



Continuous Industrialisation

Integrate Product and Production Development

Fredrik Viljesjö

WE ARE MOVEMENT

“The factory is the product”

Elon Musk



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Creating a Product



Concept



Development



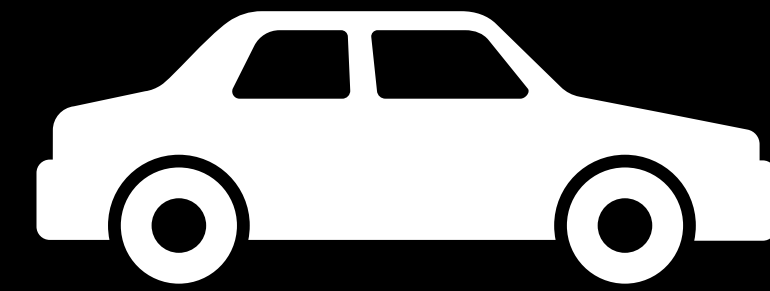
Supply Chain



Industrialization



Production



Product

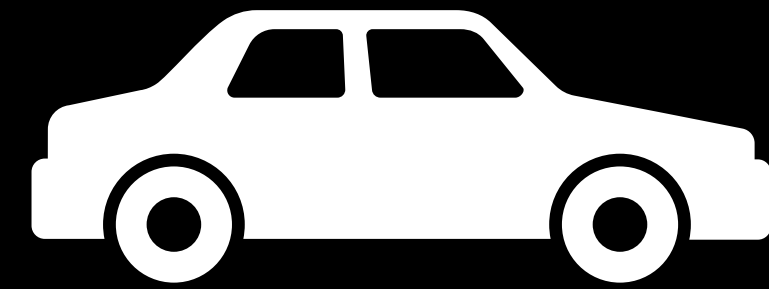
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The Fundamental Problem

The Belief of predictability in a complex situation



Customer



Product



Concept



Development



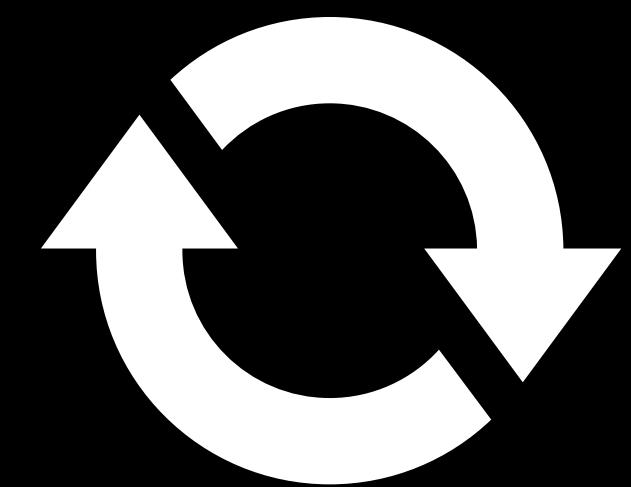
Supply Chain



Industrialization



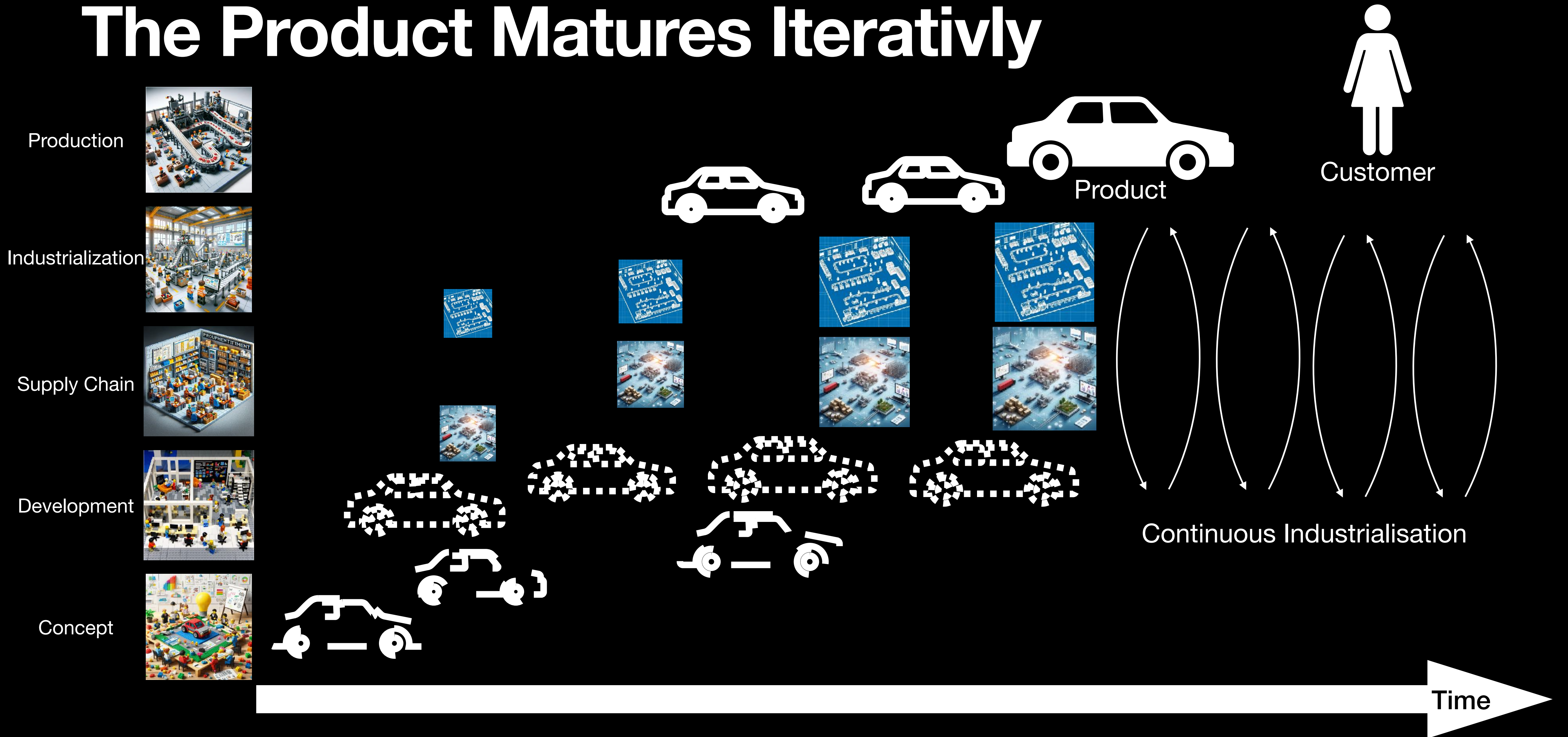
Production



Multi-year sequential effort

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The Product Matures Iteratively



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Continuous Industrialisation Pipeline

Investing in the ability to make changes to the product



Concept



Development



Supply Chain

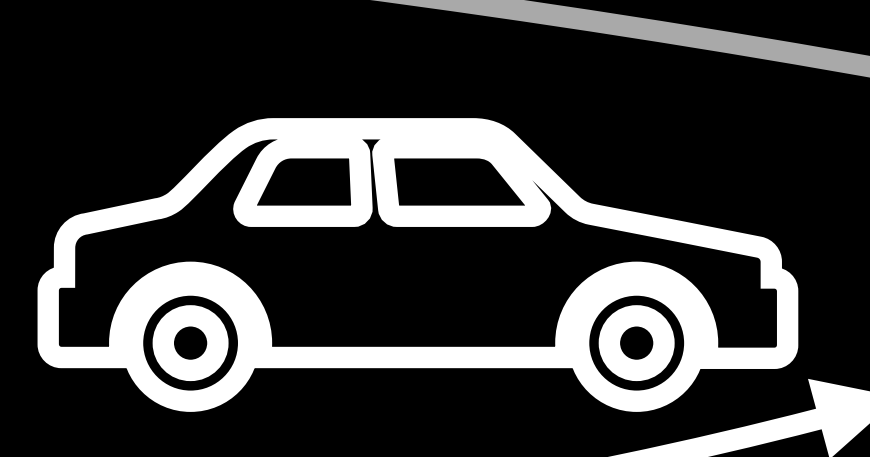
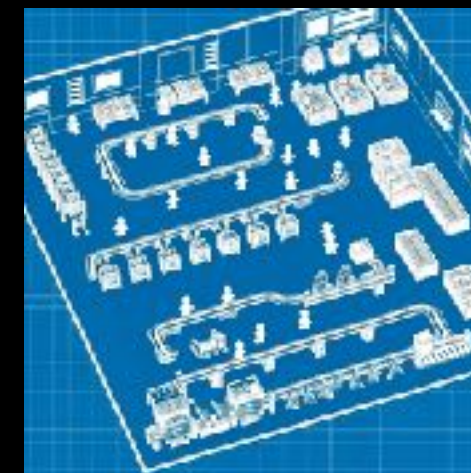


Industrialization



Production

Feedback



Customer

Pipeline

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Examples of speeding up the pipeline



Concept

- Iterative approach
- Validated learning



Development

- Early integration of prototypes through the pipeline
- Modular design for speed of change
- Design for manufacturing
- Speedy Patent processes
- Automated hardware verification tests



Supply Chain

- Flexible vendors
- Co-development agreements
- Long-term contracts - Weekly product updates



Industrialization

- Simulation
- Rapid prototyping
- Commitment to large investments at the last responsible moment
- Automated Compliance Verification Built into the production process



Production

- Cell production
- Modular design
- Built to be changed
- Digital twin

Pipeline

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Working together in a Value Stream

Building the pipeline that creates the Product



Concept



Development



Supply Chain

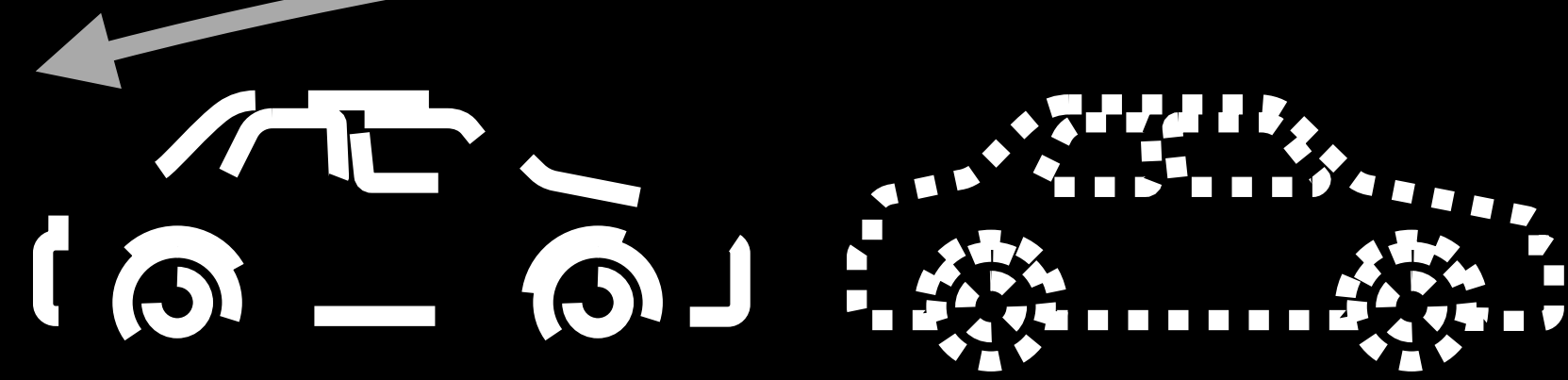


Industrialization



Production

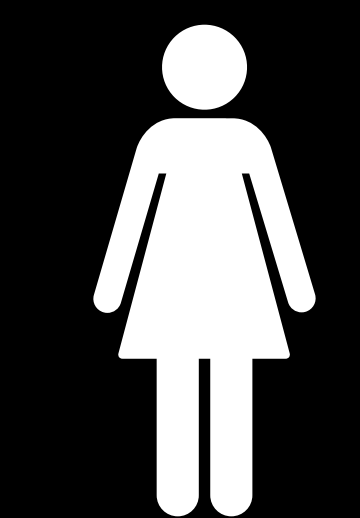
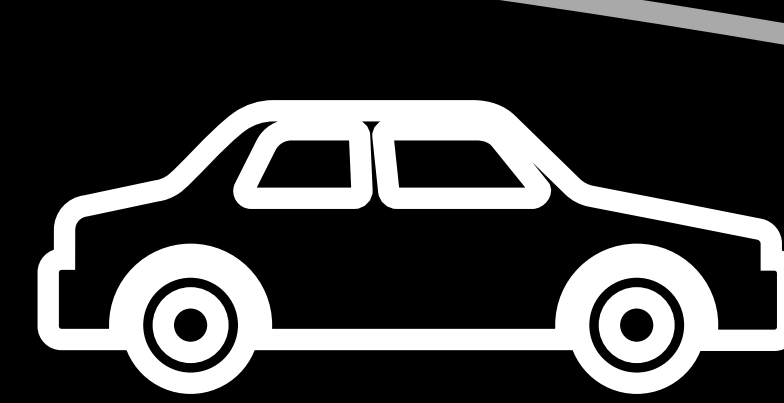
Feedback



Value Stream



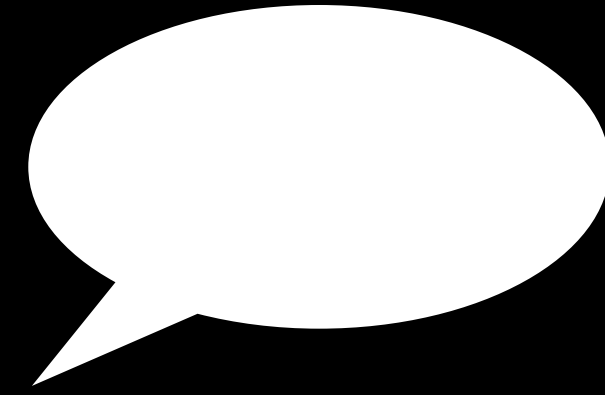
Pipeline



Customer

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Open Discussion and Q&A



- What are contributors to long lead times in your experience?
- What are the assumptions that justify the delays?
- What could challenge those assumptions and speed up progress?



Customer