4.0** through the design and implementation of a **Regional Metrology Cloud**.



17 Project Proposals \$2,4 M = \$1,4 SIM + \$1.0 BID

DT How? Action

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BID Project: “Metrology for DT to Support health services in LAC & address measurement challenges associated with pandemics such as COVID-19”

The Project has three components:

- **I : Information & Awareness.**
- **II : Development of regional pilot projects to implement digitalización processes on calibration & verification services in health issues.**
- **III: Organizational Strengthening.**





DIGITAL TRANSFORMATION INCUBATOR PROJECT (DTIP) BID-SIM THB (TERMOHIGROBAROMETER) PANAMA OCTOBER 6-12

Within SIM Taskforce #14 (DTIP) Leads agile project to develop metrologically assured and low-cost laboratory environmental condition measurement systems that will positively impact the upgrade of laboratories that want to integrate into their calibration process and address digital transformation (automation, DCC, connectivity, remote monitoring, security) in the SIM region.

Deliverables of stage 1. April-October 2022-INVESTED BUDGET \$ 20,000.0

- Survey with experts of temperature, humidity and atmospheric pressure magnitudes.
- 5 THB prototypes developed by different NMI integrating project requirements.
- Workshop with stakeholders, invited from PTB to address the issue of DCC integration in the THB.
- Presentations by the Sensors, Process and Integration working groups. Inclusion of new NMIs to the project: Panama and Brazil.

START OF STAGE 2. November 2022-August 2023
AVAILABLE BUDGET \$20,000.00





NAME	NMI	PROJECT ROL
1. ALDO ADRIAN	CENAM-MEXICO	AGILE COORDINATOR / FEATURE OWNER / PROCESS OWNER
2. Diego Cordero	INTI-ARGENTINA	TECHNICAL FEATURE OWNER
3. JUDCO GASCA	CENAM-MEXICO	PROJECT OWNER
4. Osmar Romero	LCM-COSTA RICA	TECHNICAL / INTEGRATION DEV OP
5. Ruben Gil	INACAL	SCRAM MASTER / INTEGRATION DEV OP
6. Edwin Calmes	COLUMBIA	TECHNICAL PROCESS DEV OP
7. PIZO DOMINGUEZ	CENAM	SCRAM MASTER / INTEGRATION DEV OP
8. Marcel Ramirez	ENEA-CHILE	TECHNICAL SENSORS DEV OP
9. Roberto Hoyague	CENAM	TECHNICAL PROCESS DEV OP
10. Ana Washa	ECUADOR	TECHNICAL PROCESS DEV OP
11. Carolina Herrera	LCM	TECHNICAL PLATFORM OWNER
12. El Prato	PTB	DCC GUEST
13. Mohammad Ali	PTB	DCC GUEST
14. Thomas	PTB	DCC GUEST
15. CARLOS GALVAN	CENAM	DCC GUEST

$$\text{\$1,1 M} = \text{\$0,6 SIM} + \text{0,5 BID}$$

How? Action

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Other Related Activities

- SIM - BIPM MoU e-Learning - March 2023
- SIM - NIST MoU Loan for research equipment (receiver calibration system) - TBD
- SIM - IMEKO MoU – Digital Transformation knowledge exchange - TBD



IMEKO

Save the Date!
19. – 21. September 2022

IMEKO TC6 International Conference on Metrology and Digital Transformation (M4D)
Hybrid with physical attendance in Berlin, Germany

KEY NOTES

- The DT in LAC markets advance faster than NMI changes.
- SIM has been preparing for DT changes for the last 5 years.
- SIM needs to adapt our strategy to those DT changes ASAP.
- SIM needs to focus on new TICS competences & mkt demand.
- Regional cooperation will be key for DT within the SIM región.

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¡Muchas Gracias!

Mgter. Javier A. Arias Real

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