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Extended System Operator for Product. Models

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About



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Current position	Co-founder & CEO at ZORKA LAB *Ontology-based AI agents*
Experience (TRIZ)	- Co-founder & knowledge engineer at IMLab, Corp. (1987 - 1993). - TRIZ trainer at EPAM Systems, Inc. (2015 - 2024) - Co-founder of Minsk TRIZ Club (2018 - 2021) - TRIZ Navigator for Business Models (2018) - TRIZ Ontology project (2019 - 2022) - VCM agent (2025) - Extended System Operator for Product (2026) - Business TRIZ Ontology (2026)
TRIZ Certificates	1) Minsk TRIZ School, Minsk, 1989 (Nickolay Khomenko) 2) TRIZ & VEA. Leningrad, 1990 (Simon Litvin, Vladimir Gerasimov) 3) TRIZ level 4. Moscow, 2020, (Mikhail Rubin) 4) Master of Business TRIZ, IBTA, 2026 (Valeri Souchkov)

1. System & product are different objects for analysis

SYSTEM

A set of interacting elements organized to perform the function / achieve the goal

Focus: structure • Function • Effect

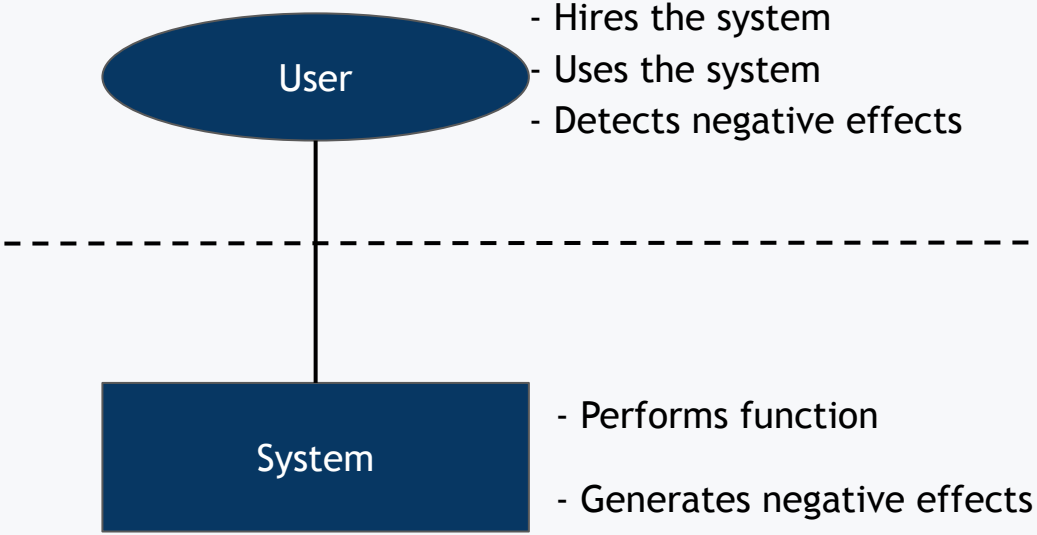
PRODUCT

Solve the customer problem, creating value in the specific context

Focus: problem • use case • value

2. Product in TRIZ System Operator

Supersystem level



- Is facing with the problem
- Hires the system
- Uses the system
- Detects negative effects

JTBD: I need to quickly capture the moment my child takes his first step so I can share it with my family.

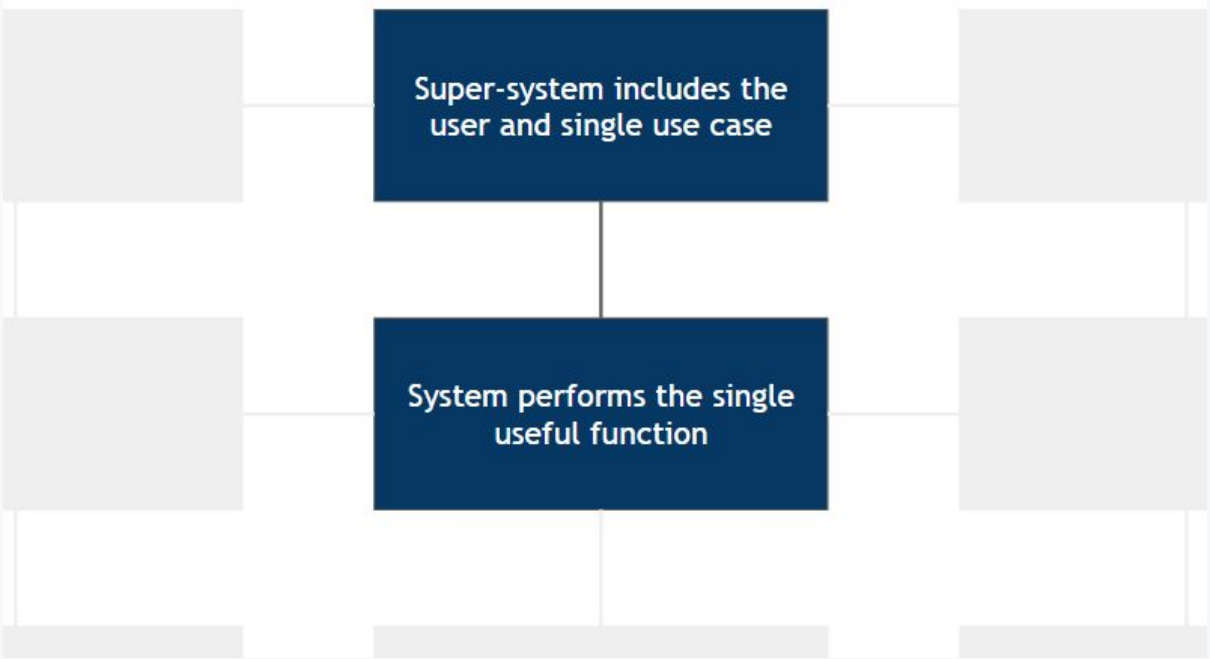
- Performs function
- Generates negative effects

Useful function: creating a digital image

Negative effect: destroying the experience of the moment in the process of capturing it

System level

3. Minimal Product Model



1 function

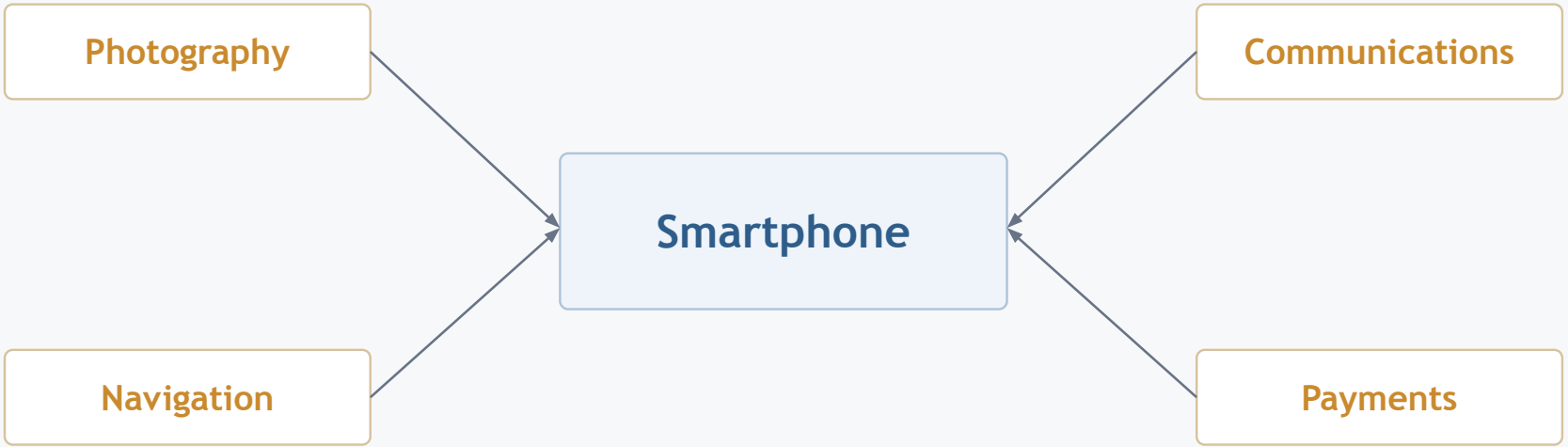
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1 use case (JTBD)

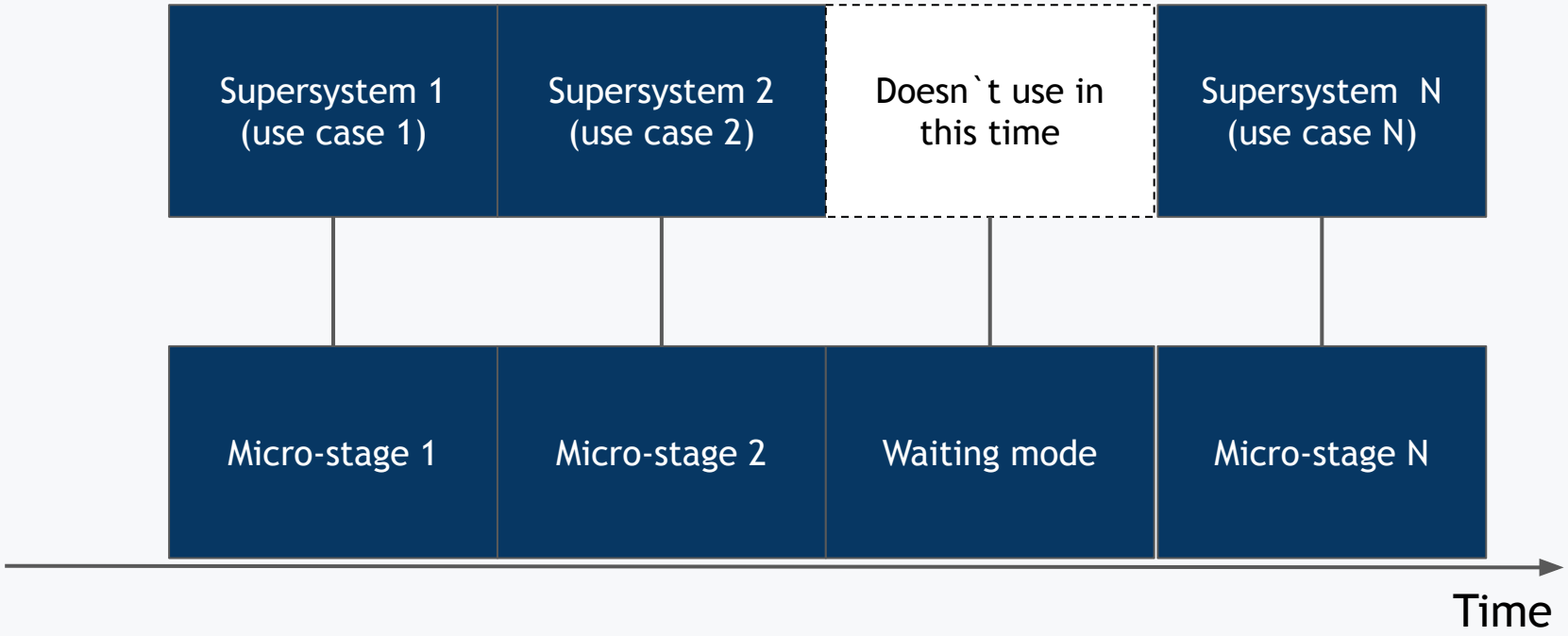
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Minimal product

4. Product: one system - several use cases



5. Micro-stages



Micro-stage - time slot in the life-cycle when the single use case is realized

6. Micro-stages on the product life-cycle

Development	Manufacturing	Usage	Maintenance
Design	Setup	Use Case A	Diagnostics
Prototyping	Assemble	Use Case B	Repair
Feasibility study	Quality Control	Waiting Mode	Update

Each life-cycle stage can ve decompose to the micro-stages and use cases or interaction scenarios

7. Evolution ≠ Life-Cycle

EVOLUTION

Past → Present → Future

System versions & generations

external macro-time

LIFE-CYCLE

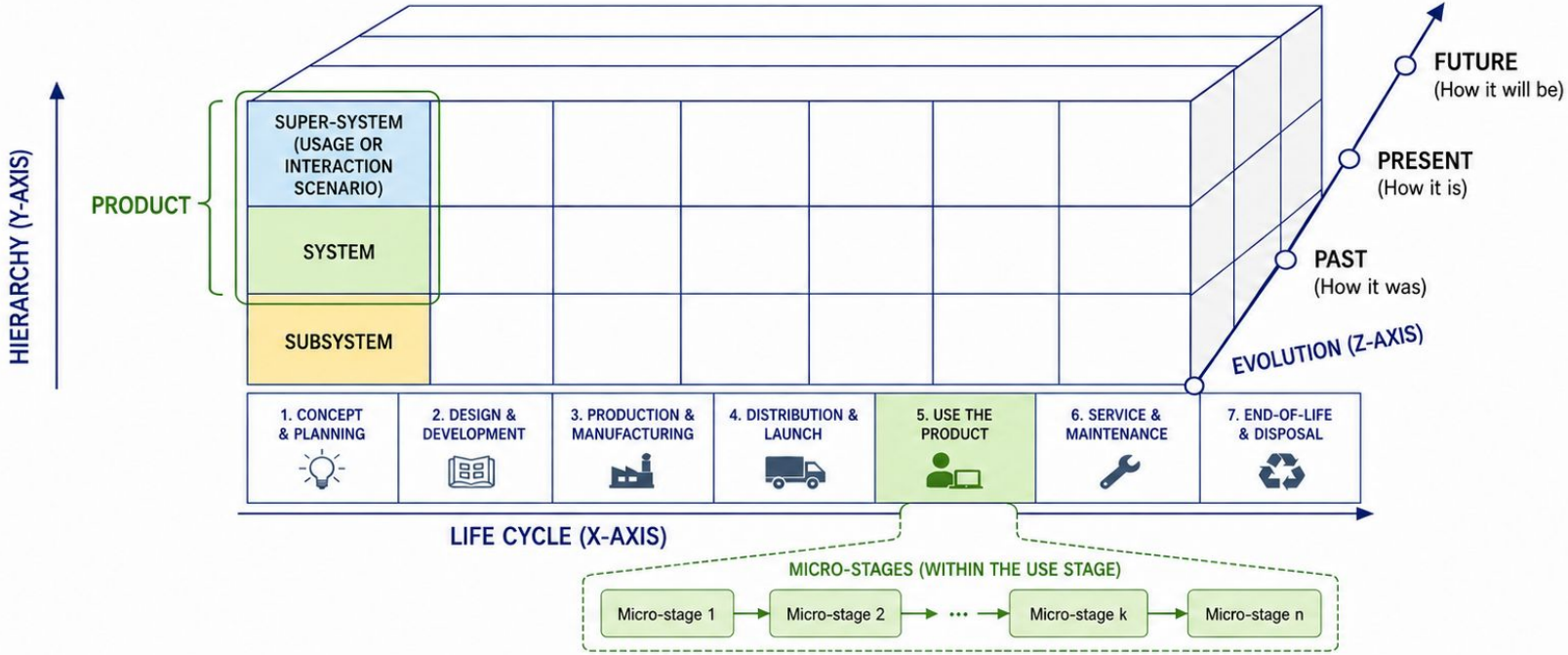
Development → Manufacturing → Usage → ...

System itself

Internal system time

Extended System Operator for a Product

A 3-Dimensional Model for Product Analysis and Design



The **extended system operator integrates three dimensions:**

Hierarchy (Y) × Life Cycle (X) × Evolution (Z).

Micro-stages can be defined for each life cycle stage.

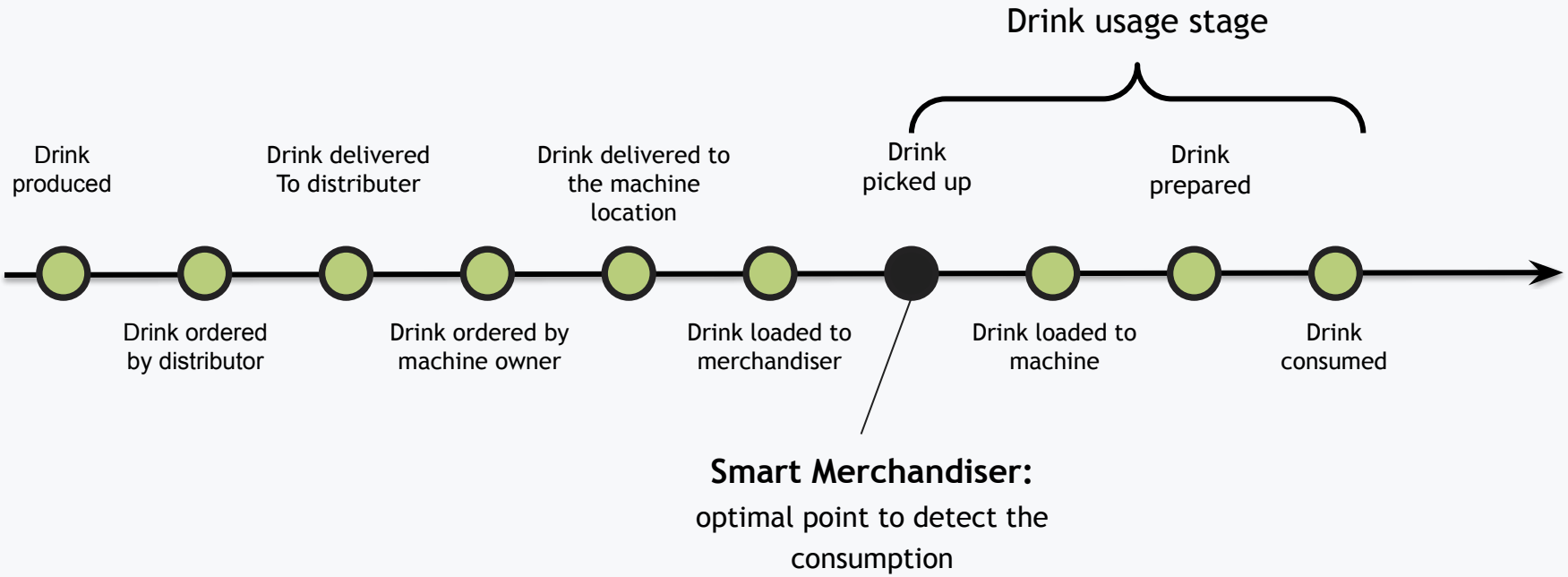
9. Changes

Classical System Operator		Extended System Operator for Product
Single Super-System	→	Multiply use cases & interaction scenarios
Single decomposition to sub-systems	→	Decomposition can be different for micro-stages and tasks
2D: Hierarchy - Evolution	→	3D: Hierarchy - Evolution - Life-cycle
No Stakeholder in super-system	→	Stakeholders and Roles

10. Example: how to collect consumption data?



11. Example: Drink Life-Cycle & Micro-Stages



12. Solution: change the micro-stage, not the machine



Change micro-stage → change the system scope → more simple solution

TAKEAWAYS

1

Product is more then the system

The system performs the function; the product produces the value

2

Life-cycle ≠ Evolution

Different perspectives for analysis

3

System operator is 3D

Hierarchy x Evolution x Life-Cycle

Thank you!