Focus Group – Master Thesis

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

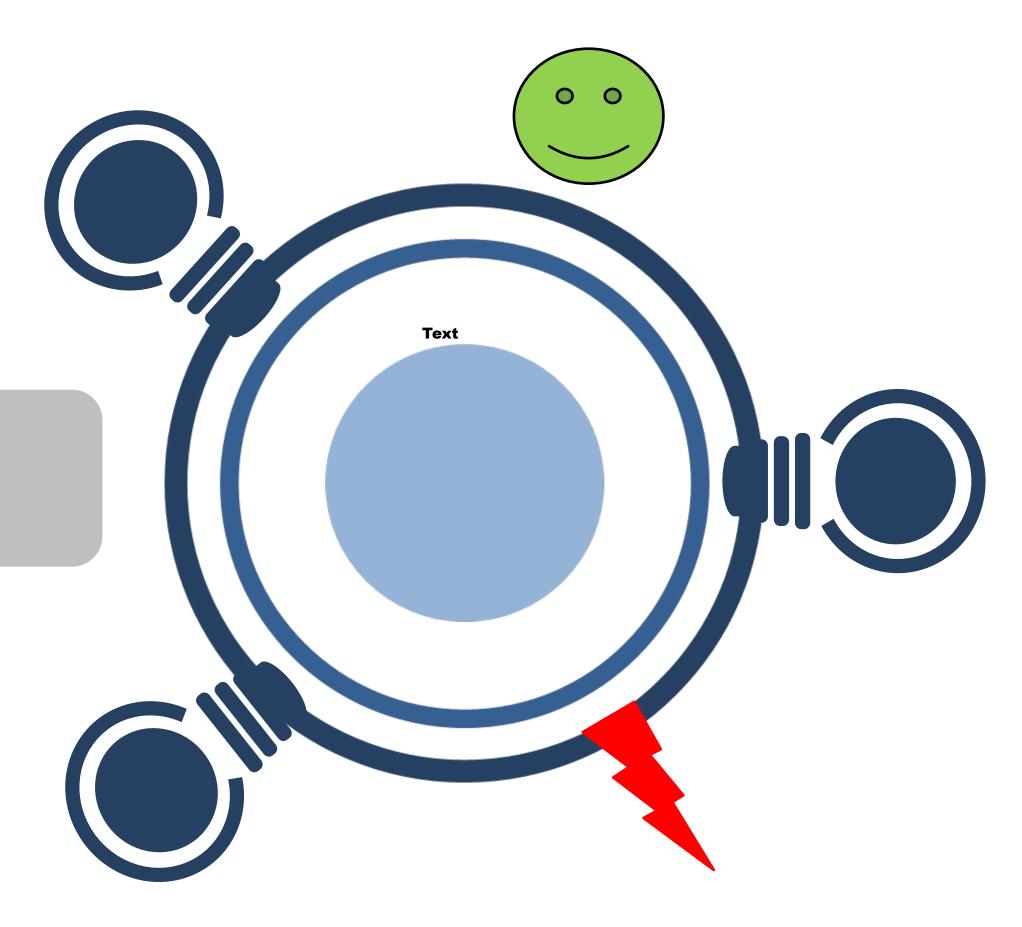
Innovation Strategy

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

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

II/ The Ambidextrous Production System

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

III/ Strategizing Innovation in the Production System

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

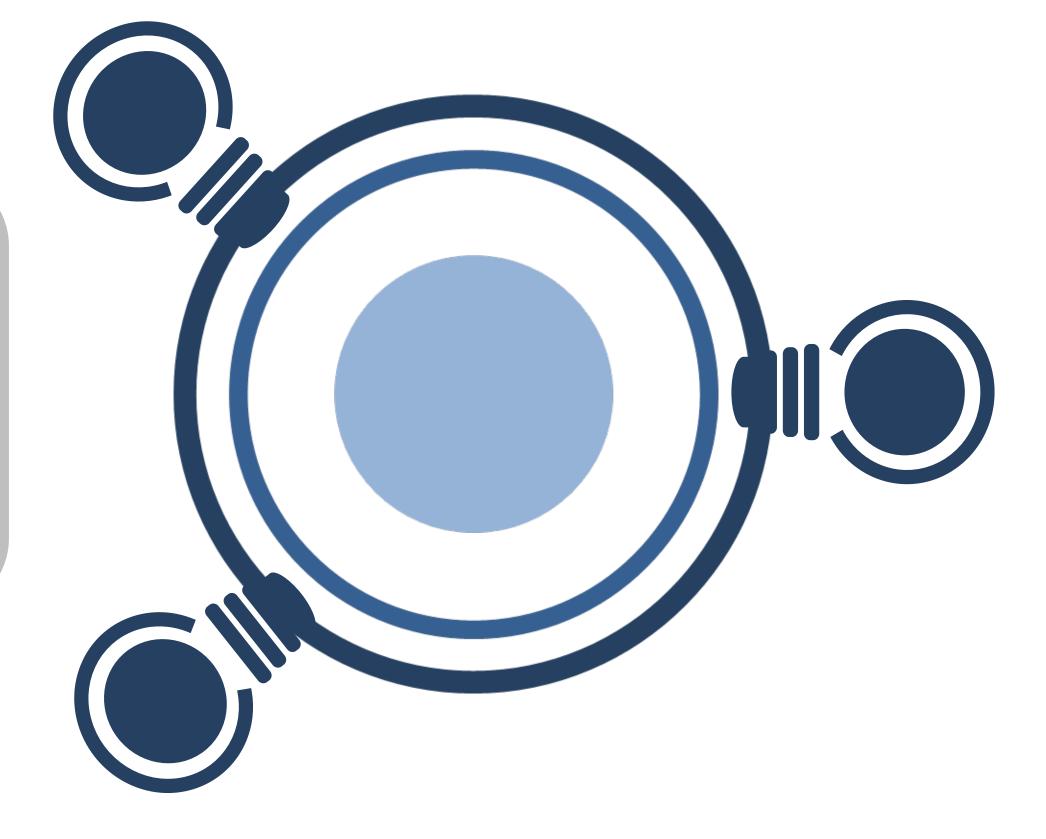




I. Redefinition of the Production System → Breaking off the Standard Perspective

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"

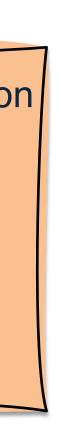
Product-oriented Production

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 us deals at and m neces

sual strategic planning t most with the products markets and with the ssary use of financial resources.		The known holistic productio systems are consistently effective in the short term. They do not rely on structural
	Short-term efficiency	measures and long-term developments.

Exploitation

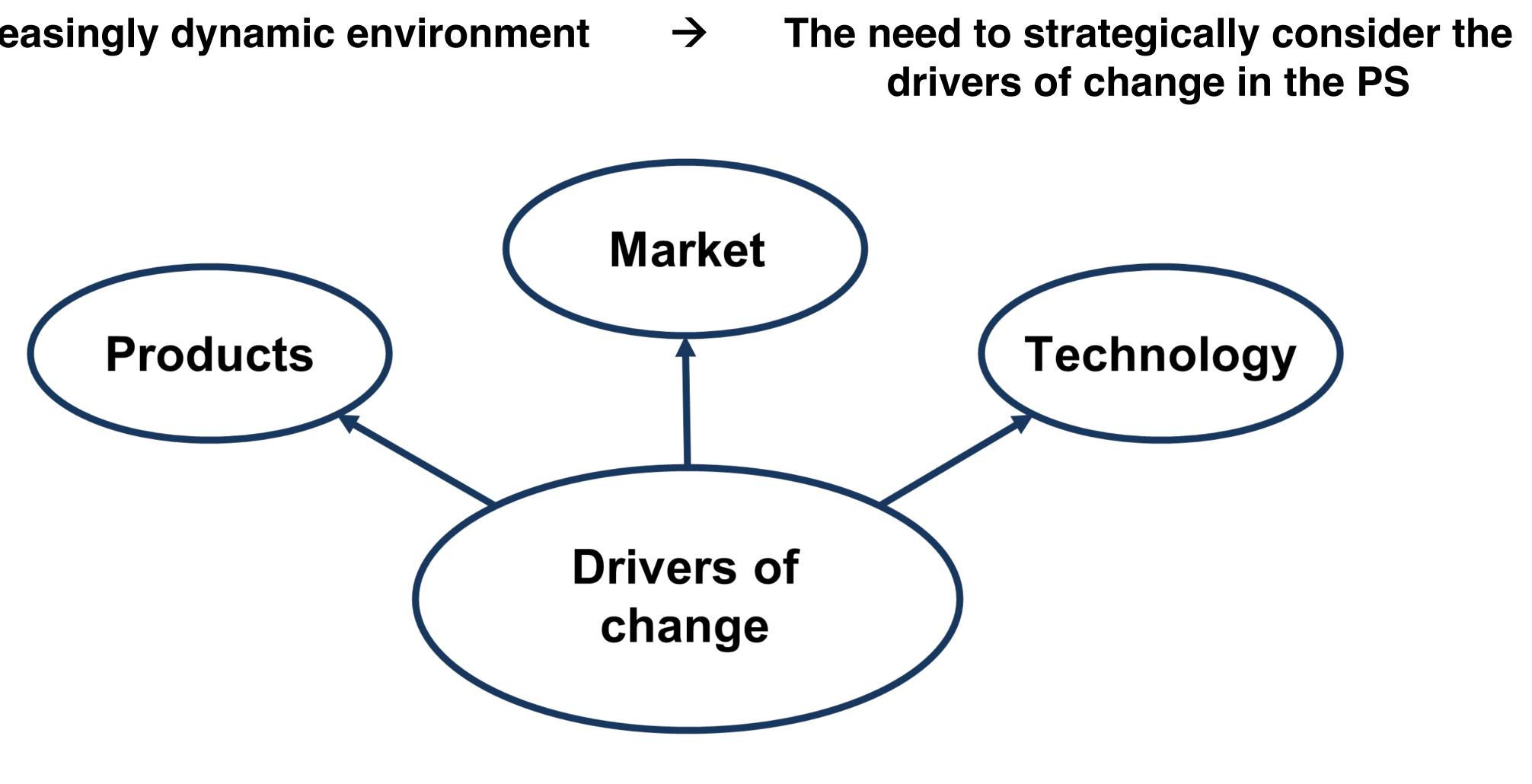
Exploitation, defined as "such things as refinement, choice, production, efficiency, selection, implementation, execution" (March 1991)





I. Redefinition of the Production System Drivers of change and new concepts

An increasingly dynamic environment





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

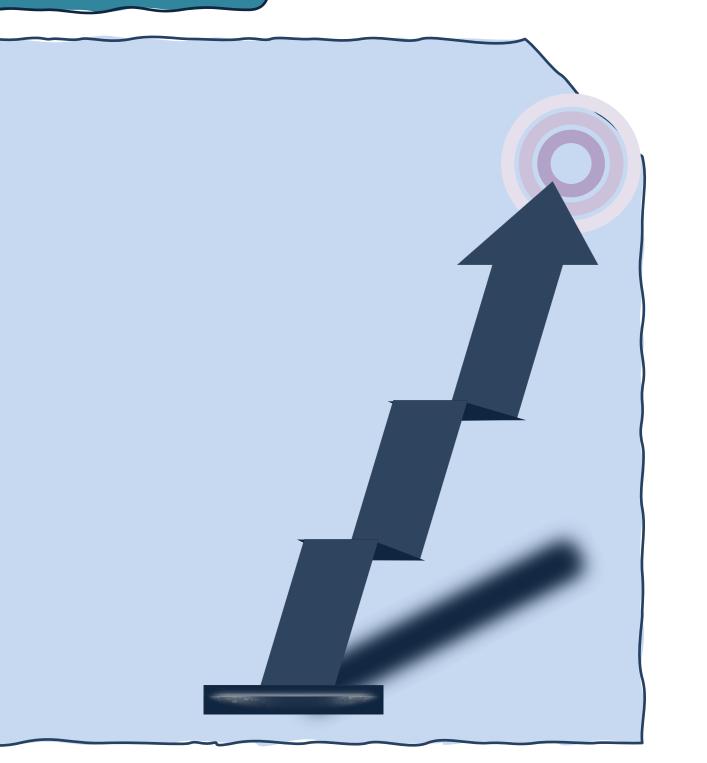


I. Redefinition of the Production System (PS) Designing the extended PS as a strategically-minded entity

Dynamic **Environment:**

- Market, Product, Technology - Concepts: I.4.0, RMS, Sustainability

Corporate Strategy



Direct Manufacturing area:

Products, Processes, Equipment, Organization, Human workforce

Peripherical area: Marketing, Product R&D, Network of production

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I. Redefinition of the Production System (PS) Designing the extended PS as a strategically-minded entity

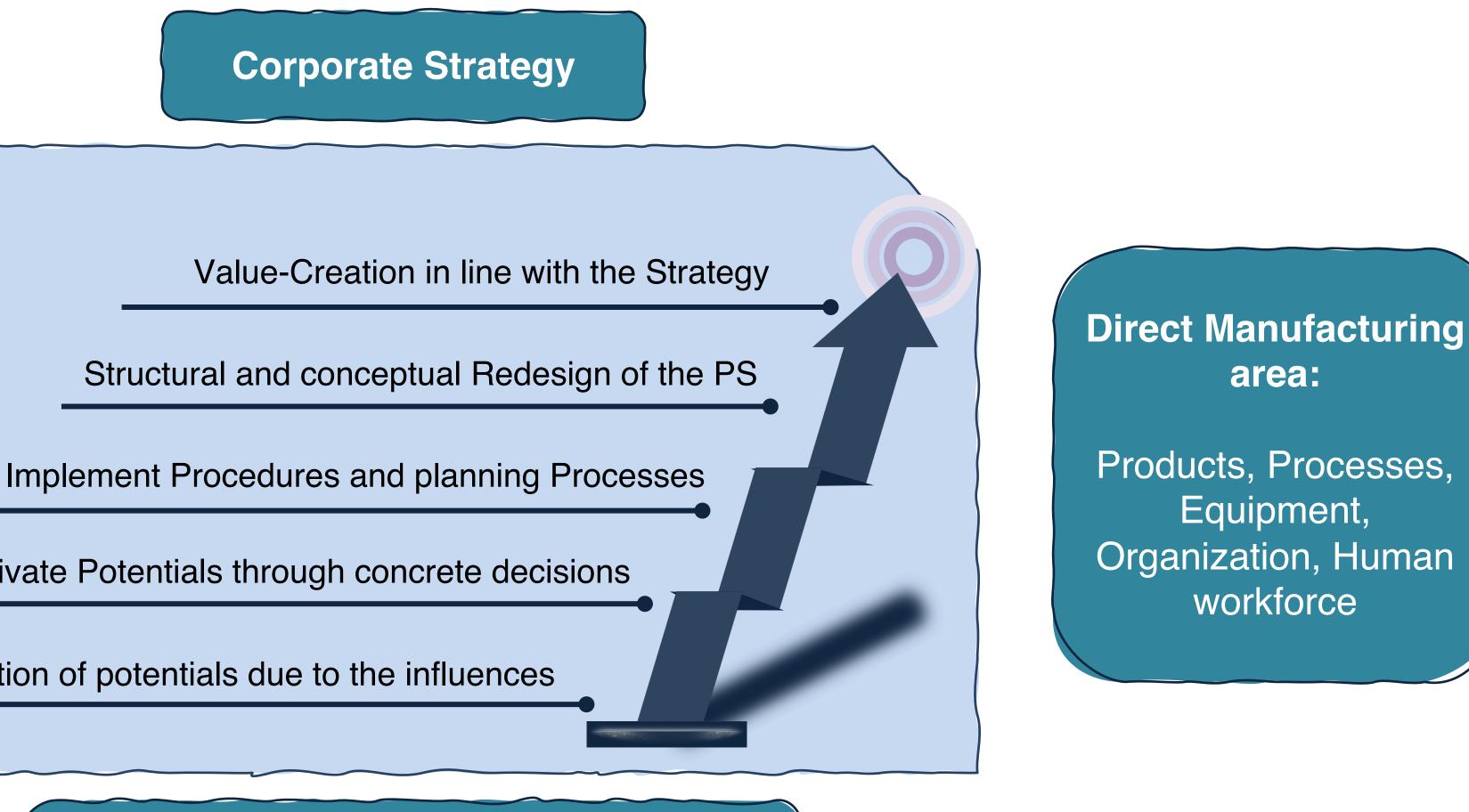


- Market, Product, Technology - Concepts: I.4.0, RMS, Sustainability

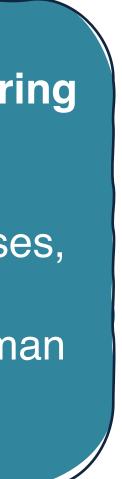
Activate Potentials through concrete decisions

Detection of potentials due to the influences

Peripherical area: Marketing, Product R&D, Network of production



09.11.2021





Topics to tackle

I/ Redefinition of the Production System

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

KEY QUESTIONS

 \rightarrow 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?

 \rightarrow From your experiences, what are the main factors influencing the extended PS? What else would make the PS a strategic entity?

 \rightarrow 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?

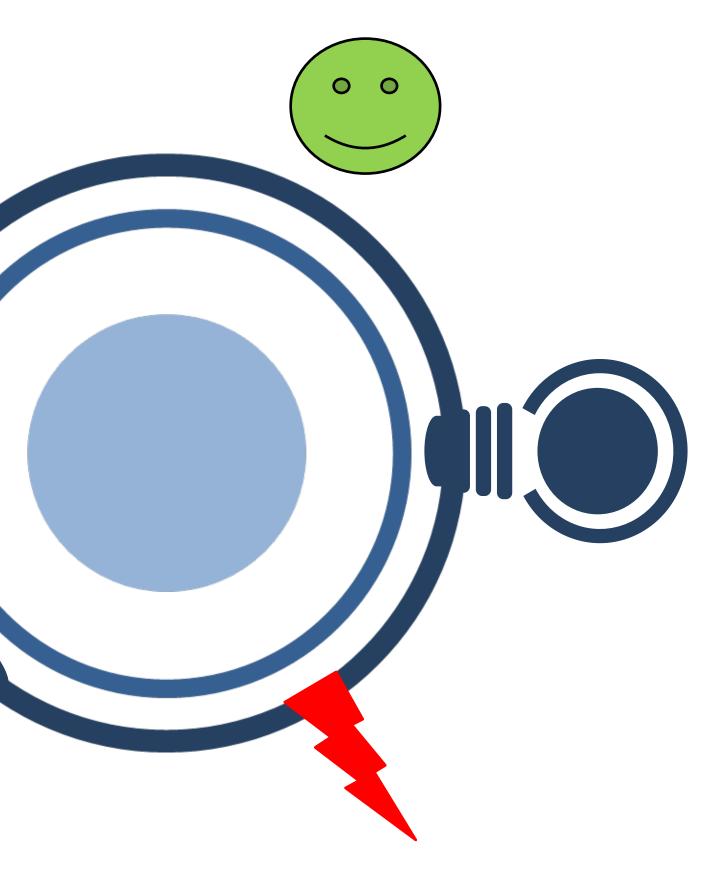


II/ The Ambidextrous Production System → Conceptual rehabilitation of ambidexterity in the PS

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Innovation Strategy

Production System



Ambidexterity

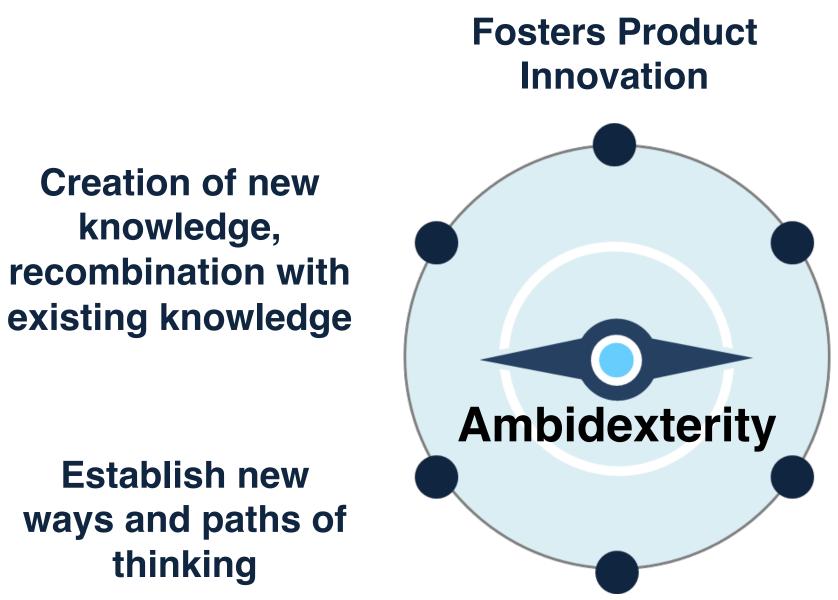


- What role for the Ambidexterity concept in the extended Production System? And vice versa, what role could play the extended PS in the ambidextrous organization?
 - Discussion free of bias

What conceptual relationship between PS and Ambidexterity?



II/ The Ambidextrous Production System Onceptual rehabilitation of ambidexterity in the PS



Establish new ways and paths of thinking

knowledge,

Promote creation of new Business Models

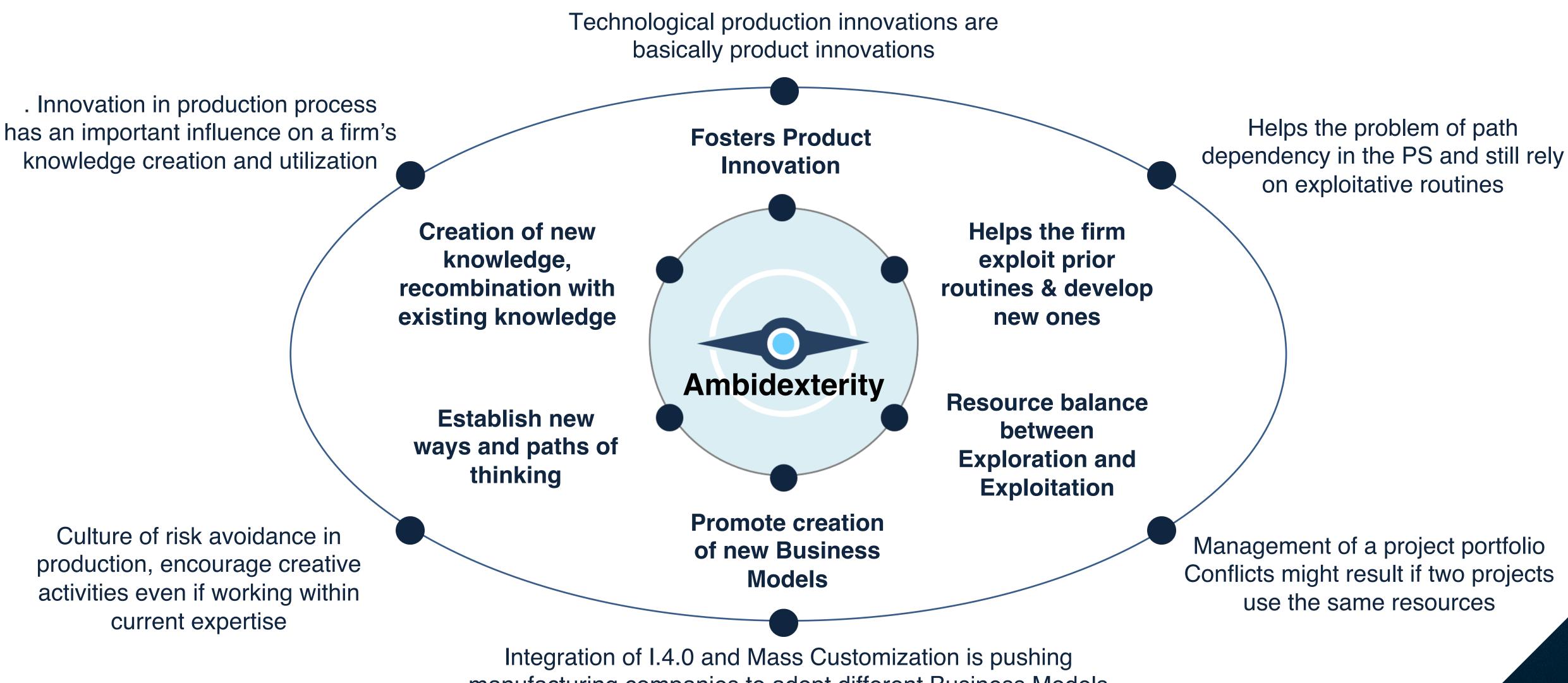
Helps the firm exploit prior routines & develop new ones

Resource balance between **Exploration and Exploitation**



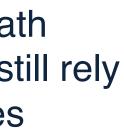


II/ The Ambidextrous Production System Onceptual rehabilitation of ambidexterity in the PS



manufacturing companies to adopt different Business Models

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II/ The Ambidextrous Production System Ambidexterity as an enabler of dynamic capabilities



Operational capabilities

Market capabilities

Technology capabilities

Dynamic capabilities

Dynamic Innovation capability

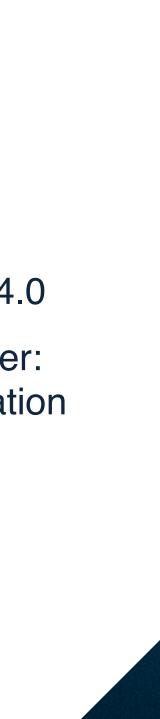
Absorptive dynamic capability

Adaptative dynamic capability

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

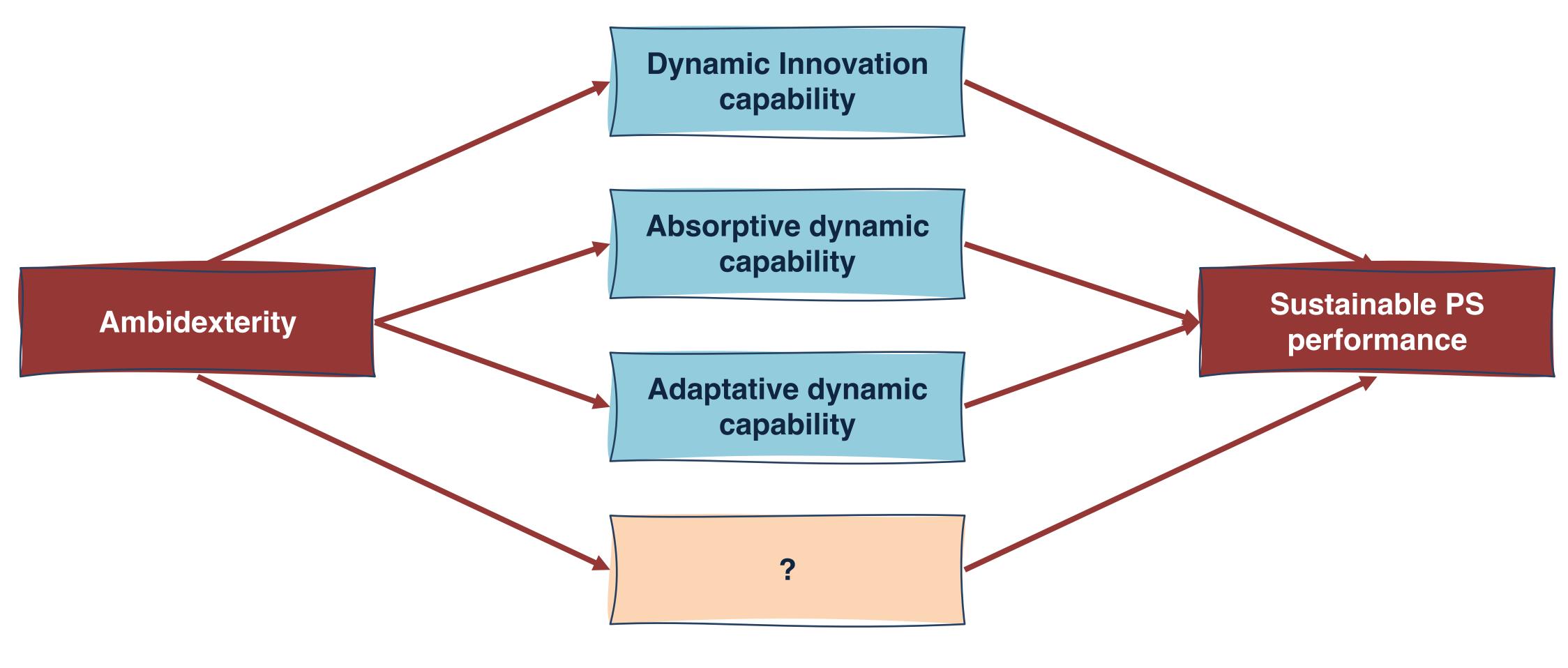
Knowledge creation and transfer: technological watch, communication between units...

> Flexibility of the PS, Project Portfolio Management



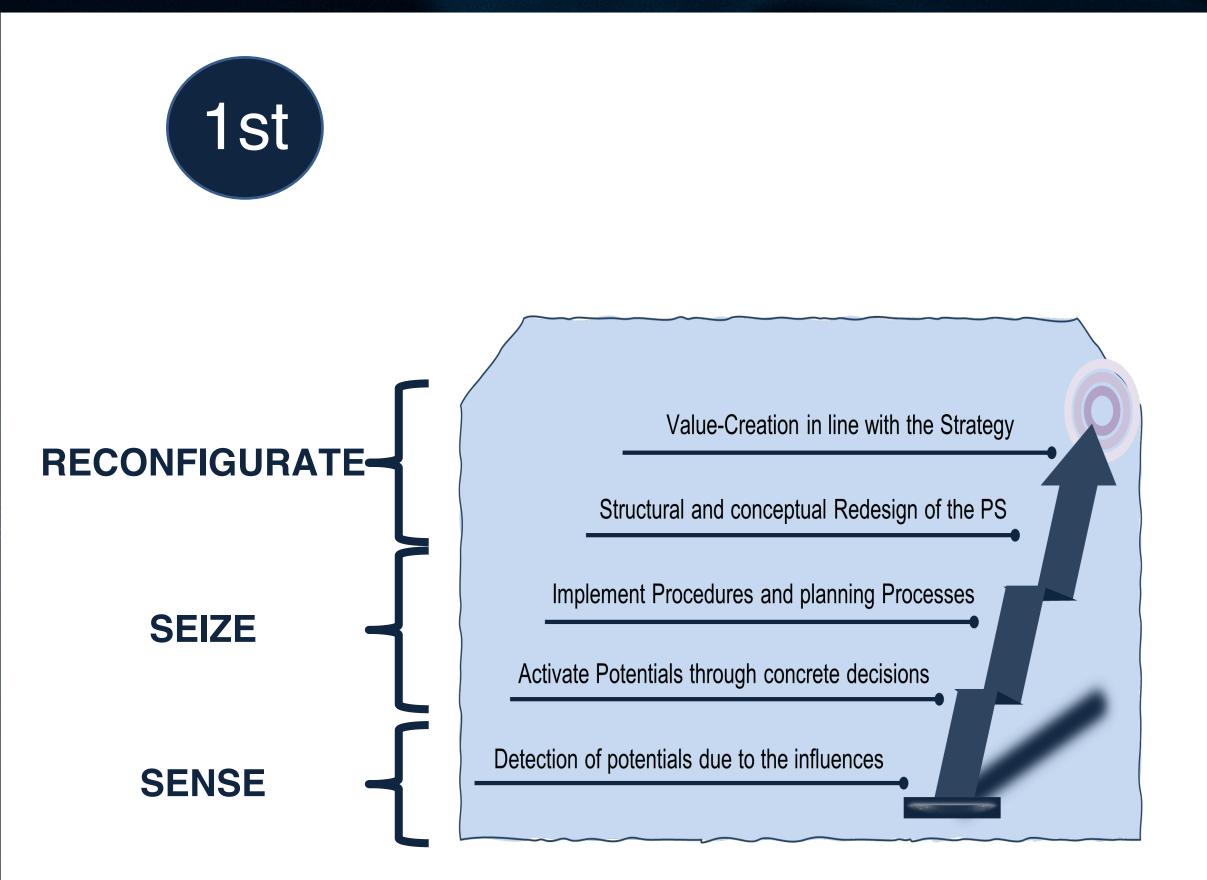
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II/ The Ambidextrous Production System → Ambidexterity as an enabler of dynamic capabilities





II/ The Ambidextrous Production System → The extended PS supporting the ambidextrous organization



Mass Customization Reconfigurable Manufacturing System (RMS)

2nd

Industry 4.0

→ Creation of new BMs and strategies: circular economy.

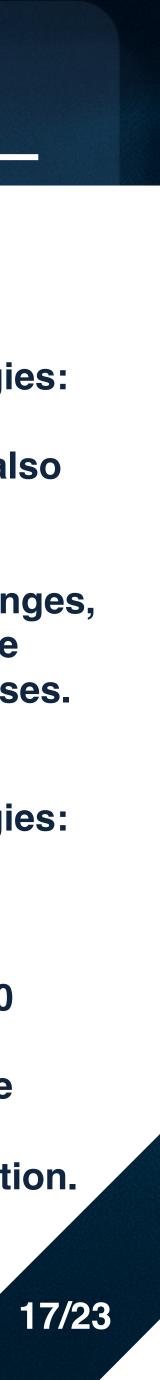
→ The ambidextrous organization also requires changes from overhead processes – coordination, communication, schedule, tool changes, work training... This is solved by the automation of the overhead processes.

→ 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.

 \rightarrow CPI triggers a more agile production.



Topics to tackle

II/ The Ambidextrous Production System

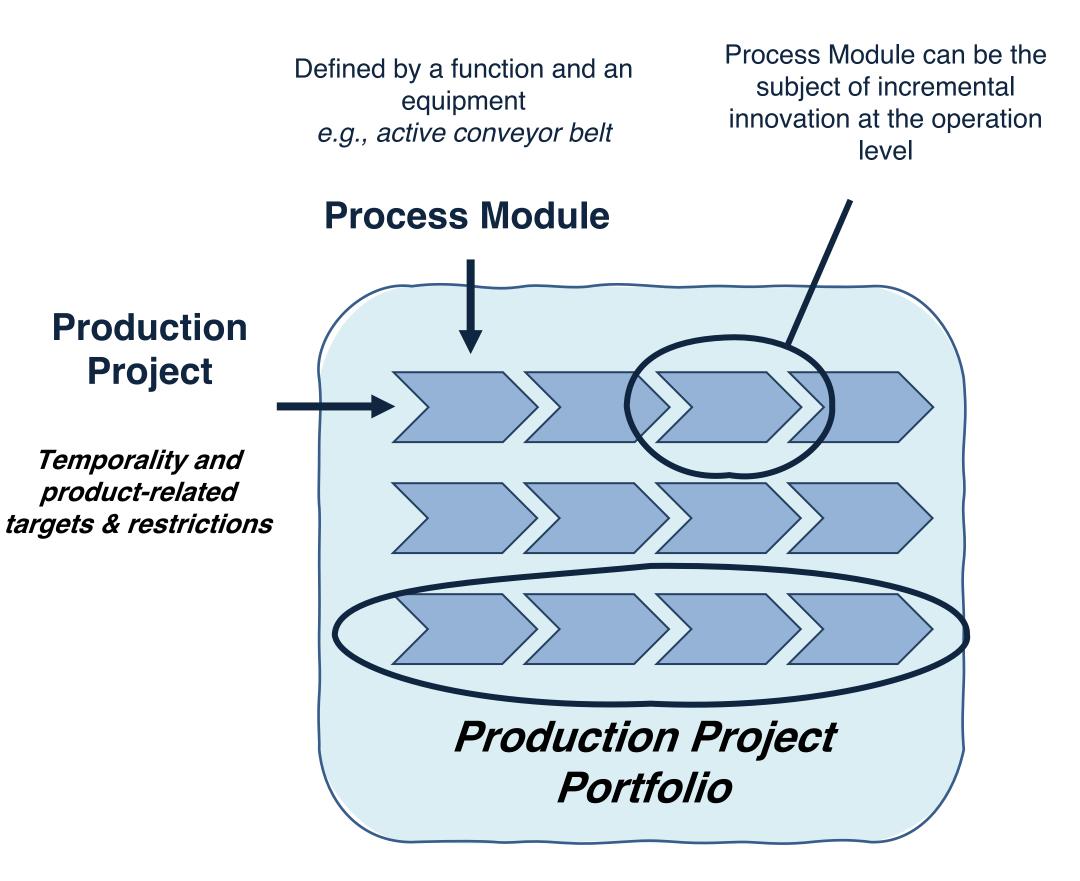
- \rightarrow Conceptual rehabilitation of ambidexterity in the production system
- \rightarrow Ambidexterity as an enabler of dynamic capabilities
- \rightarrow The extended Production System supporting the ambidextrous organization

KEY QUESTIONS:

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

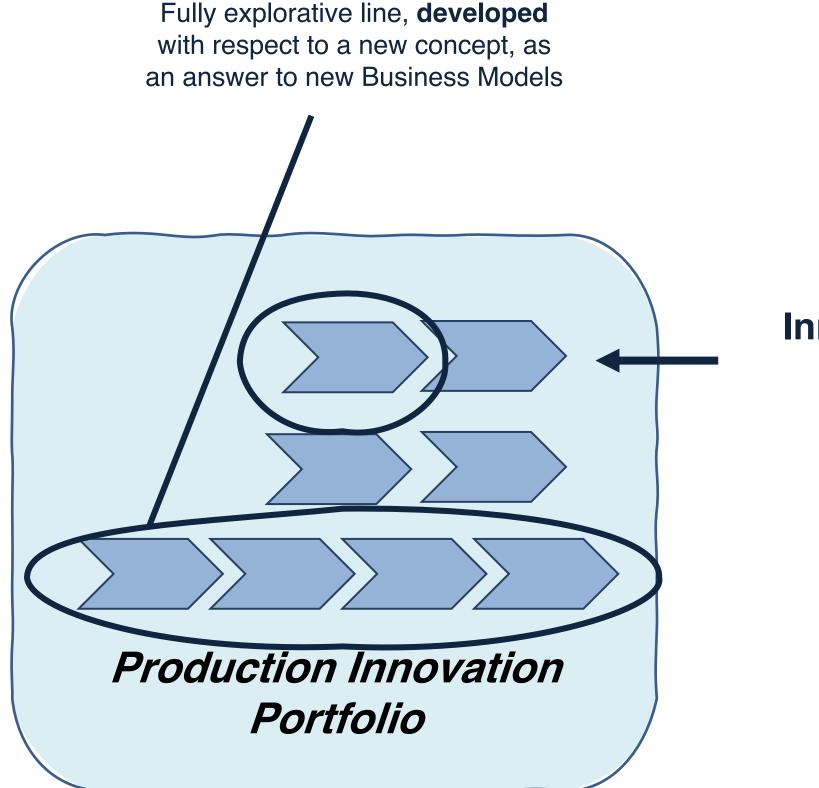


III/ Strategizing Innovation in the Production System → Framework for an ambidextrous Innovation Strategy in the PS



Operation Unit

Operators, Process Engineers, Quality Engineer, Method Engineer, Ergonomic, Maintenance Managers



Production Innovation Project

Less temporality and few productrelated targets & restrictions

 \rightarrow Liberation of the product and project requirements

Development Unit

R&D process & method Engineers, Technology experts Managers

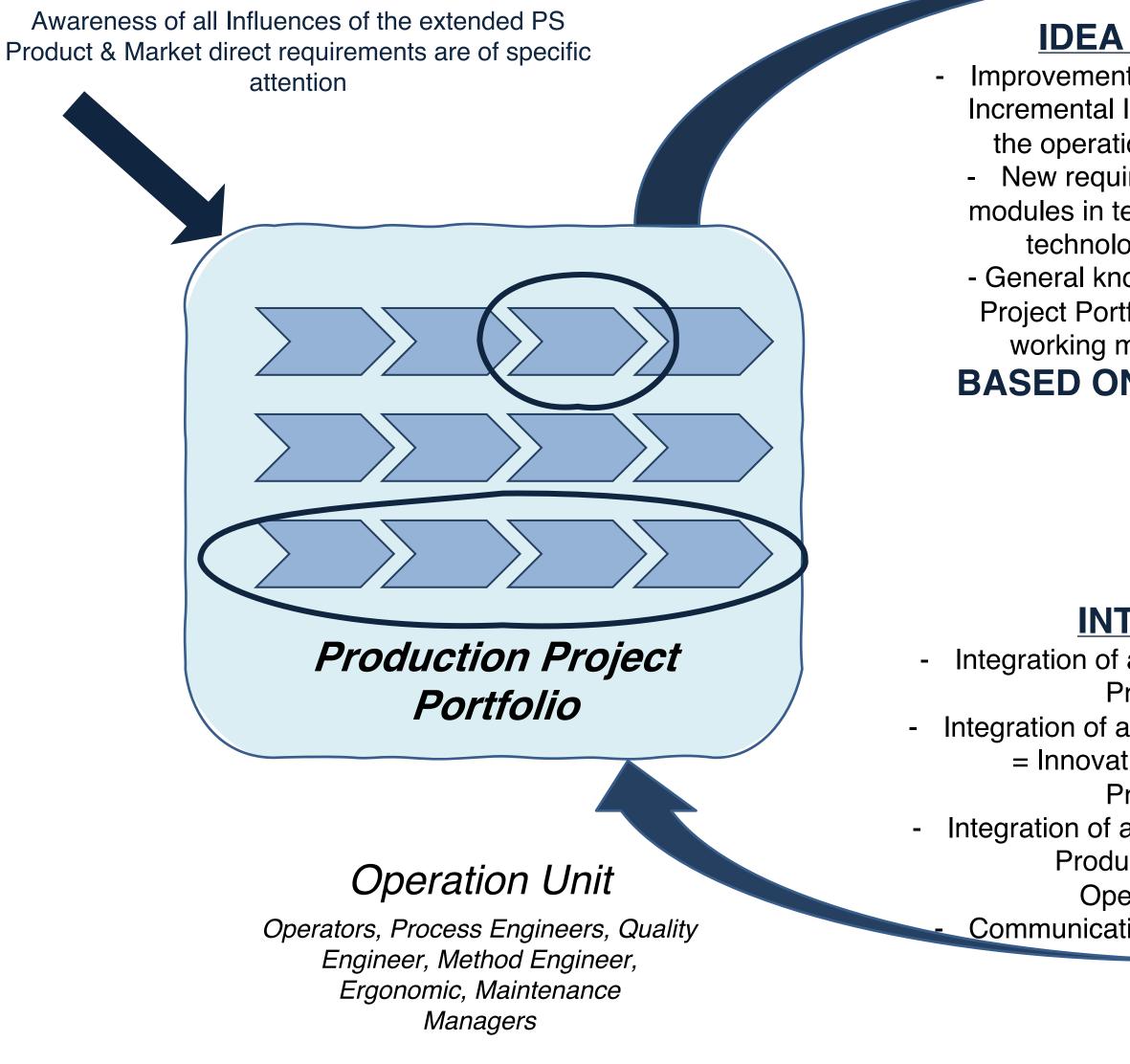








III/ Strategizing Innovation in the Production System → Framework for an ambidextrous Innovation Strategy in the PS



IDEA GENERATION:

 Improvement ideas for a process module:
 Incremental Innovation ideas coming from the operational level, from individuals.
 New requirements for future process modules in terms of working methods and technologies (e.g., Operator 4.0)
 General knowledge and feedback on the Project Portfolio in terms of Technology, working methods, existing modules
 BASED ON THE IS-SITUATION All influences of the extended PS considered

INTEGRATION:

 Integration of a product-driven module for a Production Project.
 Integration of a Production Innovation Project

- = Innovative Module in an existing
 - Production Project.
- Integration of a fully explorative for a specific
 - Production Project or as an
 - **Operationalization Test**
 - Communication on the actual state of the

portfolio

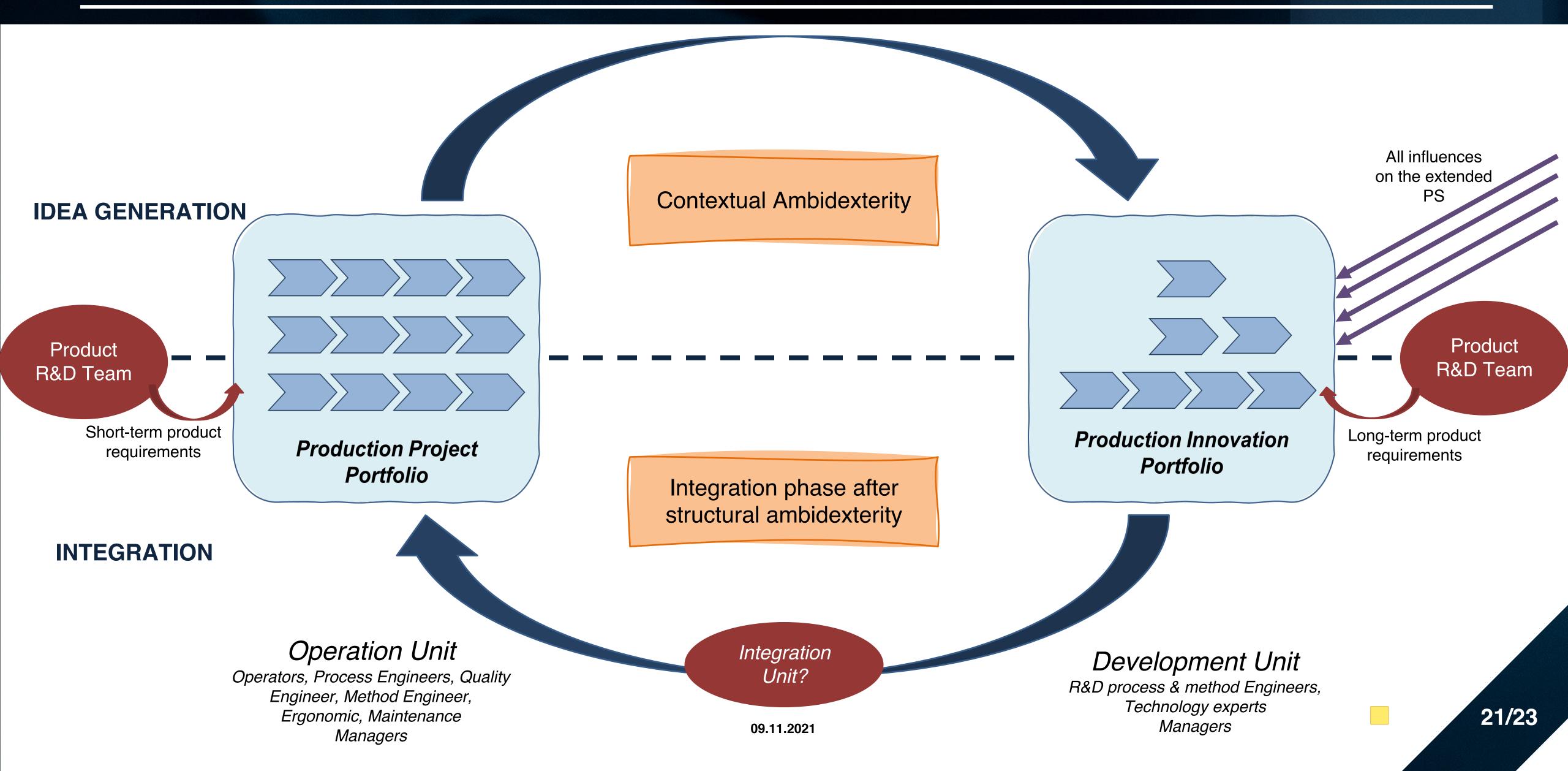


Development Unit

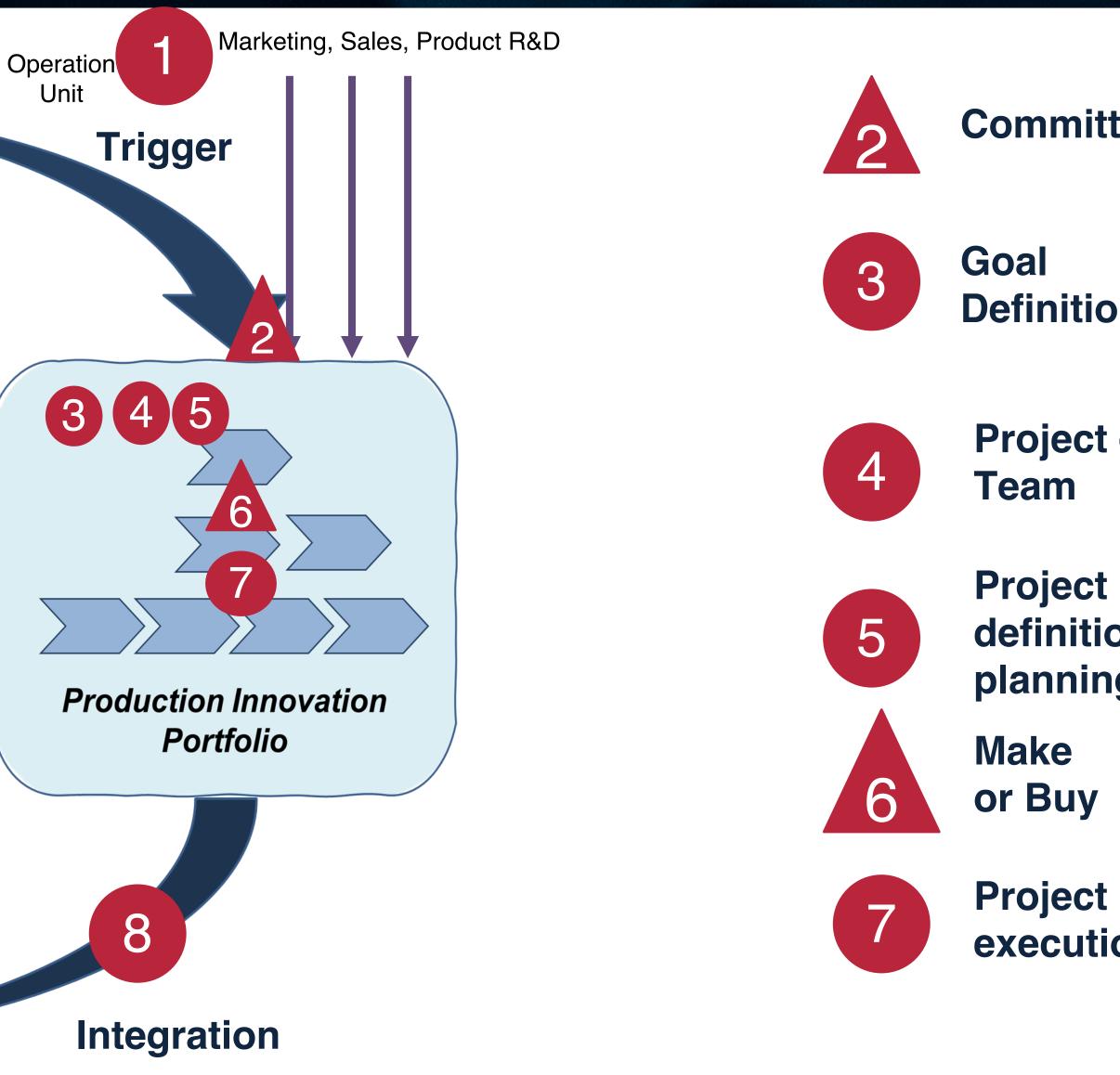
R&D process & method Engineers, Technology experts Managers



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



tee	Informal committee made of the Prod Development Unit and Unit responsible the idea generation. The two following questions must be answered: - What place for the innovation project in the PI Portfolio and the PP portfolio - What is the estimated human time investment?
n	 Define the module and its goal on the following dimensions: Exploitation: Short-term operational advantage. Exploration: Long-term strategic advantage. Based on the Prod Project Portfolio & Prod Innovation Portfolio IS-SITUATION
-	Definition of a dedicated project-team made of: - Collaborators from the Operation Unit (Project Team in case) - Experts from the Innovation Development Unit. Structural Ambidexterity is at play.
on & g	Scope & Budget, Work Breakdown Schedule, Risk Management, definition of
	Depending on the budget and the scope of the innovation project. For a radi innovative module, Top Management needs to answer: Does it fit the PS Strategy and the corporate Strategy?
on	Module Prototyping, Workforce guidelines, Validate Module Inter-Locking, Evaluation of the early outputs.



















Topics to tackle

III/ Strategizing Innovation in the Production System

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

KEY QUESTIONS

- \rightarrow What roles and characteristics do we
- \rightarrow What dimensions for a maturity assessment of the ambidextrous Production System?
- \rightarrow 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: - 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 a project-oriented if it is organized as a project, including the planning, the design of the operating line, and the operation itself.

\rightarrow 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.



\rightarrow 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.

\rightarrow Temporality

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



Annex Tools when dealing with a Production Portfolio

Project Master Schedule

Production Project Portfolio

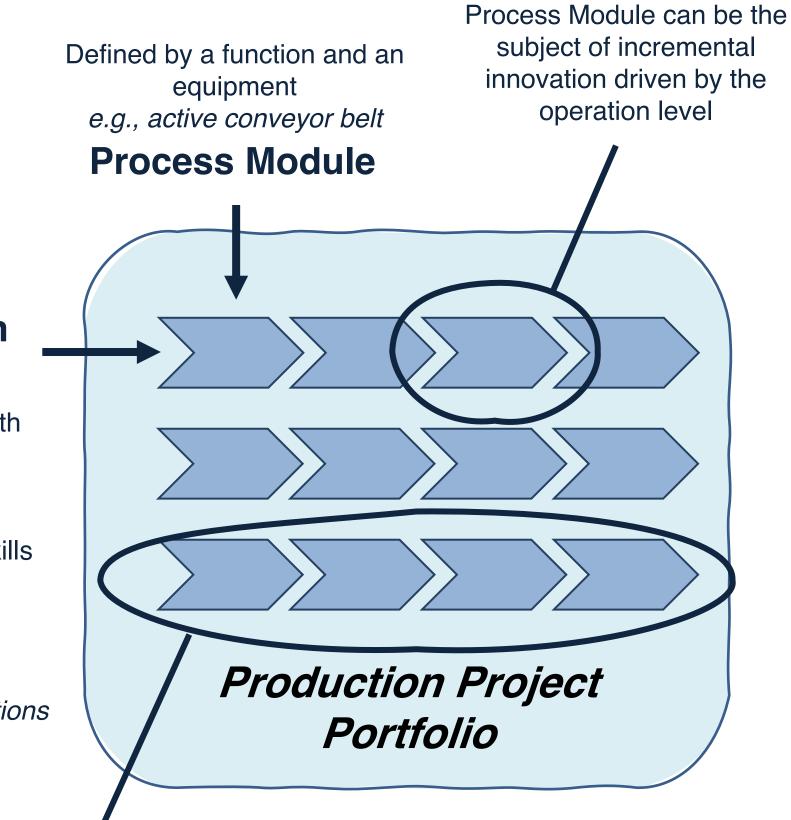
FlexEMA

Production Project

- Processes with different technologies
- Methods
- Workforce Skills
- Resources

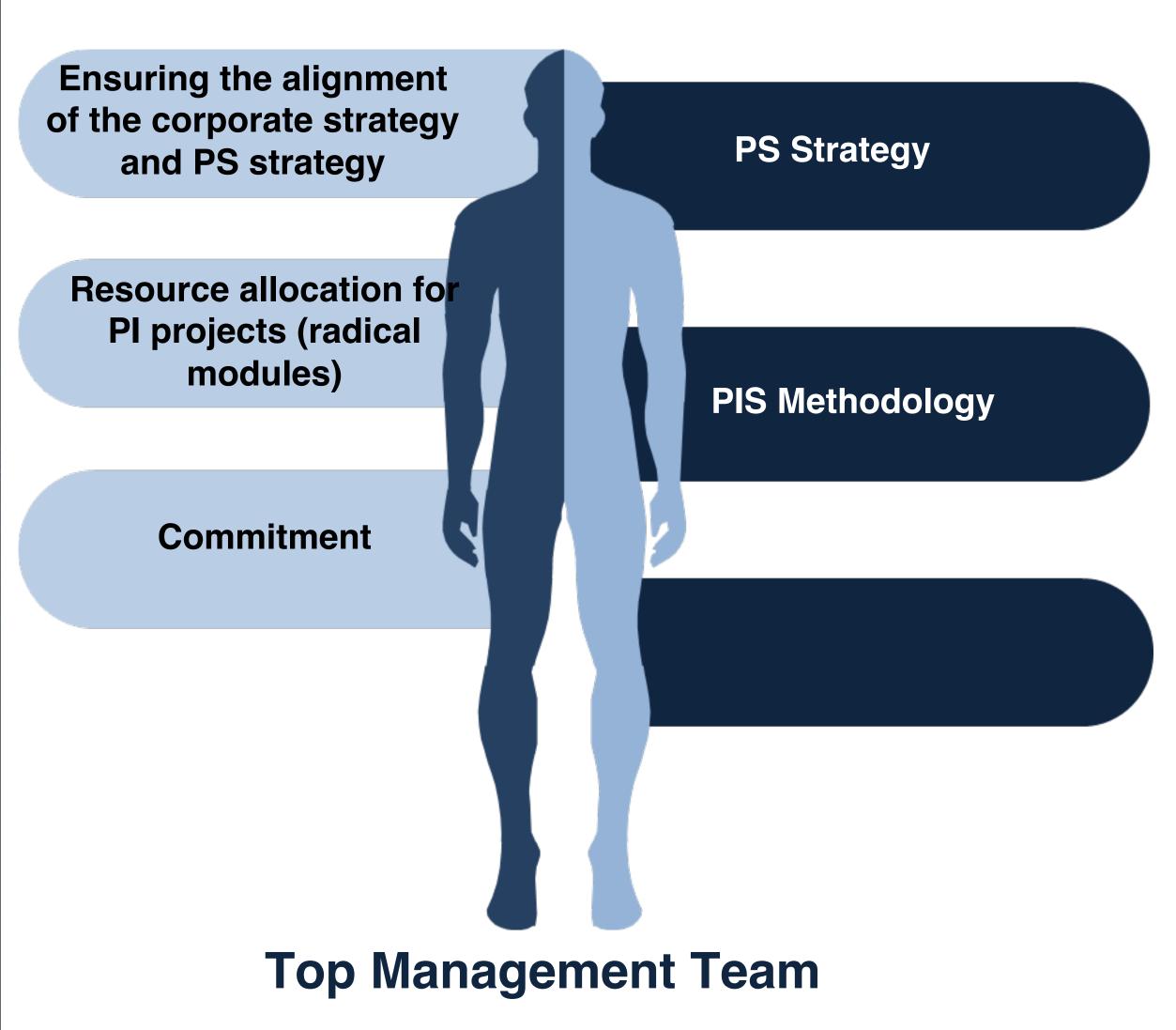
Temporality and product-related targets & restrictions

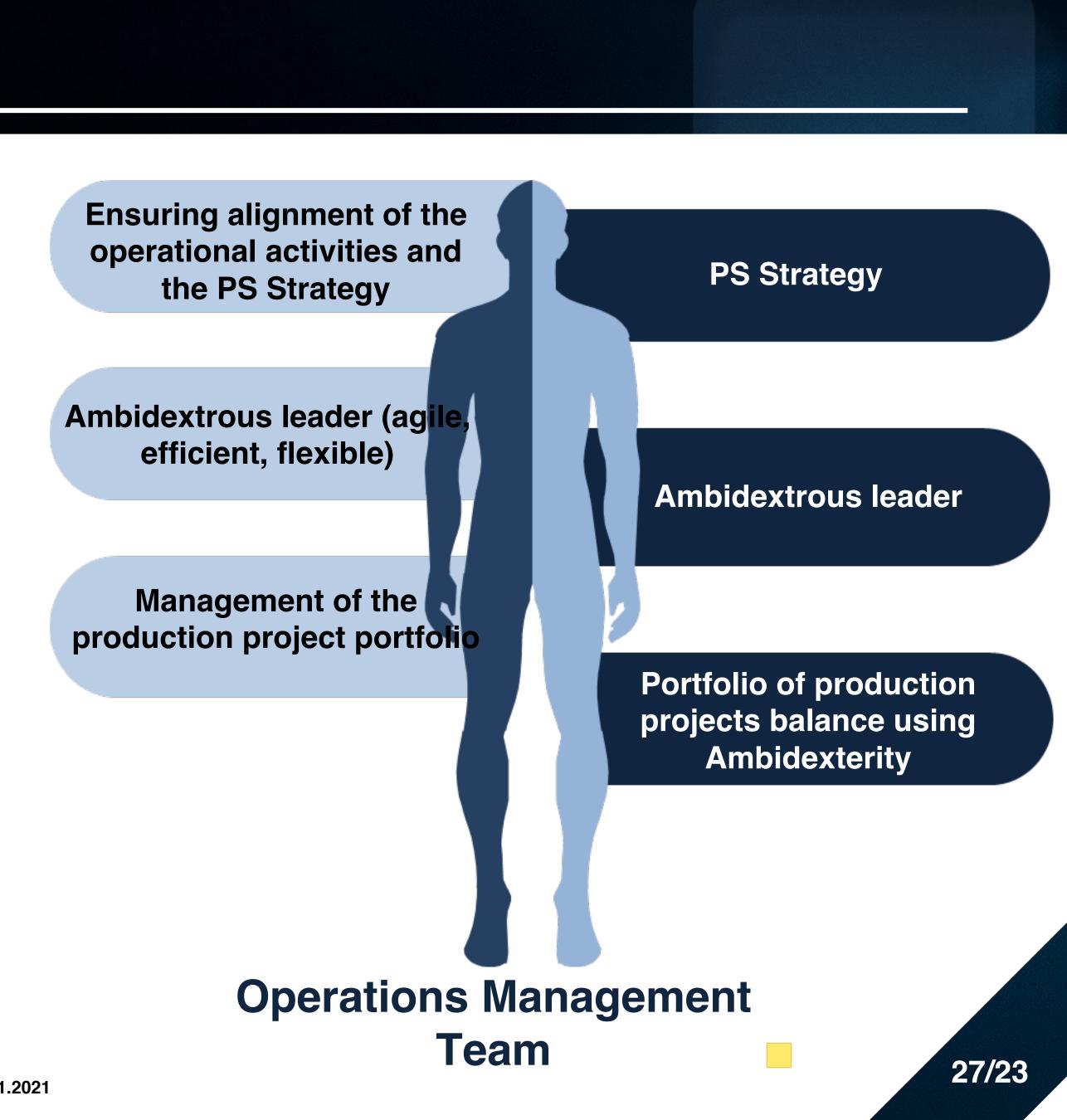
Depending on the context, fully explorative line operationalized with respect to a new concept, as an answer to new Business Models



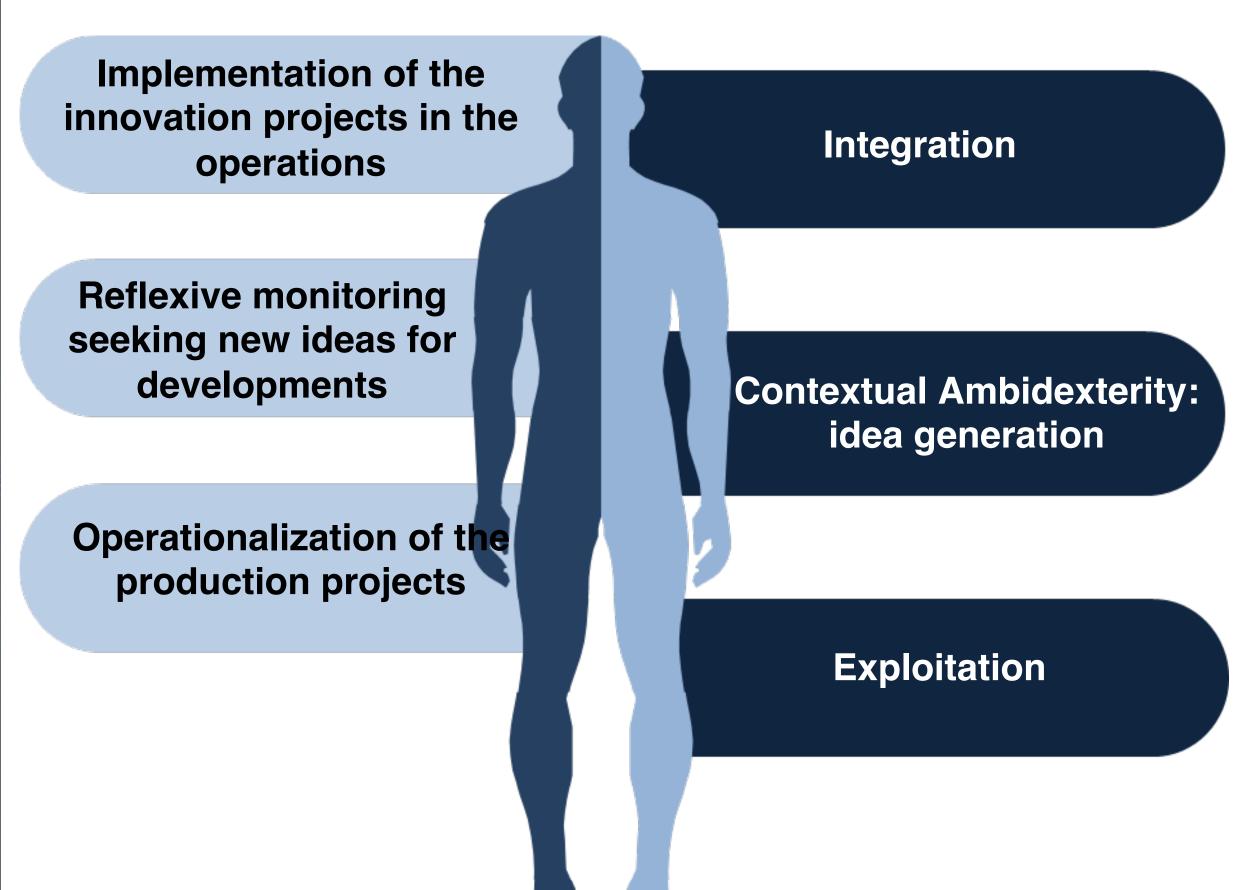


Annex Role of the people





Annex Role of the people



Operation Unit:

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

