

THE THESIS

**Methodology Development for Successful
Strategizing of Innovation in Production using
the Ambidexterity concept**

**You will find the speaker
notes in the yellow
squares at the edge of
the slides**

Methodology Development for Successful Strategizing of Innovation in Production using the Ambidexterity concept

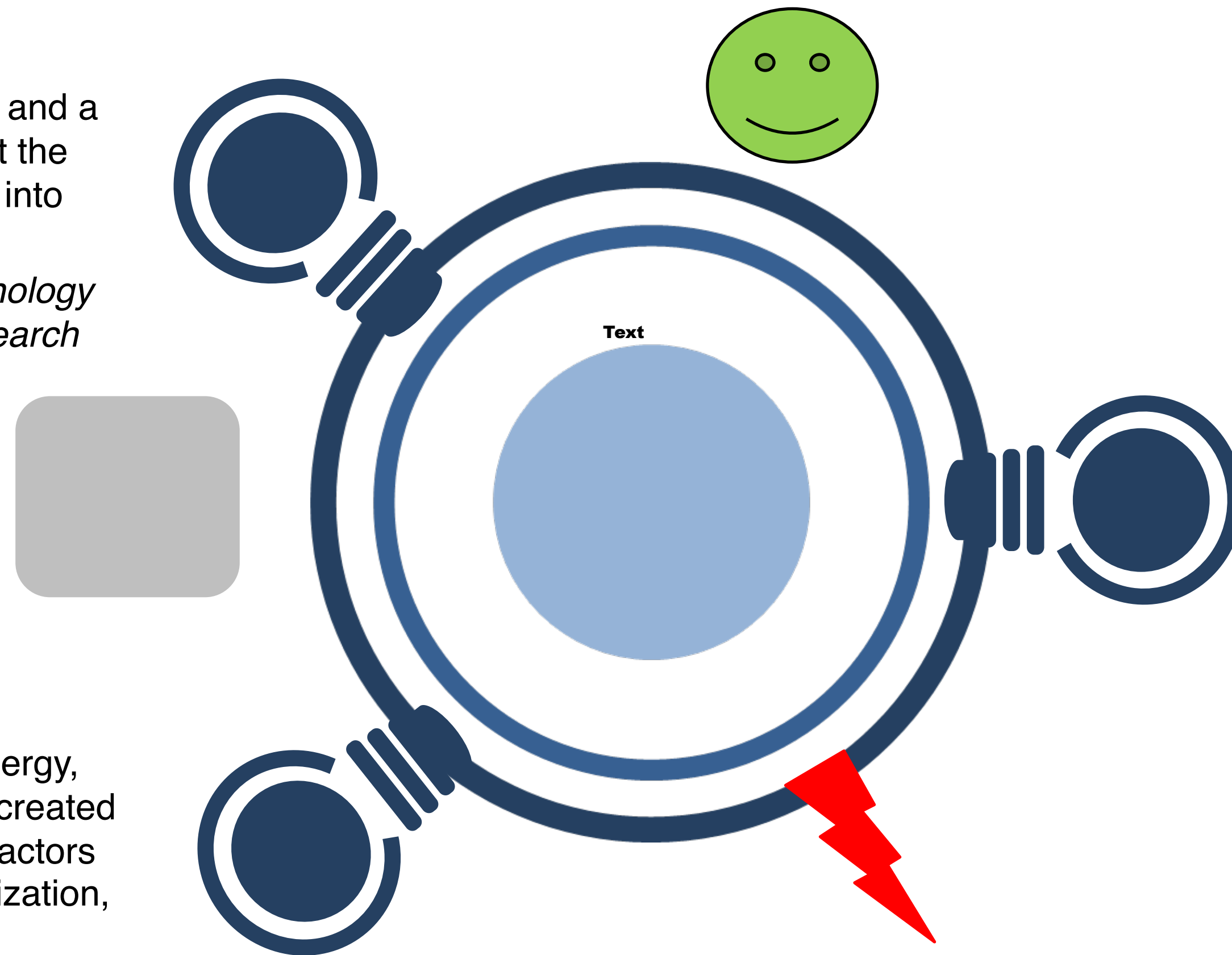
Innovation Strategy

A commitment to a common innovation mission and a structured set of activities designed to support the future growth of an organization, while taking into account the changes in its environment.

Usually by encouraging advancements in technology or services, usually by investing money in research and development activities.

Production System

A system that transforms input (material, energy, information, and monetary means) into value-created output: a fabricated or assembled product. Factors involved: product, process, equipment, organization, and human.



Ambidexterity

The ability to be “aligned and efficient in a firm’s management of today’s business demand, while also adaptive enough to change in their environment”.

Organizational Ambidexterity: Balancing Exploitation and Exploration for Sustained Performance

Topics to tackle

I/ Redefinition of the Production System

- Breaking off the standard perspective
- Drivers of change and new concepts in the Production System
- Redesigning the extended Production System as a strategically-minded entity

II/ The Ambidextrous Production System

- Conceptual rehabilitation of ambidexterity in the production system
- Ambidexterity as an enabler of dynamic capabilities
- The extended Production System supporting the ambidextrous organization

III/ Strategizing Innovation in the Production System

- Framework to implement an ambidextrous Innovation Strategy in the Production System
- Methodology for an ambidextrous Innovation Strategy in the Production System
- Role of the Top Management, Middle Management and operators

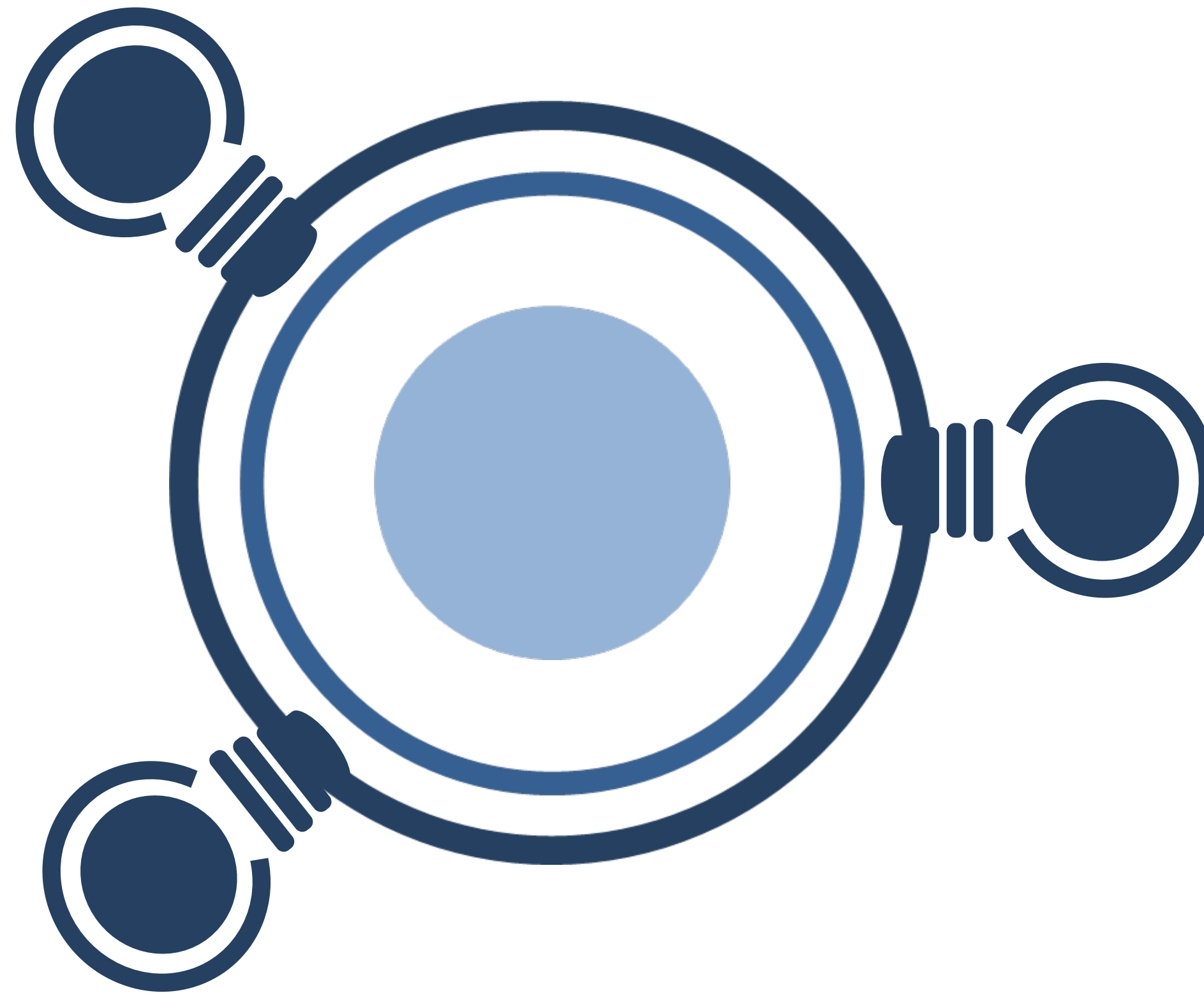
I. Redefinition of the Production System

→ Breaking off the Standard Perspective

Innovation Strategy



Production System



Ambidexterity



I. Redefinition of the Production System

→ Breaking off the Standard Perspective

“A process is never effectively developed just for the sake of it. It must be needed for a project”

Product-oriented Production

Process Development is related to a product. There can be some theoretical research and manufacturing technology surveillance, but never reaches the concretization of real development

The usual strategic planning deals at most with the products and markets and with the necessary use of financial resources.

Short-term efficiency

The known holistic production systems are consistently effective in the short term. They do not rely on structural measures and long-term developments.

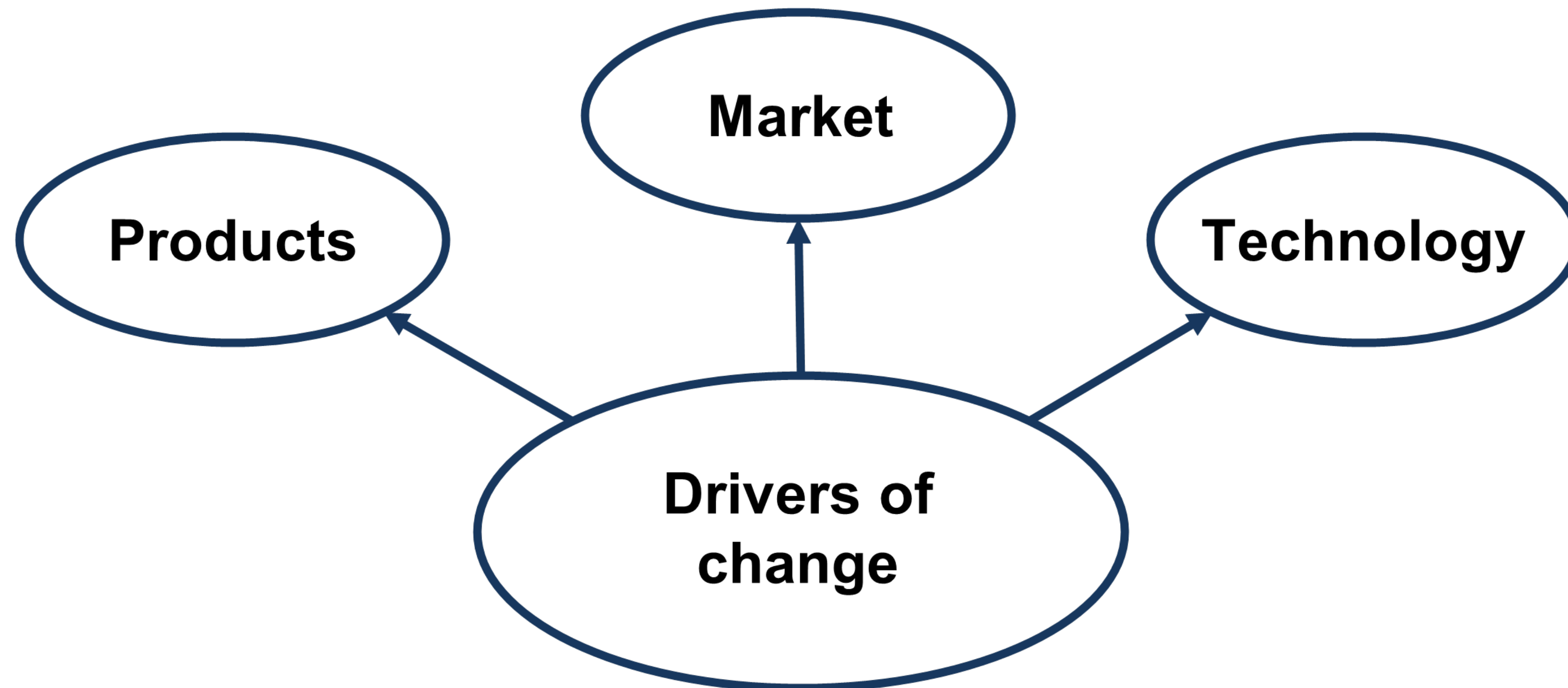
Exploitation

Exploitation, defined as "such things as refinement, choice, production, efficiency, selection, implementation, execution"
(March 1991)

I. Redefinition of the Production System

→ Drivers of change and new concepts

An increasingly dynamic environment → The need to strategically consider the drivers of change in the PS



I. Redefinition of the Production System

→ Drivers of change and new concepts

Mass Customization Reconfigurable Manufacturing System

Flexible System

Modularity & Integrability

Life-cycle Integration

Temporary character of PS

Industry 4.0 Digitalization of the Production System

Decentralization of knowledge
and its dissemination

Technology forecasting and
expertise

Workforce capabilities

Transfer of (theoretical)
knowledge value creation

Environmental Sustainability

Visionary ideas

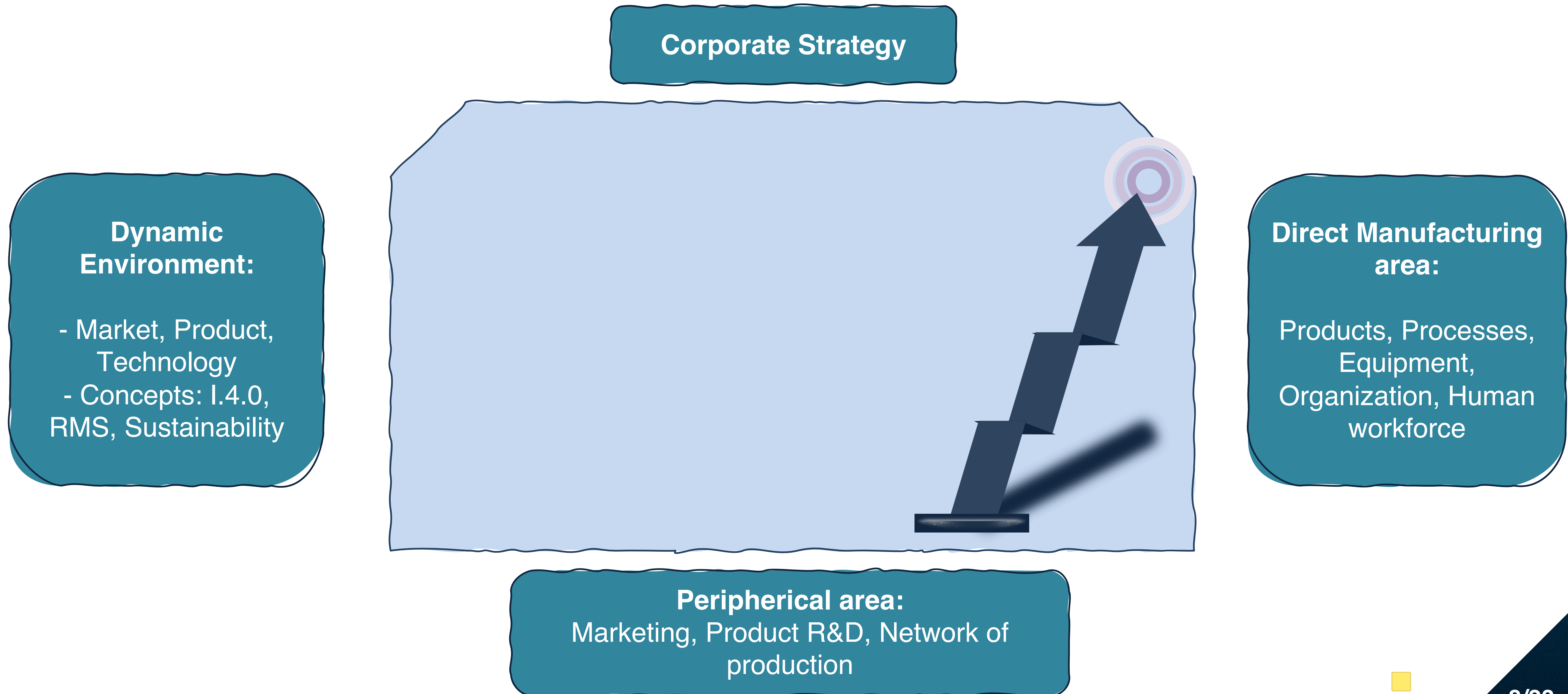
Activate technology variety
potential

Total Quality Management

Management of sustainable
Business Models

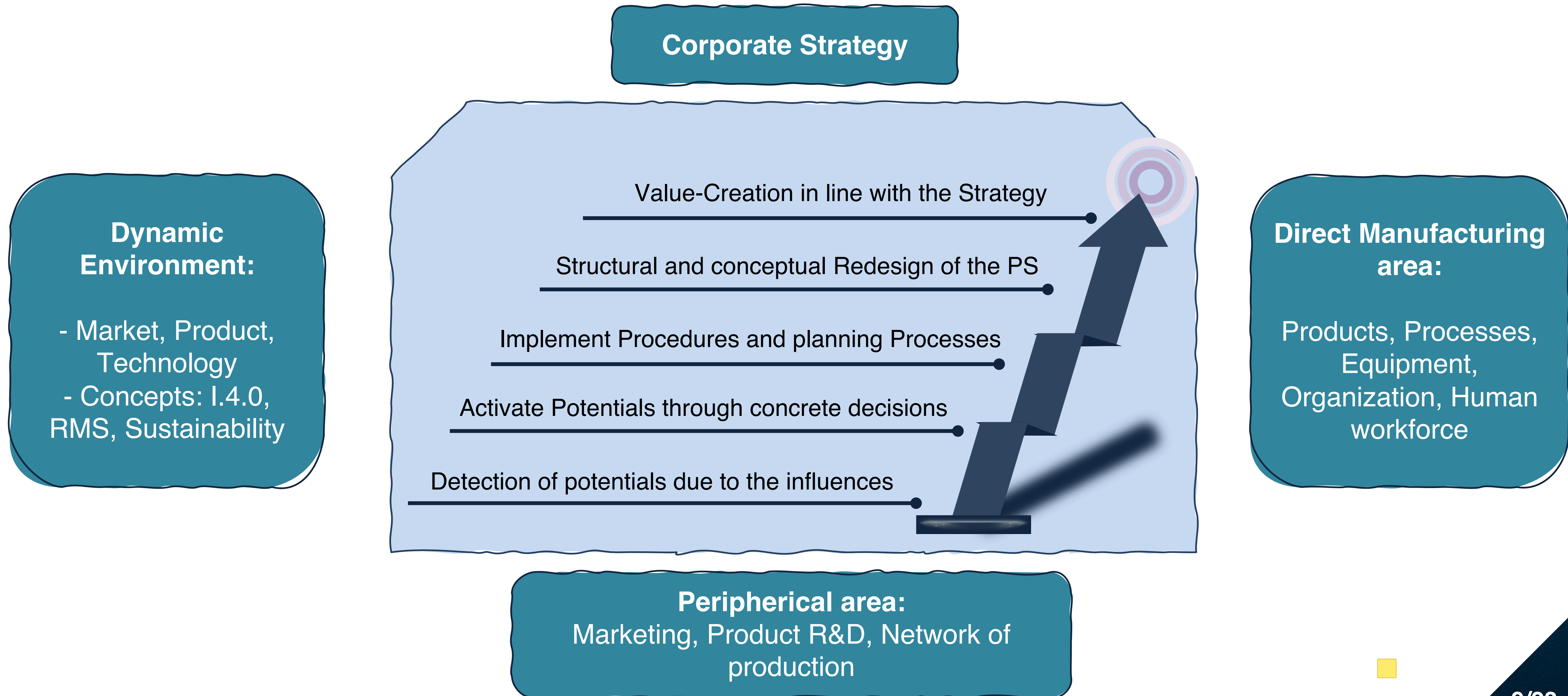
I. Redefinition of the Production System (PS)

→ Designing the extended PS as a strategically-minded entity



I. Redefinition of the Production System (PS)

→ Designing the extended PS as a strategically-minded entity



Topics to tackle

I/ Redefinition of the Production System

- Breaking off the standard perspective
- Drivers of change and new concepts in the Production System
- Redesigning the future PS as a strategically-minded entity

KEY QUESTIONS

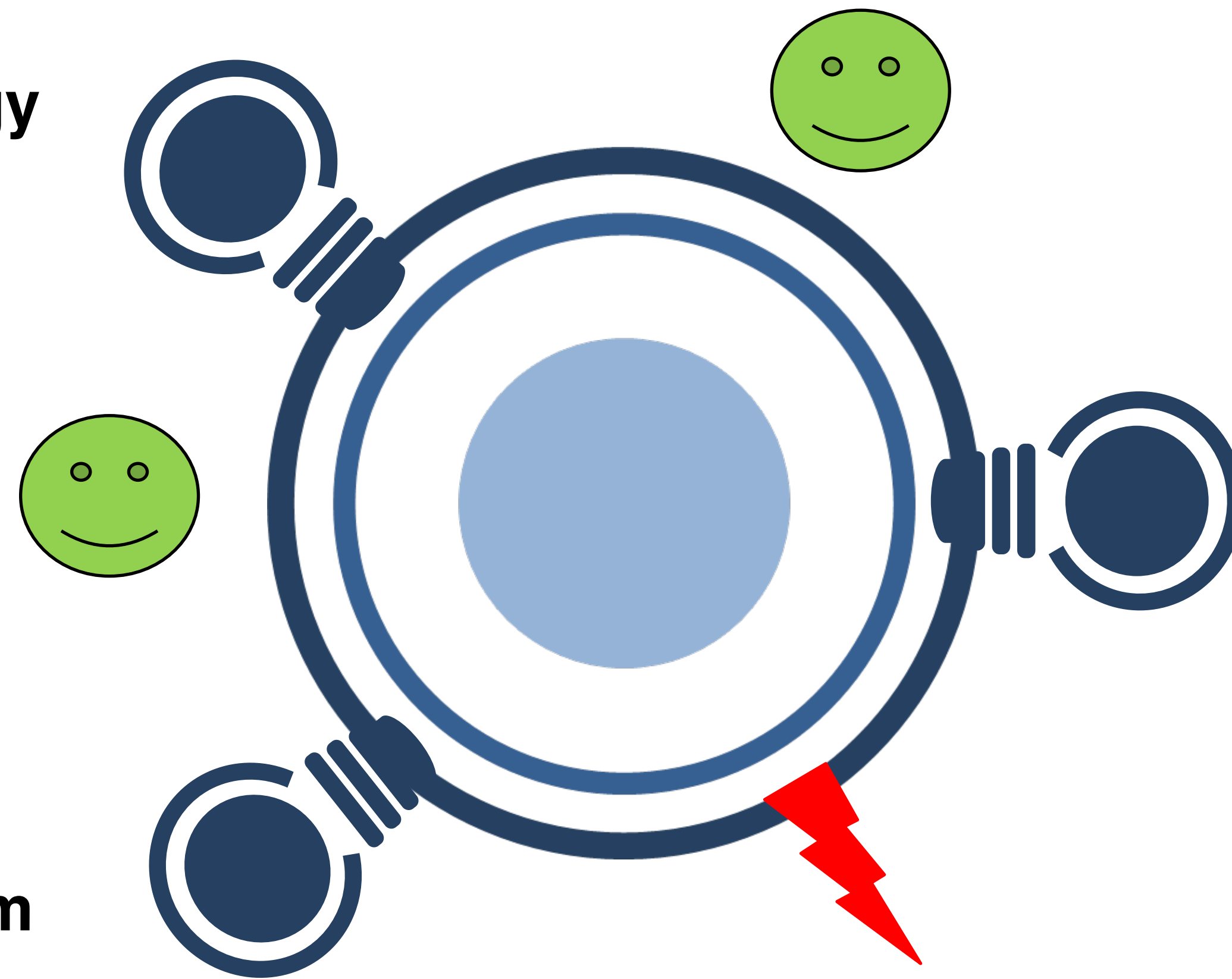
- What was your honest perception of the PS: do you think of it only as a technical-operational entity or as a strategically-minded entity?
- From your experiences, what are the main factors influencing the extended PS? What else would make the PS a strategic entity?
- How much practical applicability do you find to the strategic process: would you consider it urgently necessary, relevant in the long-run, or not even that? ;)
In which industries, types of companies?

II/ The Ambidextrous Production System

→ Conceptual rehabilitation of ambidexterity in the PS

Innovation Strategy

Production System



Ambidexterity

II/ The Ambidextrous Production System

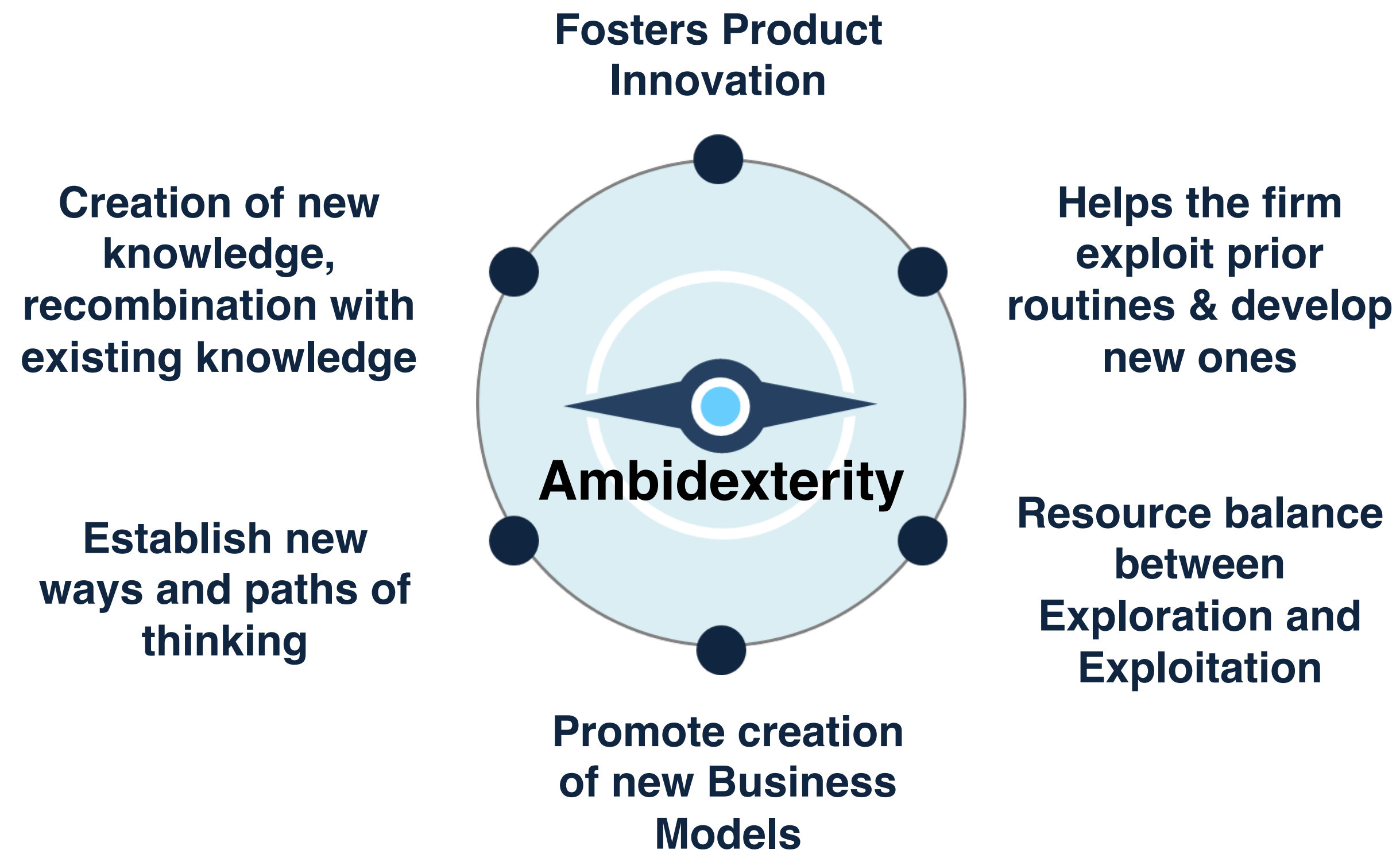
What conceptual relationship between PS and Ambidexterity?

What role for the Ambidexterity concept in the extended Production System? And vice versa, what role could play the extended PS in the ambidextrous organization?

Discussion free of bias

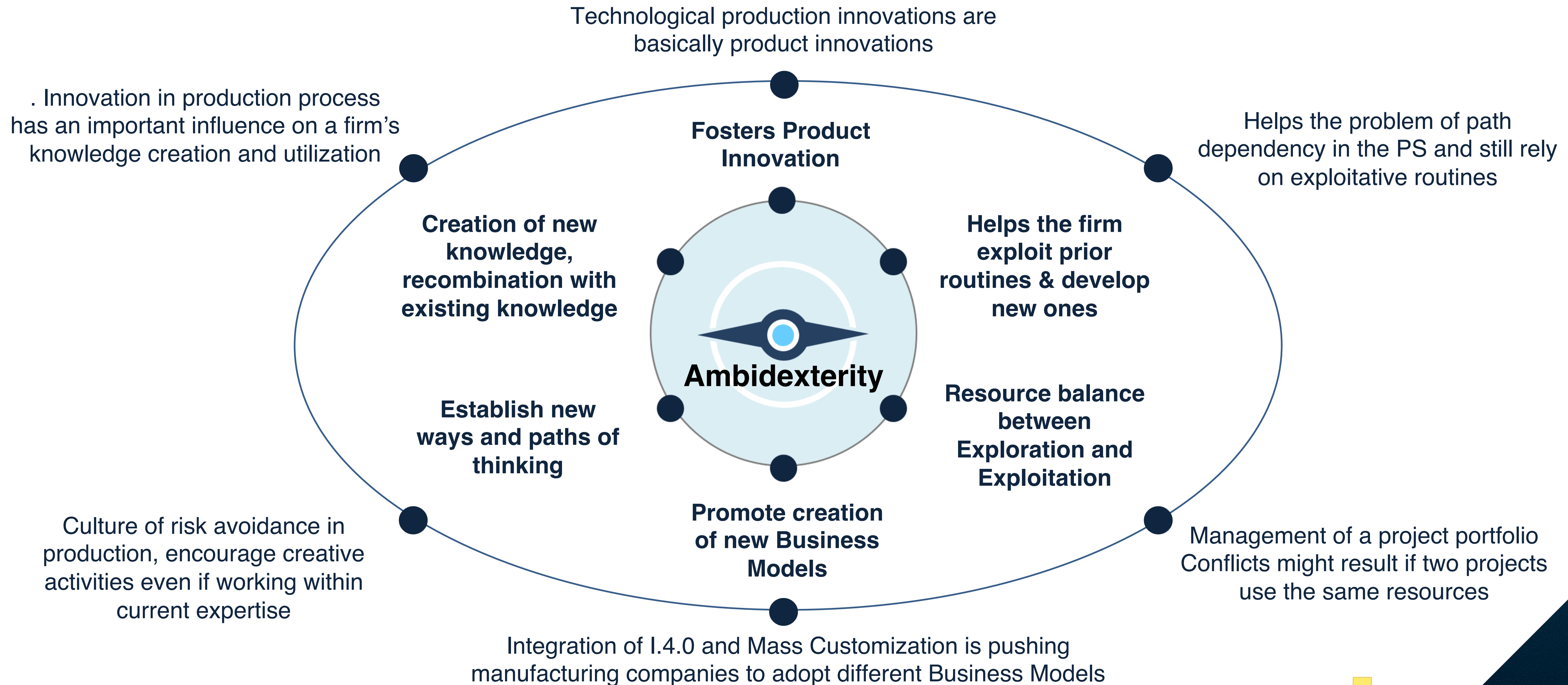
II/ The Ambidextrous Production System

→ Conceptual rehabilitation of ambidexterity in the PS



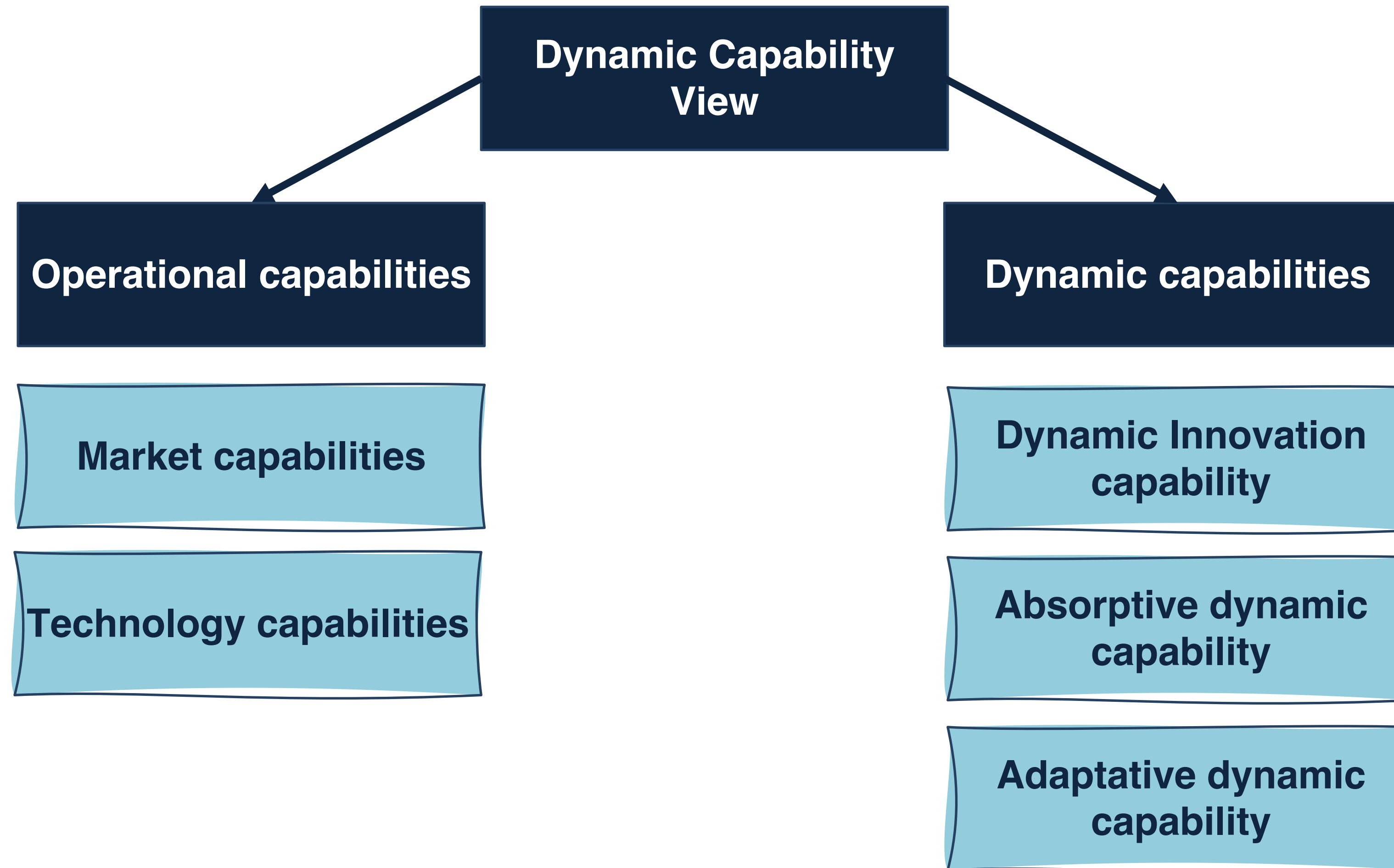
II/ The Ambidextrous Production System

→ Conceptual rehabilitation of ambidexterity in the PS



II/ The Ambidextrous Production System

→ Ambidexterity as an enabler of dynamic capabilities



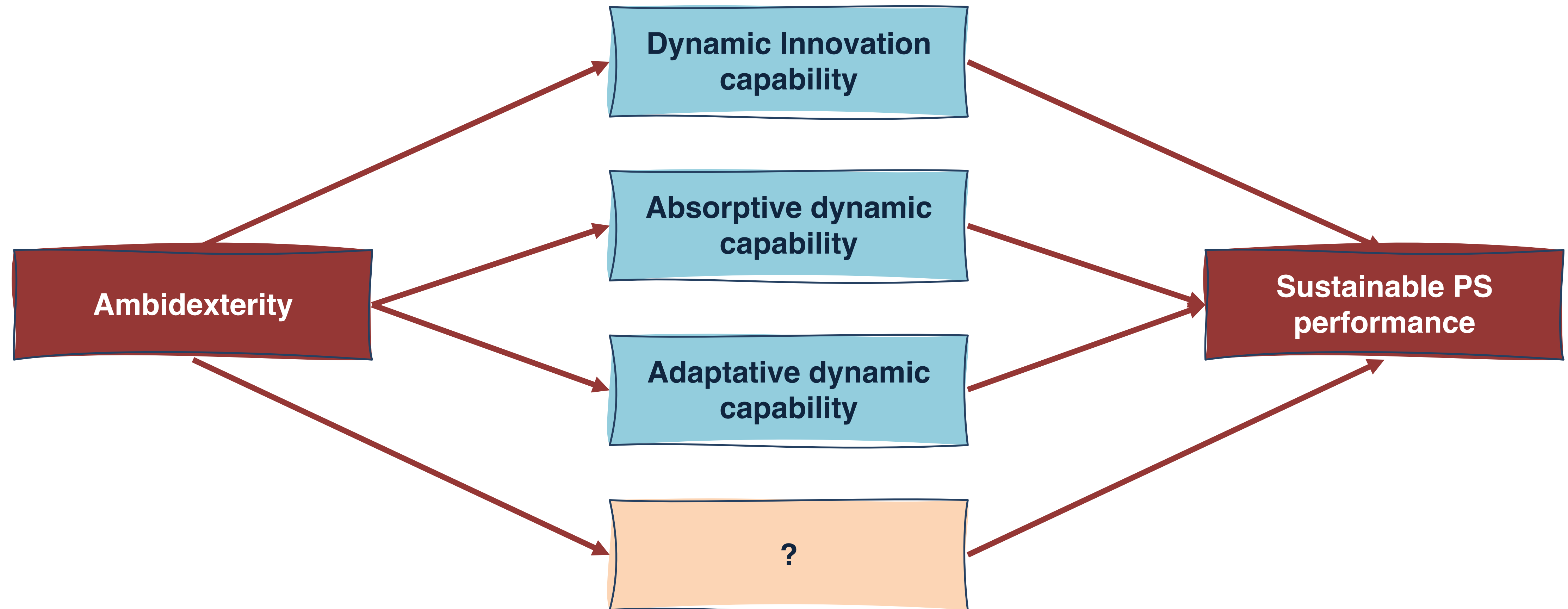
Infrastructural & Structural
Incremental & Disruptive for
example to foster the start of I.4.0

Knowledge creation and transfer:
technological watch, communication
between units...

Flexibility of the PS, Project
Portfolio Management

II/ The Ambidextrous Production System

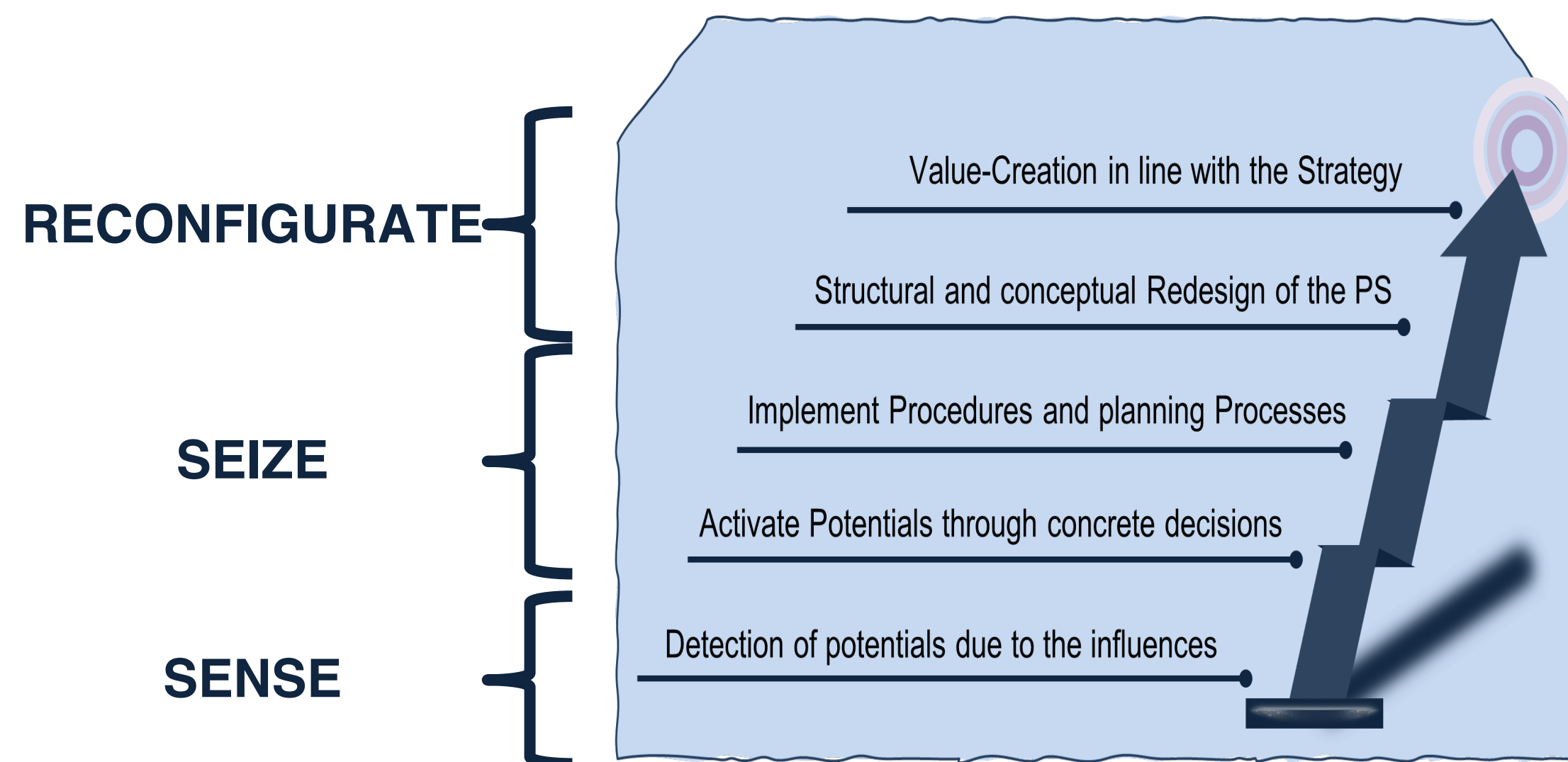
→ Ambidexterity as an enabler of dynamic capabilities



II/ The Ambidextrous Production System

→ The extended PS supporting the ambidextrous organization

1st



2nd

Mass Customization Reconfigurable Manufacturing System (RMS)

- Creation of new BMs and strategies: circular economy.
- The ambidextrous organization also requires changes from overhead processes – coordination, communication, schedule, tool changes, work training... This is solved by the automation of the overhead processes.

Industry 4.0

- Creation of new BMs and strategies: Digital BM.
- Big Data Analysis has a positive effect on human ambidexterity.
- Technological enablers from I.4.0 provide the flexibility and communication means to create the ambidextrous PS.
- CPI triggers a more agile production.

II/ The Ambidextrous Production System

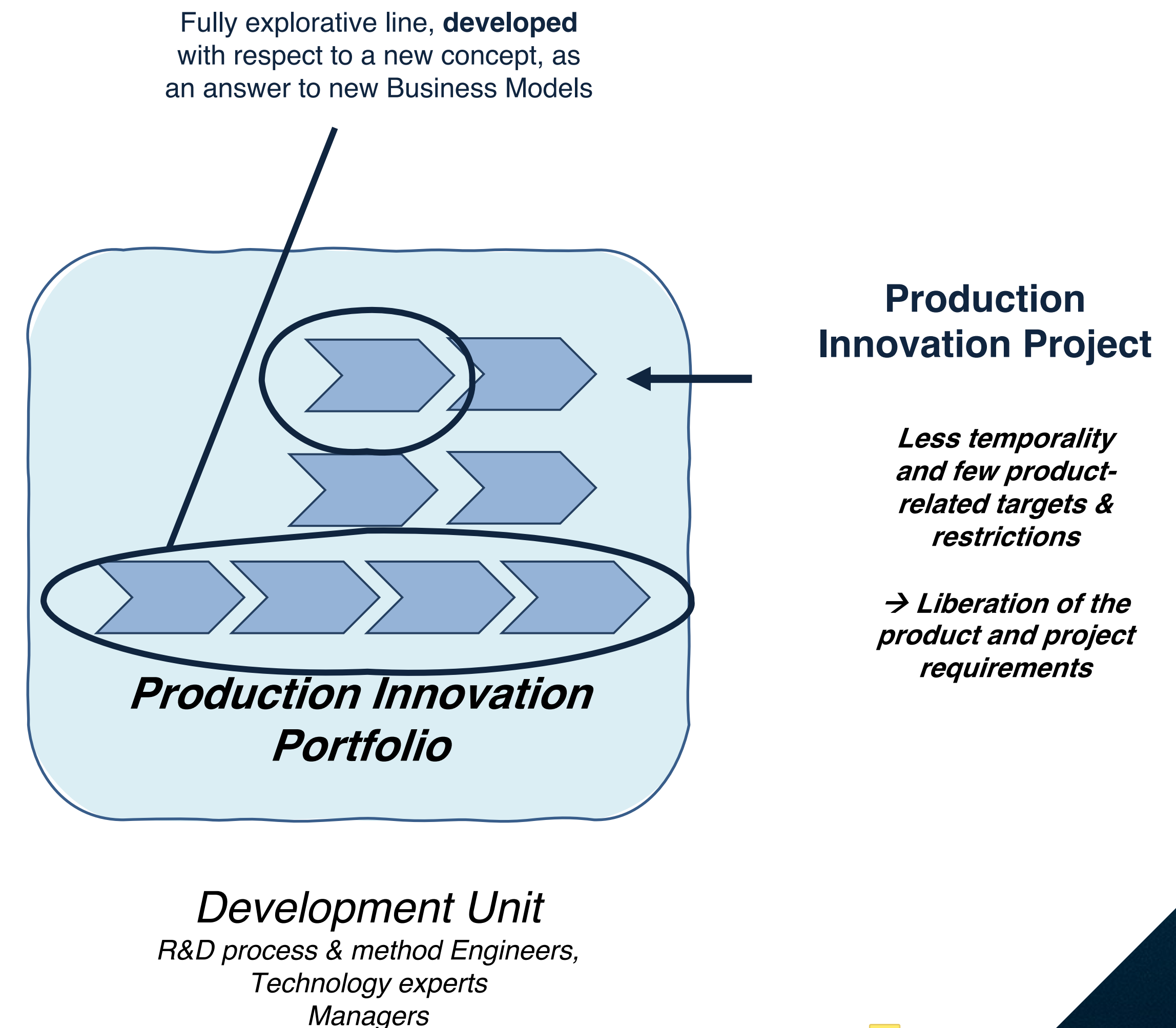
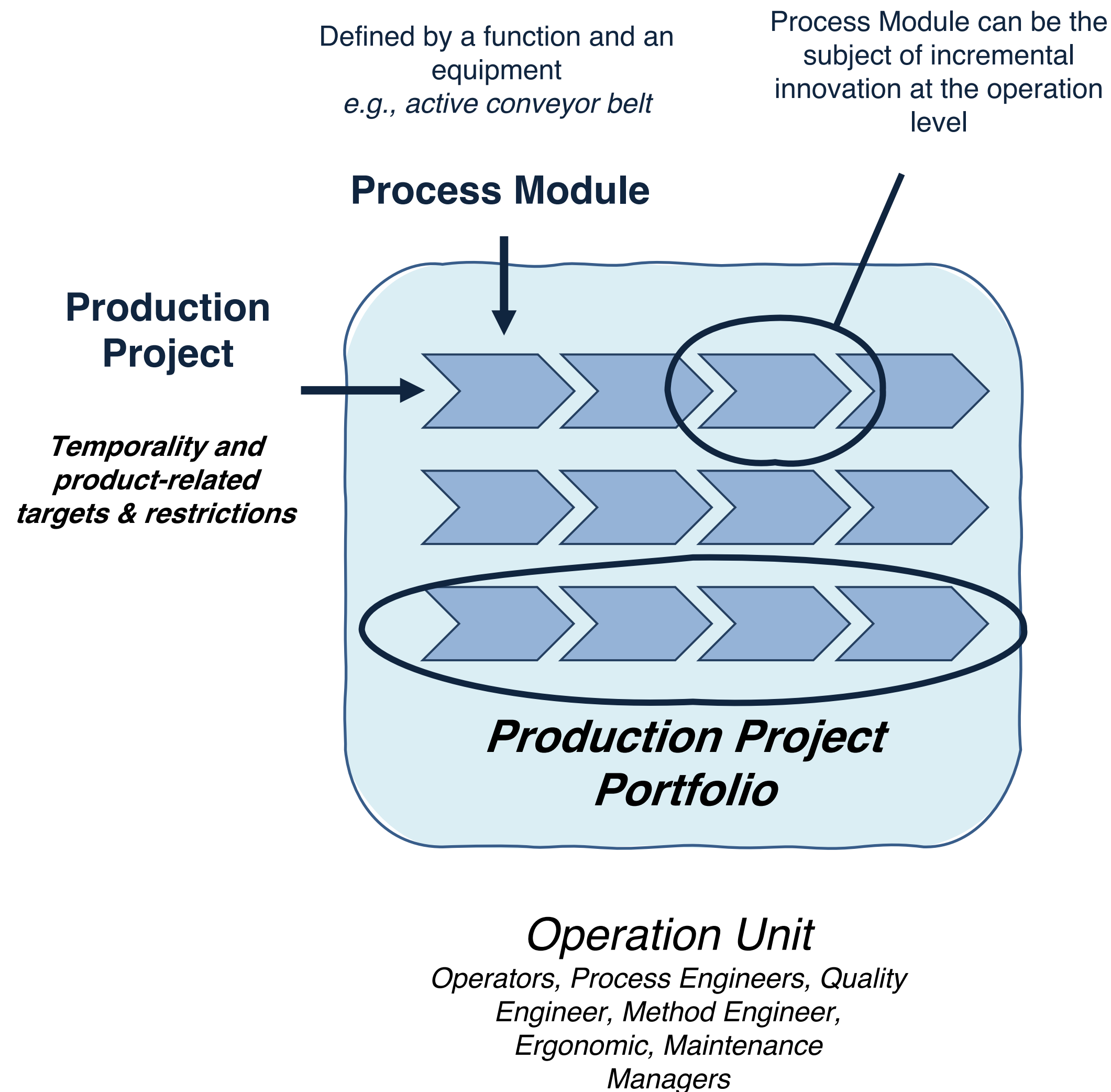
- Conceptual rehabilitation of ambidexterity in the production system
- Ambidexterity as an enabler of dynamic capabilities
- The extended Production System supporting the ambidextrous organization

KEY QUESTIONS:

- What makes, according to you, the PS and ambidexterity conceptually inconciliable?
- Does the ambidextrous organization really need an ambidextrous Production System?
- Which capabilities (Dynamic or not) can be provided by the ambidexterity concept to help the PS realize its value-creation objective? (Tangible or intangible).

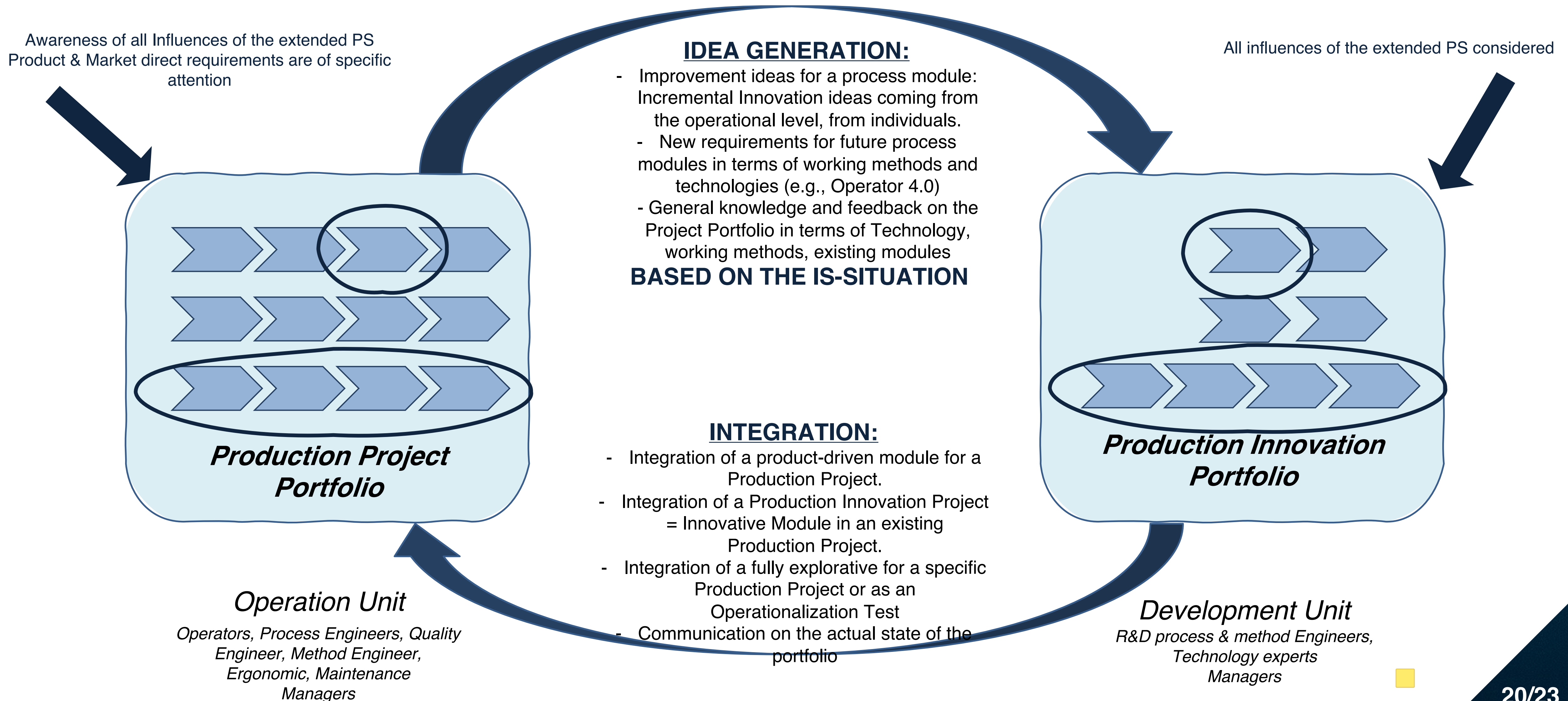
III/ Strategizing Innovation in the Production System

→ Framework for an ambidextrous Innovation Strategy in the PS



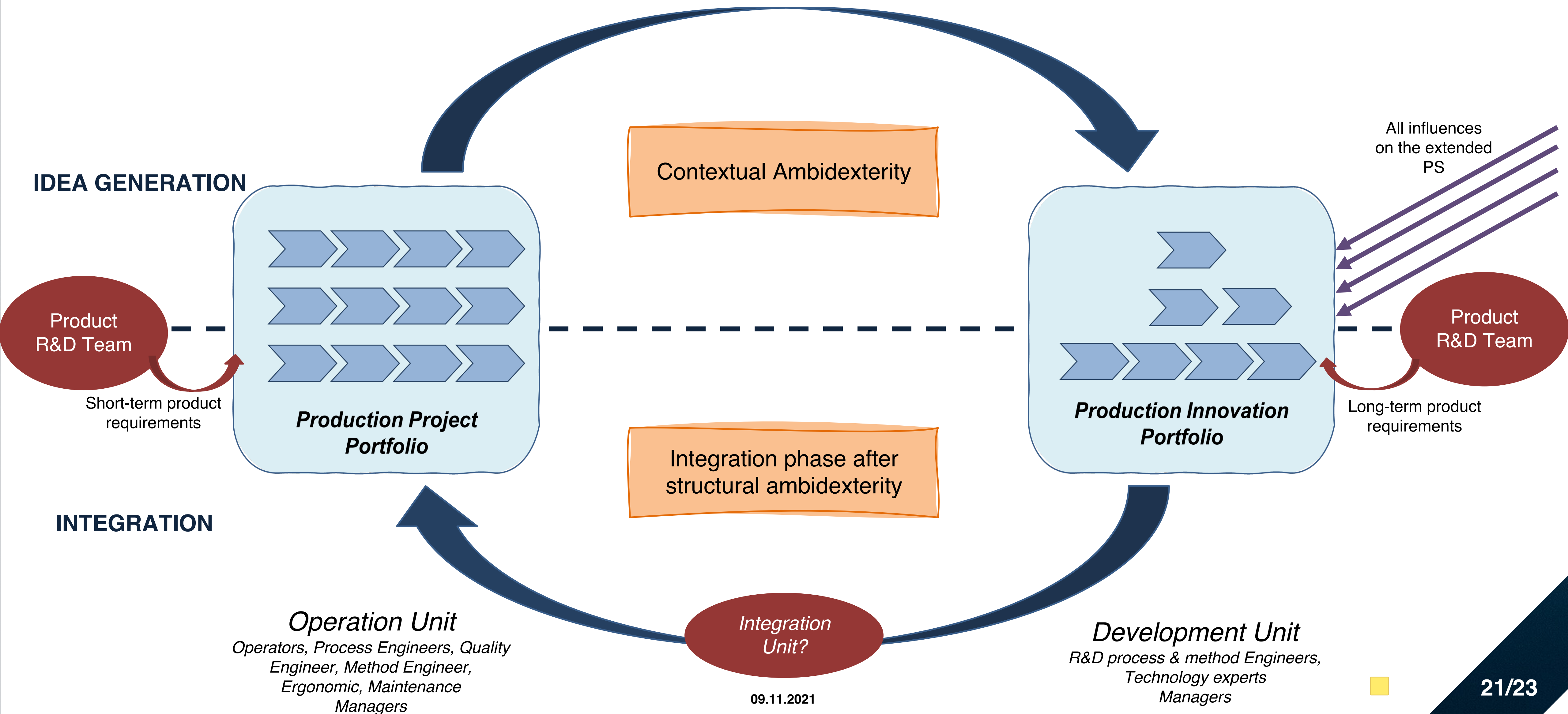
III/ Strategizing Innovation in the Production System

→ Framework for an ambidextrous Innovation Strategy in the PS



III/ Strategizing Innovation in the Production System

→ Framework for an ambidextrous Innovation Strategy in the PS



III/ Strategizing Innovation in the Production System

→ Methodology for an ambidextrous Innovation Strategy in the PS



Topics to tackle

III/ Strategizing Innovation in the Production System

- Framework for an ambidextrous Innovation Strategy in the Production System
- Methodology for an ambidextrous Innovation Strategy in the Production System
- Role of the Top Management, Middle Management and operators

KEY QUESTIONS

- What roles and characteristics do we
- What dimensions for a maturity assessment of the ambidextrous Production System?
- What would be the characteristics of an integration unit?

Annex

Production Innovation Typology

	Infrastructural	Structural
Incremental	Available work methods like Six Sigma or Lean, Leanagile	Install new production equipment externally available: Automation, Robotics, 3D printing (depending on the company) New sensors to achieve predictive maintenance
Radical	Develop new work methods and apply them in a factory: <ul style="list-style-type: none">- Industry 4.0- RMS	Develop new production equipment and apply them in a factory: AI, BDA, Nano-engineering, Advanced robotics



Annex

Project-oriented Production

Production characterized as project-oriented

Production is characterized as project-oriented if it is organized as a project, including the planning, the design of the operating line, and the operation itself.

→ Rise of complexity

Continuously changing, unforeseeable and often production location-specific influences lead to unique production conditions and shorter production lifecycles, thus an increasing complexity.

→ Important targets and restrictions

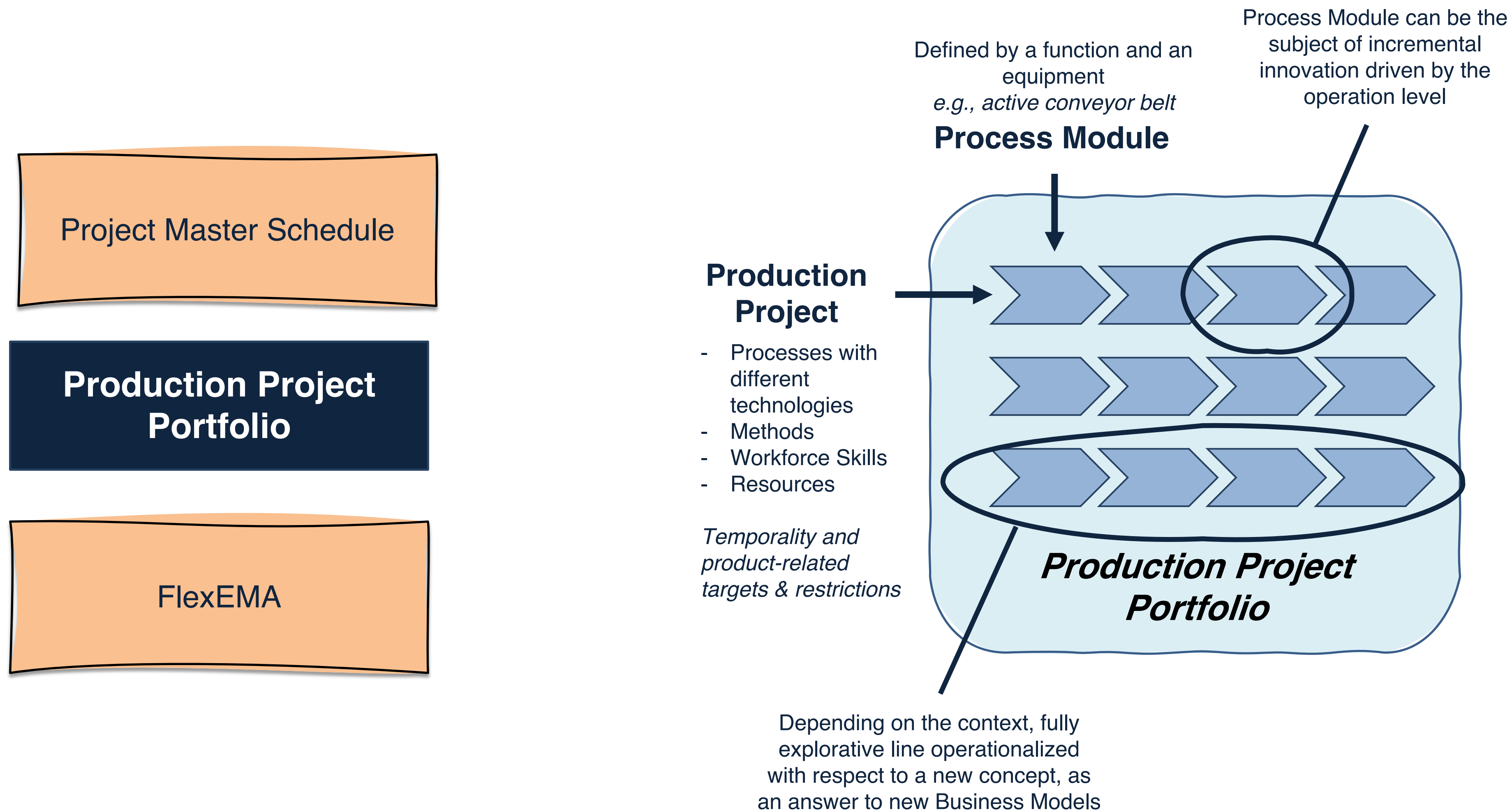
Possible targets are e.g. defined quality standards, production costs per unit, production numbers and specific requirements in terms of flexibility. Restrictions are production location-specific conditions, fixed planning and realization periods and investment budgets.

→ Temporality

Shorter reconfiguration cycles and shorter production lifecycles indicate the temporary character of many production systems

Annex

Tools when dealing with a Production Portfolio



Annex

Role of the people

Ensuring the alignment
of the corporate strategy
and PS strategy

PS Strategy

Resource allocation for
PI projects (radical
modules)

PIS Methodology

Commitment

Top Management Team

Ensuring alignment of the
operational activities and
the PS Strategy

PS Strategy

Ambidextrous leader (agile,
efficient, flexible)

Ambidextrous leader

Management of the
production project portfolio

Portfolio of production
projects balance using
Ambidexterity

Operations Management
Team

Annex

Role of the people

Implementation of the innovation projects in the operations

Integration

Reflexive monitoring seeking new ideas for developments

Contextual Ambidexterity: idea generation

Operationalization of the production projects

Exploitation

Operation Unit:

Operators, Process Engineers, Technology experts, Quality Engineer, Method Engineer, Ergonomic, Maintenance

Agile, incremental approach to discovering new materials, technologies

Exploration activities

Ensuring alignment of the development activities and the PS Strategy

PS Strategy

Management of the production innovation project

Portfolio of innovation projects + PIS methodology

Development Management Team

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