The route to a trillion devices

The outlook for IoT investment to 2035

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- Engineer in the nineties
- Analyst in the noughties
- IRO in the teenies
Over 1 trillion IoT devices (accumulated in 2016-2035)

- 275bn IoT
- 13.5bn Mobile
- 2.1bn PC, Tablet
- 15.7bn
- 4.6bn
- 7.1bn
- 1.7bn
The macroeconomics of IoT
Four decades from now…

Global population
10 billion people

Life expectancy
100 years

* Projected life expectancy for females born in the UK in 2055.
Malthus vs Technology
Malthus vs Technology

Game-changing tech in the 19th Century

- Factories, blast furnaces, oil drilling
- Internal combustion engines, automobiles
- Railways, cruise liners
- Vaccines

- Information Technology
  - Electricity
  - Morse code / transatlantic telegrams
  - Telephones
  - Radio
Malthus vs Technology

Game-changing tech in the 20th Century

- Assembly lines, consumerism
- Jet engines, aeroplanes
- Space exploration
- Antibiotics

- Information Technology
  - Television
  - Transistor / silicon chip
  - Personal computer / Internet
  - Mobile phone
Malthus vs Technology

Game-changing tech in the 21st Century

- 3D printing, nanotechnology
- Renewable energy, electric vehicles
- Genetic science
- Personalised medicine

Information Technology

- Smartphone
- Artificial Intelligence
- Internet of Things
- Autonomous vehicles and robots
Technology adoption boosts productivity

The 1990s Goldilocks Economy

IoT will boost economic output

- IoT could add 3% to global GDP by 2035
- Equivalent to $5 trillion of additional output

Based on data from US Bureau of Economic Analysis. The colours depict potential sector output boost from IoT (ARM estimates).
The microeconomics of IoT
The Information Profit Margin

Value of Data > Cost of Data

- Revenue growth
- Customer loyalty
- Operational efficiency
- Waste reduction
- Risk control

- Device electronics
- Device installation
- Device management
- Network access
- Data centre hosting
- Analytics software
As the cost of data falls, the opportunity for IoT expands

Unit price: $10m
Production: <80 pa

Source Rick Dikeman - Own work, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=24471
As the cost of data falls, the opportunity for IoT expands

Unit price: $10k
Production: >80m pa

Source: Skoda, Verisk Data Exchange
Whole-life costs of a ‘typical’ IoT system

- Electronic components
- Assembly
- Distribution
- Installation
- Financial services
- Telecoms services
- IT services

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Whole-life costs of a ‘typical’ IoT system
Whole-life costs of a ‘typical’ IoT system
Whole-life costs of a ‘typical’ IoT system

65% cost reduction by 2035

IoT Hardware

IoT Services
A trillion devices, a trillion dollars per annum by 2035

- Deployment of IoT systems adds 3% to global output by 2035 equivalent to $5 trillion pa

- Spending on IoT systems to reach $1tn pa by 2035

- Cumulative spending on IoT modules between 2017 and 2035 surpasses $750bn
The route to a trillion devices
In the 1990s, rapid adoption of Internet technologies led to strong GDP growth with low inflation.
The route to a trillion devices

Sectors that consume physical resources and have logistical complexity have much to gain from IoT

IoT will boost economic output

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Sectors that consume physical resources and have logistical complexity have much to gain from IoT
The route to a trillion devices

There are thousands of use cases for IoT, and a great diversity in solutions
The route to a trillion devices

Our definition of IoT investment covers spending on IoT electronics and data services.
The route to a trillion devices

As the cost of data falls, the opportunity for IoT expands

More IoT systems will be deployed as the cost comes down, and systems evolve from bespoke to standardised.
The route to a trillion devices

In the last three years, executives have discovered IoT security is a complex issue, but appetite for IoT is as strong as ever.
The route to a trillion devices

Some IoT devices run sophisticated AI and be ‘always-on’, others will be ultra-low cost and communicate intermittently.
The route to a trillion devices

In 2035, hardware, software and telecoms companies will generate $1 trillion of revenue from IoT.
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