Operationalising Industry 4.0 for Businesses

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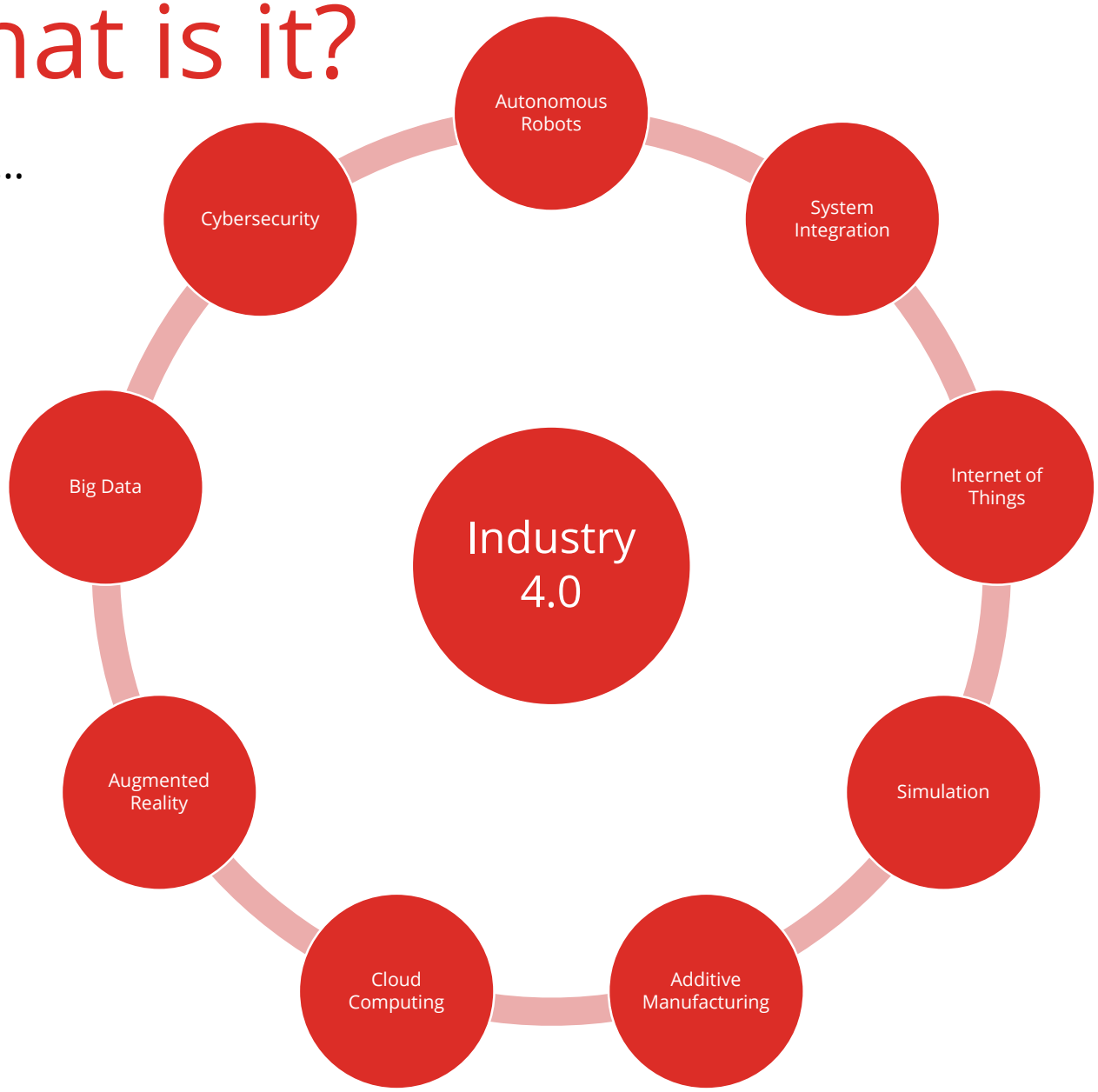
Business Opportunities Through Industry 4.0

Industry 4.0 – What is it?

A confluence of multiple technology sets…



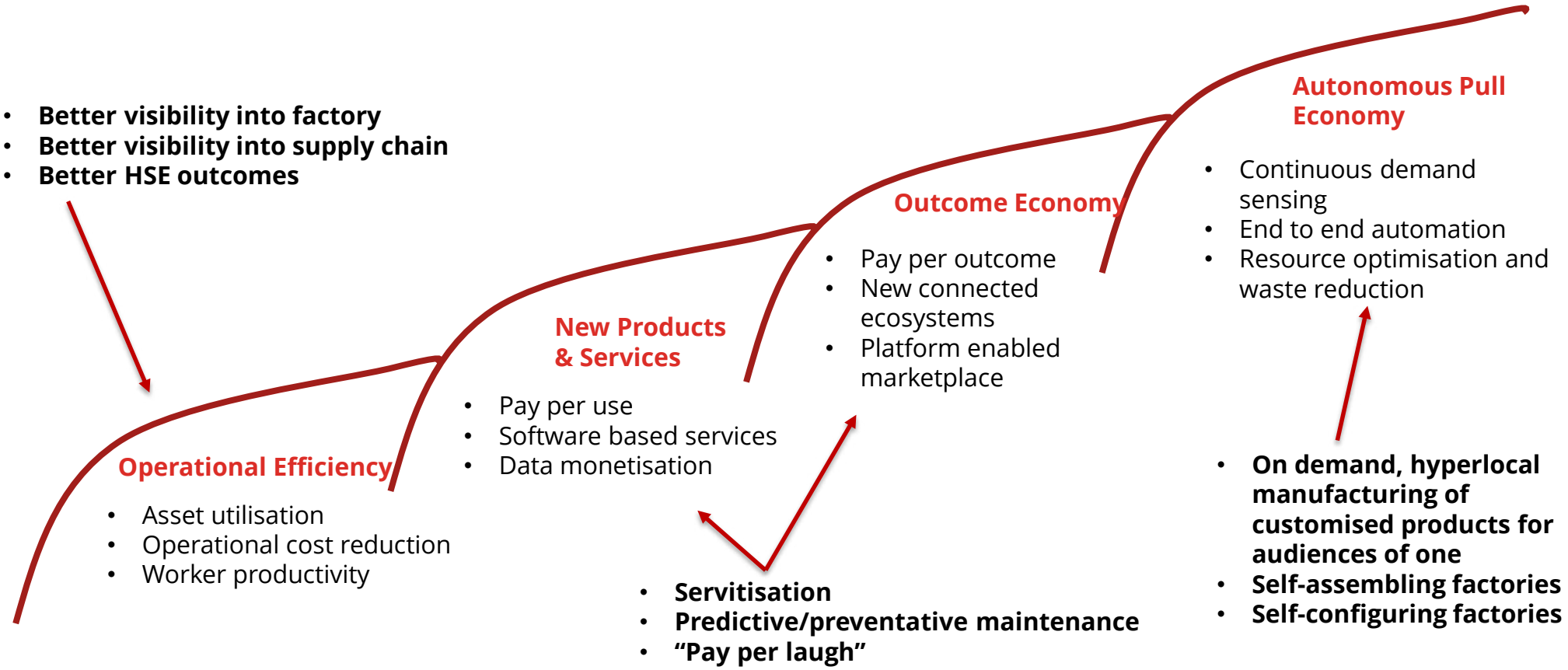
….concepts that denote the digitisation of industrial value chains……

“…the (real-time) intelligent integration of humans, machines and objects towards a management of systems…..”

Changed Value Creation and Capture

		Traditional (Manufacturing) Mindset	Digital (Manufacturing) Mindset
Value Creation	Customer Needs	Service existing needs, reactive	Address real time + emergent needs in a predictive manner
	Offering	Product obsolescence as a function of time	Product refresh via software update, partial physical upgrade, synergistic
	Role of Data	Single data point to define future products	Use data to create product experience, enable services, synergies with other systems
Value Capture	Profit Creation	Sell the next/more of product	Enable recurring revenue
	Control Points	IP ownership, brand, commodity advantage	Personalisation, context, network effects
	Capability	Use existing core competence, resources and processes	Systems thinking, n-sided markets, platforms

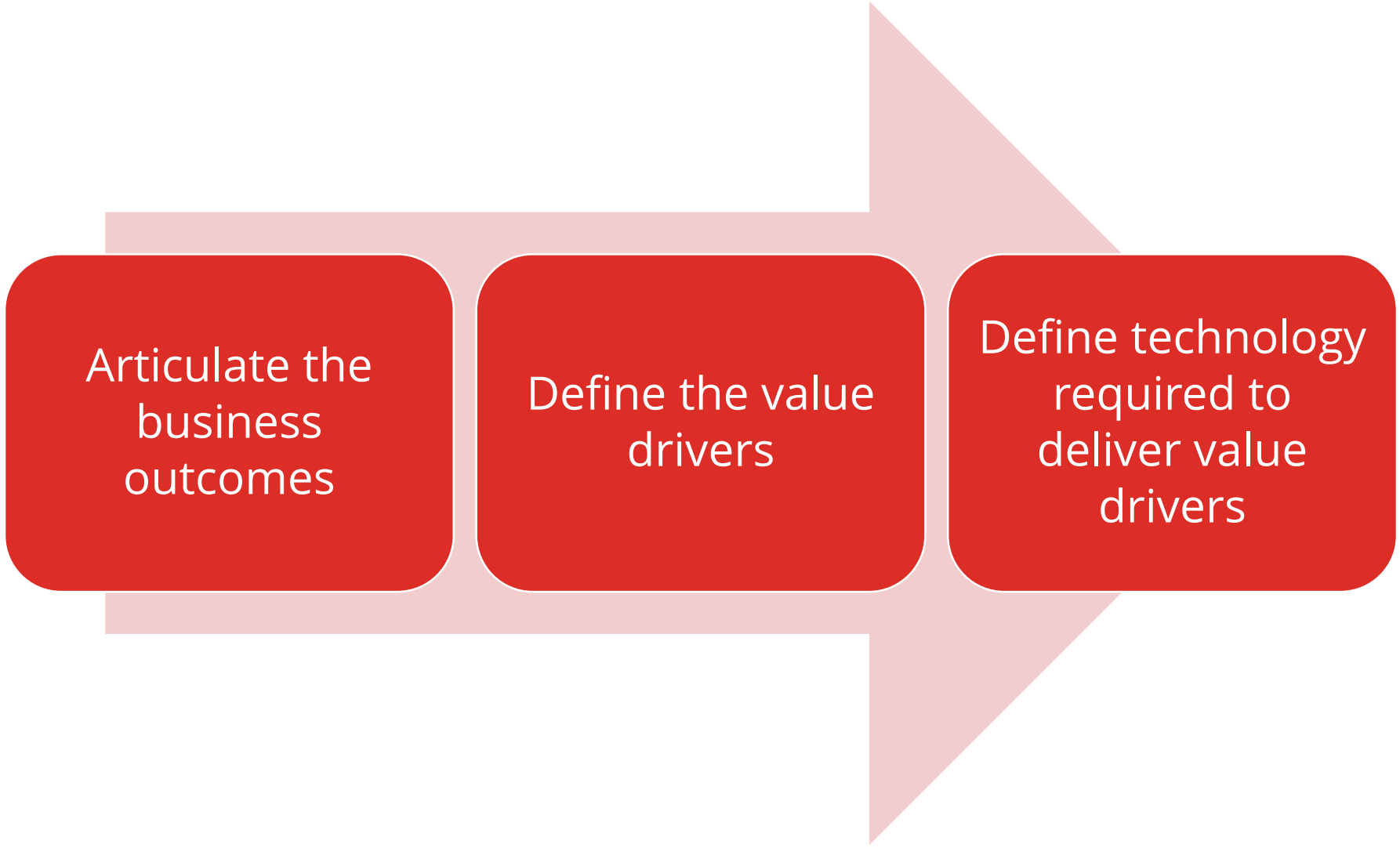
Opportunities arising from Digitisation in Manufacturing



Ok I get it….

…but how do I go about operationalising this….

How to Operationalise This?



How to Operationalise This?

- Process to get information about anatomy of my customer
  - 3D scanning
- Customer specific design
  - E.g. custom algorithm to design joints etc…
- Manufacturing process for lots of 1
- Sensors
- Data Platform
- Analytics

Articulate the business outcomes

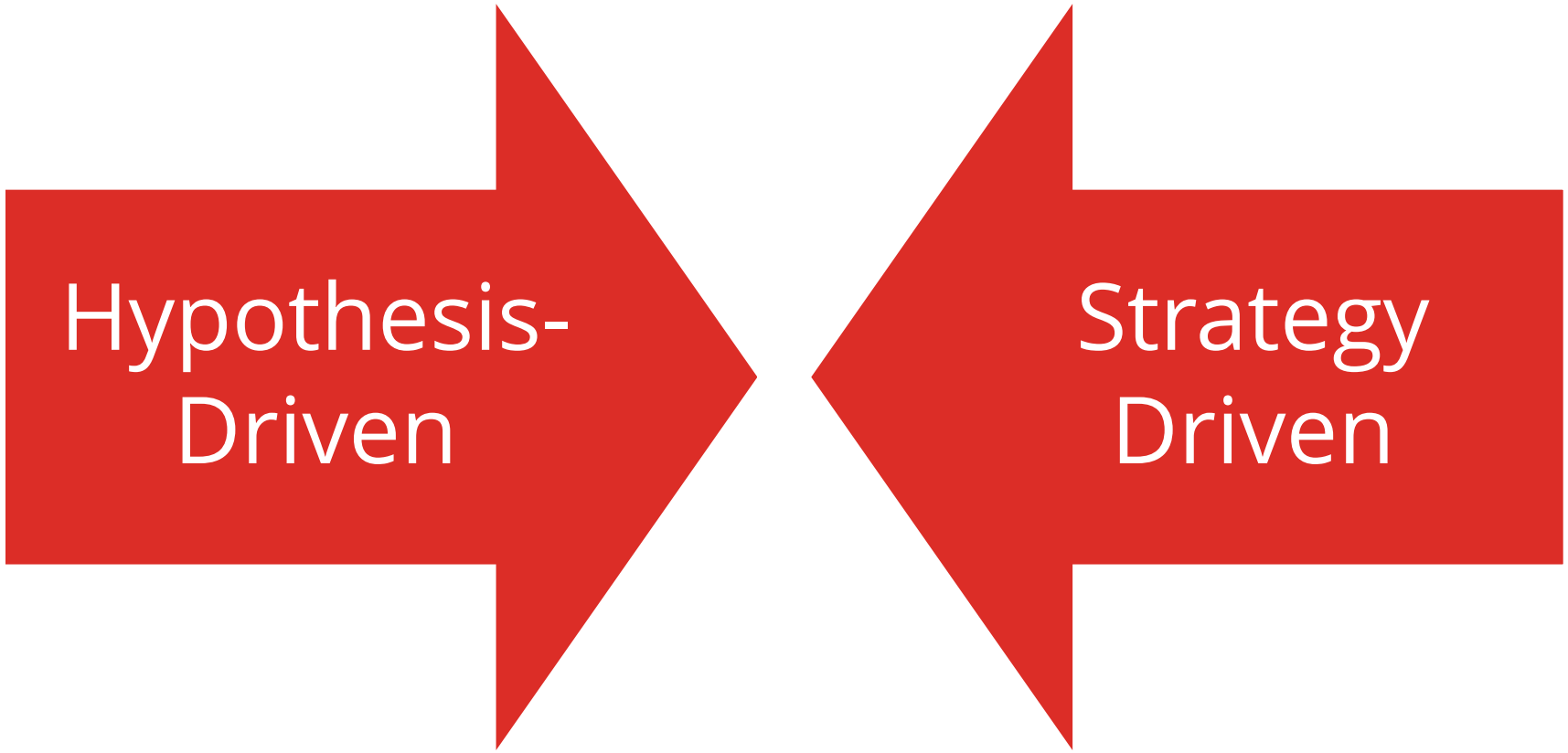
Define the value drivers

Define technology required to deliver value drivers

A new product that:
- Is customised for individual customers
- Allows my customer to get from A to B
- Gives my customer information about his fitness
- …

- Custom frame
- Custom joints
- Connected odometer
- Heart rate monitoring
- Wheels
- Breaks
- ….

Articulating Business Outcomes



Hypothesis Driven Business Outcomes

enabled by Industry 4.0

Hypothesis-Driven: Be a scientist and de-risk

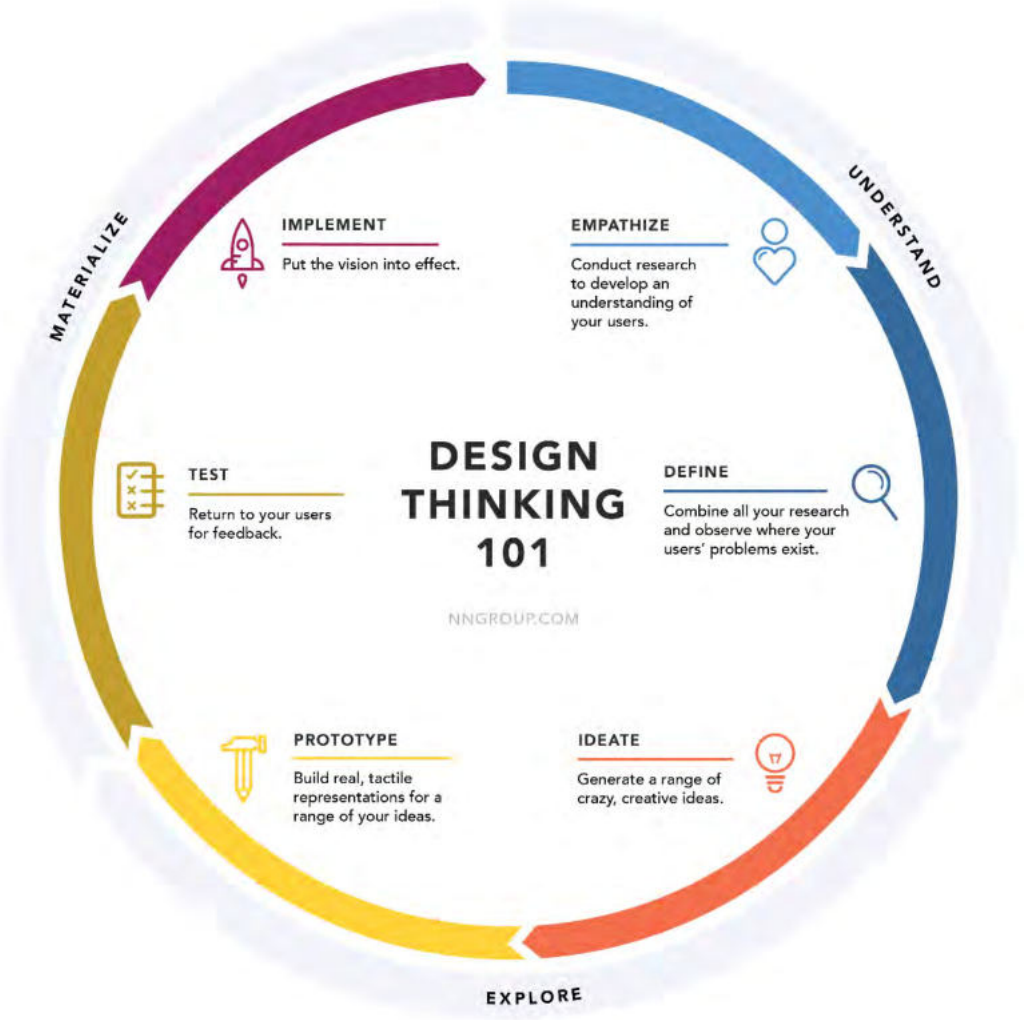
- Very new ideas
- Low company competency/skill set
- Smaller companies
- Left field ideas “that could just be it”
- Ideas where ROI isn’t clear
- Time constraints do not allow you to pursue an idea in house

Be a scientist

- Use rapid ideation, prototyping and testing to experiment

De-risk

- Tap into low cost resources to do so – university collaborations
- Leverage innovation support



https://www.nngroup.com/articles/design-thinking/

Digital Experimentation and De-risking

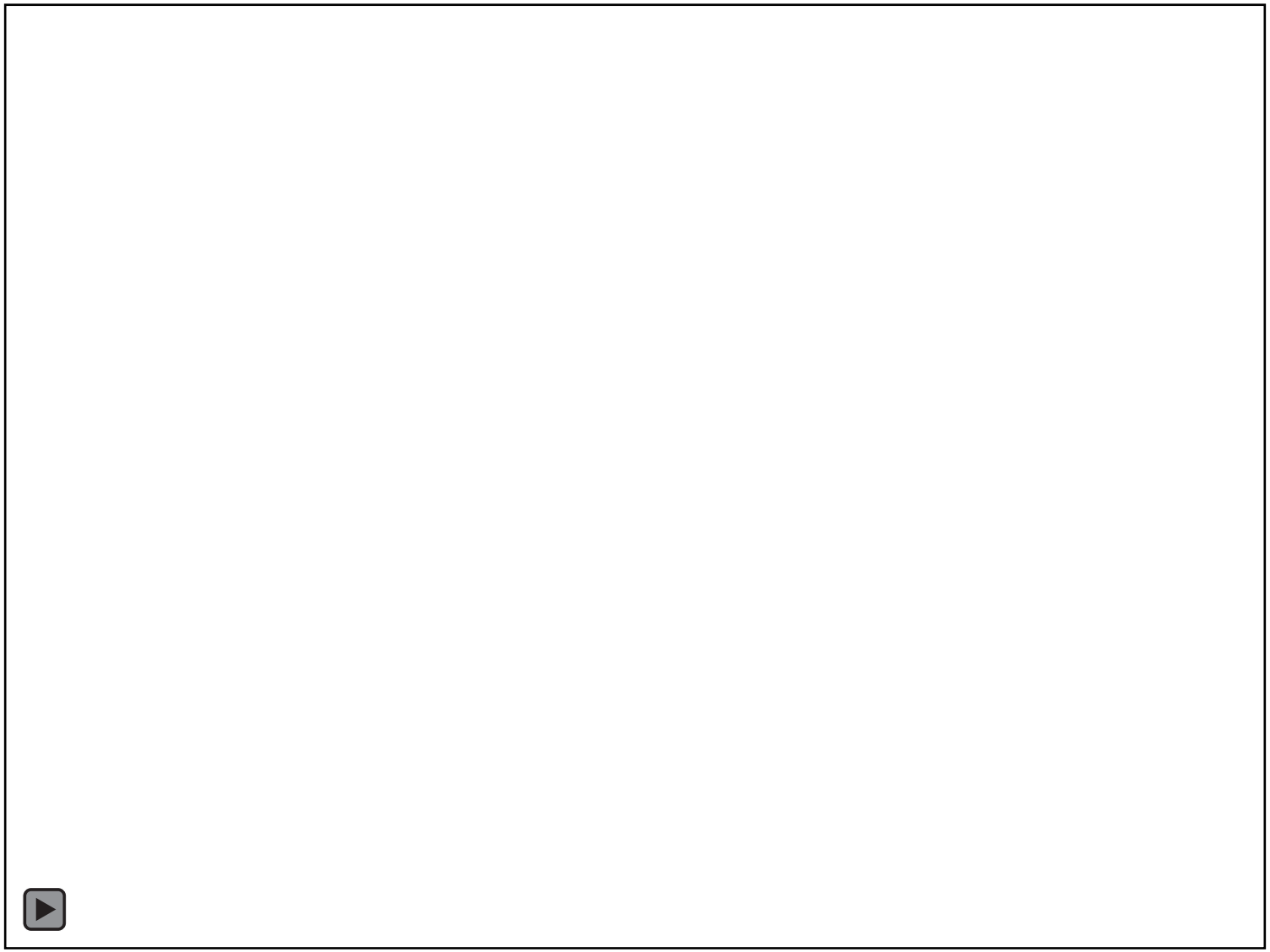
E-Class Tram Re-design

- **Objective: To improve safety, particularly for pedestrians in vicinity of trams**

- **Achieved by:**
  - **Increasing driver sightlines – thinner A-pillars, wider side windows, lower console equipment**
  - **Reducing glare on driver's windscreen**

Courtesy Dr Ambarish Kulkarni, Swinburne

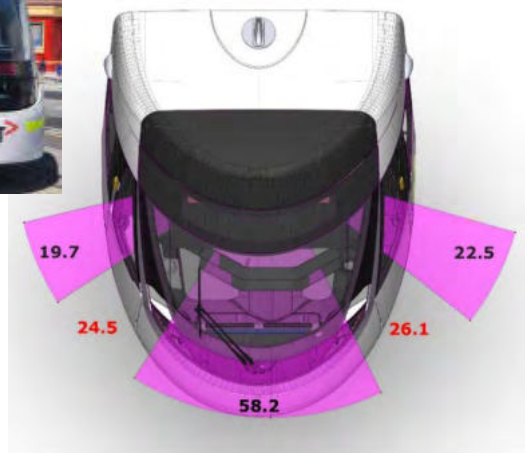
De-risking Through Digital Tools



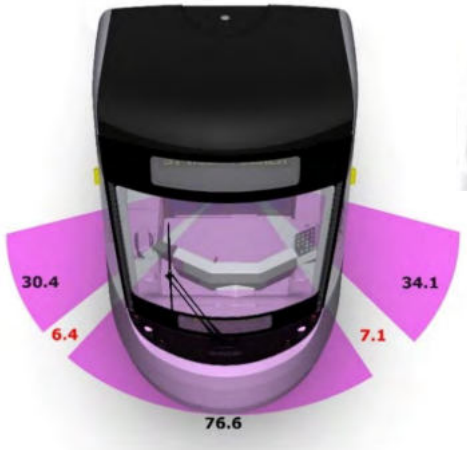
Courtesy Dr Ambarish Kulkarni, Swinburne

Improving Sightlines

CURRENT



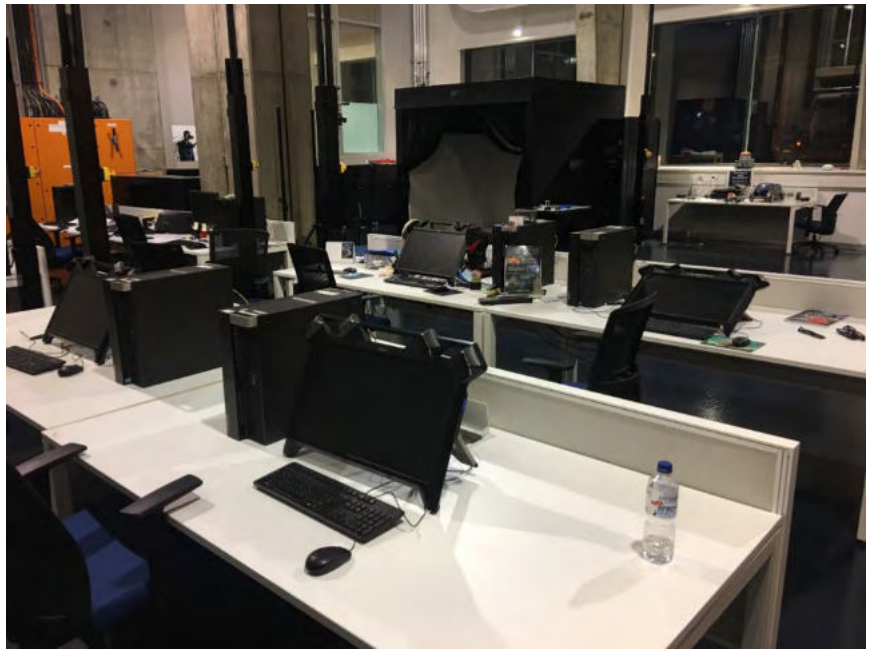
NEW CAB



Courtesy Dr Ambarish Kulkarni, Swinburne

De-risking through University/Industry Collaboration

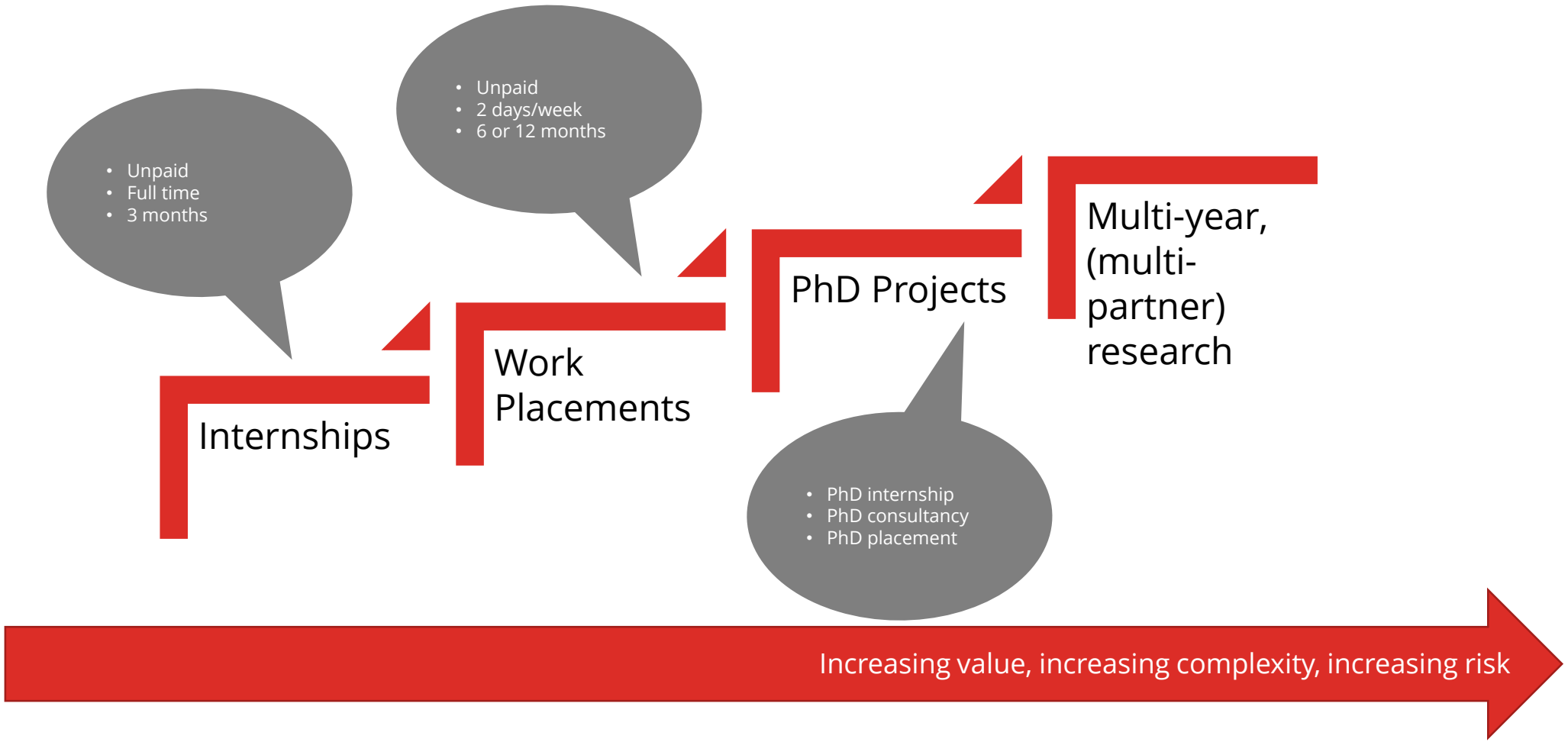
e.g. Factory of the Future



Digital Design and Prototyping

Atom-based Prototyping

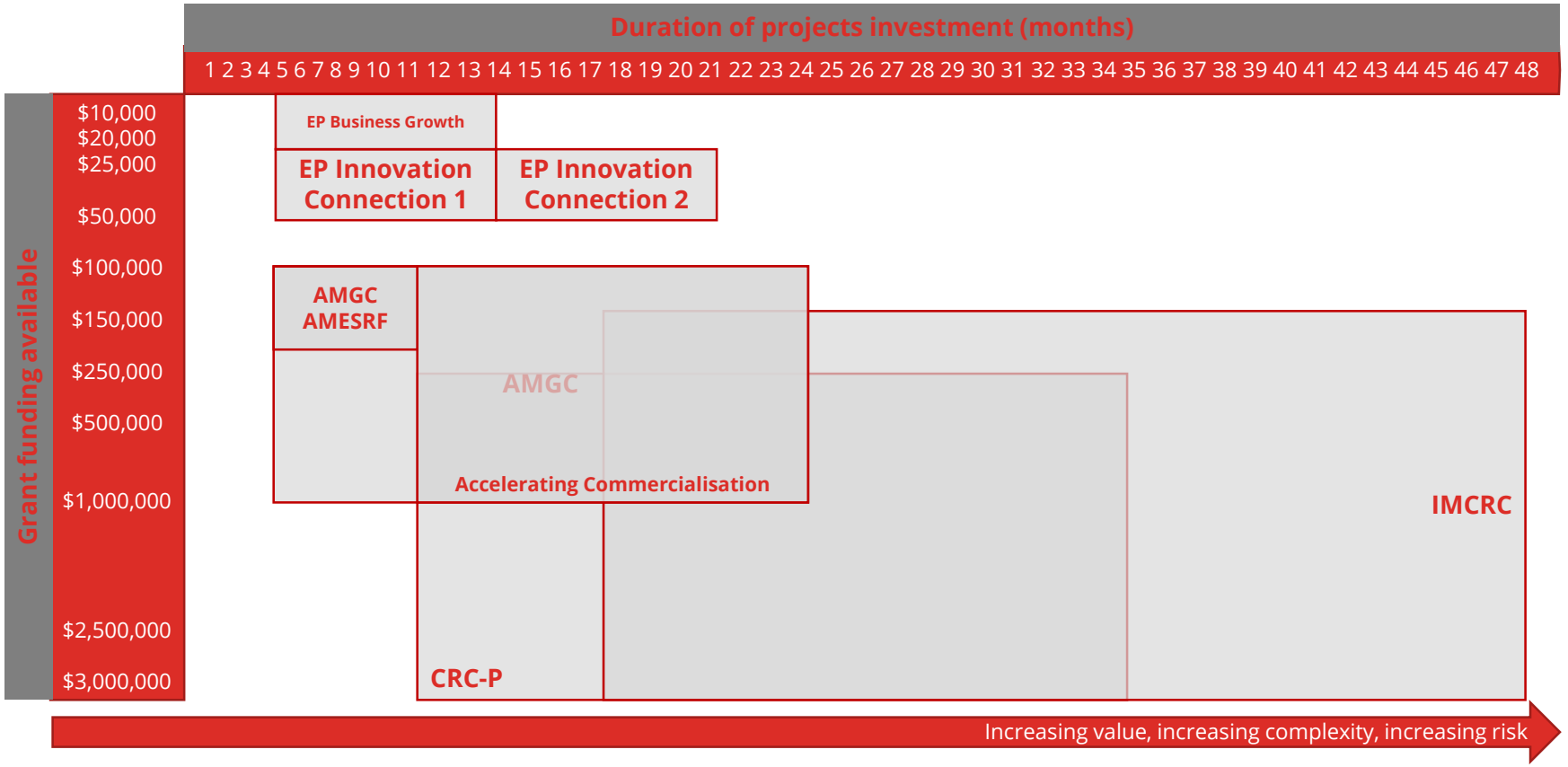
Derisking: Leverage Students and University Collaboration



Leverage Funding

e.g. Commonwealth Funding

Courtesy David Chuter, IMCRC



Strategy Driven Business Outcomes

Enabled by Industry 4.0

Business Aspects

- (Manufacturing) companies do not have digital strategies
- (Manufacturing) companies do not understand business models enabled by digital
- (Manufacturing) companies do not know how to take advantage of IoT/Industry 4.0/Industrial Internet

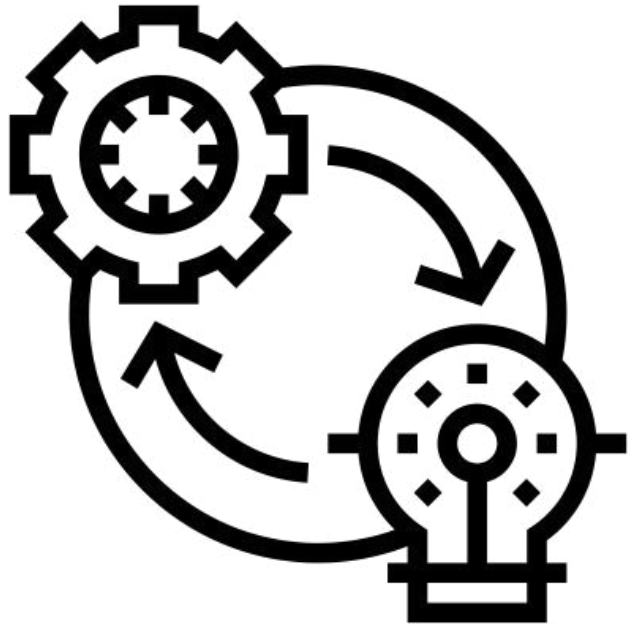
- Lack of skills

cf. Germany:
80 % of value chains digitised by 2020

Strategy provides the rationale…

Without strategy

- No rationale for investment in **people and training**
- No rationale for investment in **new technology**
- No rationale for investment in **R&D**
- No rationale for investment in **Design**
- No rationale for investment in **Prototyping**



Strategy Driven Business Outcomes at Factory of the Future

Playing

Development of technology demonstrators showing business outcomes

(Federal Gov Grant)

- e.g. increased productivity through better resource usage
- e.g. increased productivity through better predictive maintenance
- e.g. competing on differentiated value through products of one for markets of one - reconfigurability

Thinking

Co-creation of Industry 4.0 Strategy with businesses – consulting services

(Vic Government I 4.0 Hub grant)

- Delivery of Innovation Audit
- Delivery of Industry 4.0 readiness assessment
- Development of Industry 4.0 enabled product strategy
- Development of product and technology roadmaps

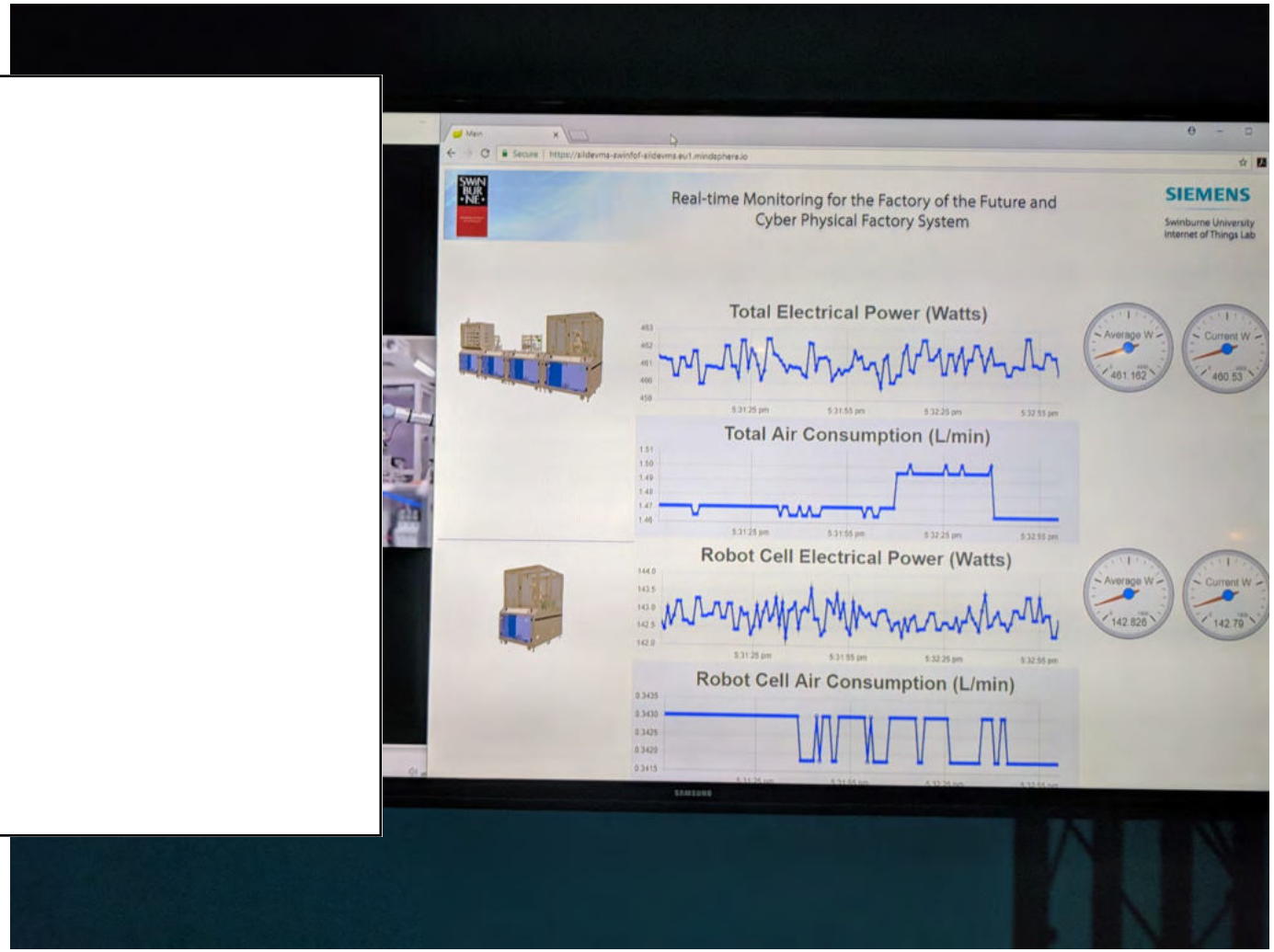
Doing

Training and scalable university engagement models

- Scaled, Industry-led R&D
- Short technical courses
- Industry 4.0 for Leaders
- FoF as a Lab for Industry

Playing – Getting the Conversation Started

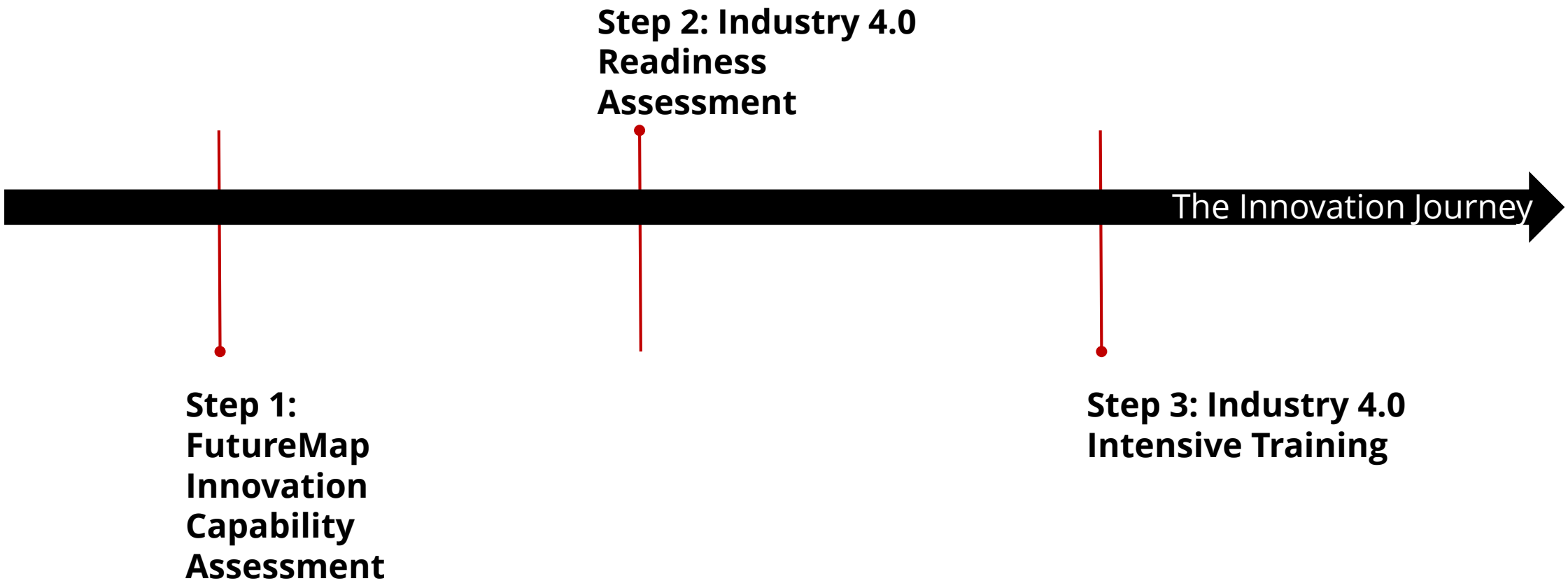
Business Outcome: Better Resource Usage



Thinking

Co-articulation of Industry 4.0 enabled business- product and technology strategy with business

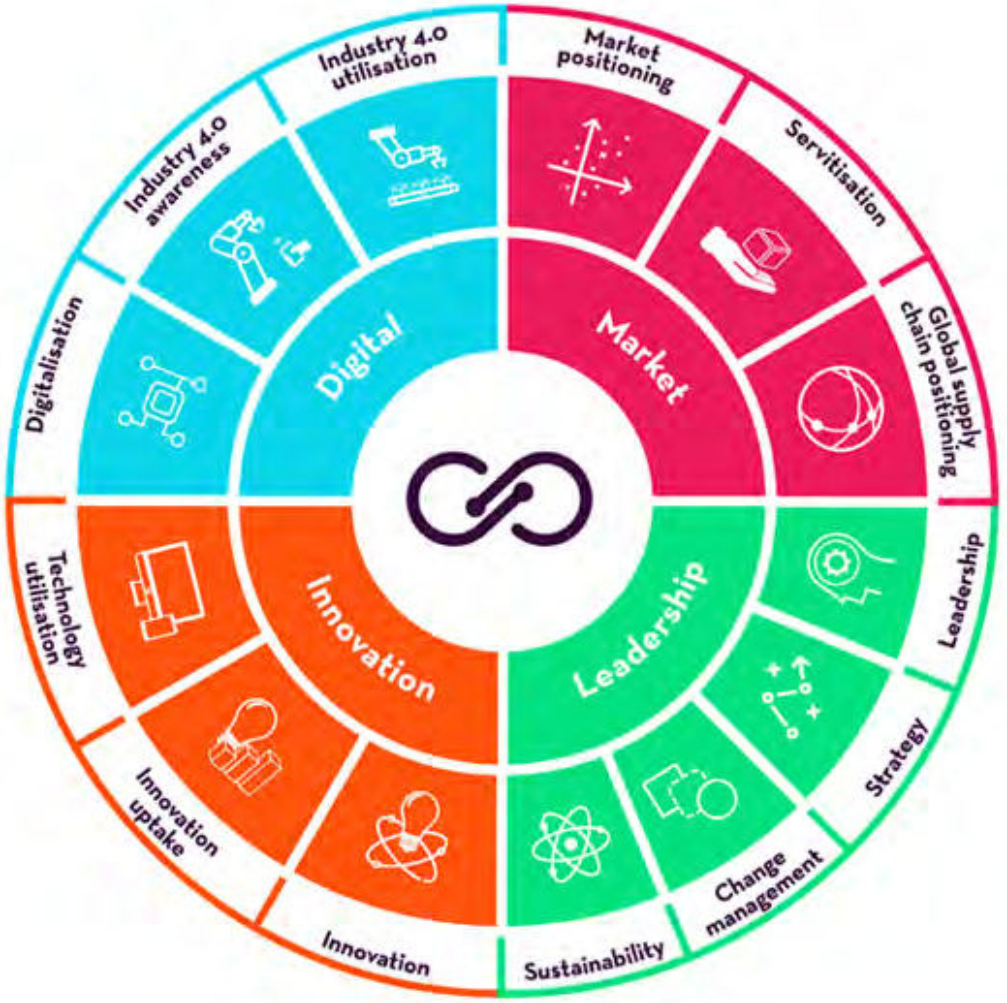
Strategy and Innovation Journeys



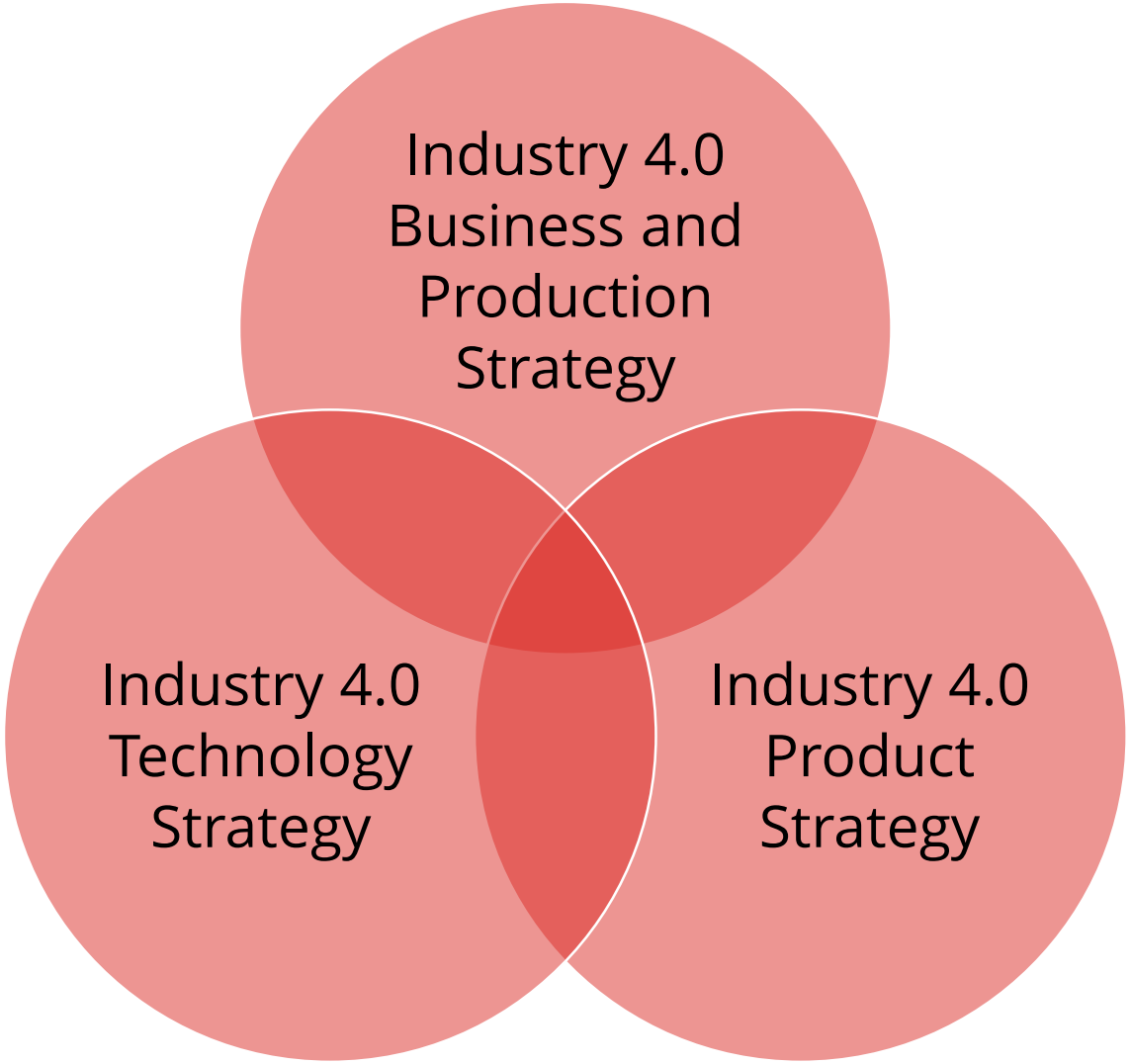
In partnership with IMCRC, Victorian Government

futuremap™

- Market positioning,
- Leadership, strategy and change management;
- Innovation and use of technology; and
- Digital manufacturing (Industry 4.0).



Strategic Approach



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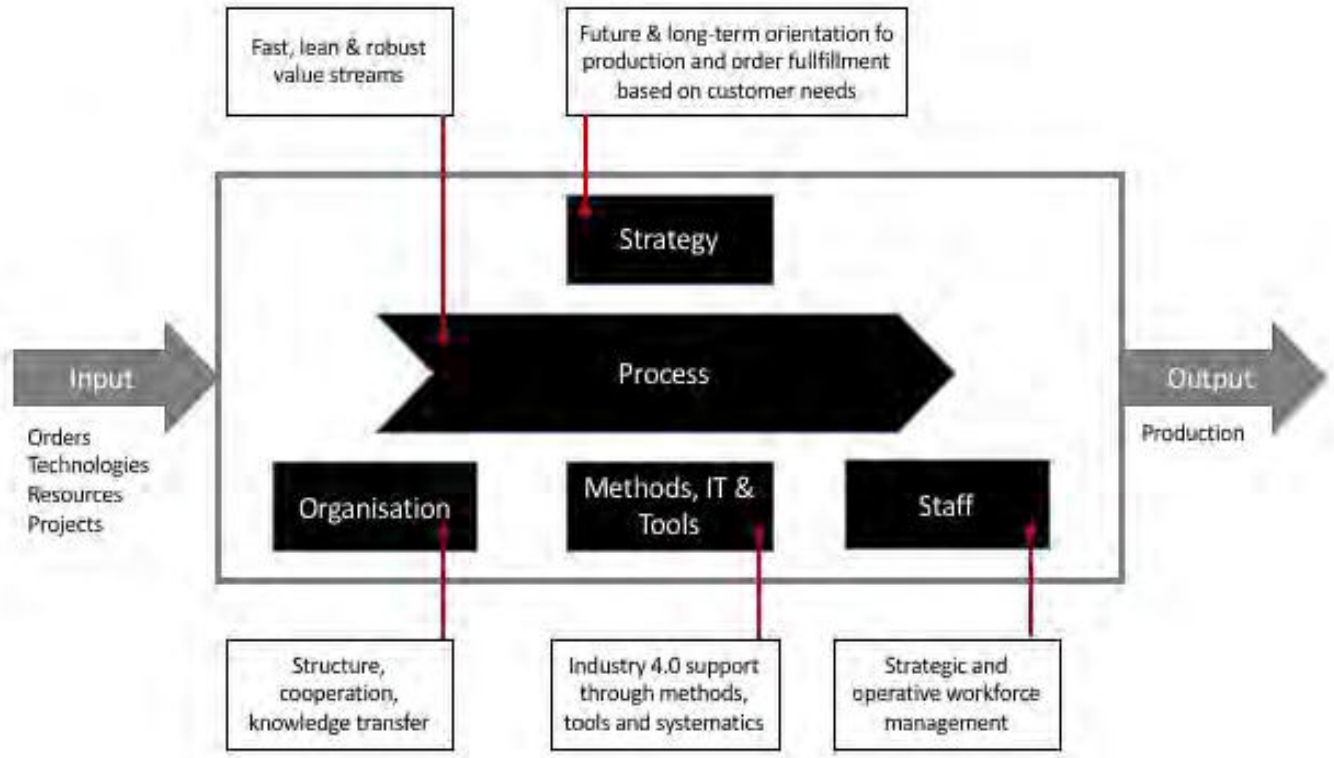
Industry 4.0 Business or Production Readiness

Use a Readiness Assessment Framework



- 31 “Super-Indicators”
- 5 -7 “Sub-Indicators”

Results

Diagnostic of current state of company

Identification of areas for improvement

Indicators

Lean

1. Design of Value Stream
2. Materials Ordering and Supply
3. Implementaton of Continuoous Improvement Processes
4. Workplace Design
5. Leveling of Production and Logistics
6. Process definition and documentation
7. Standardisation
8. Design for assembly and manufacturing
9. Employee Qualification
10. Cultural Awareness
11. Employee Flexibility
12. Quality Consciousness of Employees
13. Total Productive Maintenance

Industry 4.0

1. IT and Cybersecurity
2. Legal Requirements for new technologies
3. Industry 4.0 target planning
4. Information supply at the workplace
5. Technology and innovation management
6. Knowledge exchange and cooperation networks
7. Application of cloud services
8. Company-wide connecting
9. Monitoring and operational data collection
10. IT supported production planning
11. Digital map of the production
12. Machine-to-machine communication
13. Intelligent plants and machinery
14. IT- supported logistics management
15. Real time process control software
16. Human-machine interface
17. Application of simulation models
18. Smart Data

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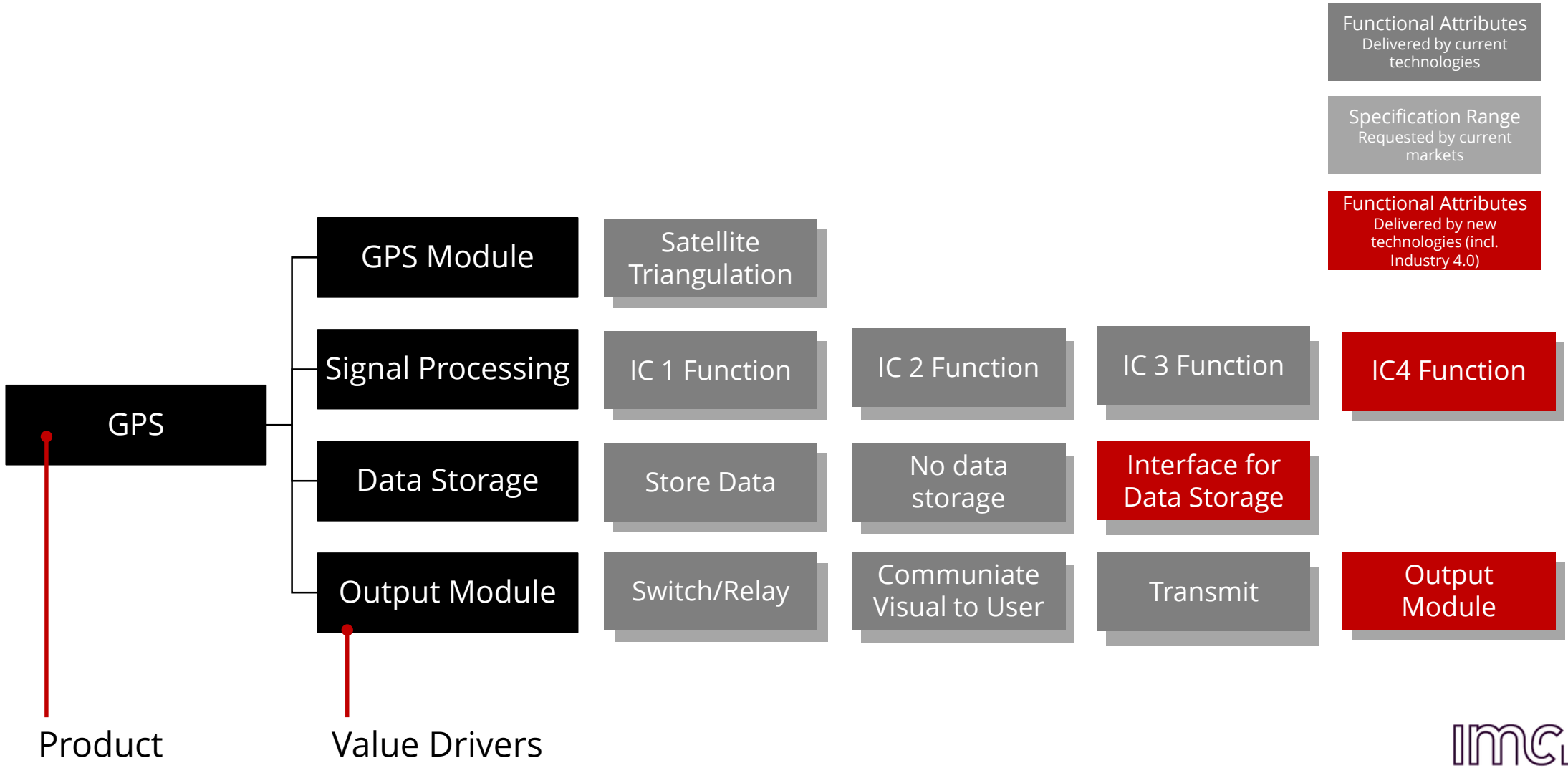
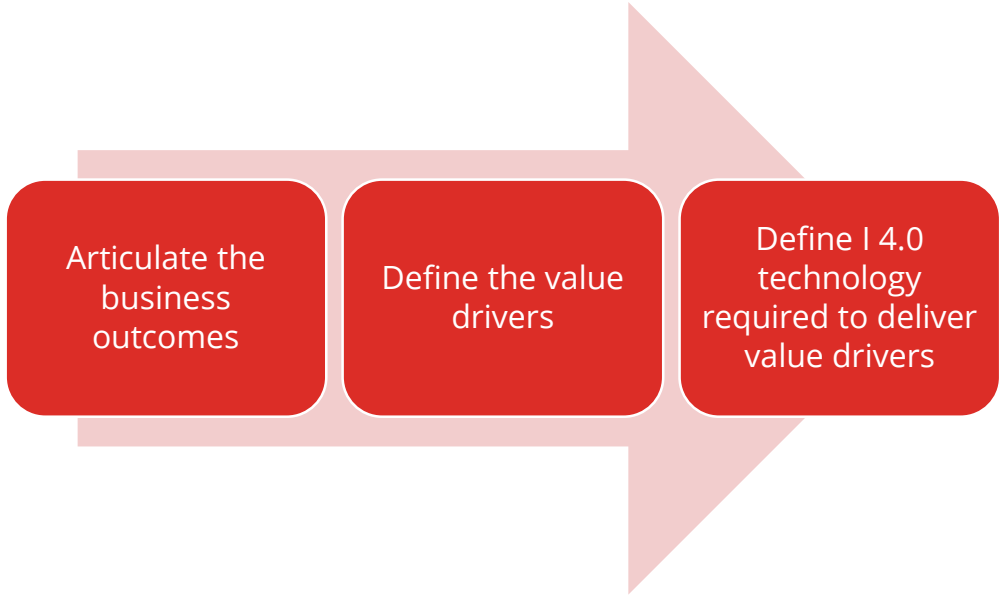
Industry 4.0 Product Management

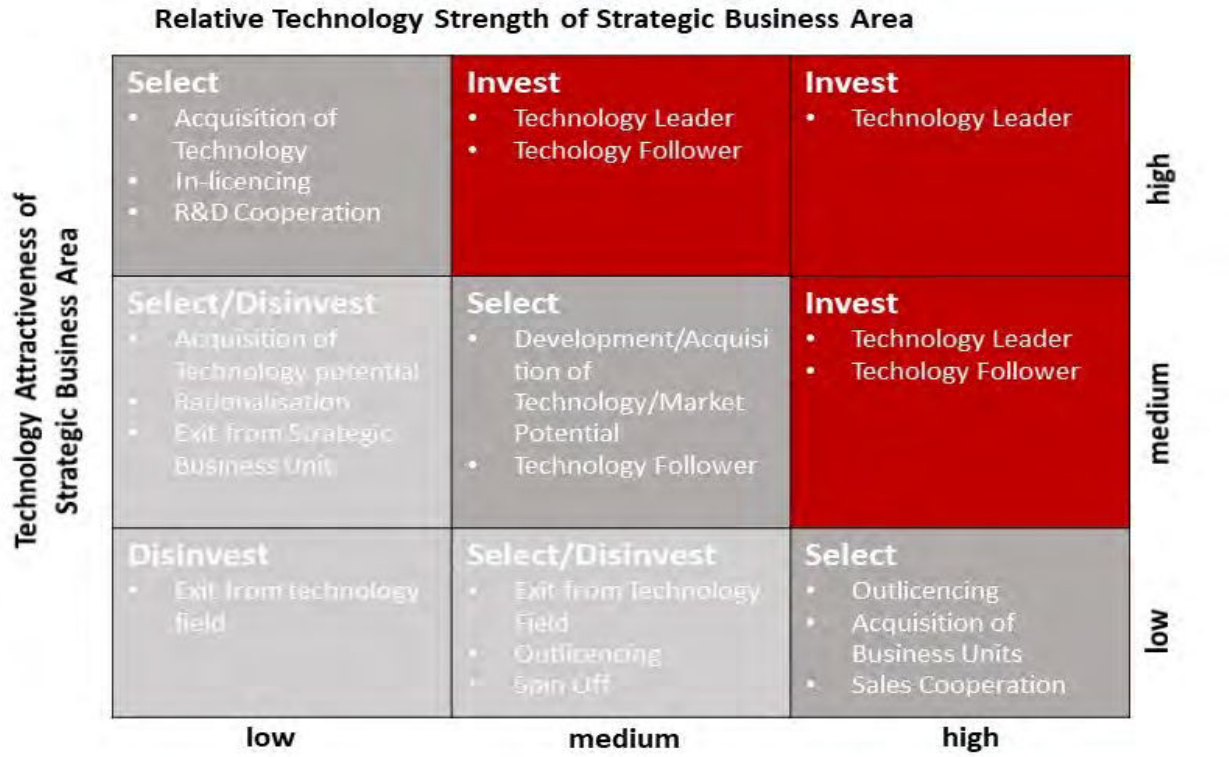


Industry 4.0 Product Management

Step 1 – Hypothesise new I 4.0 enabled value drivers

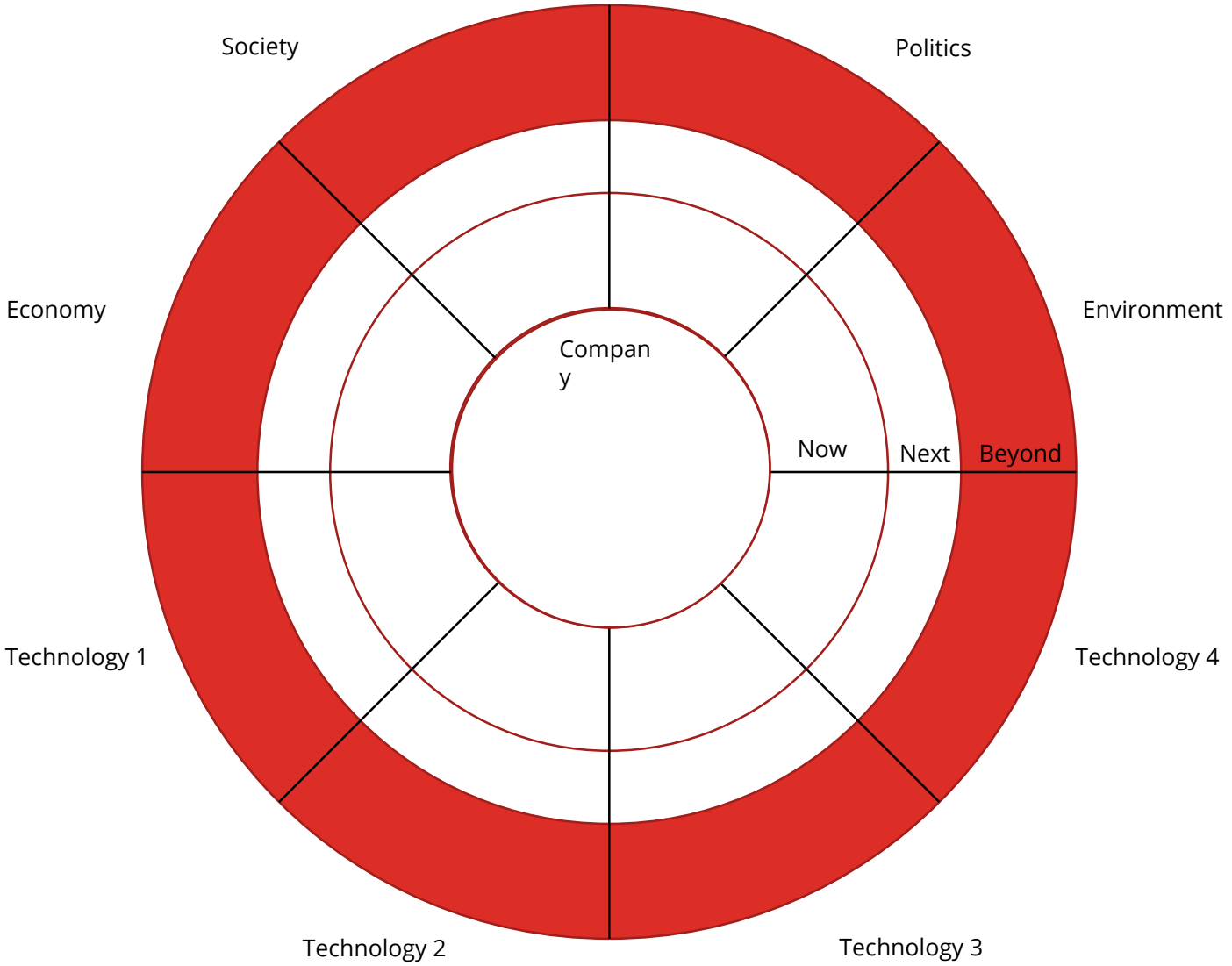


Step 2 – Prioritise using multiple tools (e.g. Pfeiffer Matrix)

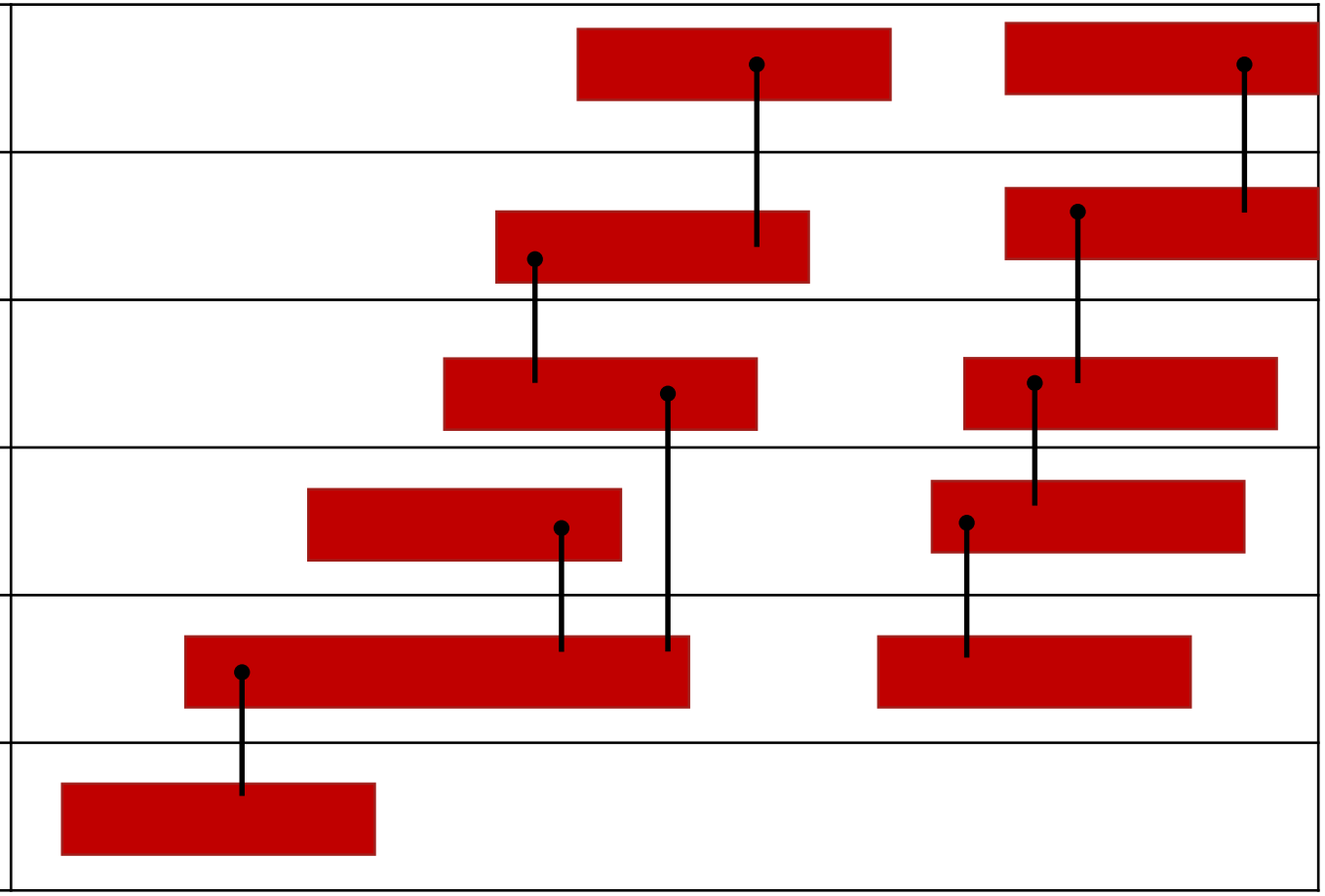


Led by IMCRC

Trend Radaring



Combine With Market Context into Roadmap

Markets	
Products	
Product Development Projects	
Technologies	
Technology Development Projects	
Knowledge & Competencies	

Doing

De-risked Innovation Projects and Training

https://www.minister.industry.gov.au/ministers/karenandrews/n 90%

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Minister for Industry, Science and Technology

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Testlab pilot program prepares for revolution

21 December 2018

A new program designed to prepare businesses for the fourth industrial revolution will take place in six selected Australian universities.

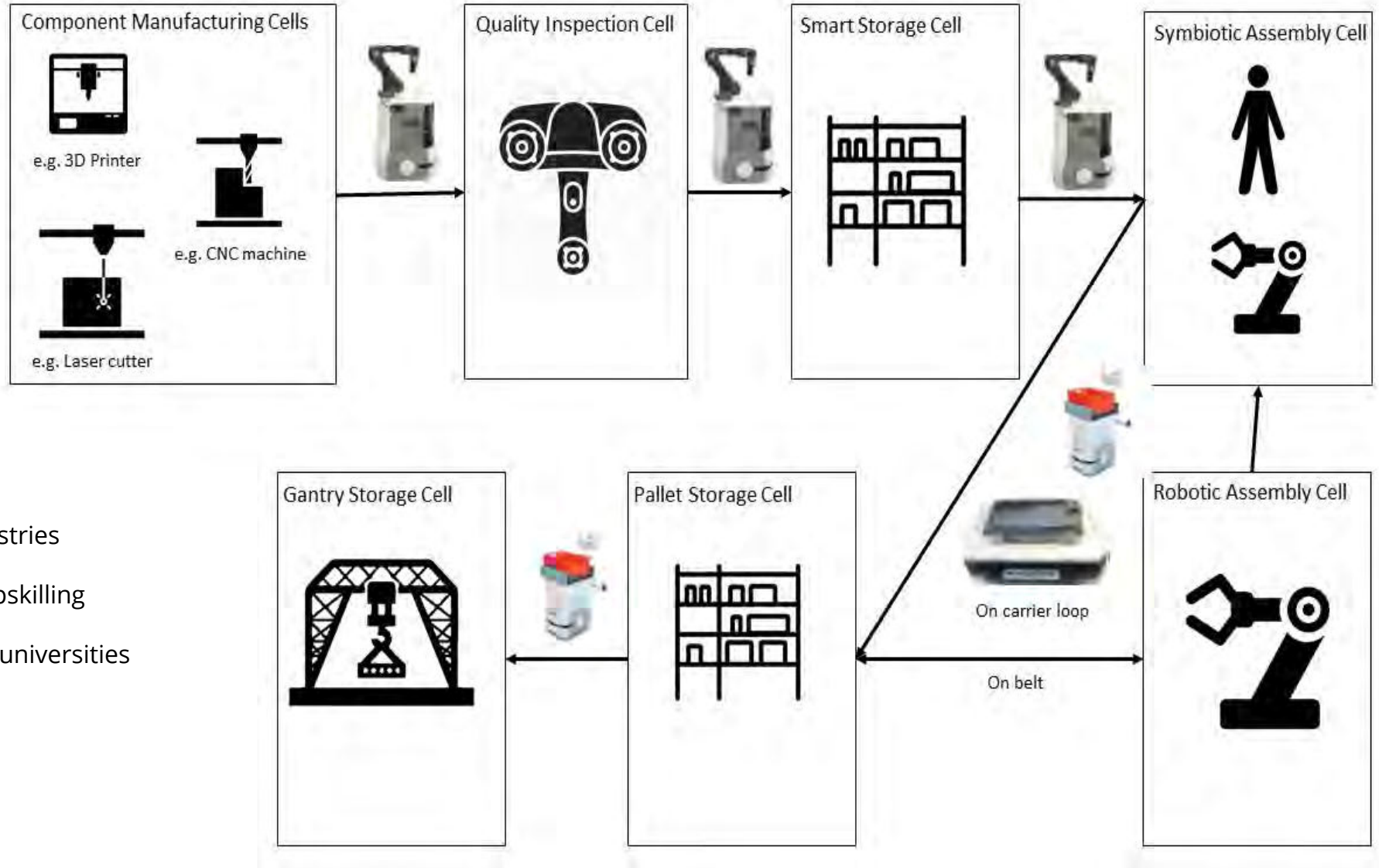
The University of Queensland, the University of Technology Sydney, the University of South Australia, the University of Western Australia and Swinburne University of Technology have been chosen to participate in the pilot program.

These institutions join the University of Tasmania, which has already been allocated funding to participate in the program.

Ministers

Senator the Hon Matt Canavan
The Hon Karen Andrews MP

An Open Demonstrator, Industry Outreach, Teaching and Research Platform for Industry 4.0



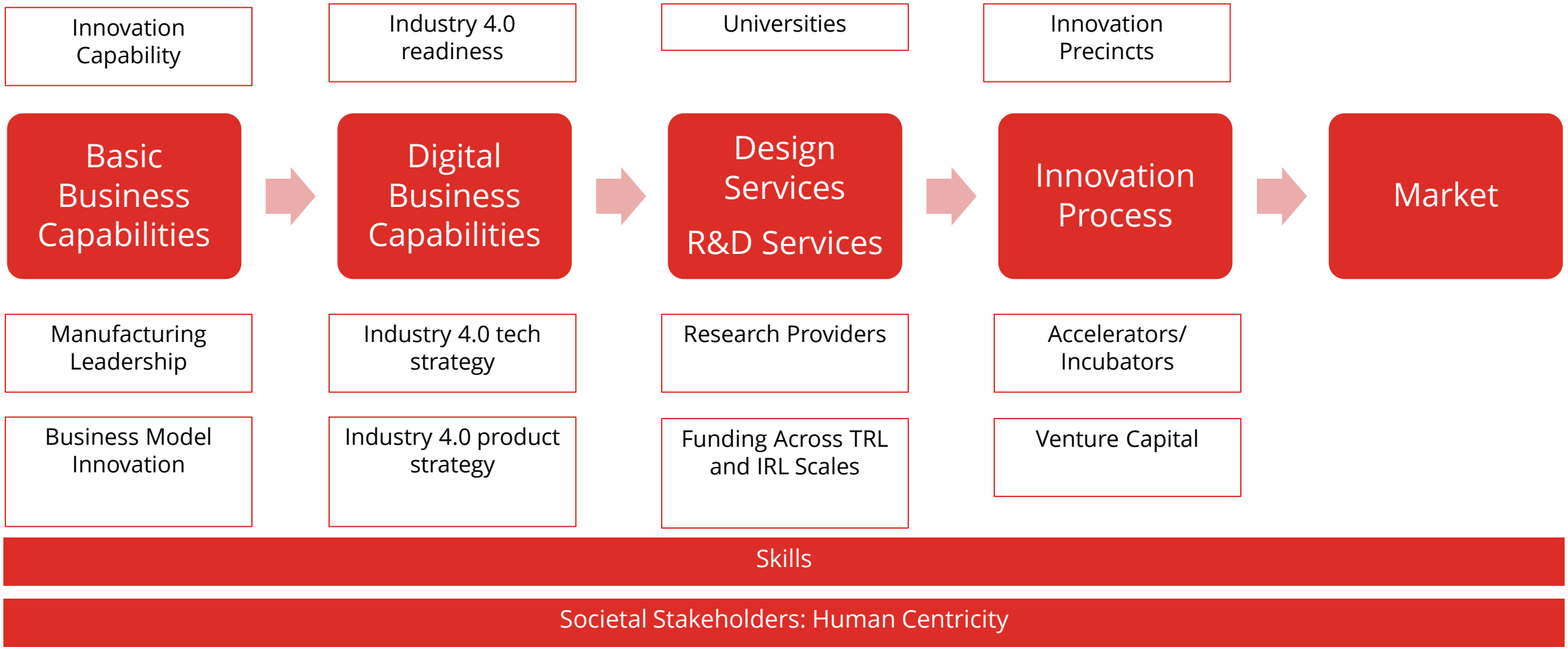
Co-creation with industries

Empowerment thru upskilling

Inclusion : network of universities

An Open Demonstrator, Industry Outreach, Teaching and Research Platform for Industry 4.0

In Summary


Innovation Capability
Industry 4.0 readiness
Universities
Innovation Precincts
Basic Business Capabilities
Digital Business Capabilities
Design Services
R&D Services
Innovation Process
Market
Manufacturing Leadership
Industry 4.0 tech strategy
Research Providers
Accelerators/ Incubators
Business Model Innovation
Industry 4.0 product strategy
Funding Across TRL and IRL Scales
Venture Capital
Skills
Societal Stakeholders: Human Centricity

Thank you!

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