



**EMERGING TECHNOLOGIES AND
REGULATORY DELIVERY —
IOTA OF DOUBT?**

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PRESENTATION OVERVIEW

Emerging/Disruptive Technologies and Regulatory Delivery - Background

Emerging Roles of Regulators

Internet of Things – Background and Example Pilots

Challenges and Critical Success Factors

DISRUPTION

Thomas Friedman in his “The world is flat: A brief history of the twenty-first century, 2011” said that in 2005:

- Facebook cannot be found under ‘F’ in the index of the first edition of The World Is Flat
- Twitter then was a sound
- Cloud was something found in the sky
- 4G was a parking space
- An Application was something you sent to college
- LinkedIn was a prison
- Skype was a typo!

DISRUPTIVE TECHNOLOGIES FOR REG. DELIVERY - PURPOSES

- ✓ Real-time data (+/- AI) for monitoring, surveillance and immediate response to events (security events, traffic enforcement, emergency response etc.)
- ✓ Firm (Business) data on compliance parameters, patterns and trends for resource allocation (e.g., inspection schedules), reporting (e.g., rating schemes) and compliance assurance/enforcement
- ✓ Sector data and analytics for policy reviews and risk management strategies

Source: Joint working papers, Prism Institute and UQ-CPF (In progress)

DISRUPTIVE TECHNOLOGIES FOR REG. DELIVERY - TYPES

Data collection

- ✓ Automated checklists
- ✓ Scans, barcodes, bluetooth (RFID tags, Bluetooth Low energy or BLE, BLE beacons)
- ✓ Sensors and actuators
- ✓ Internet of Things
- ✓ Drones
- ✓ Robotics

Data transmission

- ✓ Intranet/internet
- ✓ Blockchain

Source: Joint working papers, Prism Institute and UQ-CPF (In progress)

DISRUPTIVE TECHNOLOGIES FOR REG. DELIVERY - TYPES

Data modeling, analysis and prediction

- ✓ Analytics
- ✓ Artificial intelligence
- ✓ Machine learning
- ✓ Edge computing

Risk Management

- ✓ Alarms and notifications
- ✓ Shutdown systems
- ✓ Reporting and communication

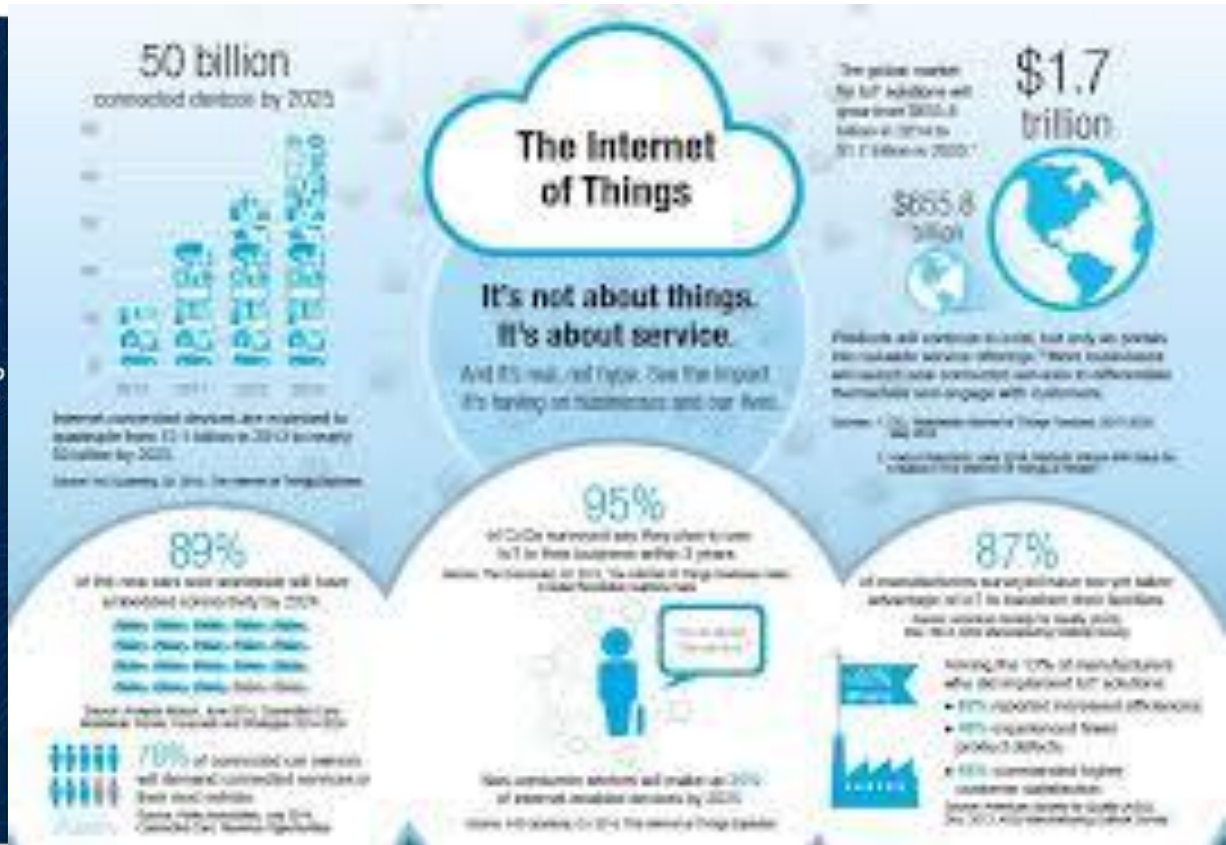
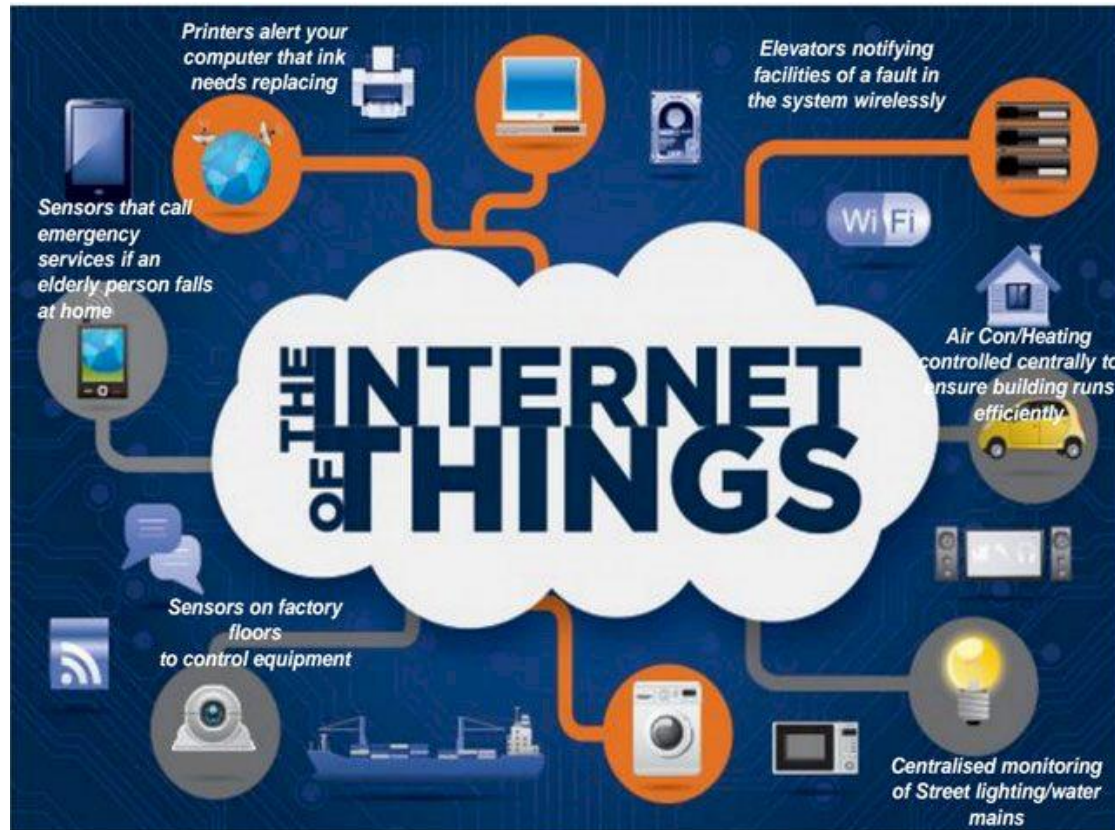
Source: Joint working papers, Prism Institute and UQ-CPF (In progress)

INTERNET OF THINGS

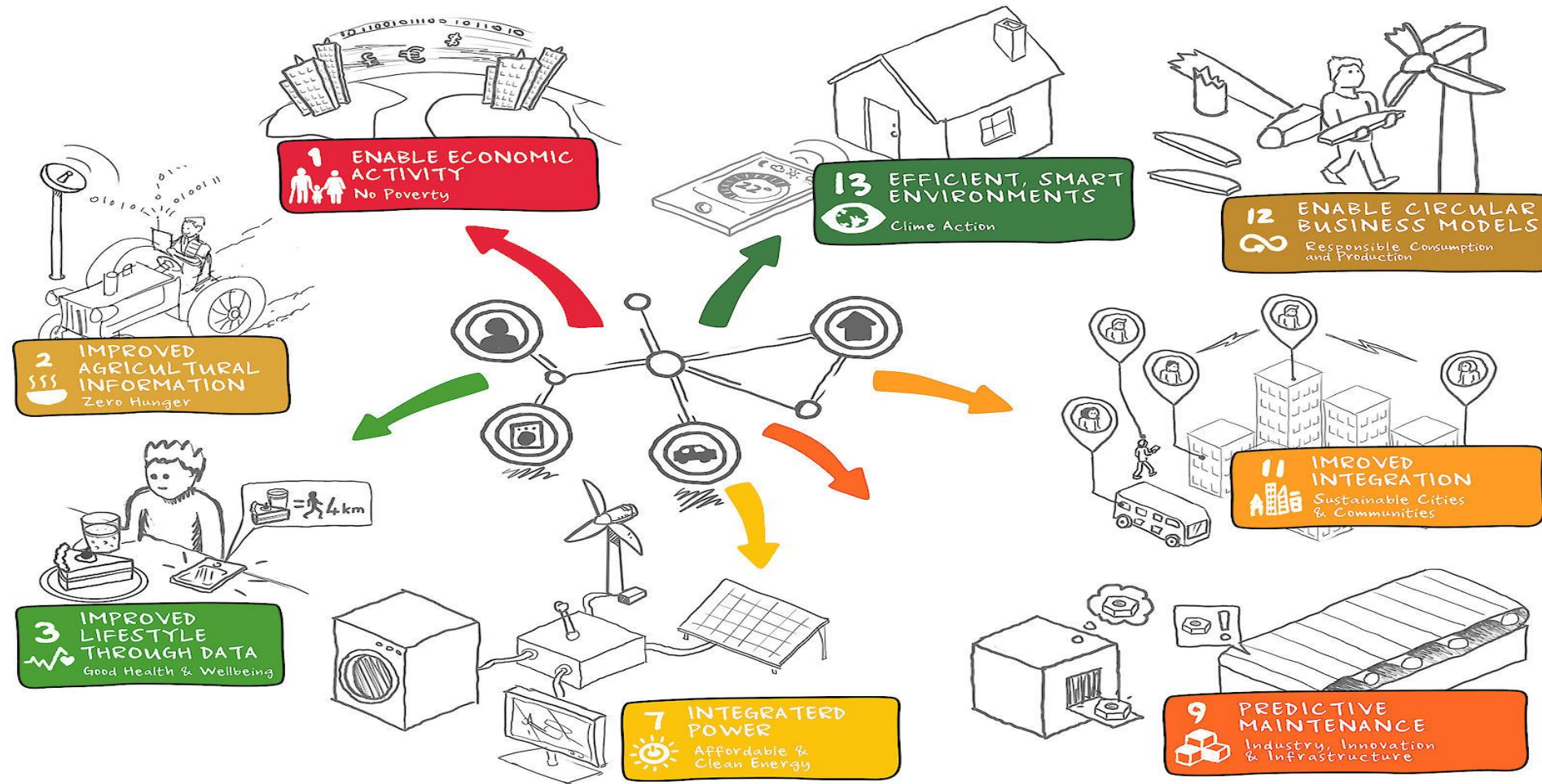
“an ecosystem in which applications and services are driven by data collected from devices that sense and interface with the physical world” – OECD

“a growing range of Internet-connected devices that capture or generate an enormous amount of data every day along with the applications and services used to interpret, analyze, predict and take actions based on the information received” – World Bank

PLETHORA OF THINGS CONNECTED



INTERNET OF THINGS AND GLOBAL DEVELOPMENT



Source: UN Global Impact

IOT AND REGULATORY DELIVERY – SOME EMERGING APPLICATION

Compliance assurance across the meat supply chain using Ear Tags – UK

Remote inspections of food storage and handling at retail locations - UK

Protecting marine biodiversity through remote monitoring of fishing vessels - Australia

Real-time integrated air quality/traffic pattern management – Singapore

Remote inspections and predictive maintenance scheduling of critical infrastructure/assets – US/Canada/UK

Remote monitoring of construction sites for worker Safety – Russia/USA

DISRUPTIVE TECHNOLOGIES — EMERGING ROLES FOR REGULATORS

1st Party — Owners

- ✓ Regulator develops and maintains technologies
- ✓ Primary purpose for **monitoring, surveillance, resource allocation and enforcement**
- ✓ Most effective but fraught with significant risks (misuse, privacy, cost, disincentive)

Source: Joint working papers, Prism Institute and UQ-CPF (In progress)

DISRUPTIVE TECHNOLOGIES — EMERGING ROLES FOR REGULATORS

2nd Party — Regulated Receivers

- ✓ Business influenced to adopt technology and share data by policy alternatives
- ✓ Regulators periodically receive data elements for **compliance assurance**
- ✓ Regulators undertake audits to verify and validate technology systems
- ✓ Businesses incented to share data (reduced physical inspections etc.) or mandated
- ✓ Recommended incentive based approach with some risks (competition, privacy, costs, fairness)

Source: Joint working papers, Prism Institute and UQ-CPF (In progress)

DISRUPTIVE TECHNOLOGIES – POSSIBLE ROLES FOR REGULATORS

3rd Party – Stakeholders

- ✓ Businesses already own technology and data (used primarily for business purposes)
- ✓ Businesses **volunteer (incented) to supply data elements for compliance assurance**
- ✓ Business **supply data and trends in response to single or multiple failures or accidents** (e.g., legal or liability scenarios)
- ✓ Businesses may choose to participate in aggregated data sharing models (e.g., integrity of systems, traceability of value chains)
- ✓ Most practical and feasible approach with some risks (competition, privacy, costs, fairness, enforcement implications)

Source: Joint working papers, Prism Institute and UQ-CPF (In progress)

REGULATORY CHALLENGES

Pace and multi-dimensionality of disruption

Disruptive business models

Ethics and Equity

Technology standardization, interoperability and access

Data privacy and security

Source: "Internet of Things – Policy Implications (World Bank Work in Progress)

EMERGING BEST PRACTICES

Innovative policies and regulations

Collaboration and partnerships

Coordinated pilots and sandboxes

Capacity building and engagement

Source: "Internet of Things – Policy Implications (World Bank Work in Progress)

THE FUTURE "REGULATORY DELIVERY MODEL"

Internet of Things – Reliable, relevant and real-time data

+

Blockchain – Secure Data

+

Artificial Intelligence – Predictive knowledge for proactive regulatory delivery