

Mass Production Lab

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1062, ADCIS 2023, Goa, India, Hybrid-Mode



CNC-Milling

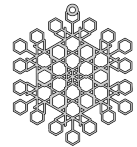
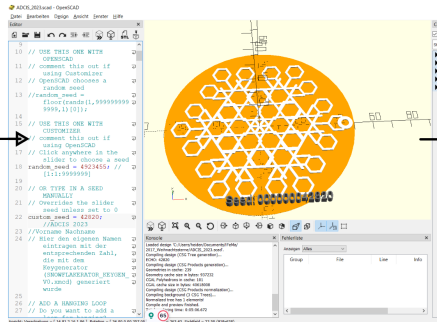
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Figure 1: Model Car Production Workshop Smartlab Carinthia, Villach, Austria, 2016

Mathcad Calculation:

$\text{KEYGEN}(\text{"ADCIS", "2023"}) = 42820$



ADCIS 2023

Figure 2: Fractal generator (Snowflakerator) by Daniel Gavric [Gav17]; production personalisation for <ADCIS 2023>. ¹



Figure 3: Wing Team 2023

¹To generate an own slowflake with the 'snowflakerator' you can follow the self assisted Workshop here:

<http://www.dr-heiden.com/Smartlab.htm> (accessed 2023/09/03).

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Motivation and Introduction:

- Orgiton Theory, System Theory, Cybernetics
- Russel → Leibniz → Boole - Boolean Logic
- Production Systems: → Zlokarnik [Zlo91]: Dimensional analysis → Buckingham π -Theorem

Aim and goal:

- Systematic base for production systems to improve production systematically → mass production lab.

Mass Production Lab

Axiomatic Production System I

Axioms:

Axiom 1

The first 'material' order system or order- o_0 is the conjunction of part-material systems, like that of computer- o_0 , human- o_0 material- o_0 , to one 'material' world.

Axiom 2

The second order is that of a higher kind, or a second level orgiton (-o), the computer-o₁, human-o₁ and material-o₁.

Axiom 3

Increasing directionality increases potentially (a) order and (b) necessarily complexity.

Axiomatic Production System II

$$p[\#] = A[] \cdot \left(\frac{rt[m, s]}{rt_0[m, s]} \right)^{D_{f_i}[]} \quad (1)$$

Axiom 4

The fractal (Hausdorff) dimension (D_{f_i})(according to (1)) measures the information or complexity of an overall (world-)production process, quantifying its room-time (rt) scaling law.

Mass Production Lab-Origitonal Model I

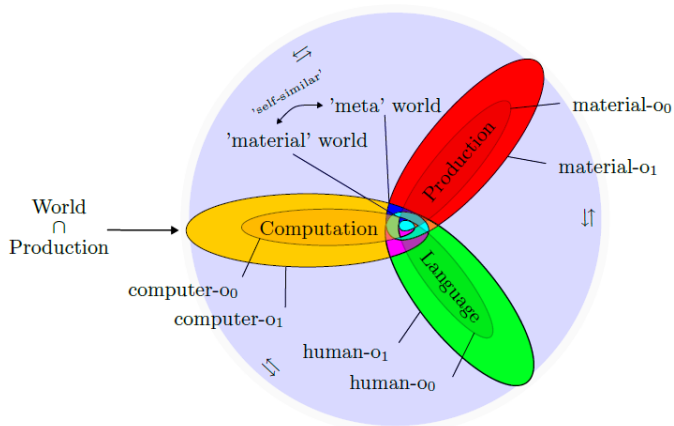


Figure 4: World, Production, Order

Production Scaling Model I

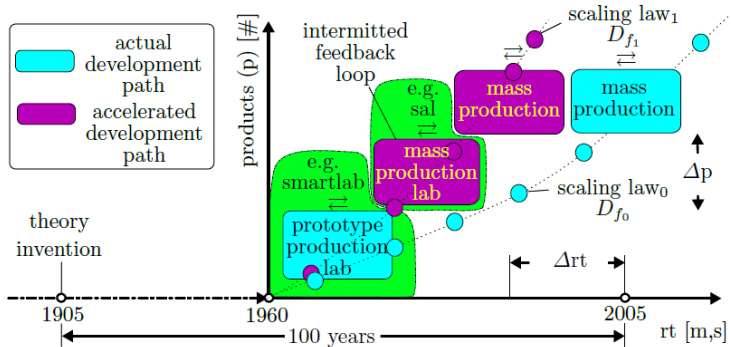


Figure 5: Production Scaling

Conclusion, Recommendation and Outlook

Conclusion:

- increasing order is a fractal bifurcation process → innovate → quality depends on specific structure (here the mass production lab)

Recommendation:

- new integrating institutions (here mass production lab)
 - efficient - 'machinely' integrating (machines)
 - cooperative - social/humanly integrating (humans)

Outlook:

- measure dependency in real world and experimentally determine system parameters
- use in control applications → design strategy
- system dynamics simulation (Witness, Mathcad, Matlab, Stella, Vensim, Powersim Studio², etc.)

²<https://systemdynamics.org/tools/core-software/> (accessed 2023/09/23).

Thank you cordially for your attention!



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PS.: The presentation can also be found at:

<http://www.dr-heiden.com/Vortraege.htm>



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