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OEF FB Oecotrophologie · Facility Management
Department of Food · Nutrition · Facilities

Systems Research Methods

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Innovative Education towards Sustainable Food Systems

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Intended Learning Outcomes

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After this lecture students should be able to:

1. Describe characteristics of a system.
2. Distinguish between systems thinking and reductionist thinking.
3. Apply systems thinking to an example from the food system.

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First, a word about some words

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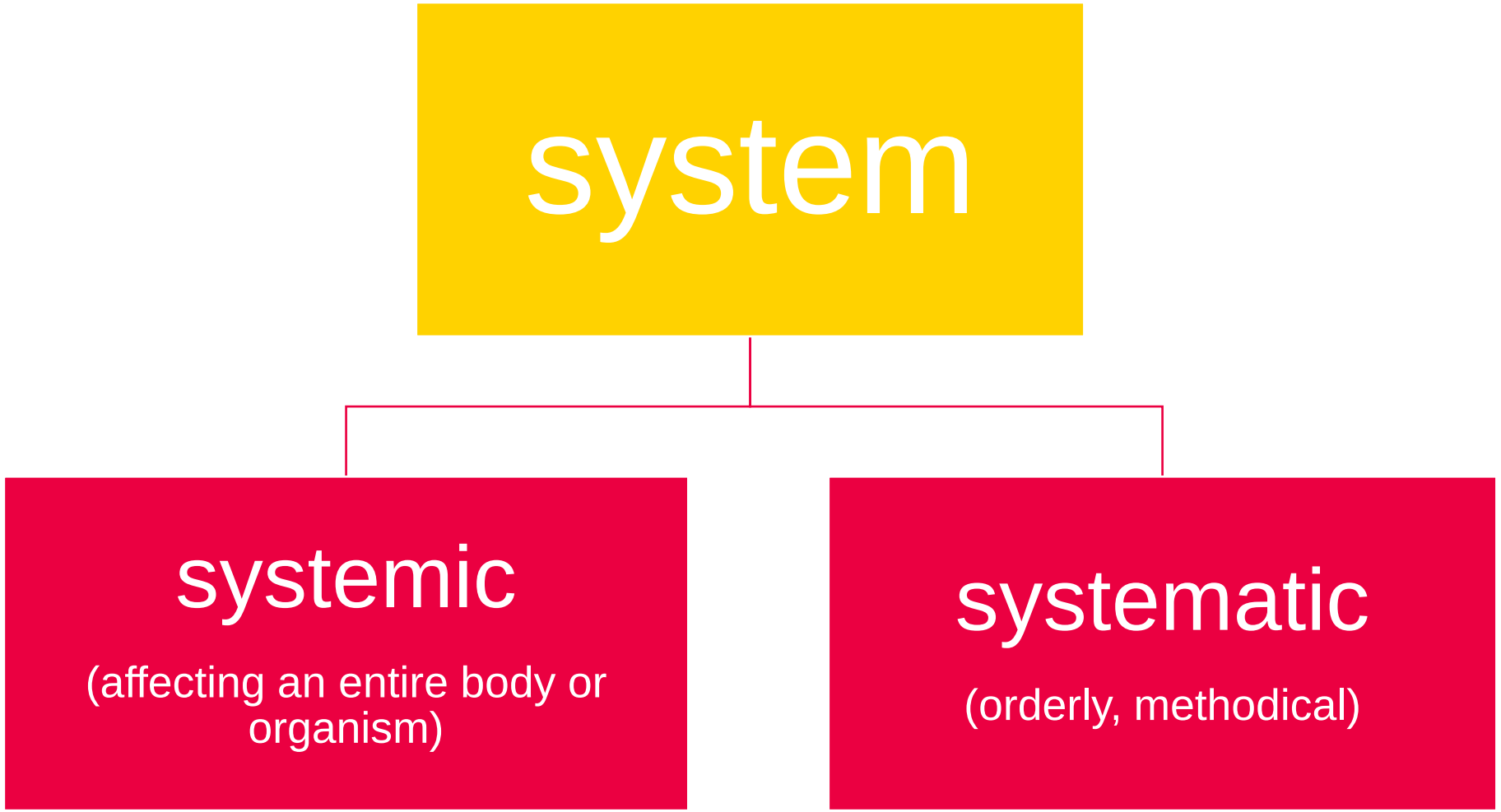

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Systems Theory

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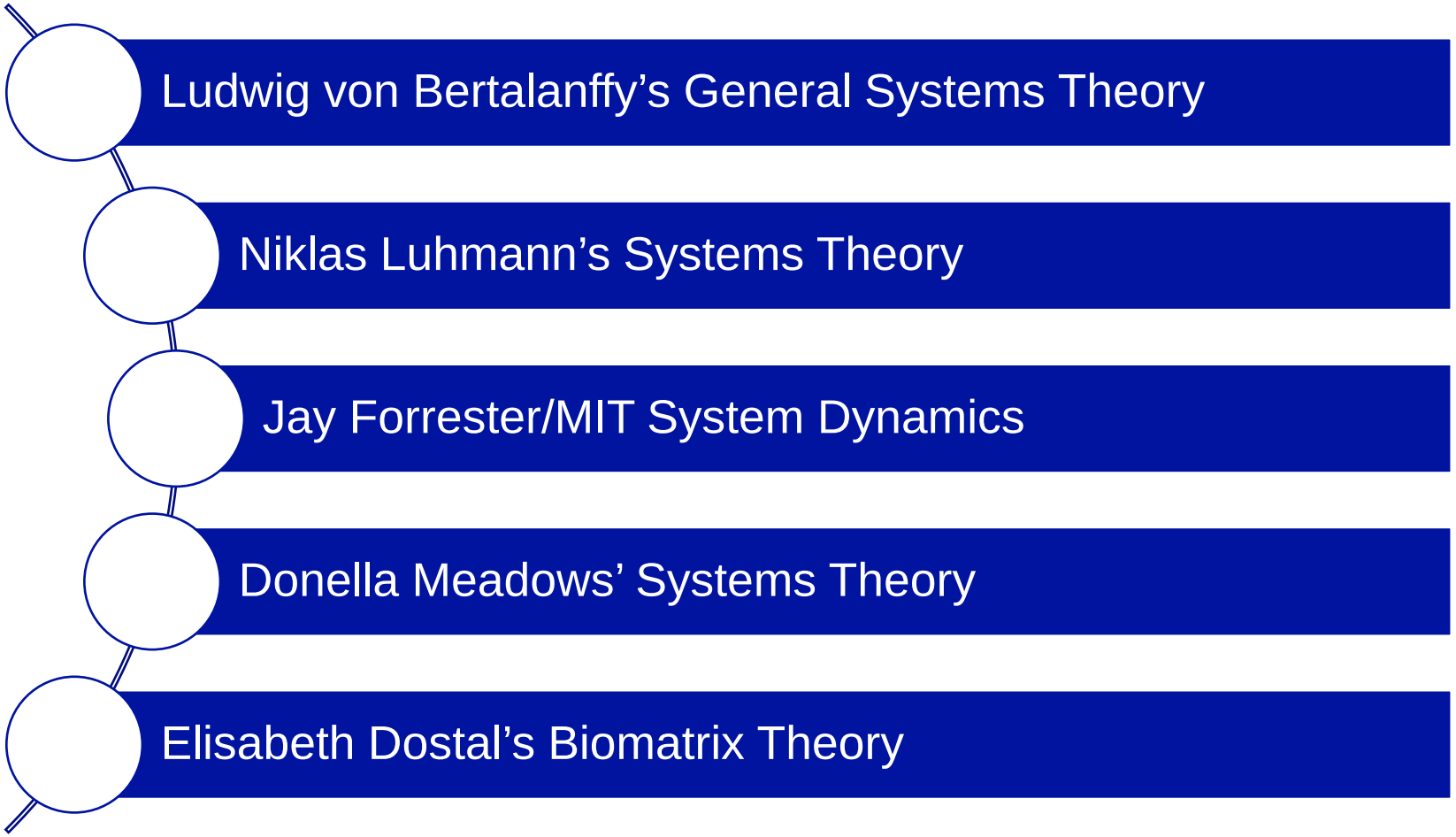
“Systems theory is an interdisciplinary theory about every system in nature, in society and in many scientific domains as well as a framework with which we can investigate phenomena from a holistic approach.”

Capra (1997) cited in Mele et al. (2010)

Actually, its *Systems Theories*



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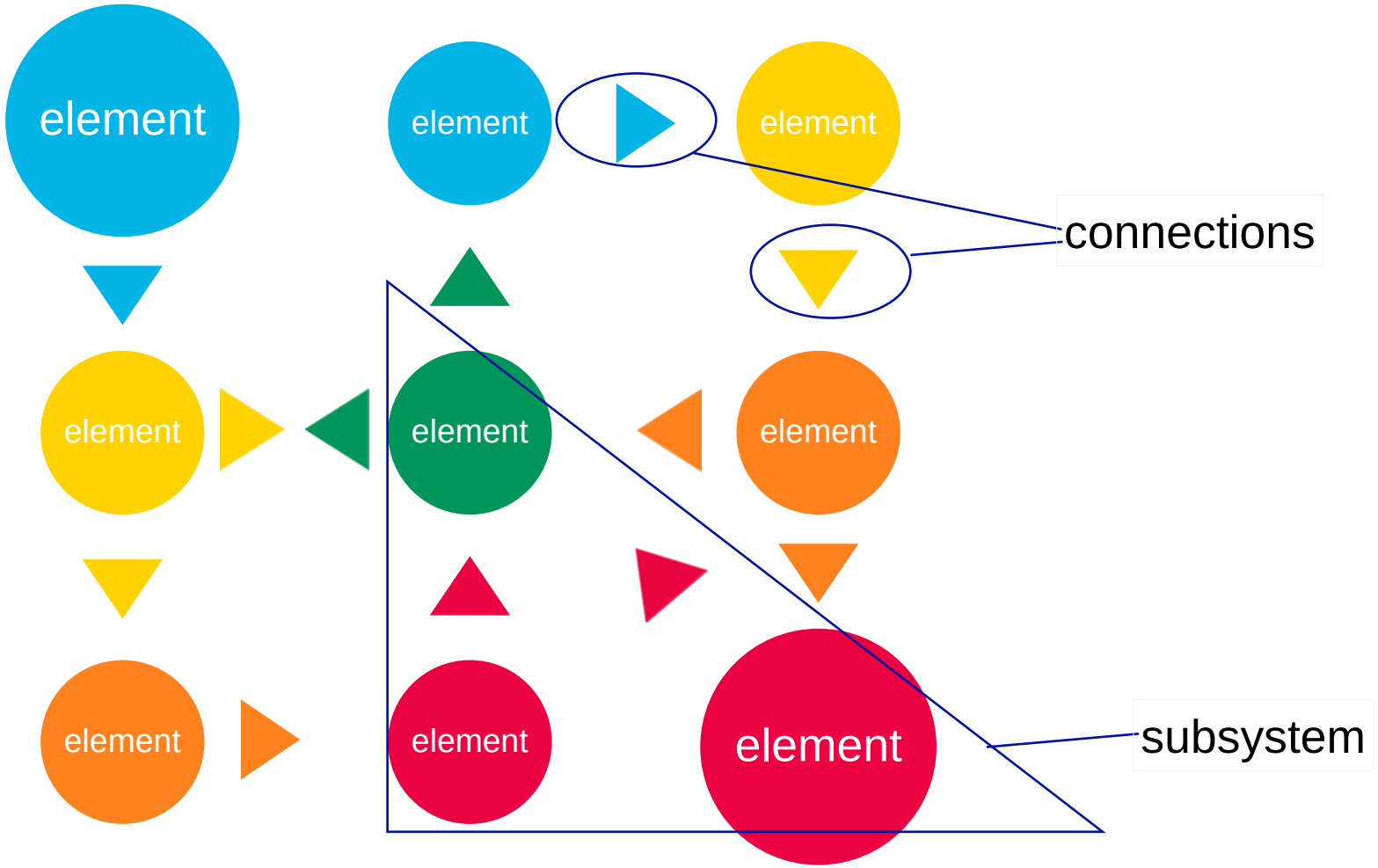
Systems' Basics



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Systems Thinking

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- focuses on interactions of elements of a system
- looks at the nature of the interaction (relationship) over time
- argues that the only way to fully understand a problem is to understand the elements (parts) in relation to the system (whole)

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Systems Research

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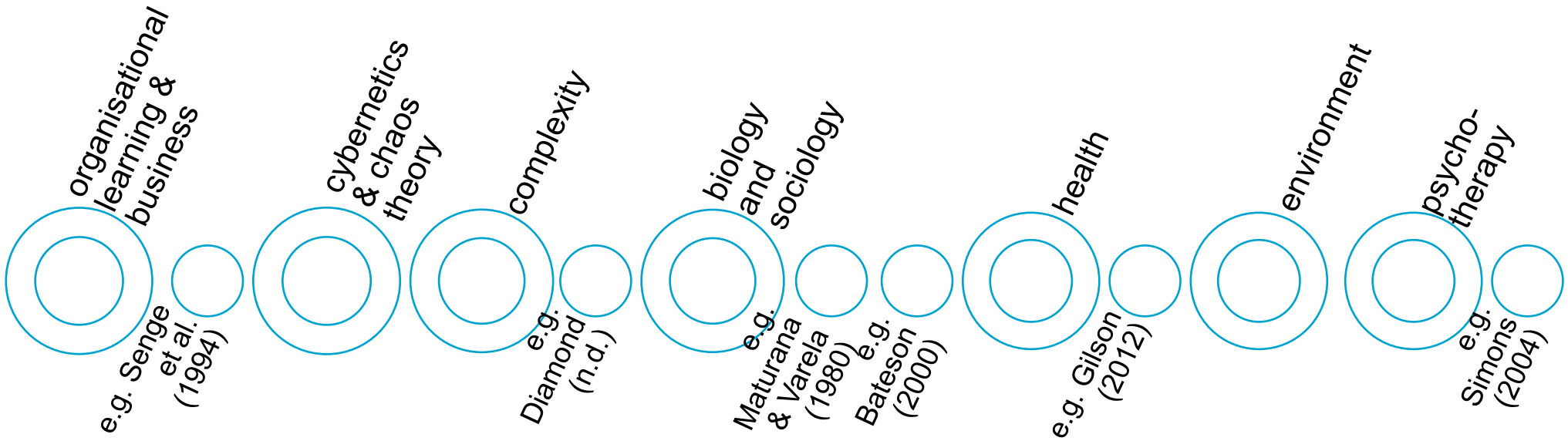

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Assemblage

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- Provides a way of examining how structures or systems are put together (i.e. assembled) and how they change over time
- Example of use in R&D: the GLOAL-RURAL project
- Example of application: New Zealand Dairy Assemblage

Project website:
https://globalruralproject.wordpress.com/about-the-global-rural-project/

Application references:
Woods (2016)
- and -
http://ifsa.boku.ac.at/cms/fileadmin/IFSA2016/2016_Plenary_Woods.jpg

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Constellation Analysis

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- Assumes that technical, natural and social developments are closely interwoven and can only be analysed when taken into account
- Assorted elements form cohesive clusters (constellation)
- Example of use in R&D: the iPOPY project
- Example of application: public procurement of organic food for youth

More information:
https://www.tu-berlin.de/ztg/menue/projekte_und_kompetenzen/konstellationsanalyse/v_menue/english_summary/

Project website:
https://djfextranet.agrsci.dk/SITES/COREORGANIC_IPOPY/PUBLIC/Pages/front.aspx

Application reference:
Nölting et al. (2009)

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Modelling, here: NutriMod

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- used to develop a qualitative cause-effect model based on scientific literature and expert knowledge
- includes four dimensions of nutrition (health, society, environment, economy)
- Example of application: interaction of drivers and impacts connected with overweight and obesity

More information:
https://www.uni-giessen.de/faculties/f09/institutes/institute-for-nutritional-sciences/units/nutrec/research/modelling-complex-nutrition-related-issues?set_language=en

Application references:
Hummel et al. (2013)
- and -
Metz & Hoffmann (2010)

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Case Study

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- allows the specifics of the case to be considered more in-depth within the context of the broader system
- Example of application: physiotherapy and rehabilitation research

Combination of case study approach with systems approach

Application references:
Chetty (2013)
- and –
Adams et al. (2014)

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Summary

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1. A ‘systems approach’ is a way of thinking that can be applied to all fields of human endeavour.

2. Systems thinking offers a framework for research on food systems or their subsystems, enabling a wider and deeper, contextual analysis.

3. Systems science can contribute to accelerate the shift towards more sustainable food systems.

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Thank you!

See paper:
Aronson D (1996-8) Overview of Systems Thinking. 3 pp. Available online at: http://www.thinking.net/Systems_Thinking/OverviewSTarticle.pdf

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