

Phaal Model in Technology Management

Technology Management Committee

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Who is Phaal?!

Dr. Robert Phaal

- Cambridge University (1997- Now)
 - Department of Engineering
 - The Institute for Manufacturing
 - Centre for Technology Management
- PhD in computational mechanics
- Research
 - Strategic Technology and Innovation Management
 - Technology road mapping and evaluation
 - The emergence dynamics of technology-based industry
 - The development of practical management tools and toolkits



Technology Management Framework

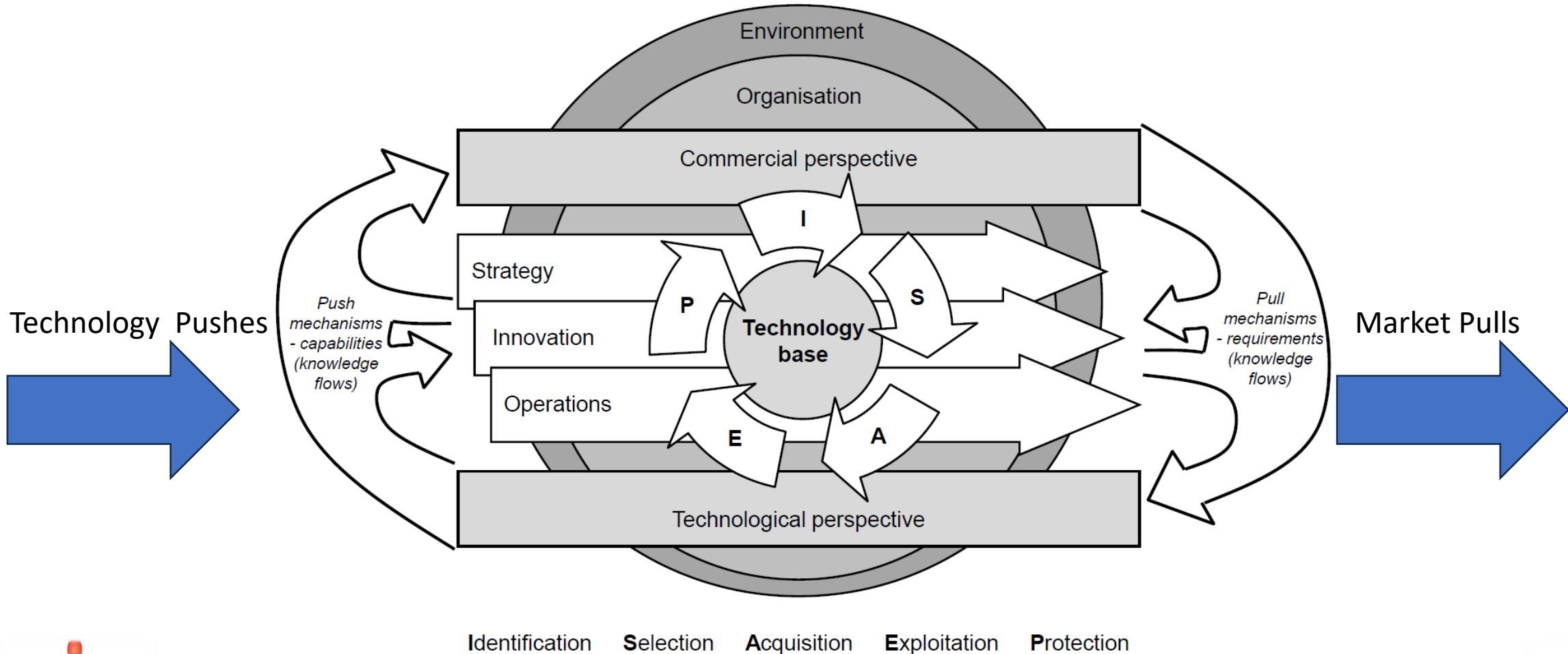


Fig. 1 Technology management framework

Technology Management Framework

Technology roadmapping *Two extremes*

1. Market 'pull'

- How to reach a goal?

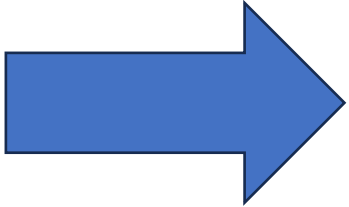
- Planning
- Market focus
- Assumes product market opportunity
- Deterministic
- Convergent
- Customer driven

2. Technology 'push'

- What opportunities could arise?

- Technology focus
- Looking for opportunities
- Open ended
- Divergent

Technology Pushes



Market Pulls

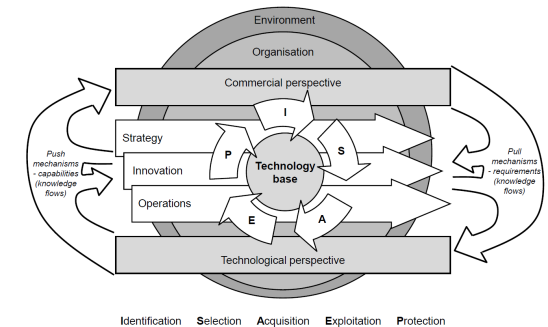
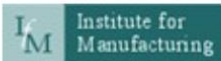
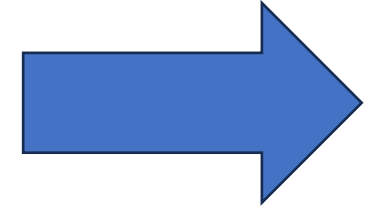


Fig. 1 Technology management framework

Phaal Model

Activities

- *Identification* of technologies that are not currently part of the firm's technology base, but may be important in the future (for example, by attending conferences, reading journals, visiting trade fairs, questioning suppliers and conducting pure research).

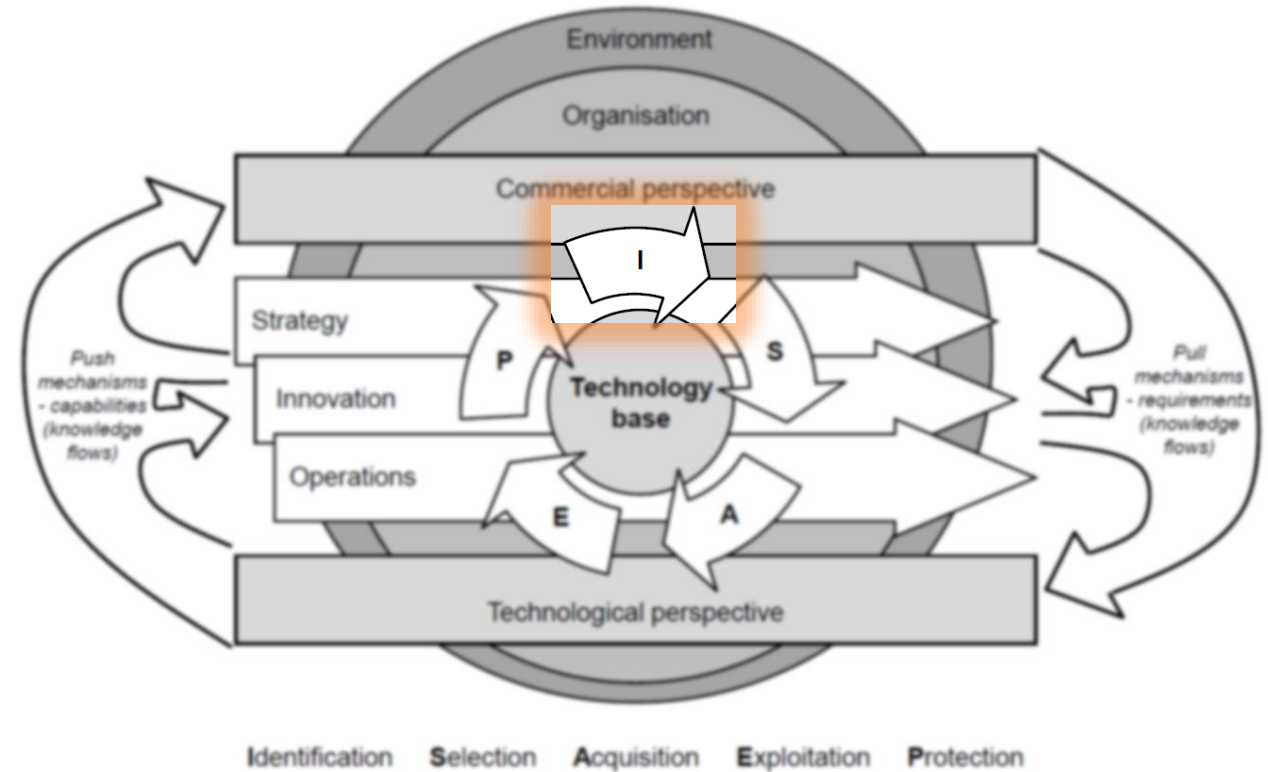


Fig. 1 Technology management framework

Phaal Model

Activities

- *Identification*
- *Selection* of those technologies that the firm needs for its future products and technologies (for example, by using portfolio-type methods, expert judgement, pilot studies and financial methods).

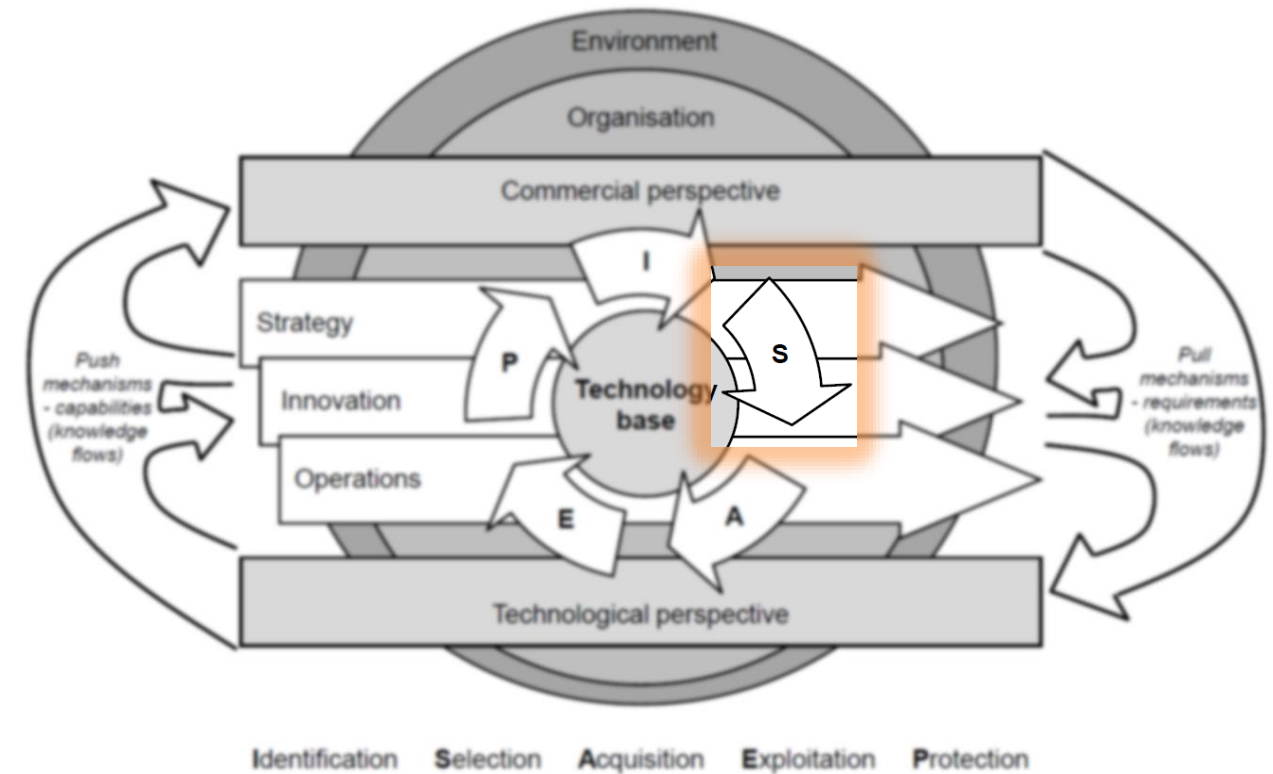


Fig. 1 Technology management framework

Phaal Model

Activities

- *Identification*
- *Selection*
- *Acquisition* of the technologies that have been selected (for example, by R&D, licensing, purchase of equipment, hiring of staff and acquisition of firms).

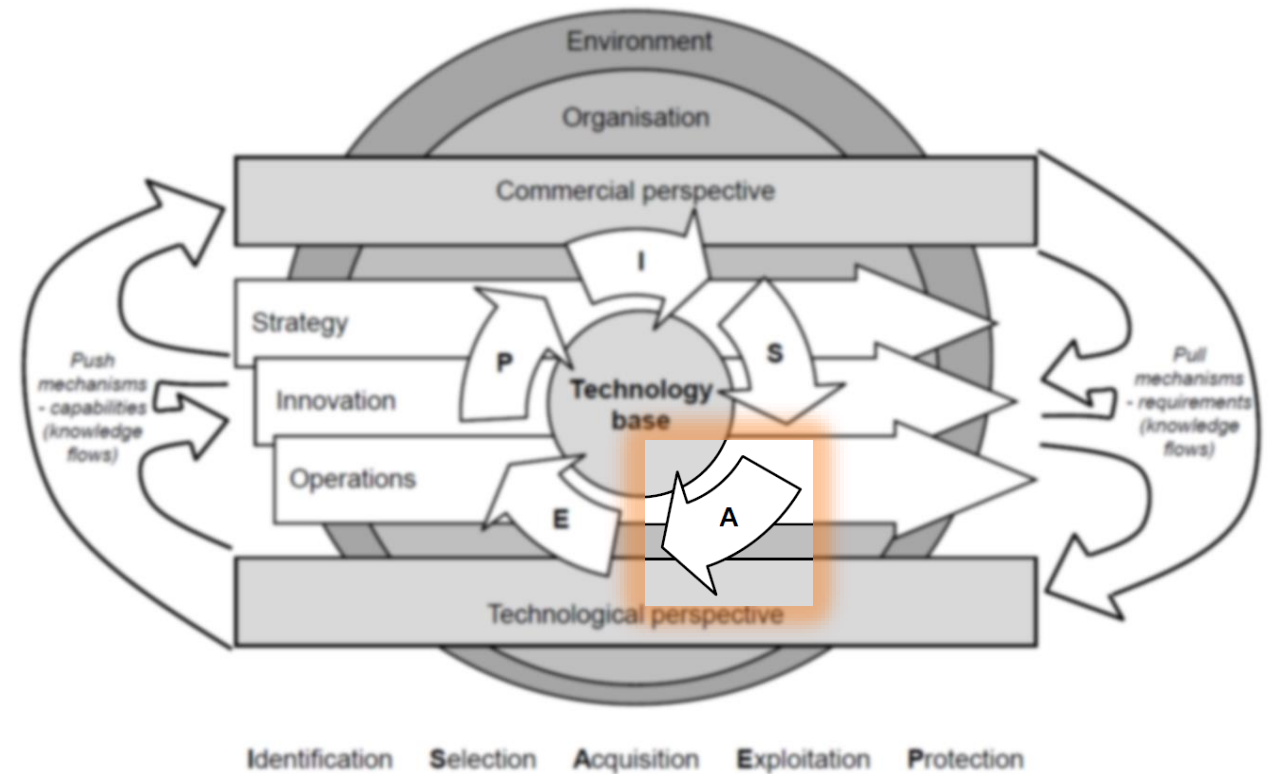


Fig. 1 Technology management framework

Phaal Model

Activities

- *Identification*
- *Selection*
- *Acquisition*
- *Exploitation* of the technologies that have been acquired (for example, by incorporating into products and services and licensing).

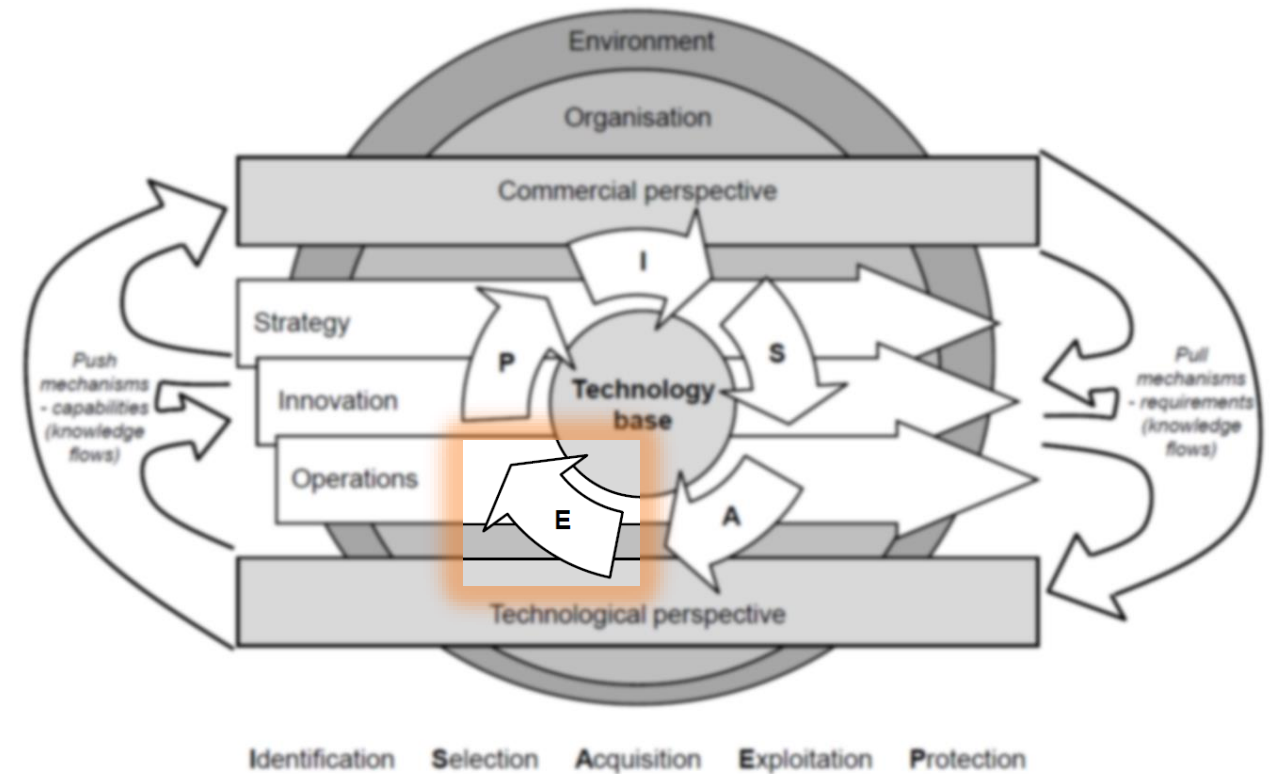


Fig. 1 Technology management framework

Phaal Model

Activities

- *Identification*
- *Selection*
- *Acquisition*
- *Exploitation*
- *Protection* of the technological assets of the firm (for example, by legal means such as patenting, contracts, trademarks, copyright, together with security measures and retention of key staff).

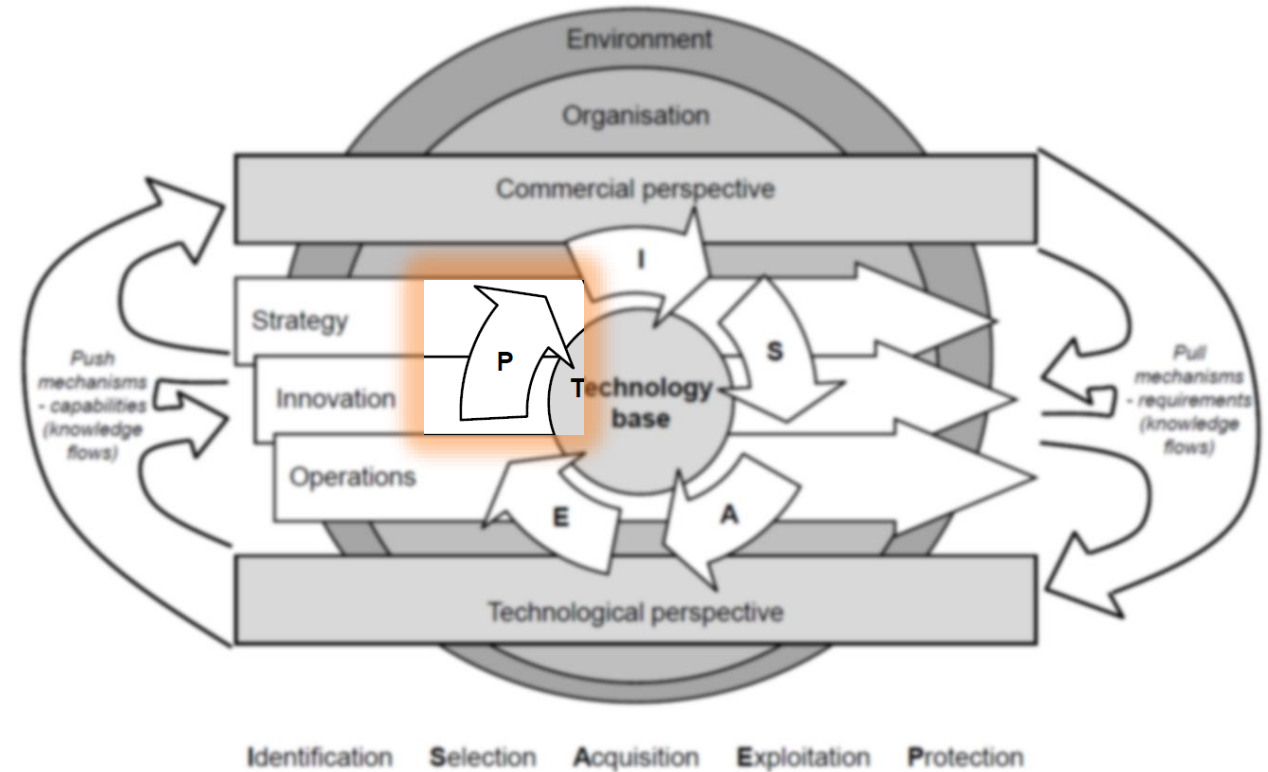


Fig. 1 Technology management framework

Phaal Model

Activities

- *Identification*
- *Selection*
- *Acquisition*
- *Exploitation*
- *Protection*

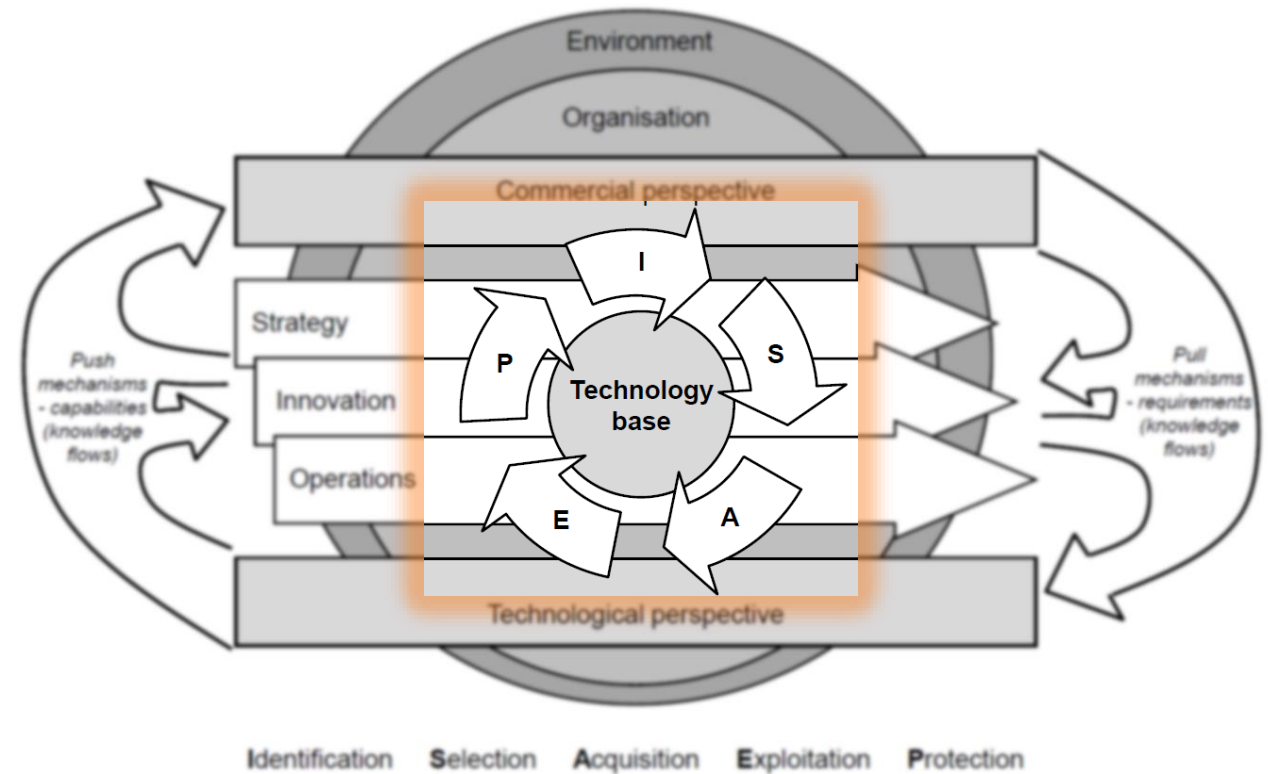
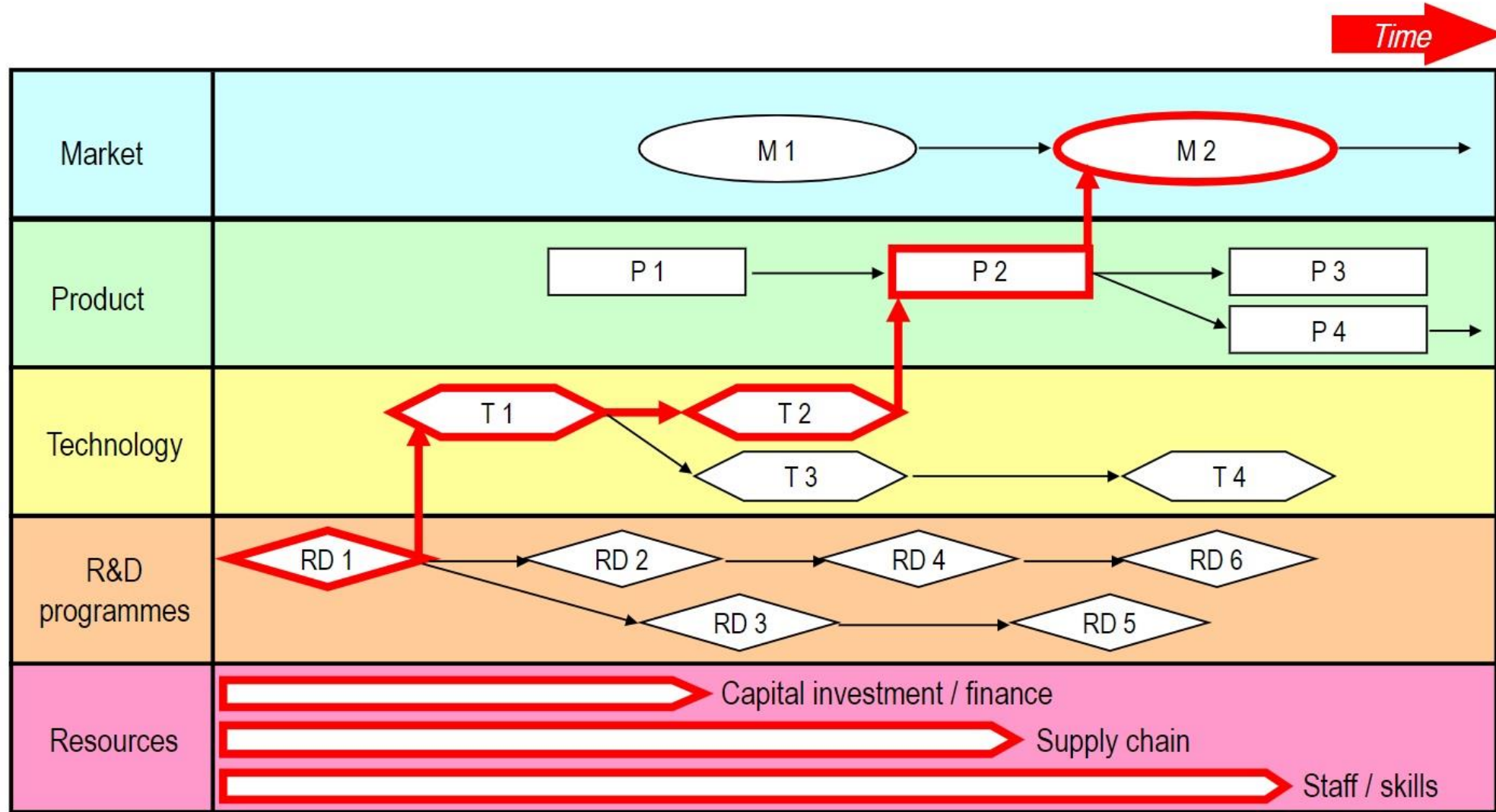


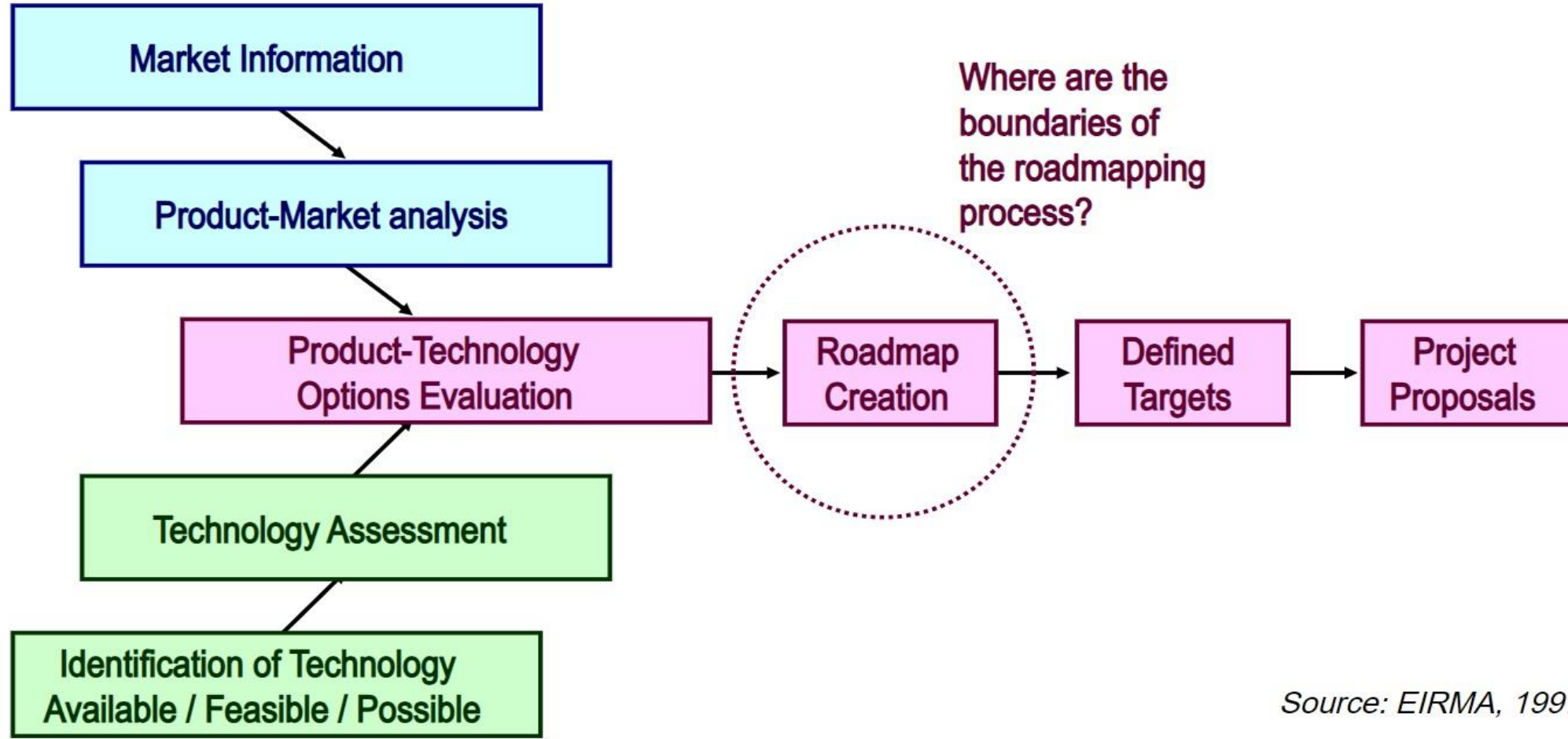
Fig. 1 Technology management framework

Roadmapping - Planning for the Future



Technology roadmapping

Relationship to the strategic planning process



Source: EIRMA, 1997

Technology roadmapping

Two extremes

1. Market 'pull'

- How to reach a goal?

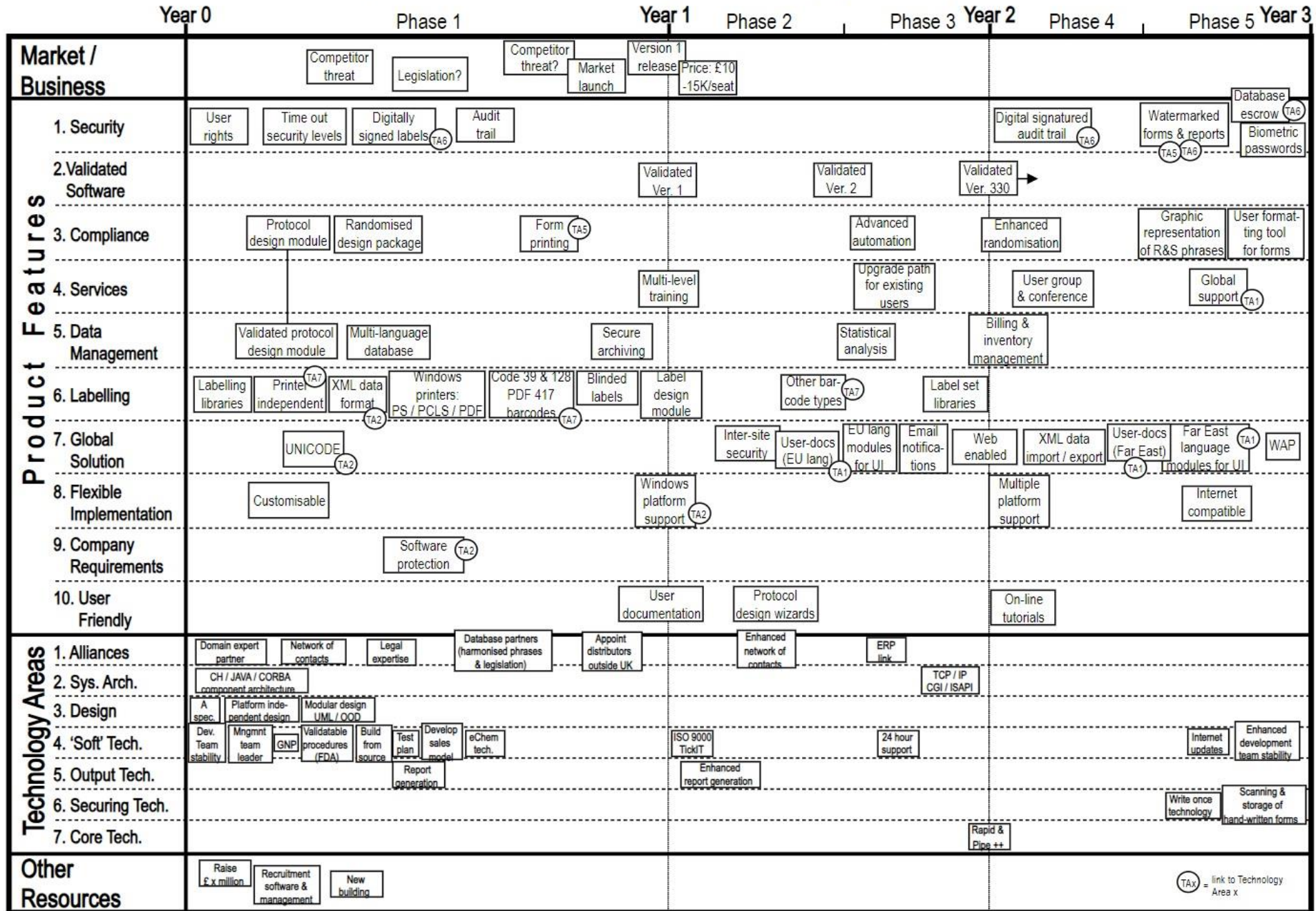
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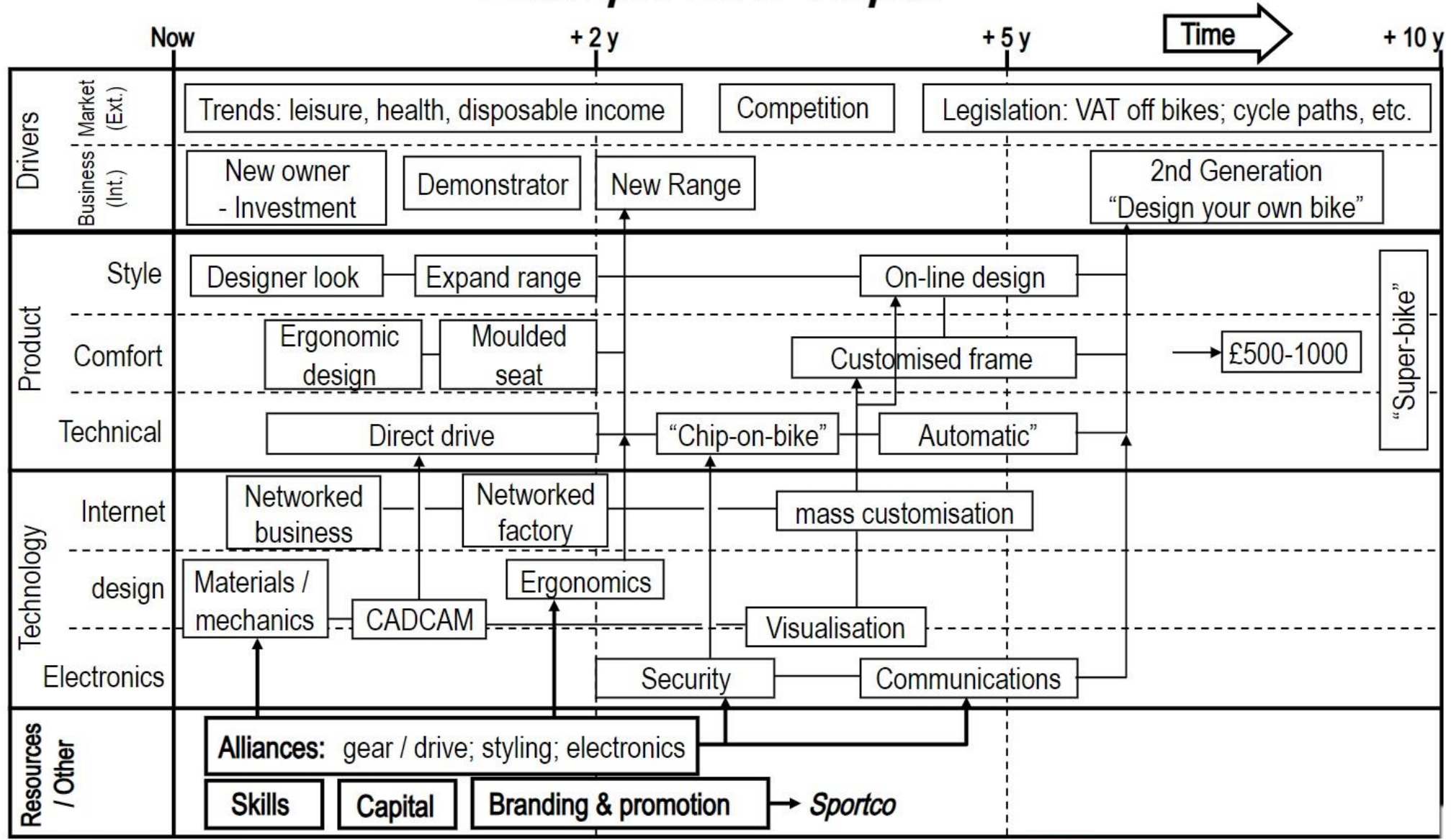
Example first-cut technology roadmap (Softco)



(TAx) = link to Technology Area x



Example Biko output



Thanks for your patience...