

Exploiting the power of Big Data

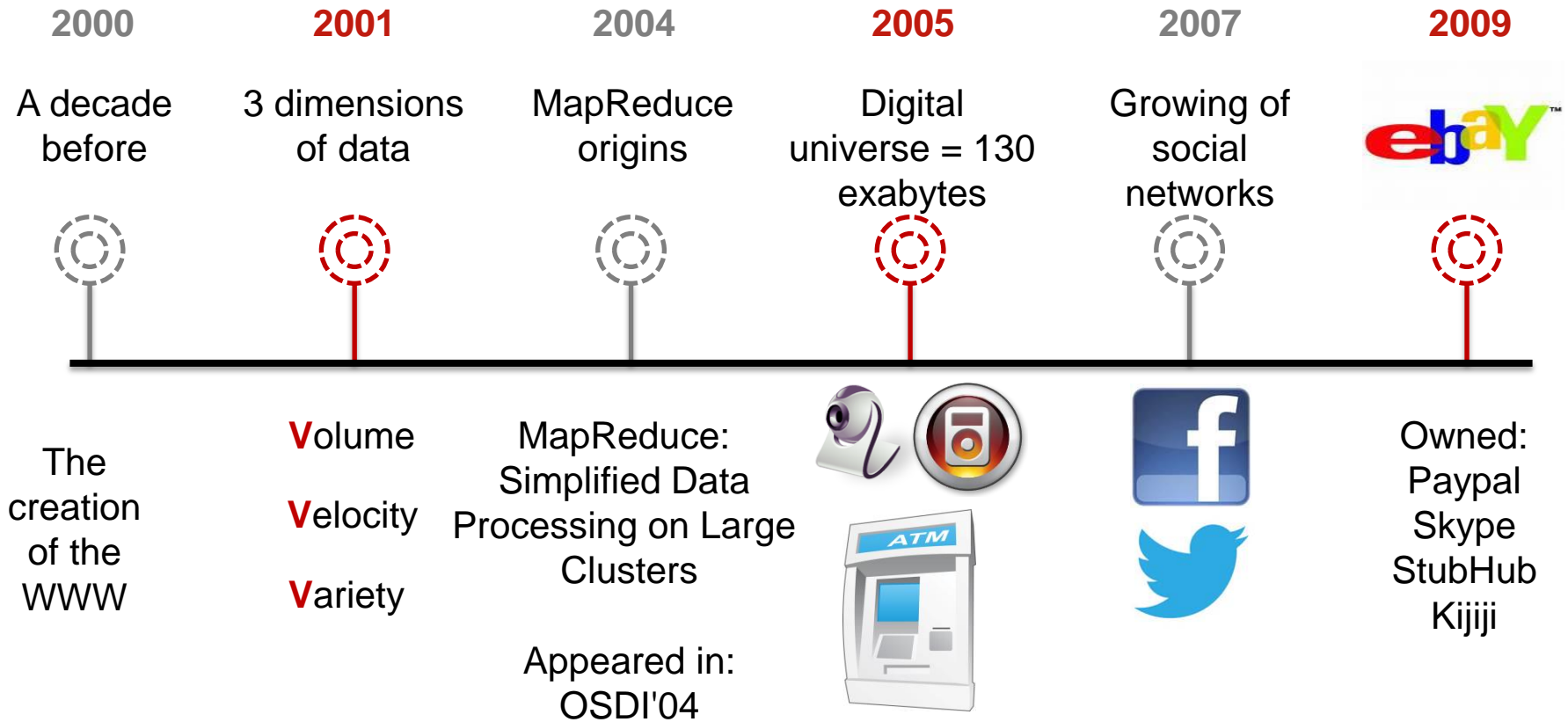
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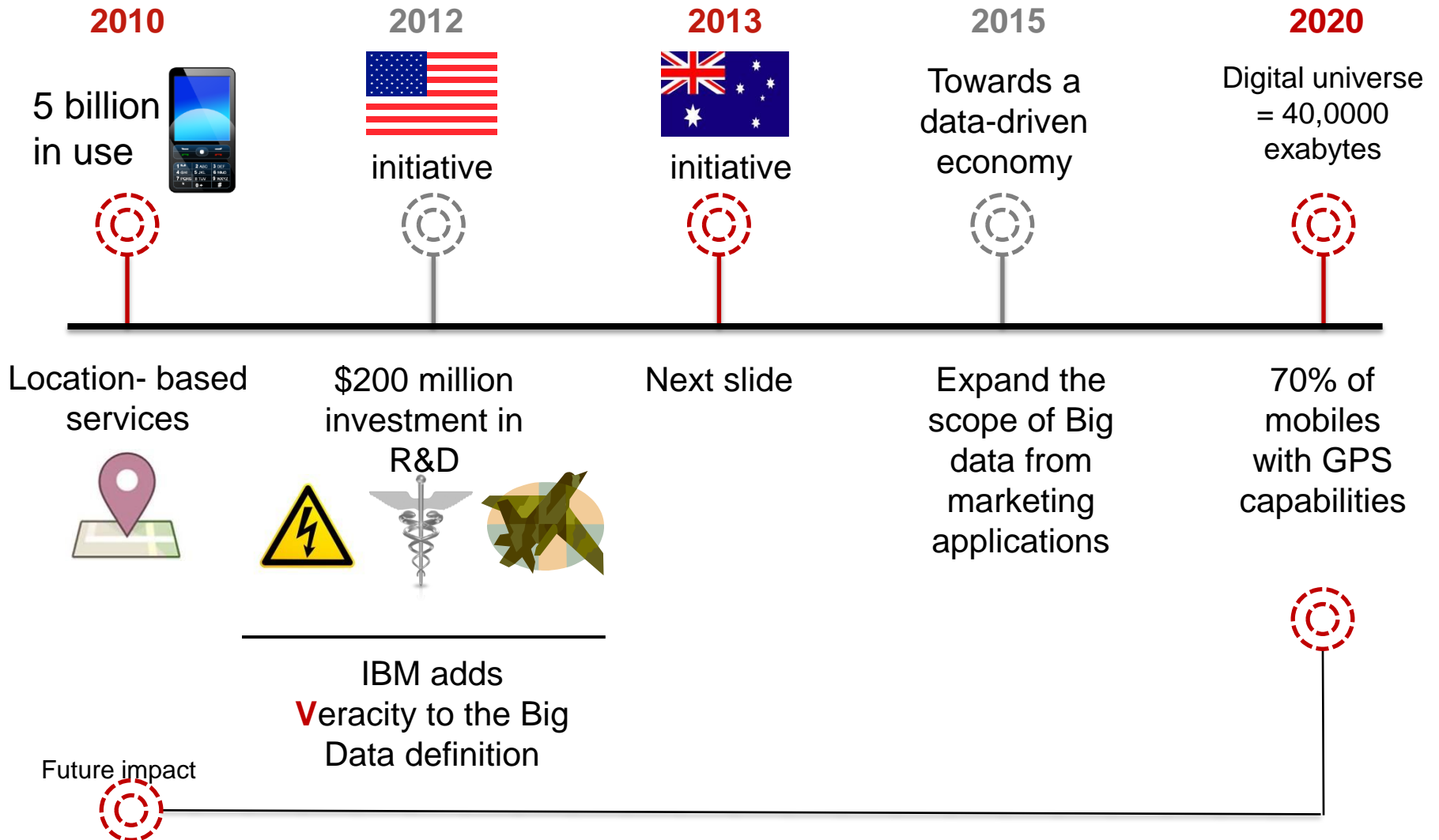
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Timeline of Big Data



Timeline of Big Data



Australian Big Data Initiatives

- How is Big Data visualised in Australia?

*“a supportive technology for the next **10 to 20** years in medicine, urgent response systems, monitoring systems and social media”*

Australian Academy of Science, 2013

*“the opportunity value is estimated in **\$3.8 billion**”*

PwC Australia, 2012

Australian Big Data Initiatives

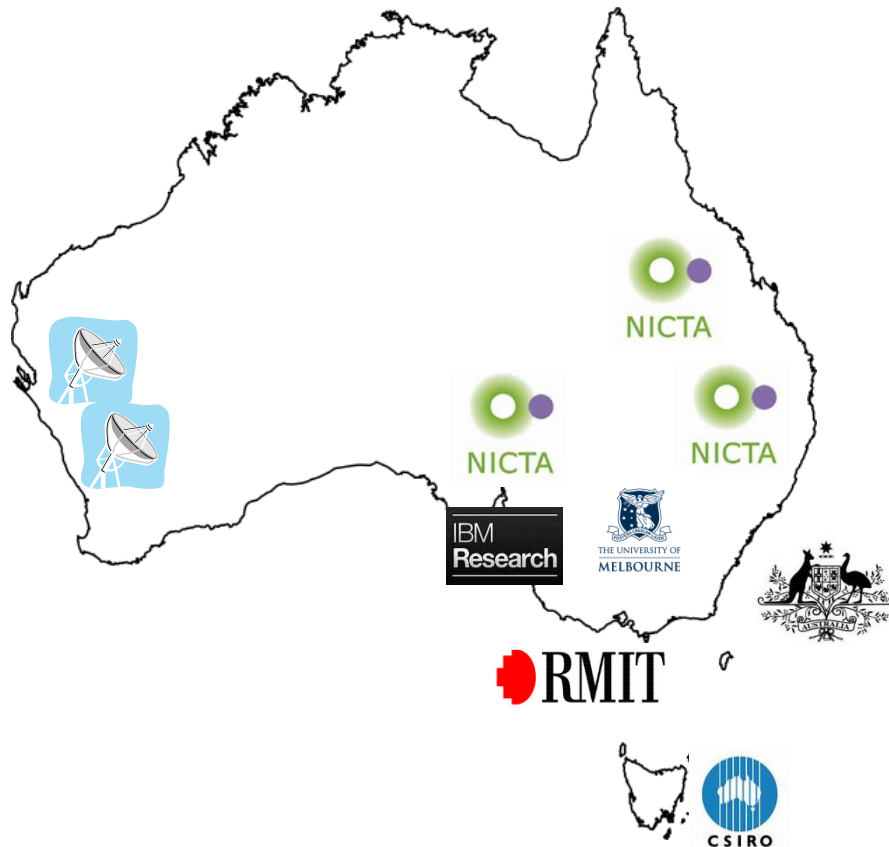
Defence System Innovation
Centre 



- Geothermal exploration
- Data analytics for natural sciences
- Medical sciences



- Smart farming
- Financial analytics
- Situation awareness



Big data
strategy
led by
the ATO

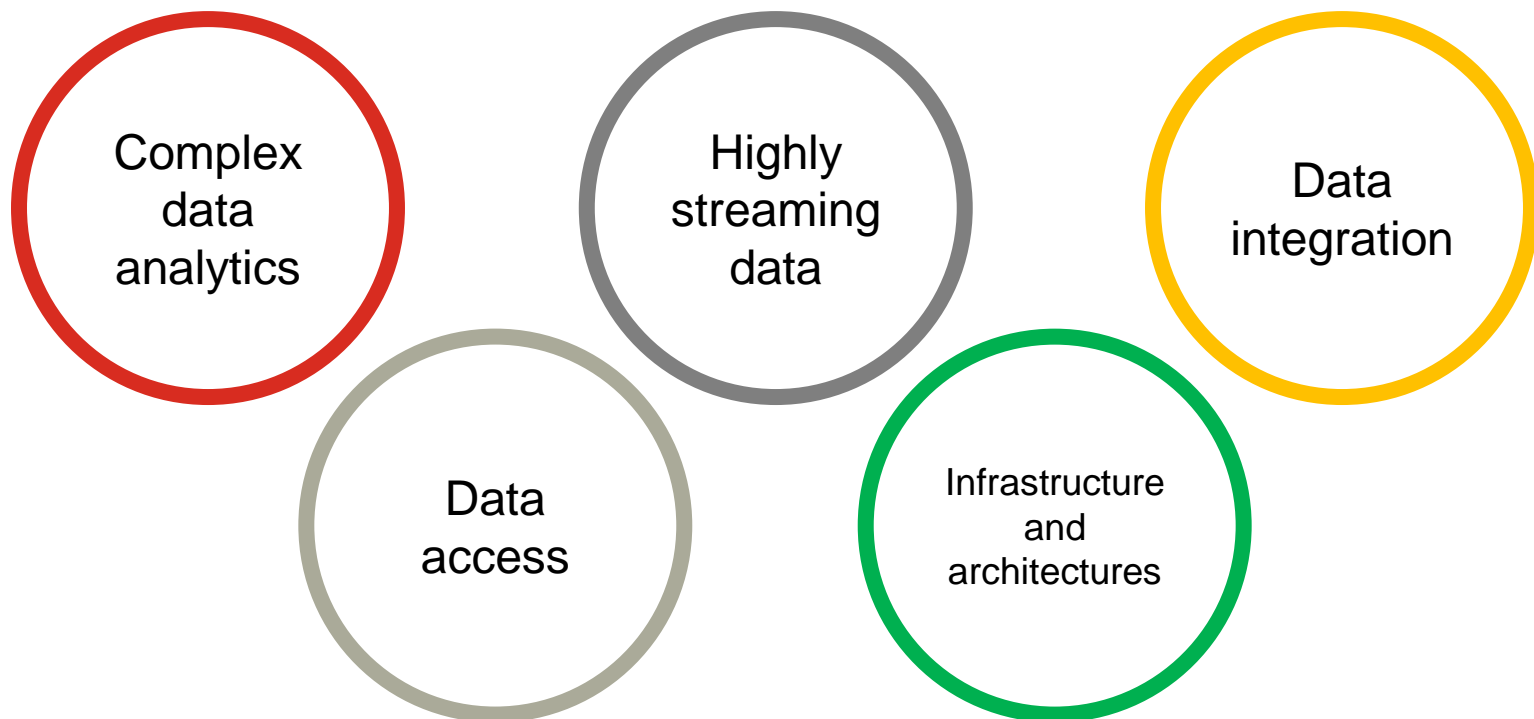
Other universities and companies are planning Big
Data projects

A close up at our research and projects

RMIT AND BIG DATA: FIRST STAGE

We investigate ...

- 5 main areas of research that can empower information within an organisation



We investigate ...

Complex data analytics:

algorithmic techniques for modelling high dimensional data, large graphs, diverse and complex (interrelated) data.



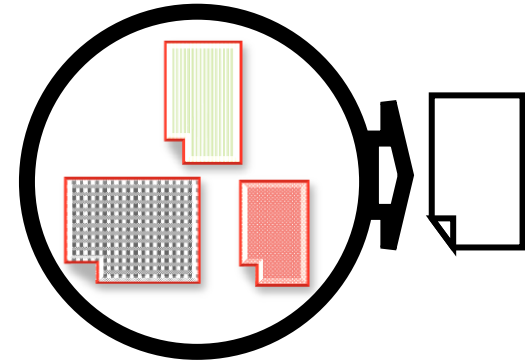
Highly streaming data:

algorithms that efficiently manage streaming data from social networks, positional sensors or mobile app data.

We investigate ...

Data Integration:

semi-automatic techniques that assist users to annotate and subsequently combine data from different sources.

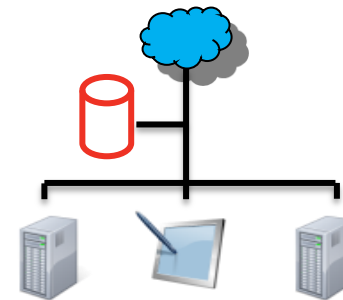


Data Access:

mechanisms that effectively manage security, privacy, provenance, queries

Infrastructure and architectures:

Cloud computing, distributed systems, p2p systems,



Our projects

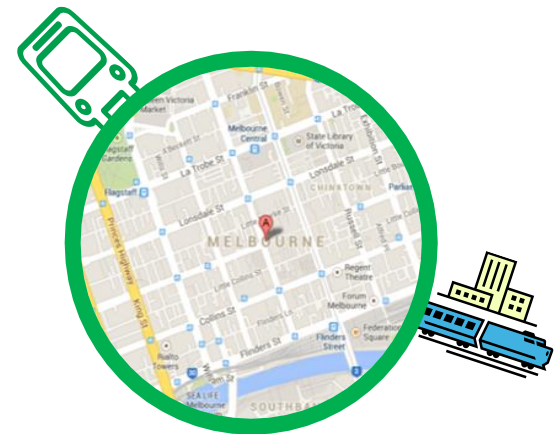
- Healthcare applications

- Monitoring data from elderly patients
- Secure access of electronic health records in the cloud.



- Smart cities applications

- Smart metering of power grids
- Protection against cyber-attacks of monitoring systems.
- Intelligent transportation systems



Our projects

- Resource management
 - Mining industry

A potential application: real-time monitoring of equipment to schedule maintenance problems

- Situation awareness
 - Emergency response systems involves:
 - the *perception* of the elements in the environment,
 - the *comprehension* of the current situation, and
 - the *projection* of future states (prediction)

Privacy and Provenance

- Of special interest wrt legal issues
- Privacy-aware applications
 - Can I change applications to preserve privacy?
 - “Prevent” instead of “react”
 - Example: location is not disclosed; instead send an approximate location
- Data Provenance – the Ws
 - Who, When, Where, What....
 - Data citation

Final remarks

- Several companies struggle with making sense of and creating opportunities from their data (the data economy).
- Big Data is a key factor for enterprises.
- Big Data has a transformative potential in a wide range of areas, and interesting, new, legal issues are raised.