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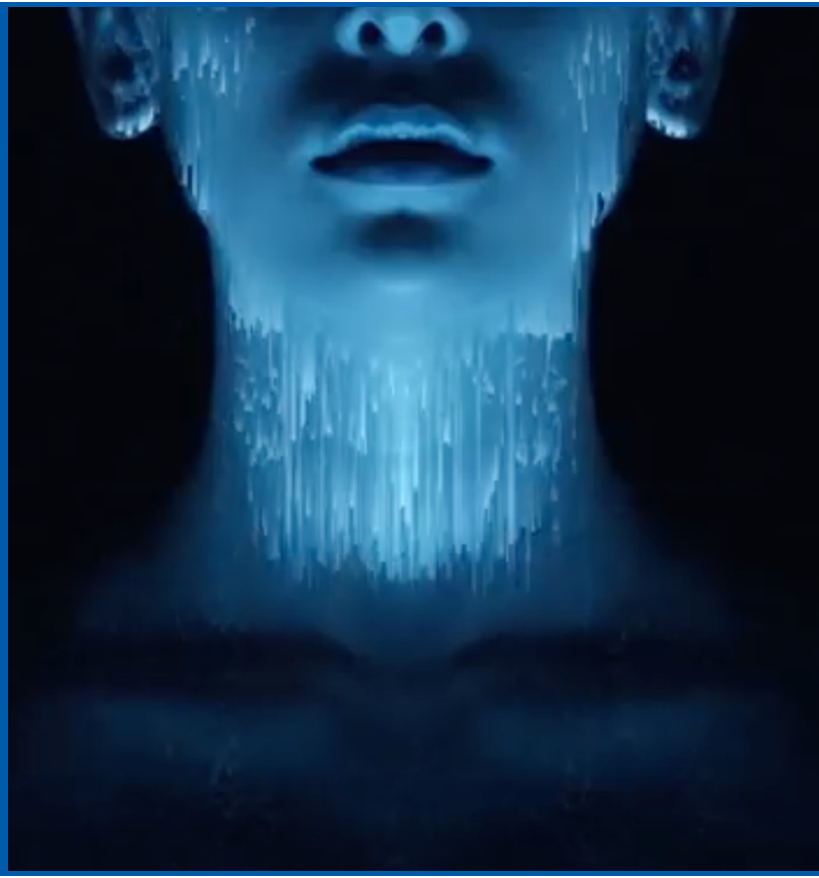
Education 4.0: Making the Internet of Things Relevant with Arduino

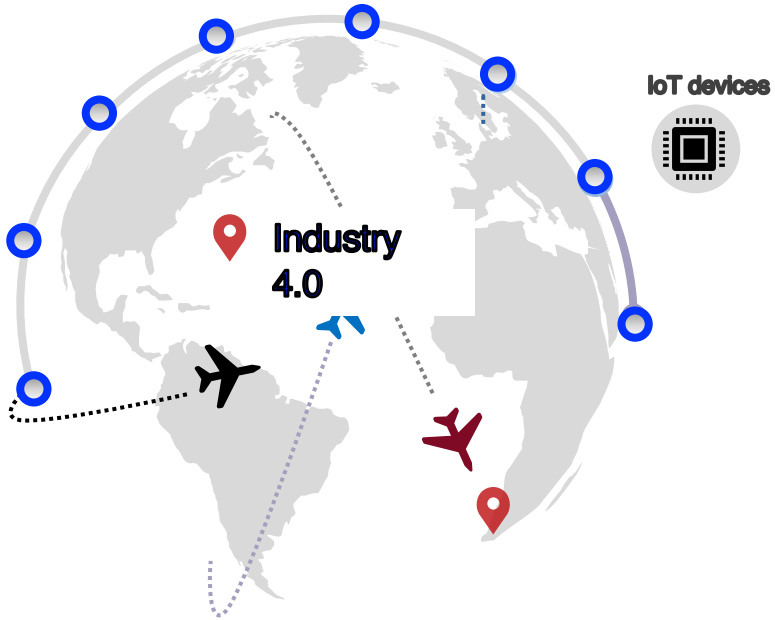


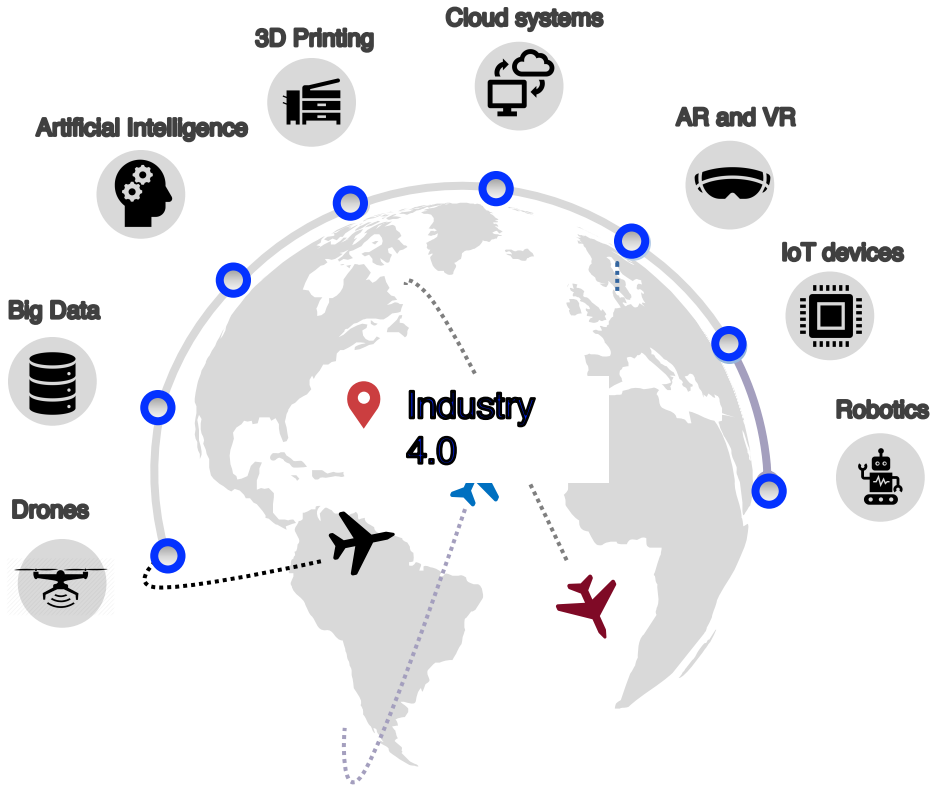
Sean Kruger

March 2019

Overview

- 4IR and IoT
- Interlinkages and importance of innovation and education 4.0
- Applications in business, research and teaching and learning
- Using IoT technologies Digital Humanities


IoT devices
Industry
4.0



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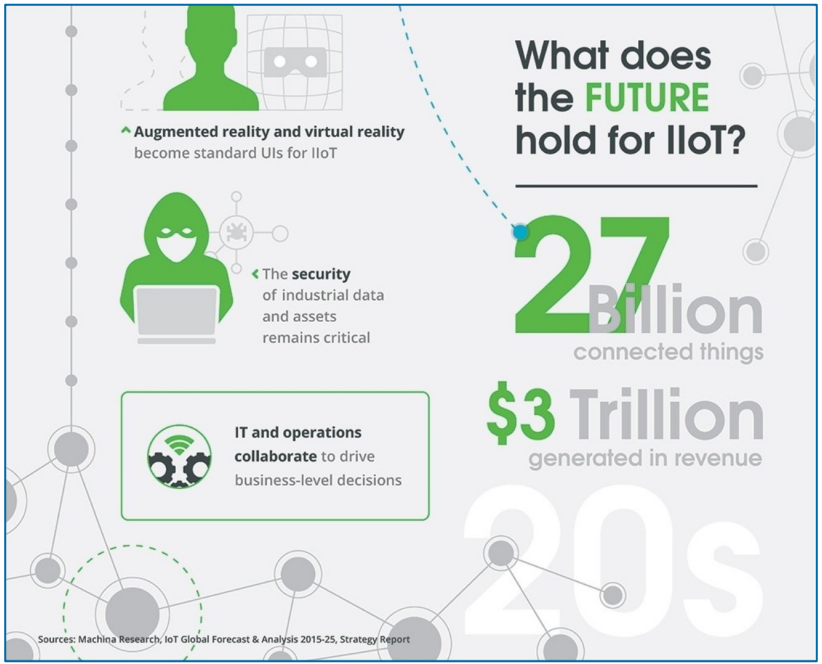
The Internet of Things (IoT)

- “there is no common definition or understanding today of what the IoT actually encompasses”. (Flu¨chter, 2015:221)
- The aim though is interconnectivity between devices to gather data or provide pertinent information or feedback
- This has brought challenges and opportunities including:
  - New value creating business models
  - Cybersecurity risks
  - Data storage and protocols
  - Network protocols
  - Hardware
  - Education paradigms

The Internet of Things (IoT)

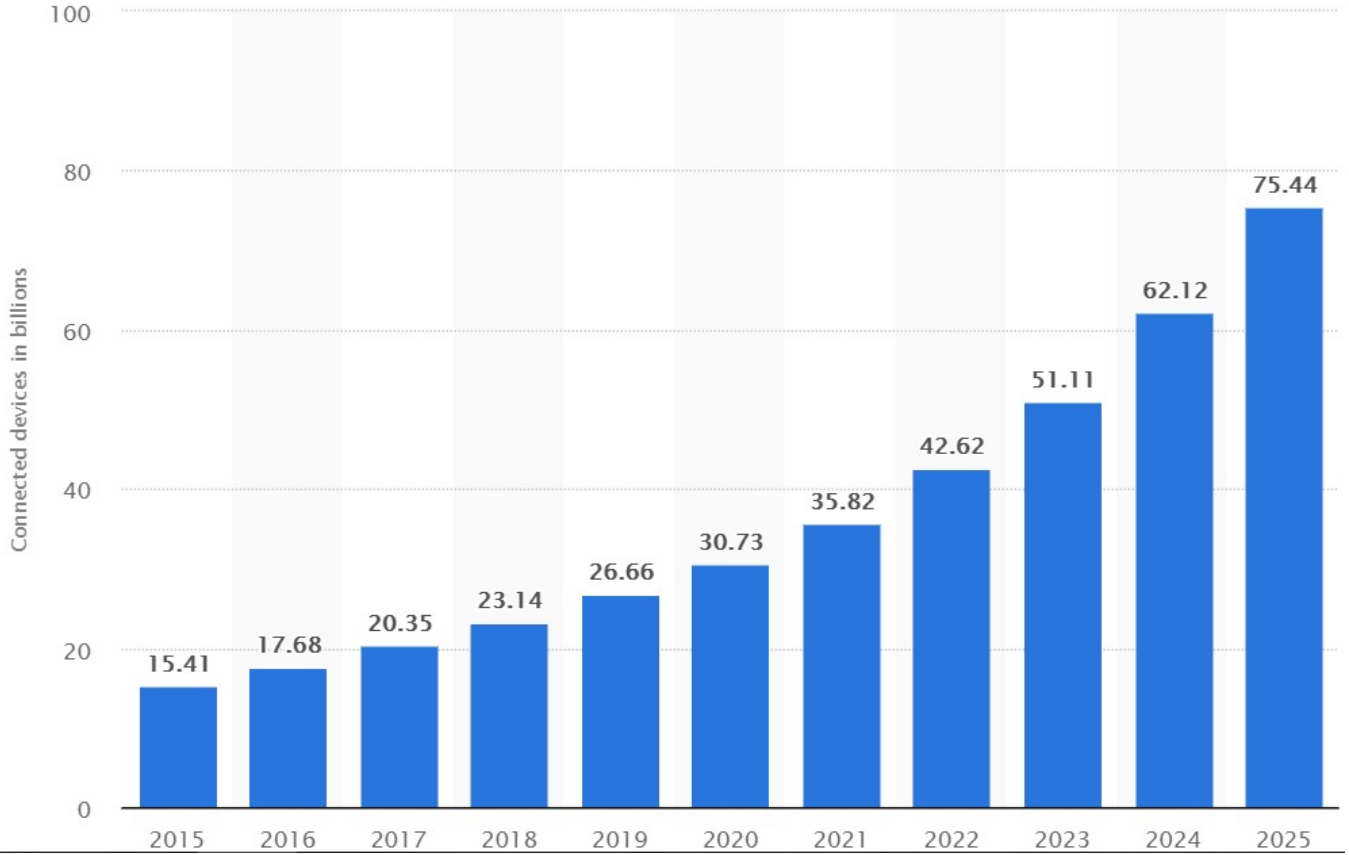
1983: Ethernet is standardized
1989: Tim Berners-Lee creates Hypertext Transfer Protocol (HTTP)
1992: TCP/IP allows PLCs to have connectivity
2002: Amazon Web Services launches, and cloud computing starts to take hold
2006: OPC Unified Architecture (UA) enables secure communications between devices, data sources, and applications.
2006: Devices start getting smaller, and batteries and solar energy are becoming powerful and more economical.
2010: Sensors drop in price, enabling them to be put into pretty much everything

The Internet of Things (IoT)

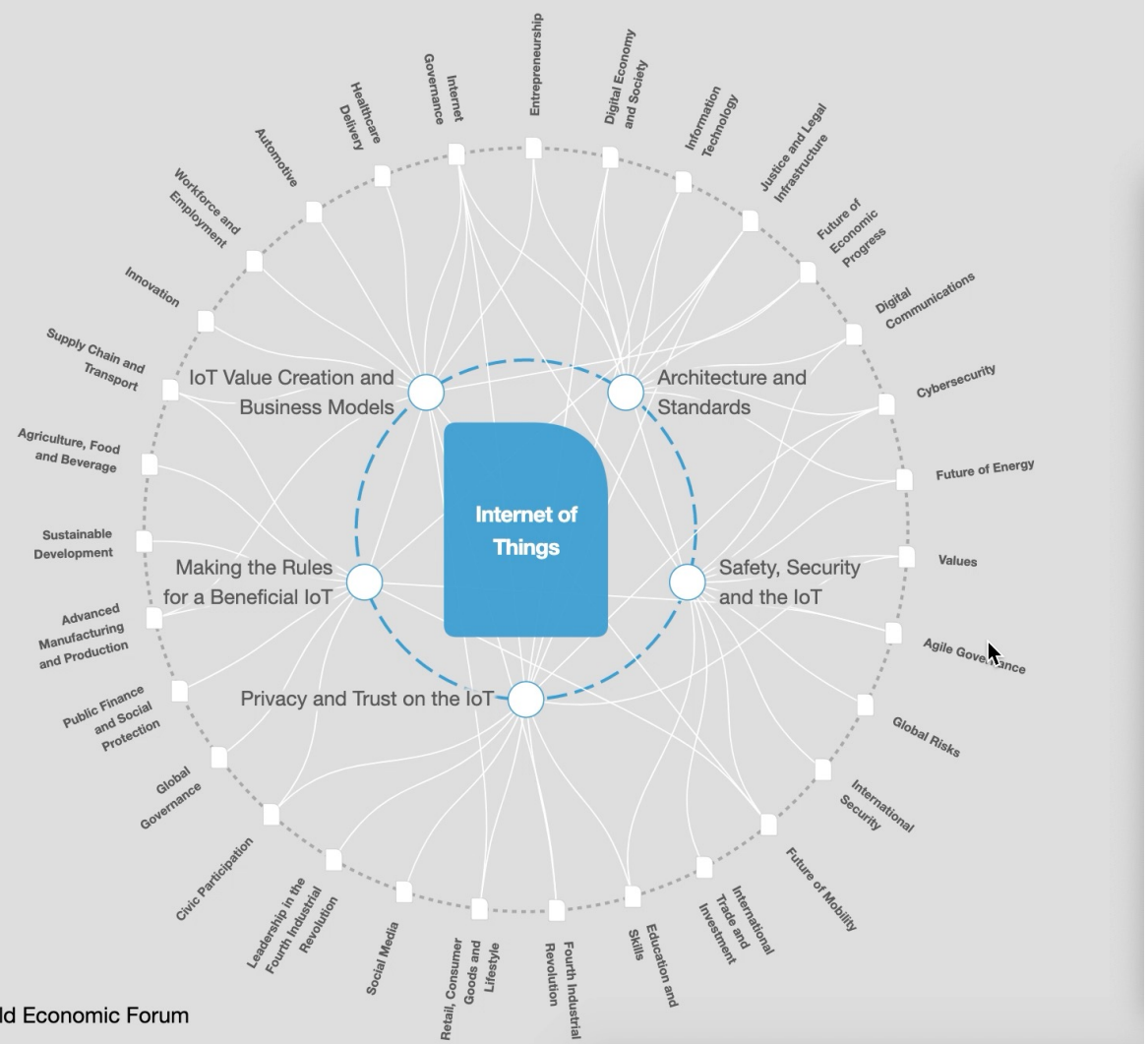


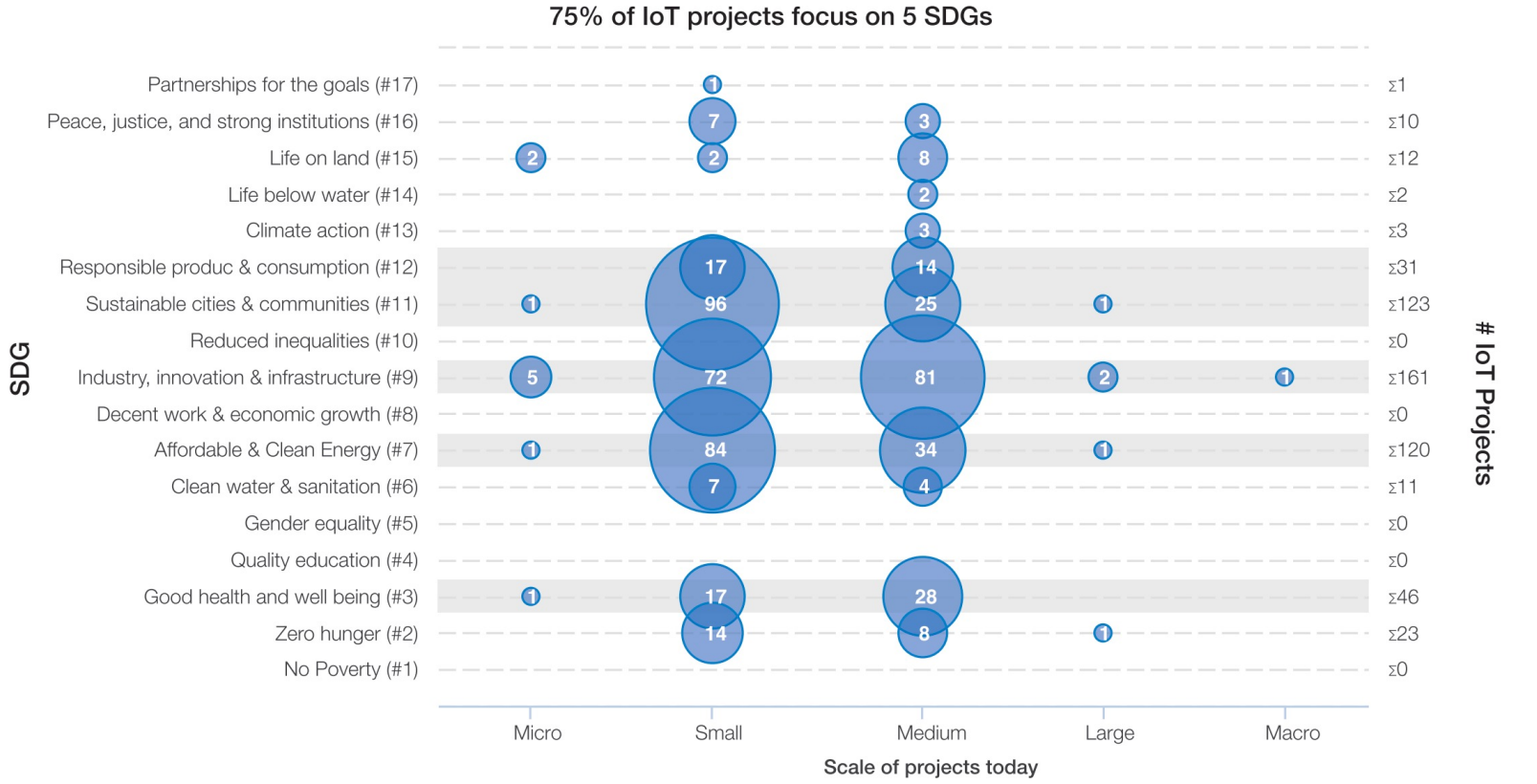
https://www.weforum.org/agenda/2018/01/how-the-internet-of-things-has-evolved-over-the-last-50-years

IoT



- Statista 2018





World economic Forum: http://wef.ch/IoT4D%0Ahttp://www3.weforum.org/docs/IoTGuidelinesforSustainability.pdf

IoT value creation in Research

Smart Life: Wearable devices

- Data always available
- Track human movement patterns
- Safety patterns and areas
- Geo-tracking and optimisation of traffic

IoT value creation in Business

Smart Health

- Real-time and accurate data,
- Remote monitoring
- Record management

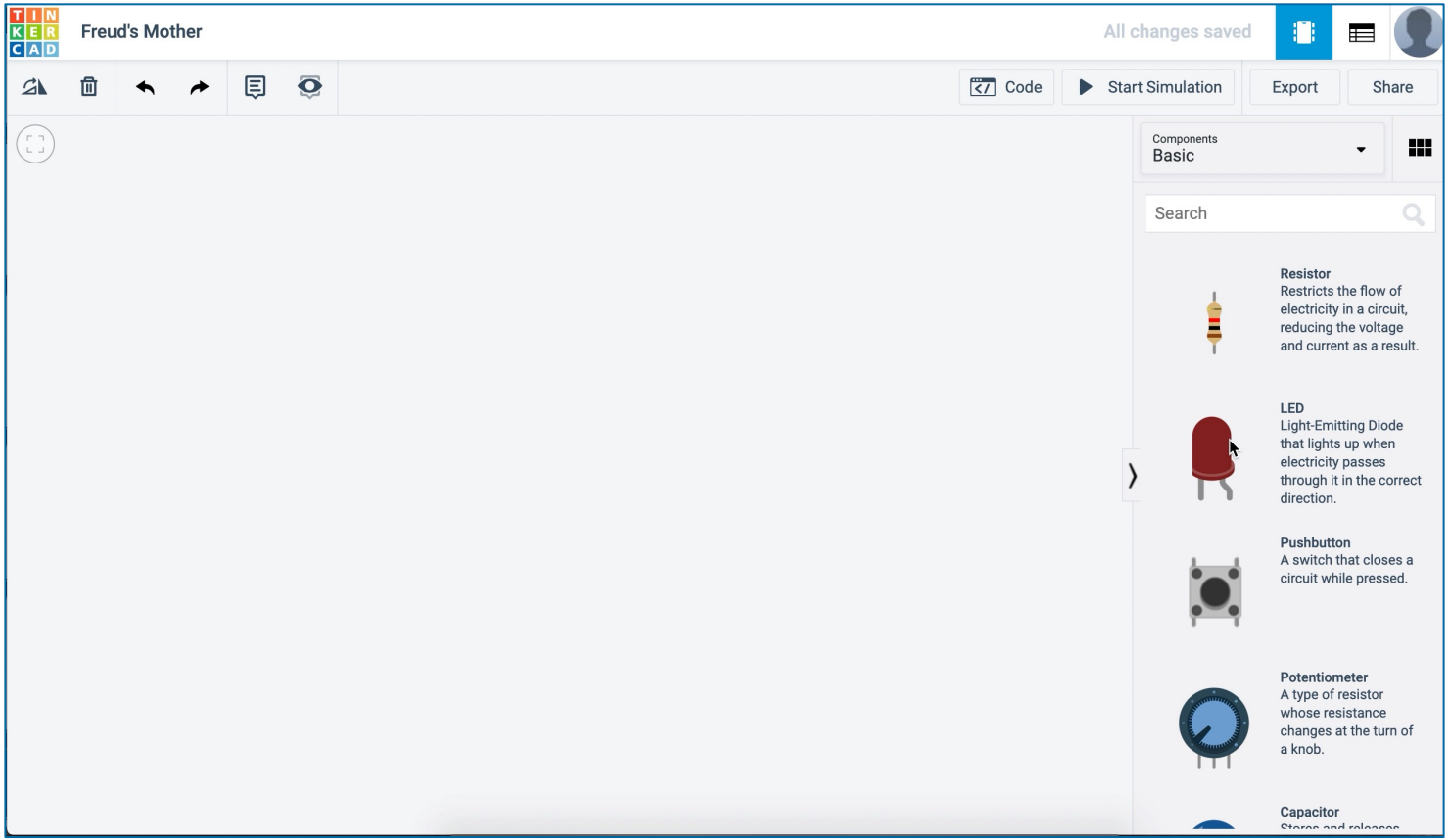
- Reduce human based errors
- Warning signs
- Optimal medical dispensing

Library Makerspace

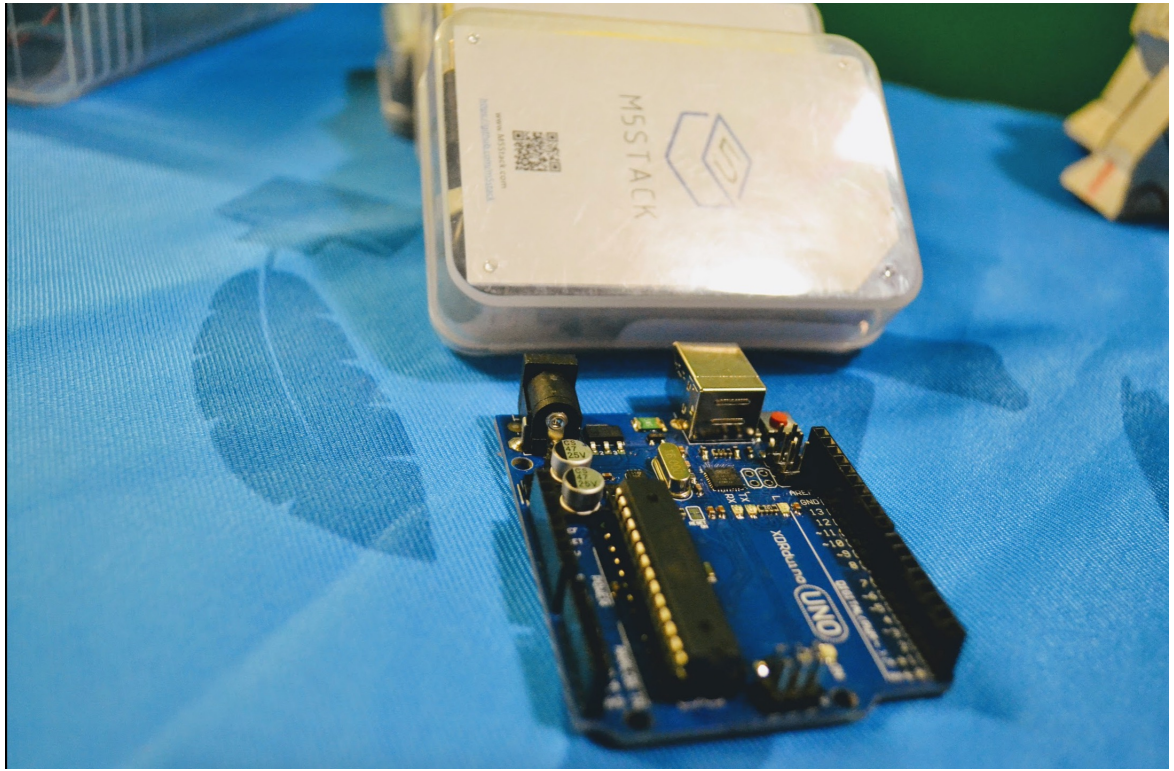
- Neutral zone
- Supports cross-disciplinary research
- Expertise and consultation
- Open collaboration environment

Arduino: Basis for IoT Teachings

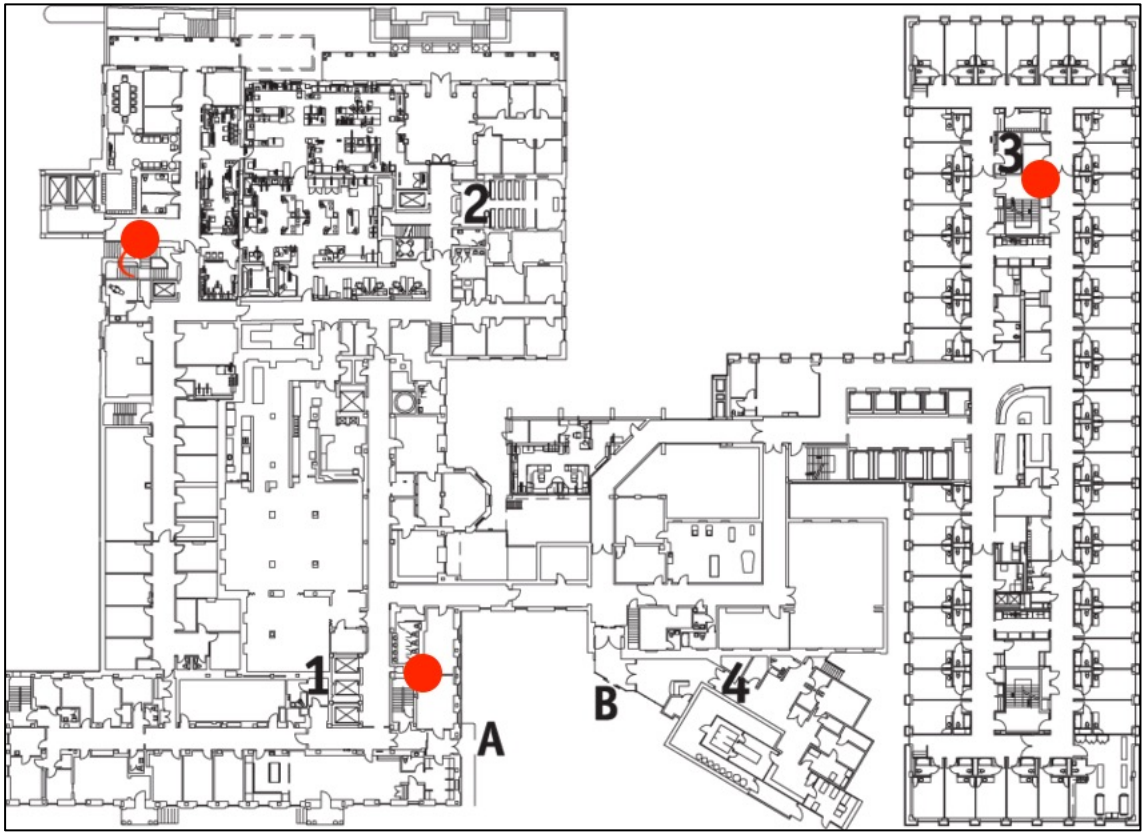
- Basic circuitry
- Bring together hardware and software
- Inexpensive
- Cross-platform
- Open source code
- Open source extendable hardware
- Customised solutions



IoT value creation in Digital Humanities Research



IoT value creation in Digital Humanities Research



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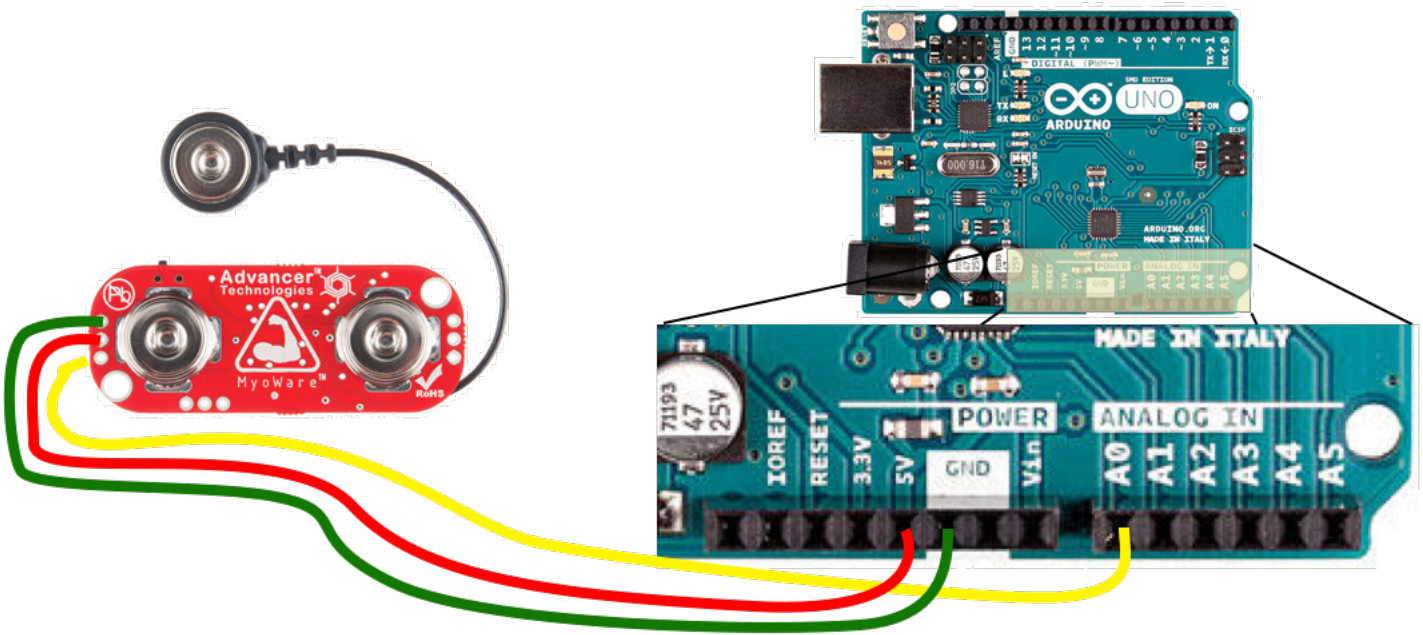
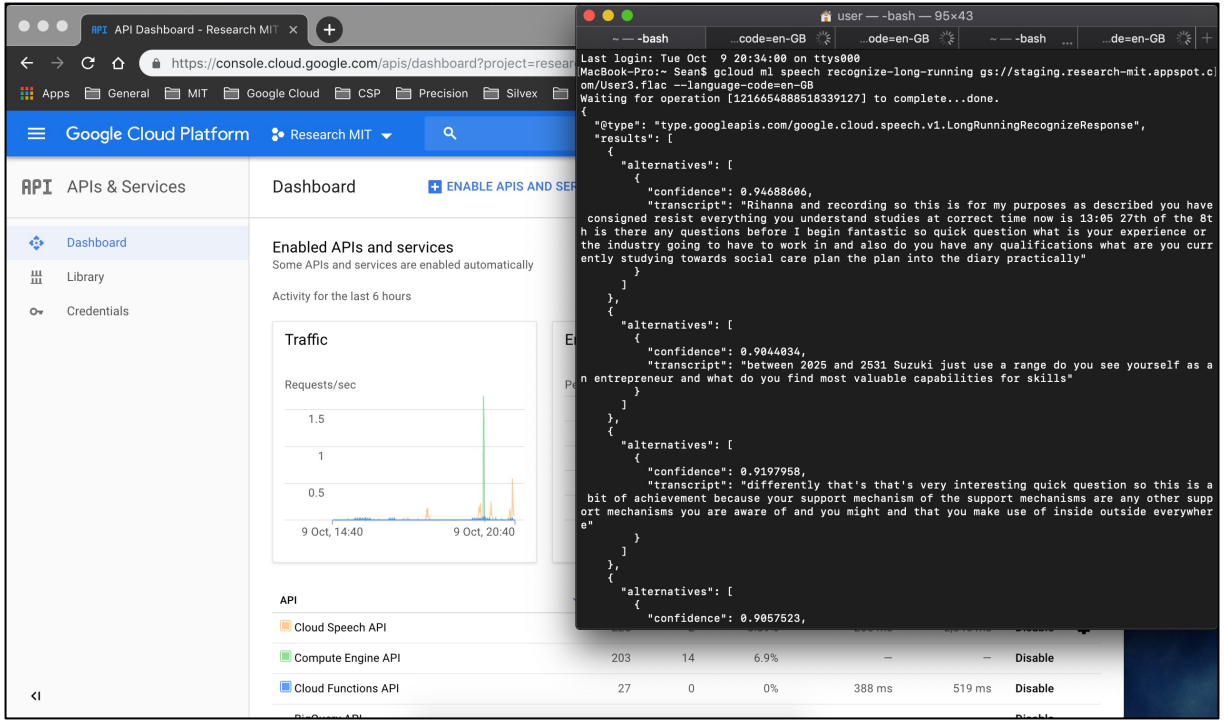
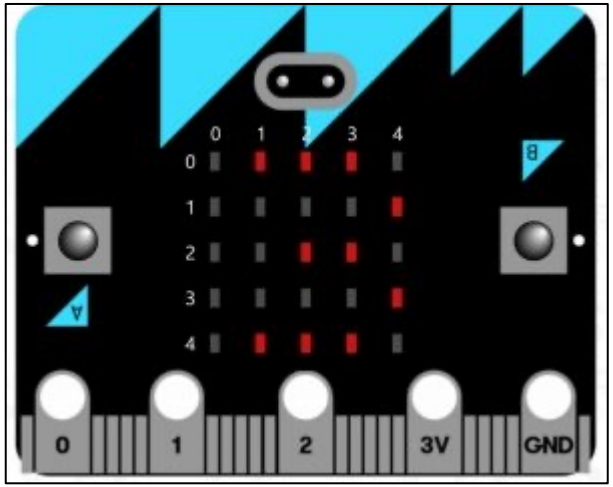
IoT value creation in Digital Humanities Research

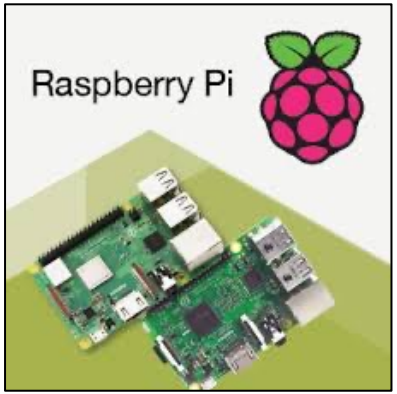


IoT value creation in Digital Humanities Research



IoT Alternatives





IoT Alternatives

Thank You

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