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Production Orgitonization - Some Principles of the Central/Decentral Dichotomy and a Witness Application Example

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03/03-04/2022 Online - Virtual Conference
(previously planned San Francisco, California, USA)

FICC 2022
3-4 March 2022 | Virtual

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Introduction

Motivation and Introduction:

- Orgiton Theory
- Increasing Complex Systems - How to describe?
- Interdisciplinarity
- Controllability of Systems $\rightarrow$ Optimization Problem

Method and Goal:

- Systems Theory, Orgiton Theory: Cybernetic elements of *information*, *energy* and *mass*
- $\rightarrow$ Production Orgitonization: Modelling Central/Decentral Orgitons & Computer Modelling in Witness

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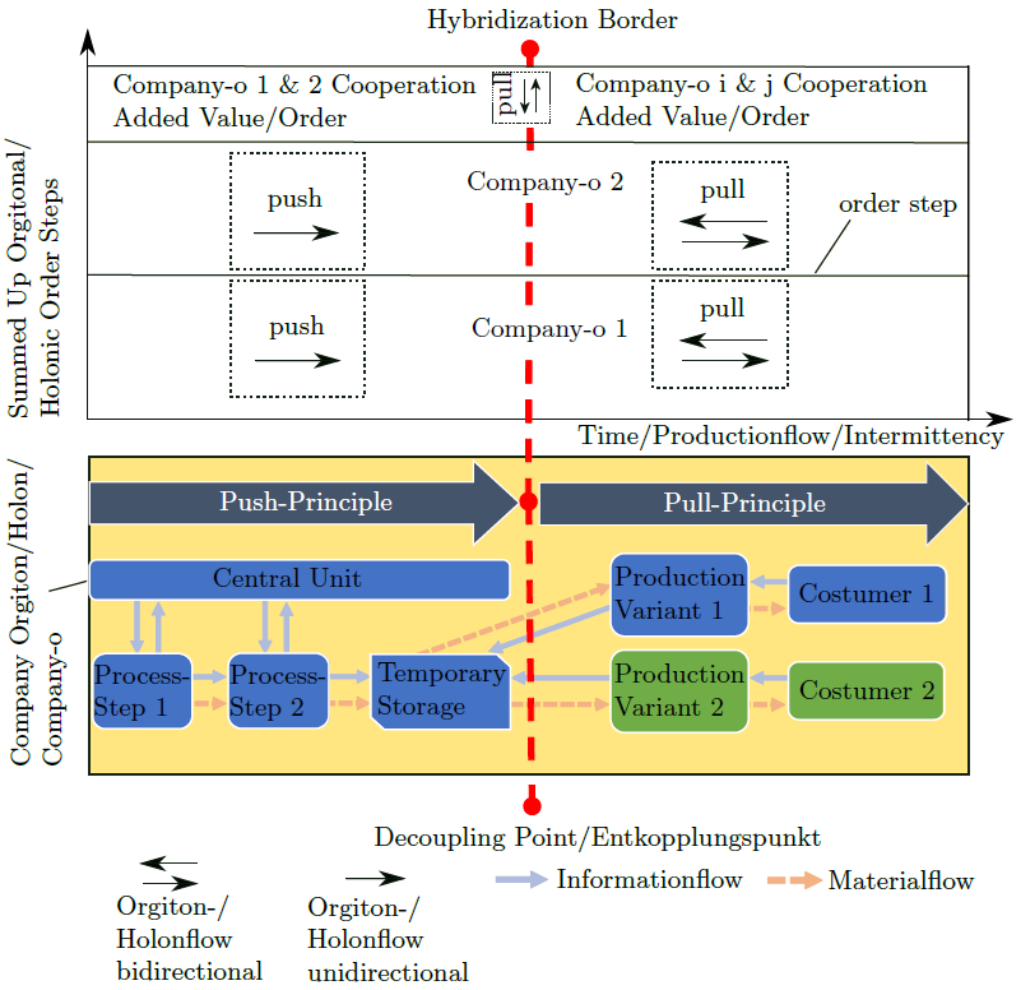

Figure 1: Push/Pull Principle.

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Witness Model I

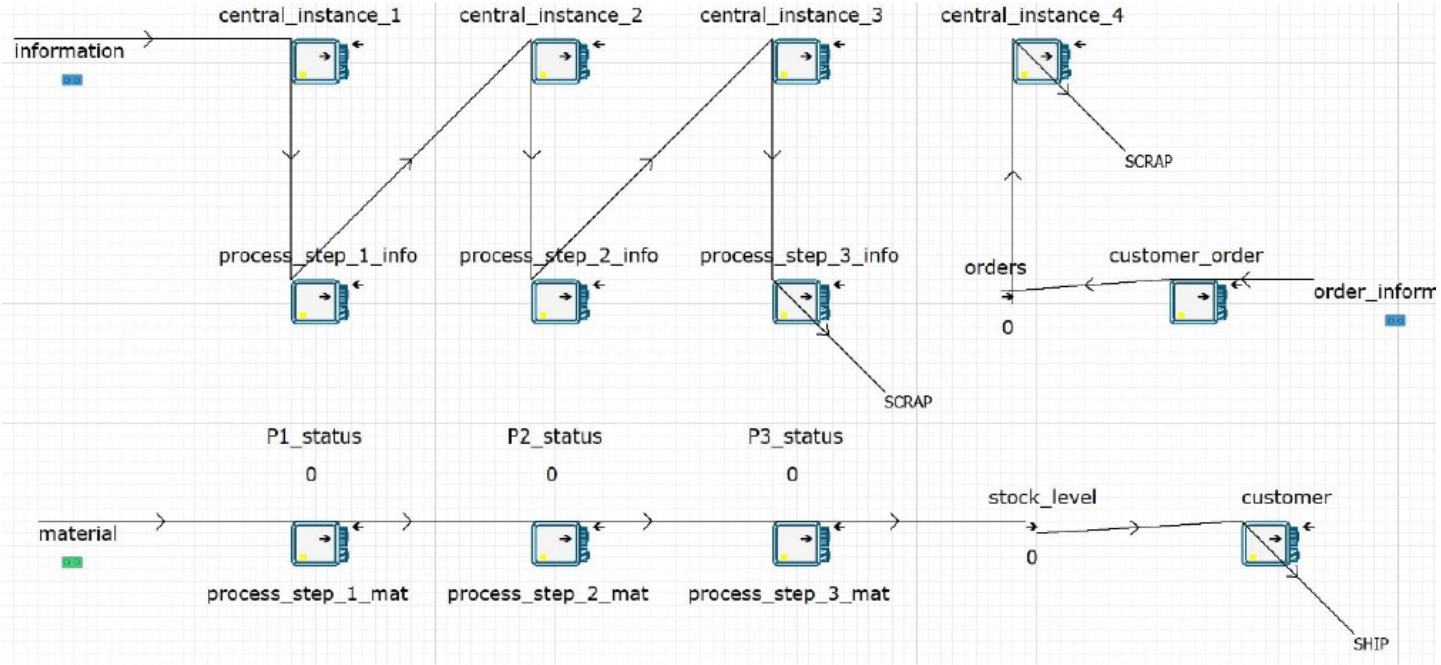

Figure 2: WITNESS simulation model of a centralized production control [Kna21]

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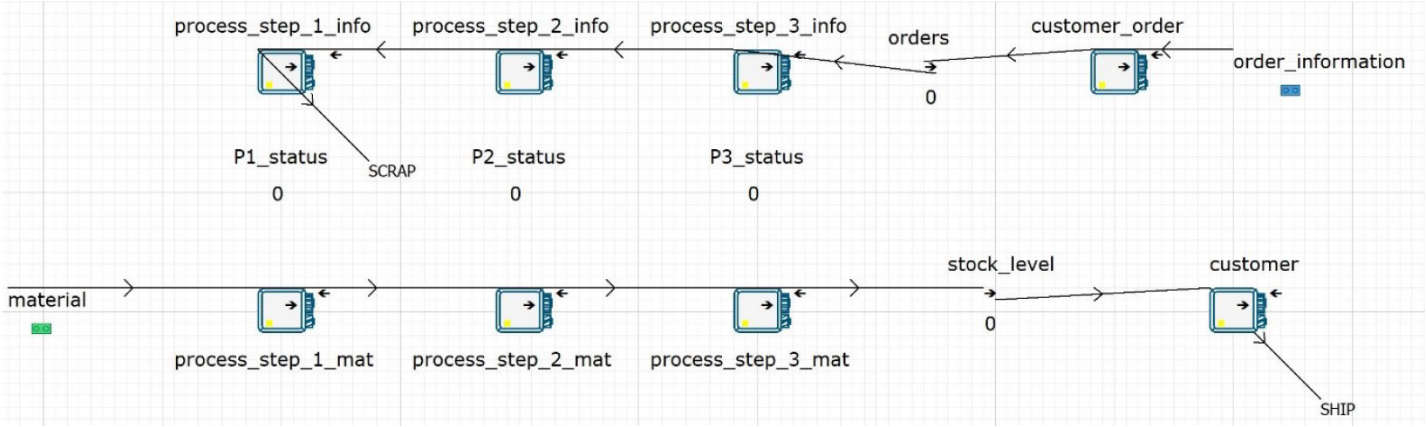

Figure 3: WITNESS simulation model of a decentralized production control [Kna21]

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Witness Model III

- Szenario 1 - High demand
- Szenario 2 - Low demand
- Szenario 3 - Random order profile

Simulation results	Orders	Produced	Shipped	Stock	Productivity
Szenario 1 central	1440	204	204	0	Ca. 70 %
Szenario 1 decentral	1440	285	285	0	Ca. 100 %
Szenario 2 central	24	204	24	180	Ca. 70 %
Szenario 2 decentral	24	24	24	0	Ca. 8 %
Szenario 3 central	190	204	190	14	Ca. 70 %
Szenario 3 decentral	190	186	186	0	Ca. 65 %

Table 1: Simulations Results according to [Kna21]

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Limits:

- Small approach for principle investigation → in big system new properties may emerge
- Limited number of different szenarios

Conclusion:

- Decentral/Central:
  (1) Low production - central is best
  (2) Intermediate production regime central/decentral work equivalently
  (3) High production decentral (production) is best

Outlook:

- Sophisticated models
- Emergence of new properties in more complex systems
- Combination with chaostheoretical simulation, and agent models
- General investigation of directionality and order relation

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Thank you cordially for your attention!

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PS.: The presentation can later also be found at:

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

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