Arthur D Little

Regulatory Framework for Digital Future - 5G, IoT and AI

Infofest Conference

1st October 2018

Regulation should be managed carefully, otherwise it can…

Impede industry growth

Ref Flag Act of 1865

< 4 miles/hour

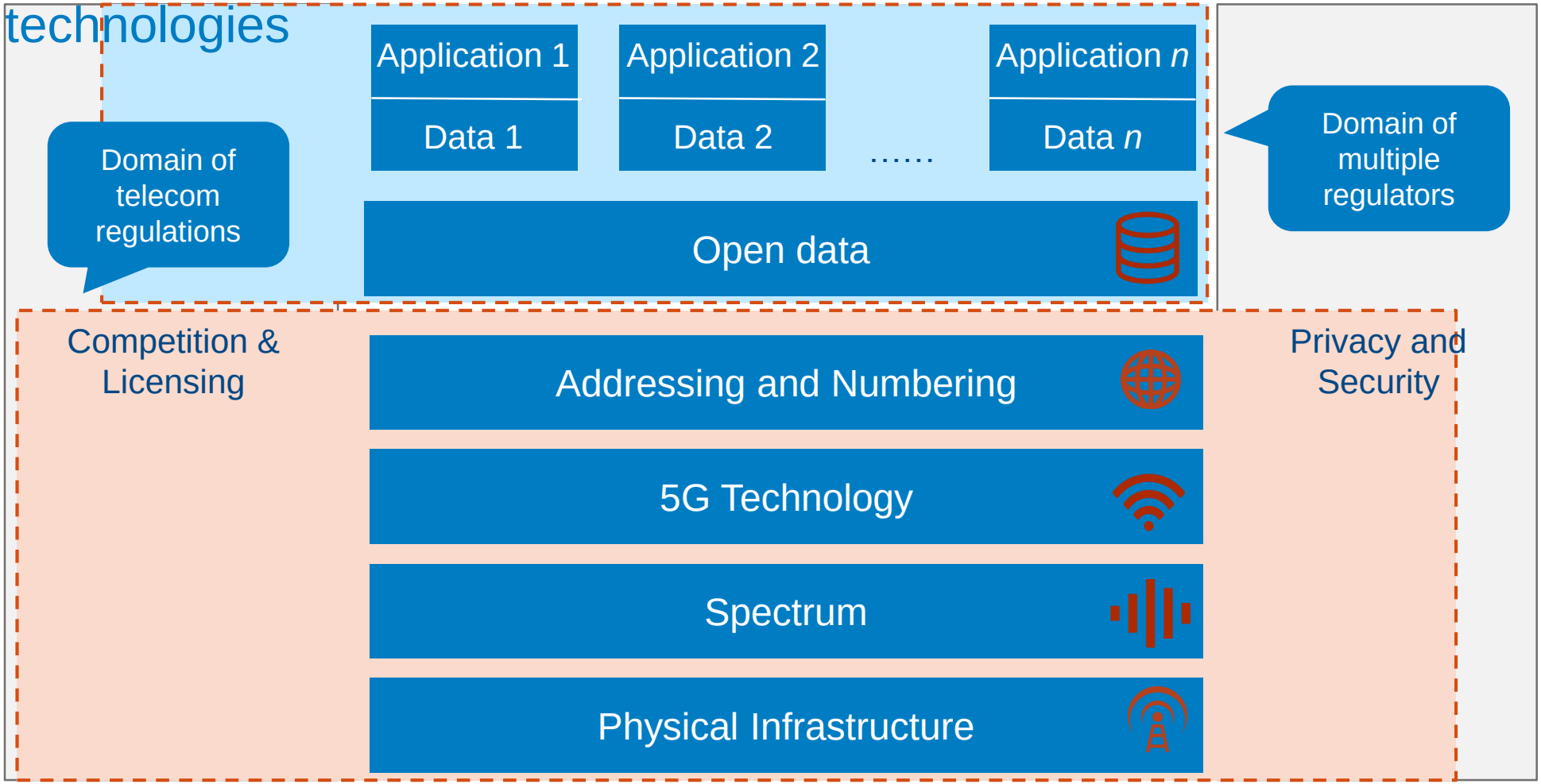
Harm people

1. A drone nearly killed someone

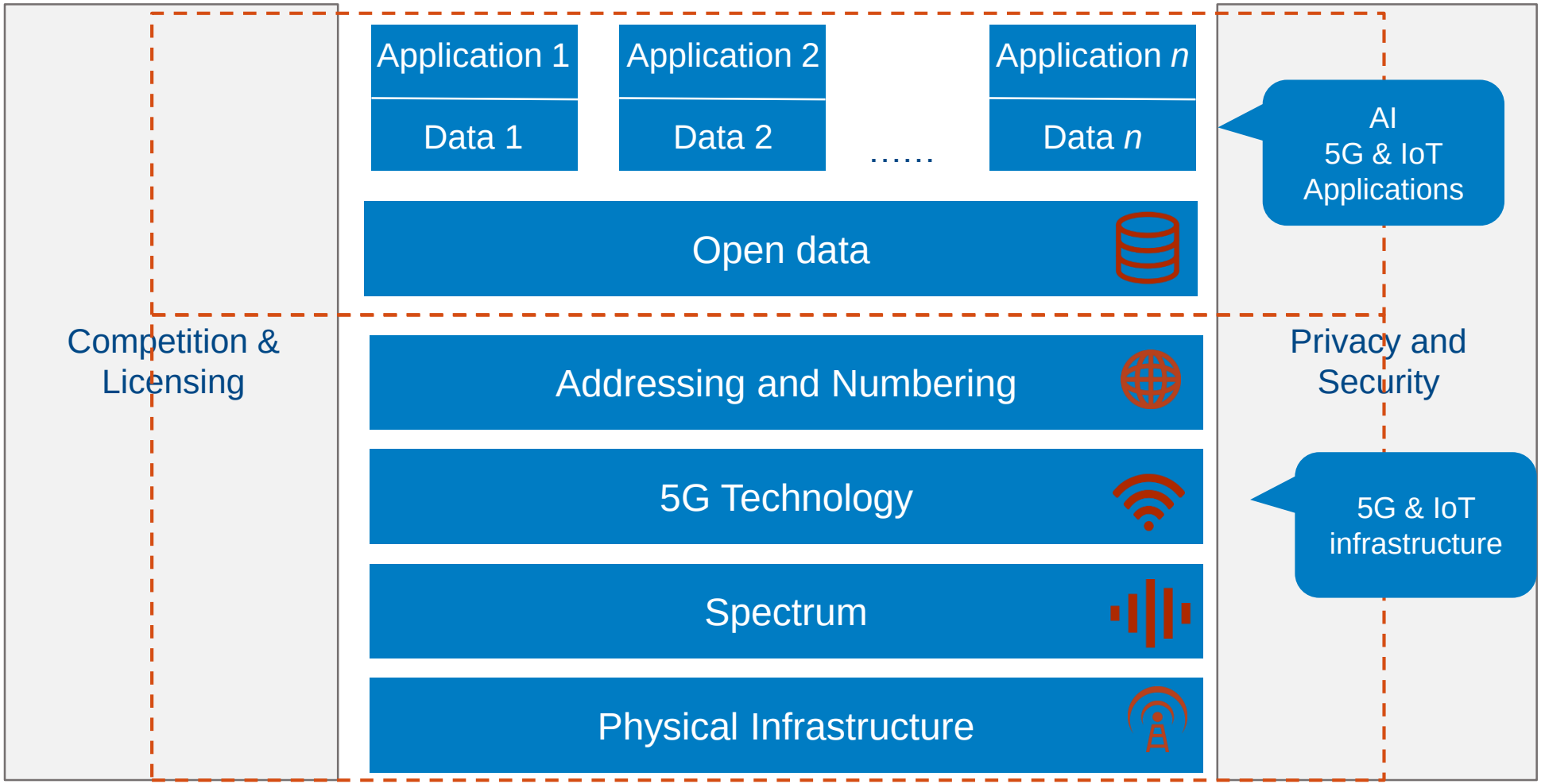
2. An self driving car kills a pedestrian

Arthur D Little

Going forward, as intelligence moves into applications, telecom regulators alone will not be able to manage many of the emerging technologies



Where should AI, 5G and IoT be regulated?



Asimov developed laws for robotics but they were not designed to solve coming AI wave

Asimov's laws of robotics

1. A robot may not injure a human being or, through inaction, allow a human being to come to harm
2. A robot must obey the orders given it by human beings except where such orders would conflict with the First Law
3. A robot must protect its own existence as long as such protection does not conflict with the First or Second Laws

Issues

- AI applications launched in the market based on:
  - Untested algorithms
  - Incomplete /biased data set
  - Proliferation of AI applications – how to prioritise
- Ethical issues
  - A self driving car, whom to save: Car driver/passenger vs pedestrians

AI regulatory guidelines are in the early stage of evaluation

Asilomar AI Principles (2017)

Research Goal

- Research goal
- Research funding
- Science-policy link
- Research culture
- Race avoidance

Long term issues

- Capability caution
- Importance
- Risks
- Recursive self-improvement
- Common good

Ethics and Values

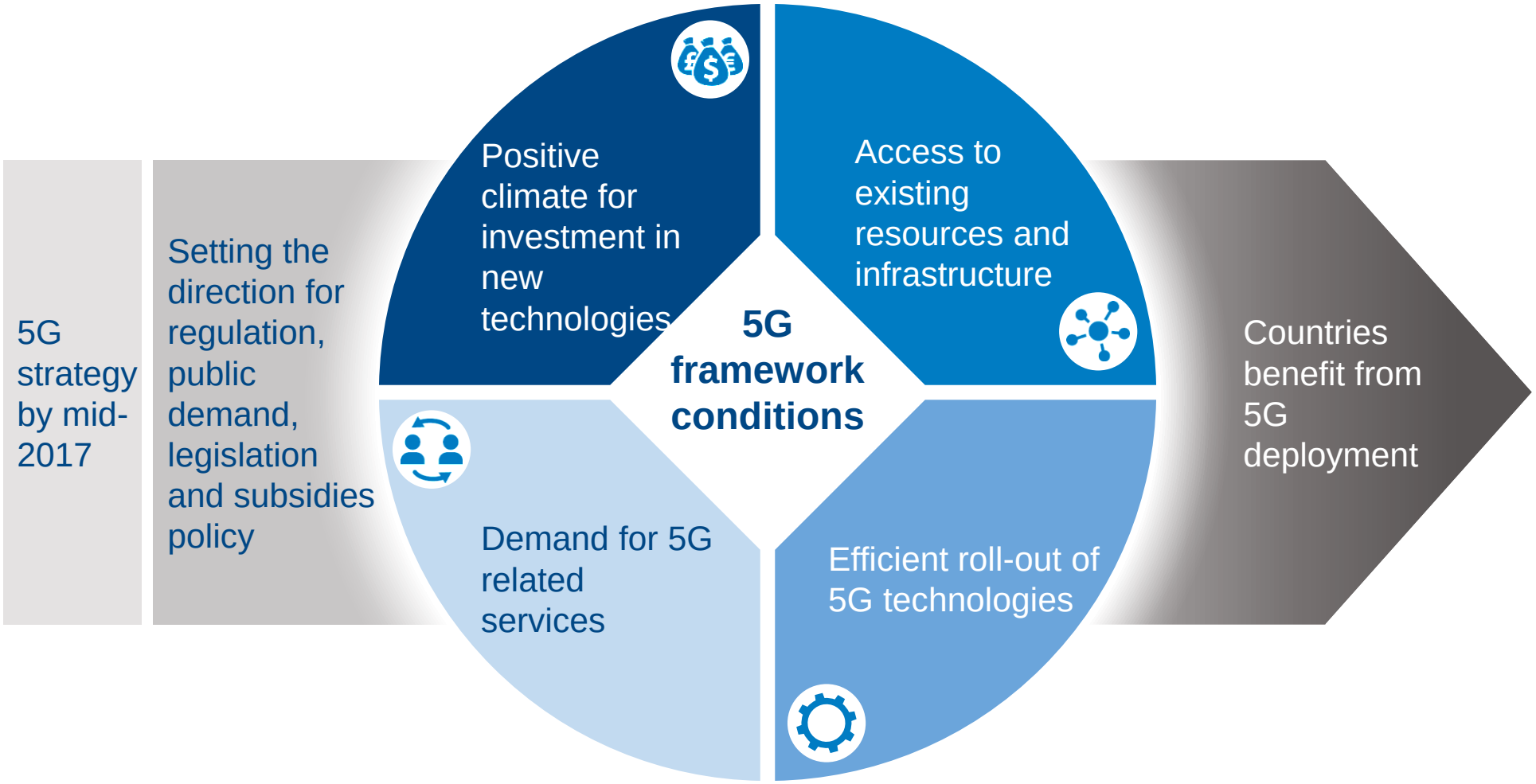
- Safety
- Failure transparency
- Judicial transparency
- Responsibility
- Value alignment
- Human values
- Personal privacy
- Liberty and privacy
- Shared benefit
- Shared prosperity
- Human control
- Non-subversion
- AI arms race

Scope of current AI regulation

- There are no clear regulations yet, but European commission has opened applications to join an expert group on AI that will be tasked to :
  - Help build a diverse community of stakeholders in European AI alliance
  - Support upcoming AI initiatives
  - Draft guidelines for ethical development of AI and use of AI in conjunction with EU's fundamental rights

Note: Asilomar AI principles were developed as part of the Asilomar conference in held in Asilomar, USA in 2017

The way to the top requires a 5G strategy and 4 framework conditions for regulation, public demand, legislation and subsidies



Efficient implementation and access to new technologies, positive climate for investment and demand stimuli are conditions for effective 5G rollout

Positive climate for investment in 5G

- Prompt introduction of 5G taskforce for cross-agency coordination
- Deregulation as leading principal
- Targeted subsidies for expansion of 5G infrastructure
- Additional subsidies for 5G devices

Access to existing resources and infrastructure

- Timely, transparent and economical placing of a significant amount of new spectrum (>100MHz)
- Efficient access to existing infrastructure (network partnerships, simplification of processes for planning and usage of existing infrastructure, free or subsidized construction, etc.)

Efficient implementation of new technologies

- Roll-out process – simplification (pipeline easement, approval process, emission standards, etc.)
- Reduction of network – operating cost, primarily rent for public properties as well as frequency –usage and directional radio fees, power connection, etc.
- Service differentiation for 99,999% availability of critical applications

Demand for digitization technologies

- Positioning of public sector and leading businesses as important demanders of 5G services
- Support of 5G projects (incl. subsidies for R&D[1])
- Usage subsidies for 5G services
- Information campaigns
- 5G professorships or research laboratories

For IoT ecosystem to grow, regulators and policy makers should define their stand in various aspects having direct bearing

A Licensing & Spectrum

- IoT specific spectrum
- Type approval

B Switching & Roaming

- Over the air provisioning
- Permanent roaming

C Addressing & Numbering

- IoT number range & pricing
- Transition to IPv6

D Competition

- Differentiated service quality

E Privacy & Security

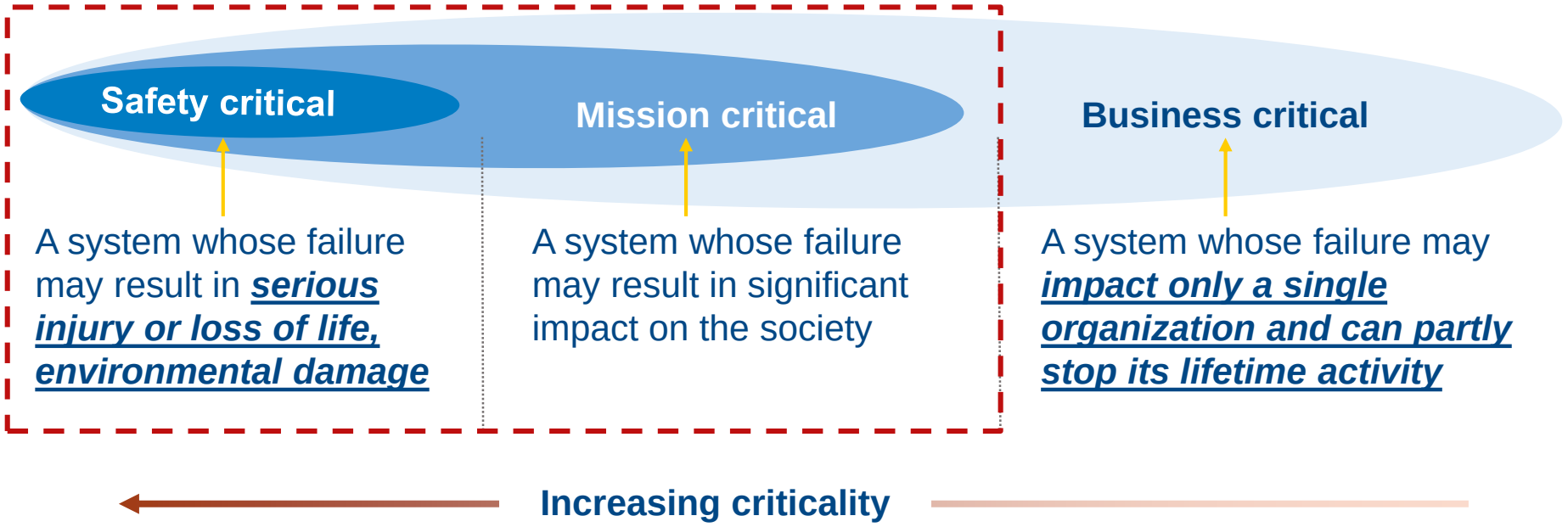
- GDPR related issues

F Infrastructure sharing

- Plan for IoT ecosystem

Source: Arthur D. Little analysis

When reviewing IoT applications, concept of mission critical can be a good test to approve applications



Source: Arthur D. Little analysis

Emerging technologies can be regulated using 3 broad approaches

Co-regulation

Collaboration between ICT ministries and other regulatory bodies like medicine, transportation

Regulatory sandboxes

Platform for regulators and innovators to experiment new technologies and design regulations together

Target based regulation

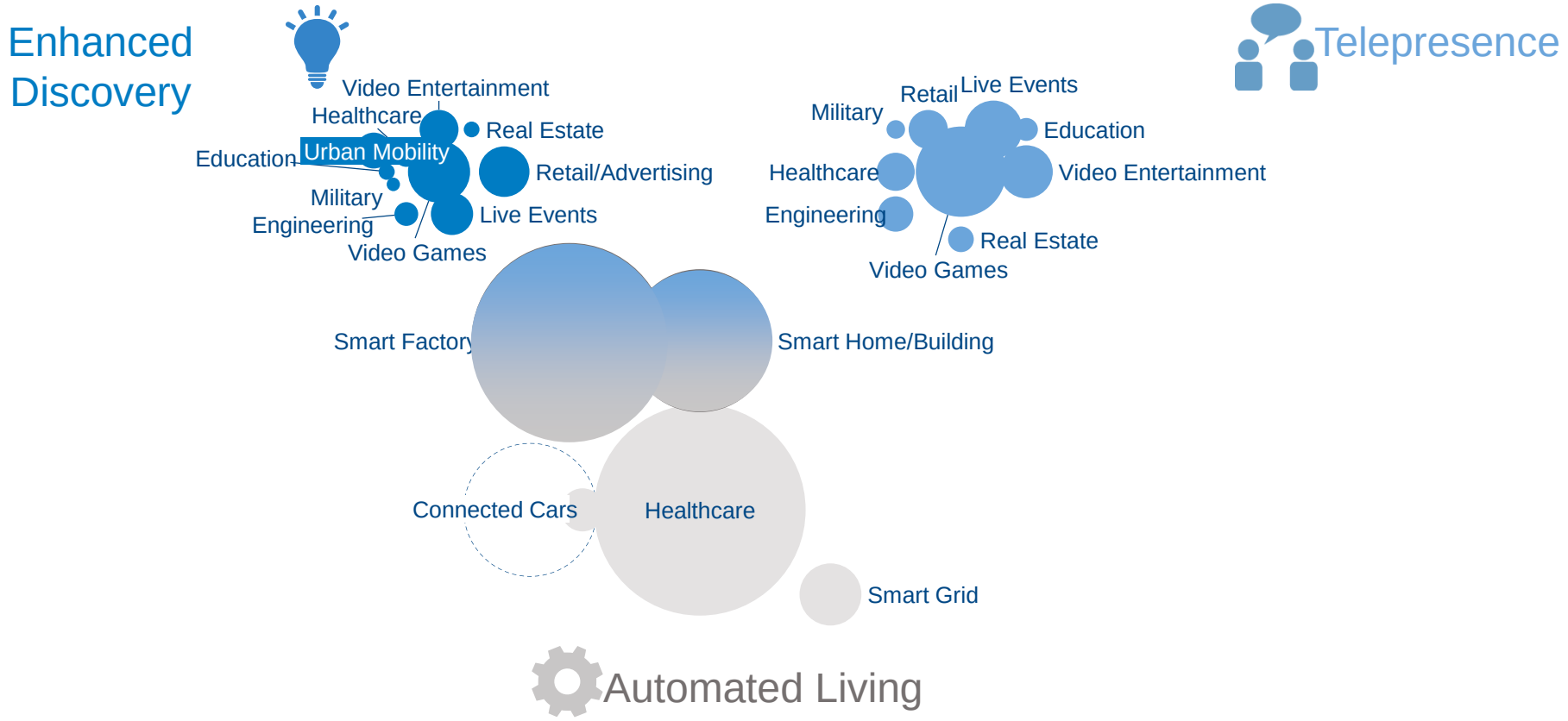
Major focus on results and outcomes over setting restriction on inputs

Next-generation applications are expected to unlock a market of US$500-600 Bn by 2025

Expected Market Potential by 2025

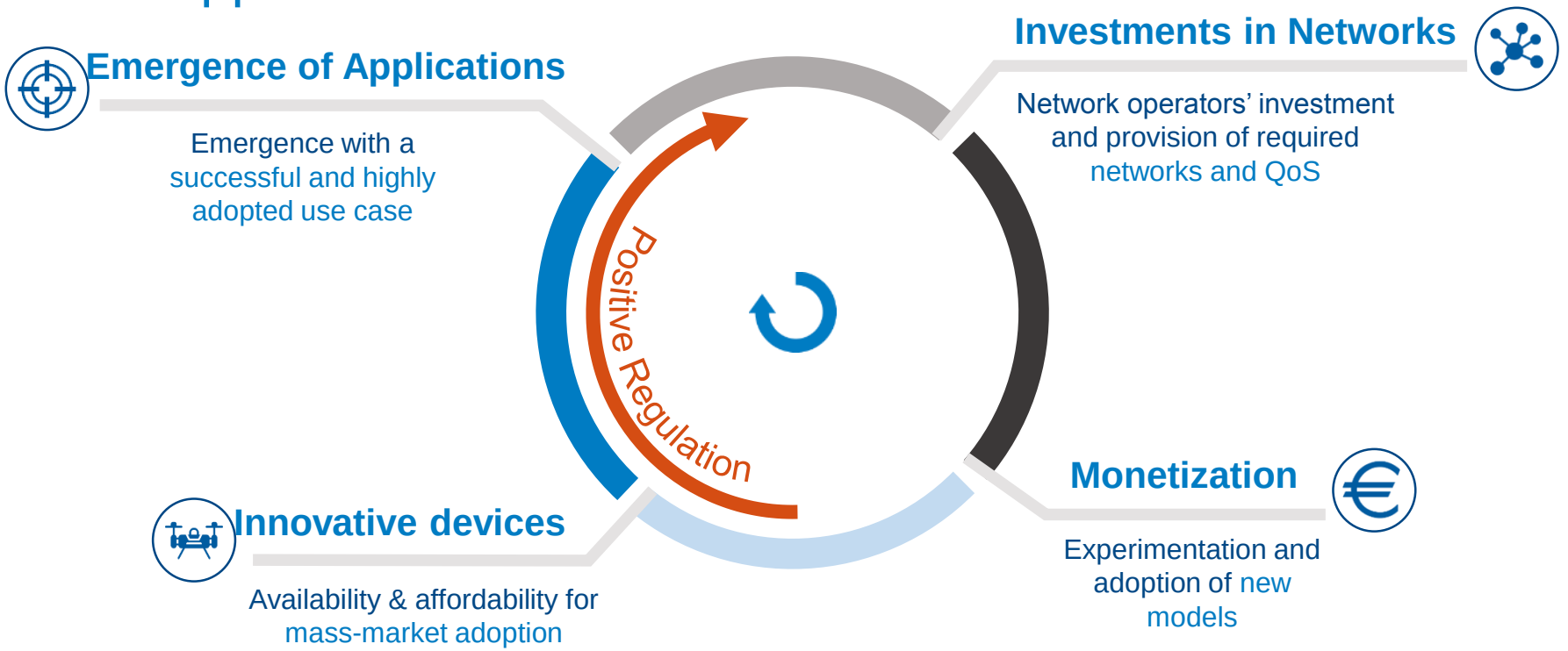
World, Bn.US$

ESTIMATES



Source: Statista, Goldman Sachs, Cisco, Intel, Arthur D. Little analysis

So we as regulators should help to propel an Innovation cycle can enable the required economies of scale that lead to mass adoption of GIGAApps



"You cannot prescribe innovation, but you can discourage it !"

Source: Arthur D. Little analysis

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We navigate our clients through changing business ecosystems to uncover new growth opportunities. We enable our clients to build innovation capabilities and transform their organizations.

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