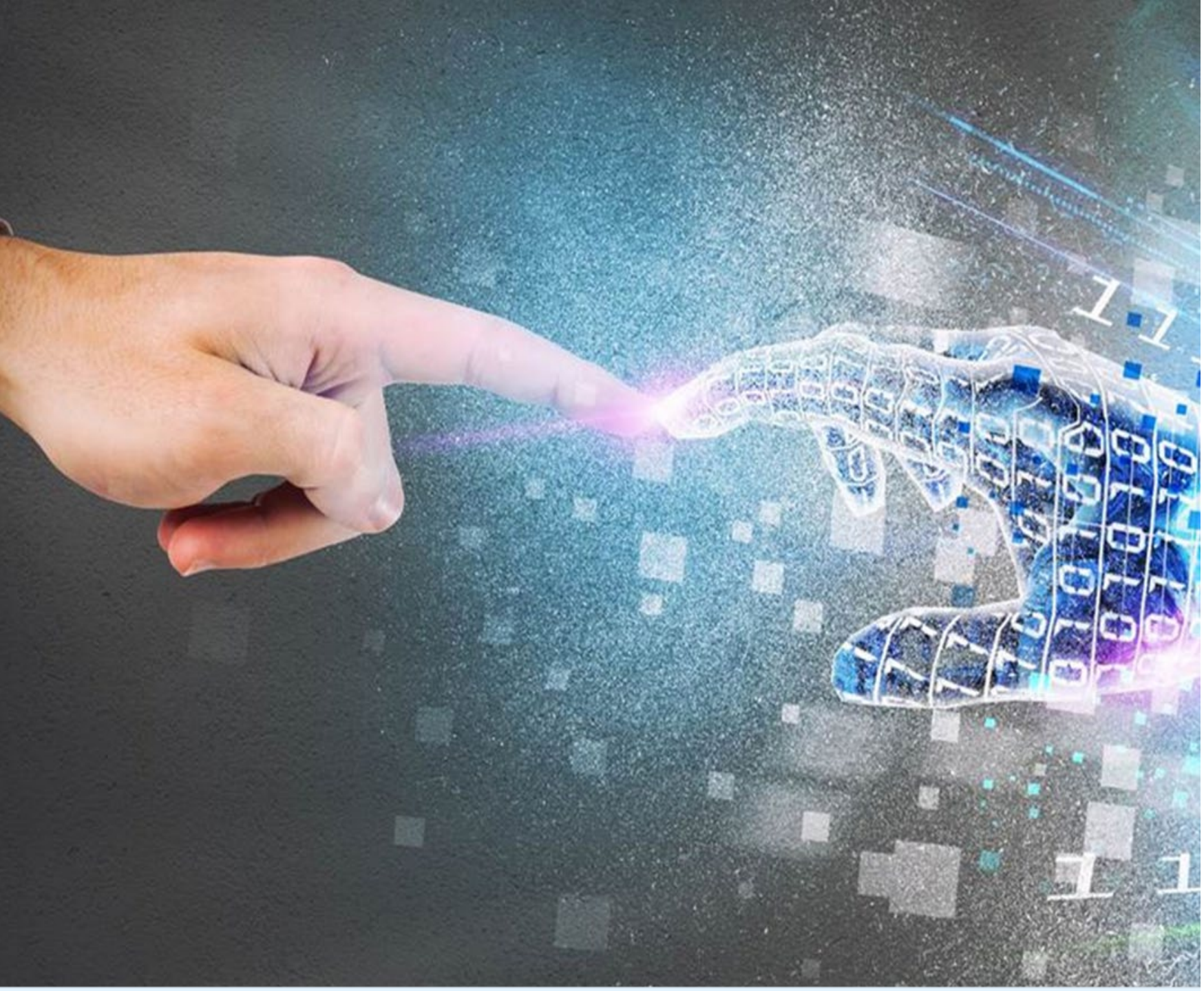


Conformity Assessment for the Future

Shawn Paulsen

IEC VP & CAB Chair

November 23rd, 2023

Note from UNECE secretariat:

- The author and the speaker of this presentation confirm that they have authorization to use all photos and visual elements.
- The material is either copyright-free or the author / speaker holds the necessary copyright.
- The UNECE will remove any material from its events and supporting websites if there is unlawful use of copyrighted material.
- The author / speaker takes responsibility for any infringements on copyright and holds the UNECE harmless to this effect.

What is Quality Infrastructure (QI) ?

Quality infrastructure → INetQI definition

The system comprising the organizations (public and private) together with the policies, relevant legal and regulatory framework, and practices needed to support and enhance the quality, safety and environmental soundness of goods, services and processes.

The quality infrastructure is required for the effective operation of domestic markets, and its international recognition is important to enable access to foreign markets. It is a critical element in promoting and sustaining economic development, as well as environmental and social wellbeing.

It relies on

- metrology,
- standardisation,
- accreditation,
- conformity assessment, and
- market surveillance.

National Quality Policy (NQP)

The policy adopted at national level to develop and sustain an efficient and effective quality infrastructure.

Source: https://www.inetqi.net/documents/quality-infrastructure/

Background & Context

Responding to the challenges of globalization, trade and sustainable development, 14 organizations have agreed to enhance their cooperation in promoting the understanding, value and acceptance of QI and providing guidance and support for its effective implementation and integration worldwide

- International Bureau of Weights and Measures (BIPM)
- International Accreditation Forum (IAF)
- International Electrotechnical Commission (IEC)
- Independent International Organization for Certification (IIOC)
- International Laboratory Accreditation Forum (ILAC)
- IQNet Association - The International Certification Network
- International Standards Organization (ISO)
- International Trade Centre (ITC)
- International Telecommunication Union (ITU)
- International Organizations of Legal Metrology (OIML)
- United Nations Economic Cooperation for Europe (UNECE)
- United Nations Industrial Development Organization (UNIDO)
- World Bank Group (WBG)
- World Trade Organization (WTO)

Value of Conformity Assessment

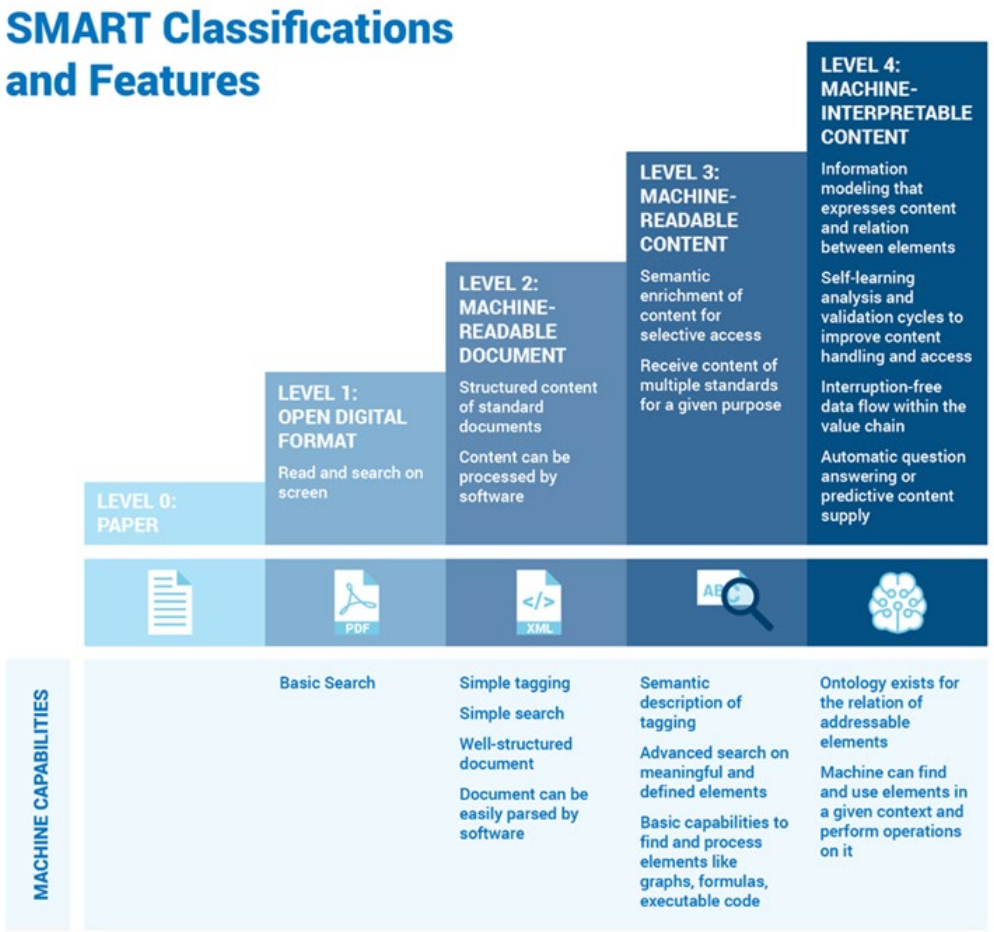
- Regulatory, Manufacturers, and Consumer Confidence
- Non-conformance risks – regulatory requirements
- Supply chain confidence
- International recognition
- Enhancing export and integration in international trade
- Facilitating trade by eliminating duplication of testing and improving market access
- Recognized by the United Nations via UNECE formal endorsement – Cybersecurity & IECEx

Why Conformity Assessment is Used by Policy Makers and Regulators

Decisions related to:

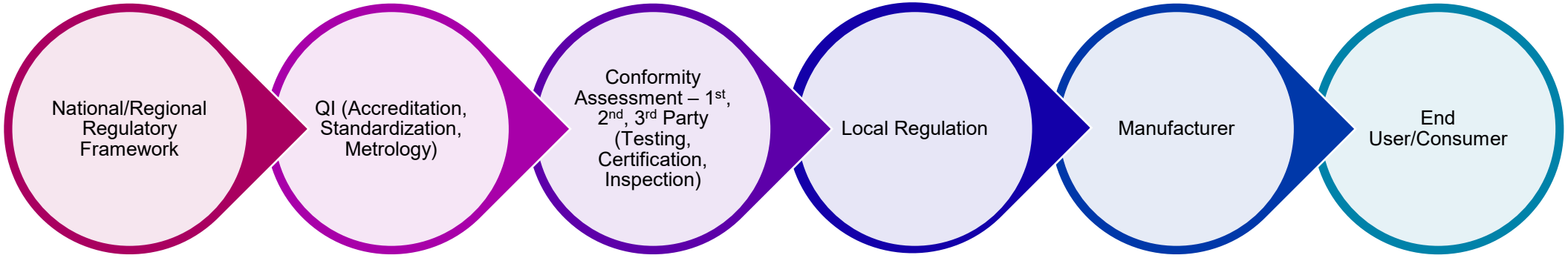
- Protecting the health and welfare of consumers and the public
- Protecting the environment
- Developing new regulations and requirements that do not create barriers to trade
- Measuring compliance with regulatory and legal requirements
- Allocating resources, both technical and financial

SMART Classifications



- **Establishment of CAB WG 19 - DT (Digital Transformation)**
- **IEC/ISO Joint SMART CA Group**
- **IEC CAB TF on AI**
- **INetQI**

Quality Infrastructure Value Chain



Quality Infrastructure Definition: The system comprising the organizations (public and private) together with the policies, relevant legal and regulatory framework, and practices needed to support and enhance the quality, safety and environmental soundness of goods, services and processes.

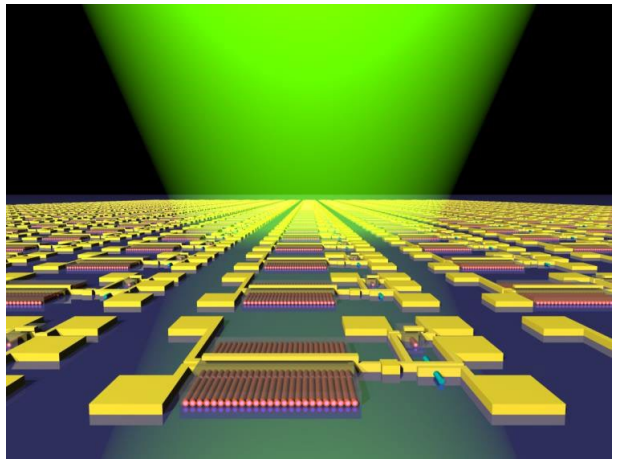
The quality infrastructure is required for the effective operation of domestic markets, and its international recognition is important to enable access to foreign markets. It is a critical element in promoting and sustaining economic development, as well as environmental and social wellbeing. It relies on

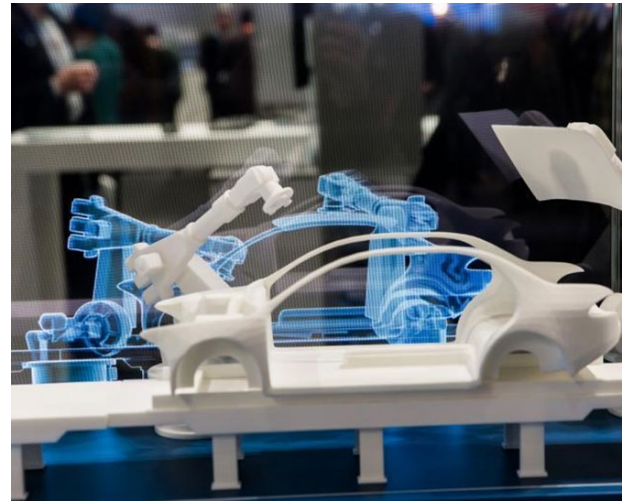
- metrology,
- standardization,
- accreditation,
- conformity assessment, and
- market surveillance.

Unprecedented integration

- Digital twins
- IoT/IIoT
- Sensor networks - Virtual
- Control and algorithms
- Big data and the cloud
- Bridge between the physical and digital world
- Robotics
- Wearables
- Bio-digital Convergence
- Interoperability, and more
- Efficient data exchange across multiple technical systems, domains, departments, factories

Greater efficiencies, new opportunities





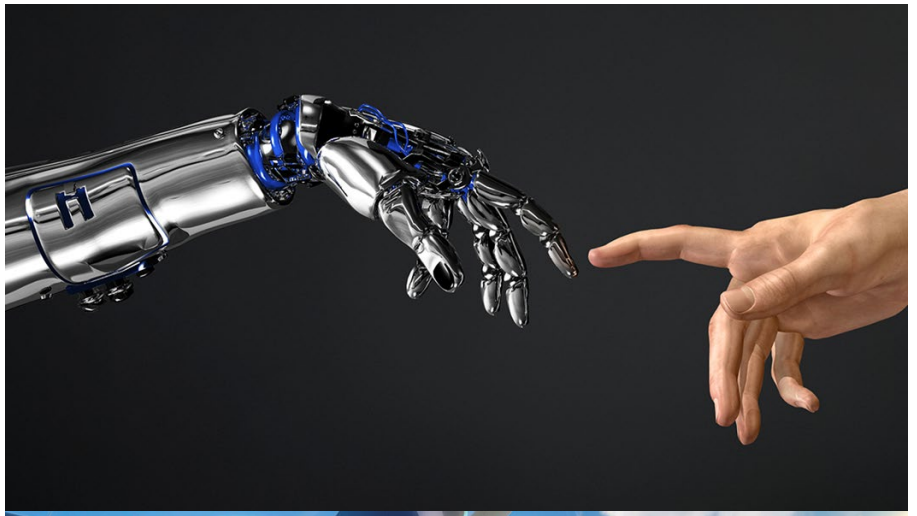
Challenges for the future

- Facilitating social responsibility.
- Standardization of an ecosystem of intelligent systems.
- Algorithms need to be robust, adaptable and understandable
- Lack of regulatory frameworks
- Conformity assessment with intelligent agents.
- Skills and Education
- Achieving global safety excellence.
- Data privacy

Future CA Challenges

- Remote technologies for monitoring and inspection;
- Test methods through machine learning and artificial intelligence;
- Digital testing;
- 3D printing;
- Big Data;
- Virtual measuring;
- Digital twins;
- AI embedded in products and systems.

These are all possibilities which may define the future of conformity assessment.



Market Surveillance for the Future

- Digitization on conformity assessment (testing, inspection, and certification) will open up new areas for increased market surveillance.
- Web Crawlers – Training and Results Monitoring
- Certification databases and on-line certificate systems
- Blockchain in CA Processes
  - Integration of machine trust and institutional trust
  - Increasing transparency and data verification
- UNECE Digital Product Conformity Certificate Exchange – digital certificates and verifiable credentials.
- Verifiability across various networks – Continuous Compliance Methods
- Artificial Intelligence:
  - Use of AI in conformity assessment,
  - AI risk management and monitoring with algorithms & machine learning
  - Initial and ongoing verification and validation of AI,
  - Ethics
  - Cybersecurity, etc.

Thank you

Questions?