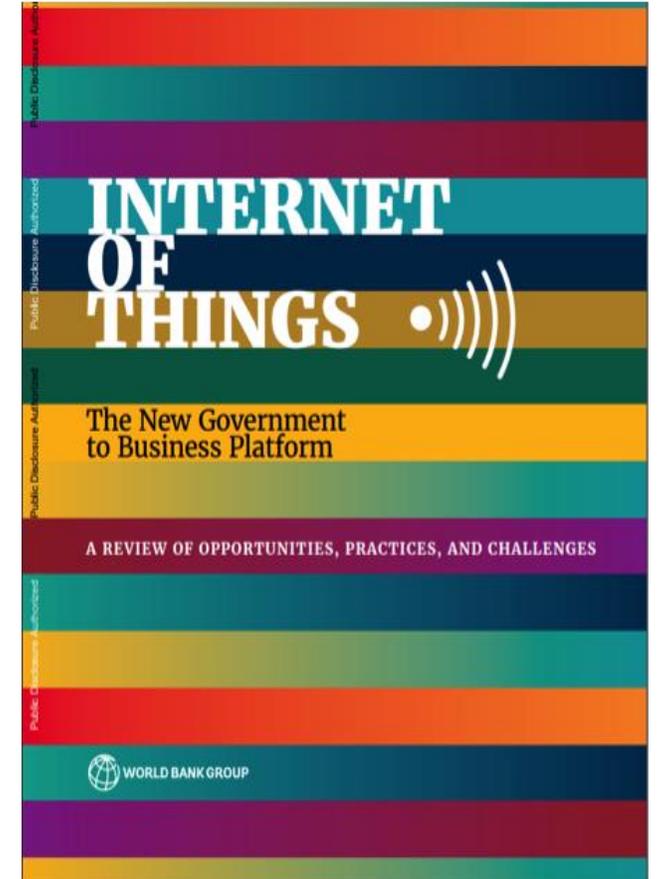


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Sandboxed in Disruption at Scale in the IoT World



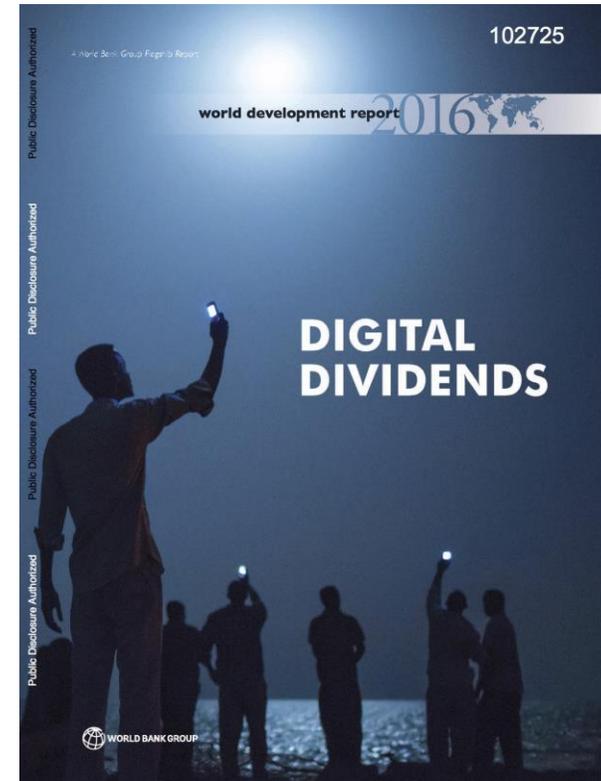
Kuala Lumpur
February 27, 2018



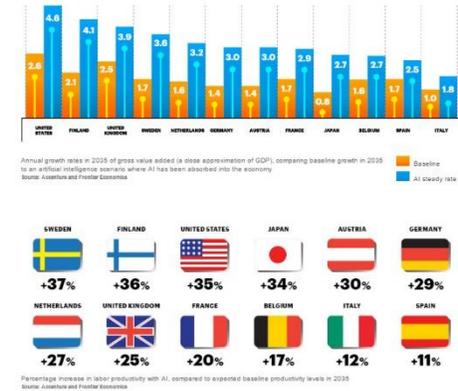
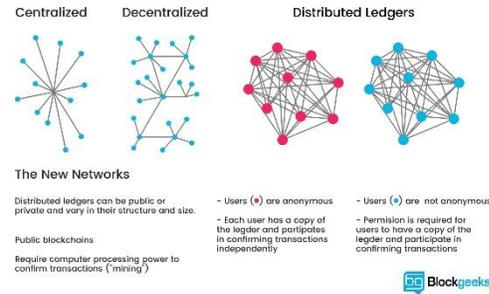
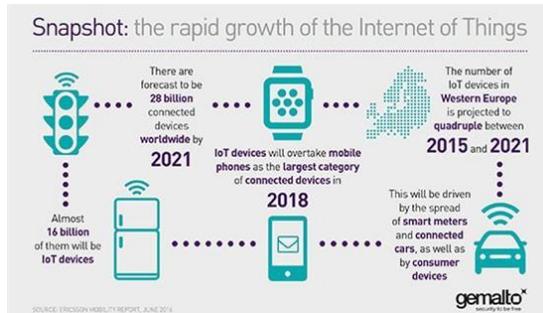
@prasannalaldas @infodev

We live in an increasingly digital and 'disrupted' world

- Growing digitalization of government and business
- Emergence of disruptive technology
 - The rapid growth of IoT as a component in almost all disruptive change
- Future competitiveness and socio-economic growth at stake



We are surrounded by the drumbeat of disruption but has the reality caught up with the hype



What is it
How does it affect me
How can I apply it

We examined the experience on the ground



We heard about 3 major challenges for government

Knowledge gap

What is IoT

Going from hype to reality

How is IoT relevant to me

Tools to scale

How can I implement IoT

IOT Study – Interview Protocol (Government/Regulatory Agencies)

Category I: Organizational Information

1. Country/City Name:
2. Name of Organization:
3. Person(s) Name:
4. Person(s) Title:
5. Person(s) Roles and Responsibilities:

Category II: Legal/Regulatory Framework

1. Is there a formal digital policy from the government?
2. Does the digital policy recognize the use of IoT-based applications for government service delivery?
3. Is the current policy designed to foster or inhibit the growth of IoT in society?
4. Is the policy aimed at specific uses of IoT or is it more general than that?
5. Are there existing laws or policies on freedom/right/ access to information or privacy laws that either facilitate or hinder/pose a barrier to the use of IoT-based applications?
6. Does the policy cover IP?
7. Are there any specific laws that regulate the collection and use of data produced by IoT applications?
 - a. Who owns the data? (The device provider or the buyer? The government? Or another?)
 - b. Are there any limitations on the sharing and use of this data?
8. Does the policy contain any cybersecurity provisions?
9. Does the policy specify any technical standards for IoT; is interoperability a policy goal?
10. Is there a formal stakeholder consultation/citizen engagement process? Were businesses consulted?
11. Were the stakeholders consulted prior to formalizing the use of IoT-based applications?
12. What was the mechanism for consultation and what was the feedback and response from the consultation process?
13. Are there any outstanding/residual concerns from stakeholders?

14. What is the authorizing framework/environment for the use of IoT-based applications within the agency (e.g., mandate letter, policy direction, etc.)?
15. Are there policy guidelines/standards informing the IoT implementation, and if so, what are they?
16. Are any measurement/evaluation standards incorporated in the policy?

Category III: Areas of Public Infrastructure

- What are the areas of public infrastructure services and what type of IoT applications are being considered?
1. Built Environments/Buildings, including institutions such as hospitals, schools, social housing, seniors' homes, etc.
 - a. Smart systems such as lighting, elevators, face recognition-based security systems, etc.
 - b. Predictive maintenance of engineering systems such as elevators/escalators using real-time monitoring
 - c. Real-time monitoring of operation and maintenance of emergency management systems such as fire protection, backup generators, etc.
 - d. Performance-based licensing and inspections by regulatory agencies
 - e. Sensor-based integrated building management systems (e.g., supported LEED buildings)
 2. Energy Systems, including power generation, heating, ventilation and air conditioning equipment, boilers and pressure systems
 - a. Remote monitoring and operation of energy systems
 - b. Sensor-based detection, response, and management of equipment failures such as corrosion, leaks, and environmental releases
 - c. Drone-based monitoring of pipelines
 - d. Indoor air pollution monitoring and response systems
 - e. Remote monitoring and verification of certified contractors
 3. Transportation
 - a. Real-time GPS-based scheduling and routing
 - b. Real-time monitoring and management of fleet, such as school buses
 - c. Remote vehicular inspections

What is IoT

Sensors

Network of intelligent objects performing sensing, actuating, monitoring, and control

Networks

Wireless protocol, network addressing and protocol

Analytics

Sense-making and decision support

All backed by a robust data infrastructure



A range of initiatives

Ludwigsburg

- Parking
- Lighting
- Smart grids

Astana

- Smart polyclinics
- Solid waste management
- Fuel management in locomotives
- Smart schools
- Public transit management
- Street lighting

Mississauga

- Public sector network
- Energy systems

Similar examples in most other cities studied

AT A GLANCE

Policy references

- [U.K. Digital Strategy](#)
- [Technology and Innovation Futures 2017](#)

Implementing agencies/programs

- [IoTUK](#)
- [Innovate UK](#)
- [Catapults](#)

Focus areas

- [Future cities](#)
- [Health](#)

Data

- [IoTUK Nation Database](#)

Technology

- [Supporting low-power networks](#)

Financing

- [Department of Business, Industry and Sport \(U.K. government\), academic institutions, and industry](#)

Capacity development

- [Best Practice Guides](#)

Related initiatives

- [Multiple ongoing projects](#)

Jobs

- Not known

We focused on a couple of government to business services

Regulatory compliance

- Reduced administrative burden
- Greater compliance

Competitiveness

- Innovation
- Entrepreneurship
- Commercialization of research
- Infrastructure management



We found that IoT is still nascent in governments

Strong value-proposition but no clear business models

Data is the key

Significant policy challenges

IoT as an enabler

IoT as a technology

Infrastructure is a major obstacle

Clear role for government

Major capacity gaps

Successful projects share characteristics

It is important to recognize risks

Jurisdiction	Policy	Capacity	Data	Tech	Top Support	Public-Private Partnership	Business Models	Pilot Space
Bristol	Green	Green	Green	Green	Green	Red	Red	Green
Milton Keynes	Green	Green	Green	Green	Green	Green	Red	Green
Reutlingen	Green	Grey	Grey	Grey	Green	Green	Red	Green
Hamburg	Green	Yellow	Yellow	Green	Green	Green	Yellow	Grey
Ludwigsburg	Green	Green	Red	Yellow	Green	Green	Red	Green
Mannheim	Green	Green	Grey	Grey	Green	Grey	Grey	Grey
Astana	Yellow	Red	Red	Yellow	Green	Yellow	Red	Green
Estonia	Green	Green	Green	Yellow	Green	Yellow	Red	Yellow
Mississauga	Green	Green	Green	Green	Green	Yellow	Yellow	Yellow
Kobe City	Grey	Grey	Red	Green	Yellow	Green	Yellow	Green
Dubai	Green	Grey	Yellow	Yellow	Yellow	Red	Grey	Green
Rajkot	Green	Grey	Red	Red	Green	Green	Red	Yellow

Note: **Green** = available and functional; **yellow** = partially available; **red** = not available; **grey** = not known.

Strong value-proposition but unclear business models

Most initiatives still at the pilot stage

Exploratory sandboxes
(Bristol Living Lab)

Constrained geographies
(Reutlingen)

Temporary business models

Funded largely through grants or limited funds,
uncertain long-term financial viability)

Different types of pilots

Funded largely through grants or limited funds,
uncertain long-term financial viability)



Data management is a major barrier

Most governments unprepared for the deluge of IoT data

Open Data initiatives (Milton Keynes, Mississauga)

Shared platform for data exchange (Estonia's X-Road)

Data hubs (Milton Keynes Data Hub)

Data visualization experiments (Bristol Data Dome)

Data as a potential competitive asset

Development of businesses based on open IoT data



The policy environment is under-developed

IoT as an enabler

- Regulations
- Prescriptive requirements

IoT as a technology

- Data
- Security
- Interoperability and standards
- Infrastructure



Infrastructure is a major challenge

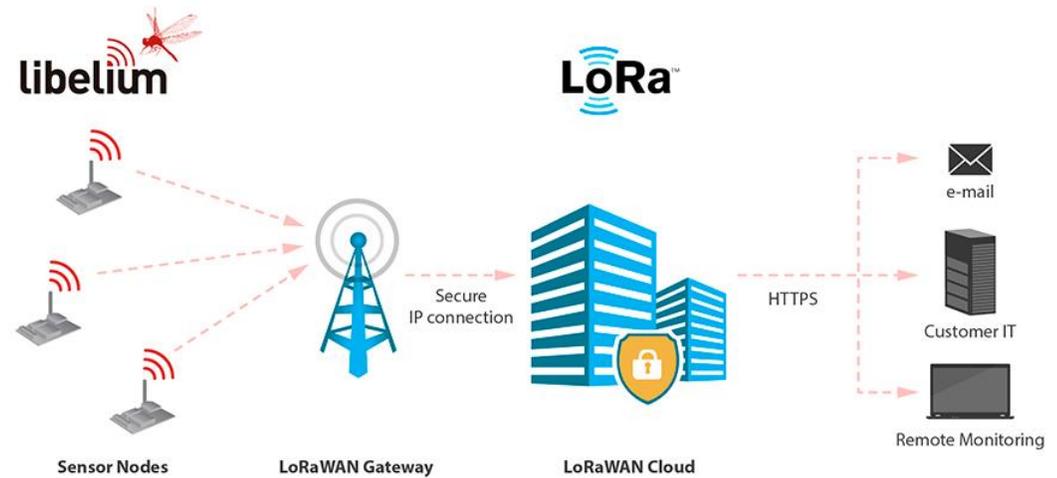
IoT has specific infrastructure needs

Limitations and Strengths of IoT specific networks
(e.g., LORAWAN)

Broadband availability

New infrastructure models

Public versus private networks (city owned,
telecoms)



Most successful IoT projects share common characteristics

Coordinators

Astana Innovations, Fraunhofer Institute, Digital Catapult

Public-private partnerships

Government seed funding/grants
Private investments with long-term incentives
Academic involvement for credibility and research

Local

Engaging local communities
Localizing applications/business models aligned with local needs

Leadership

Mayoral commitments and leadership (e.g., Astana, Bristol, Mississauga etc.)



There are clear skills gaps in government and the private sector

IoT/digital skills programs

IoT literacy (Open University)

Digital imagination (Bristol's Knowle West Media Centre)

Digital skills and educational curriculum (e-Estonia)



The government can be a major enabler

Diverse roles

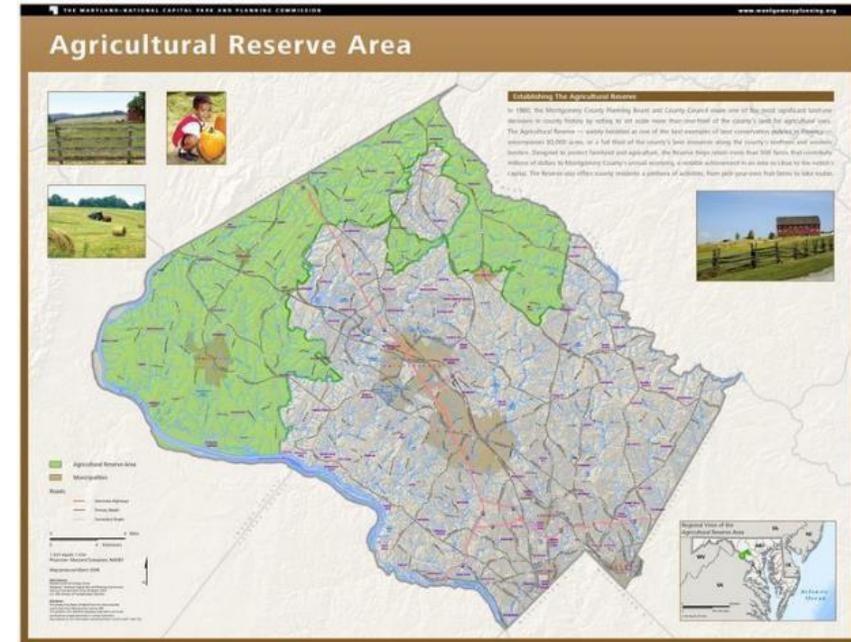
Public infrastructure to test IoT applications (Bristol, Mississauga)

Physical/community spaces (Living Labs)

Innovative procurement (Reutlingen)

Policy sandboxes (Morgenstadt)

Financing



What should government do to create IoT ecosystems

Leadership/Policy

- Proactive policy development
- Align strategic objectives

Strategy and Implementation

- Establish sandboxes to develop pilots (test value proposition, technology, policies, infrastructure, security)
- Establish a coordination agency to manage and run pilots
- Develop public-private partnerships and platforms
- Research and develop “localized” business models
- Develop IoT infrastructure

Capacity and Engagement

- Engage local stakeholders through education and outreach
- Develop IoT capacity within and outside the government
- Encourage standardization



[Download the report](#)

[Read the blog](#)

