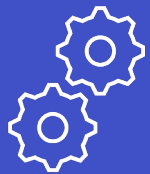


THINKING IN SYSTEMS: BRINGING A SYSTEMS DESIGN ENGINEERING PERSPECTIVE TO ACADEMIC LIBRARIANSHIP



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OUTLINE

SYSTEMS
DESIGN
ENGINEERING

SYSTEMS
THINKING

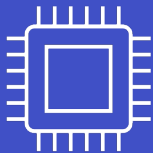
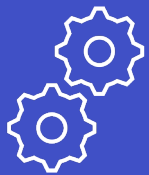
ITERATIVE
DESIGN
PROCESS

USER-
CENTERED
DESIGN

LIBRARIES AS
SYSTEMS

SYSTEMS DESIGN ENGINEERING

“Our Systems Design Engineering [SYDE] program teaches students to create **innovative** solutions to **complex** problems by thinking **holistically**”



Mechanical, Electrical, Environmental, Biomedical, Software, Societal, AI, Transportation Systems (...and more!)

“*Systems* is how we understand the world and *design* is how we change it”



UNIVERSITY OF
WATERLOO

FACULTY OF
ENGINEERING

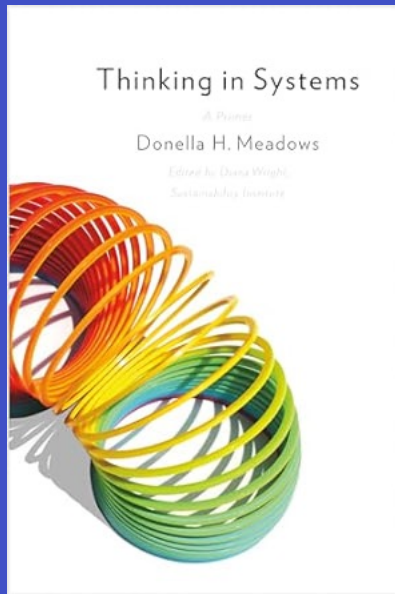
BLACK BOX SYSTEMS

“A **system** is an interconnected set of elements that is coherently organized in a way that achieves something. If you look at that definition closely for a minute, you can see that a system must consist of three kinds of things: **elements, interconnections, and a function or purpose**” (Meadows & Wright, 2008, p. 11)

“We do not mean that the system is inscrutable; we mean that we can’t see inside to the system’s internal structure or inner workings. In the **black box** view, we can characterize the nature of the **input-output** control and **data transformations** performed by the system but we can’t tell **how** those transformations performed or what **internal parts** played roles in those transformations” (Powel, 2016, p. 337)

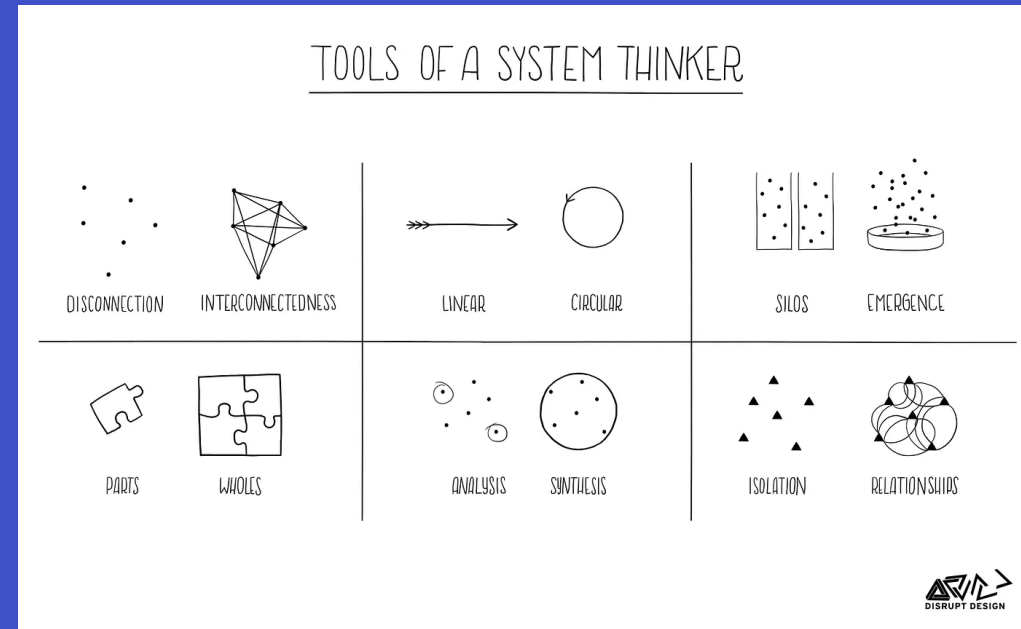


SYSTEMS THINKING



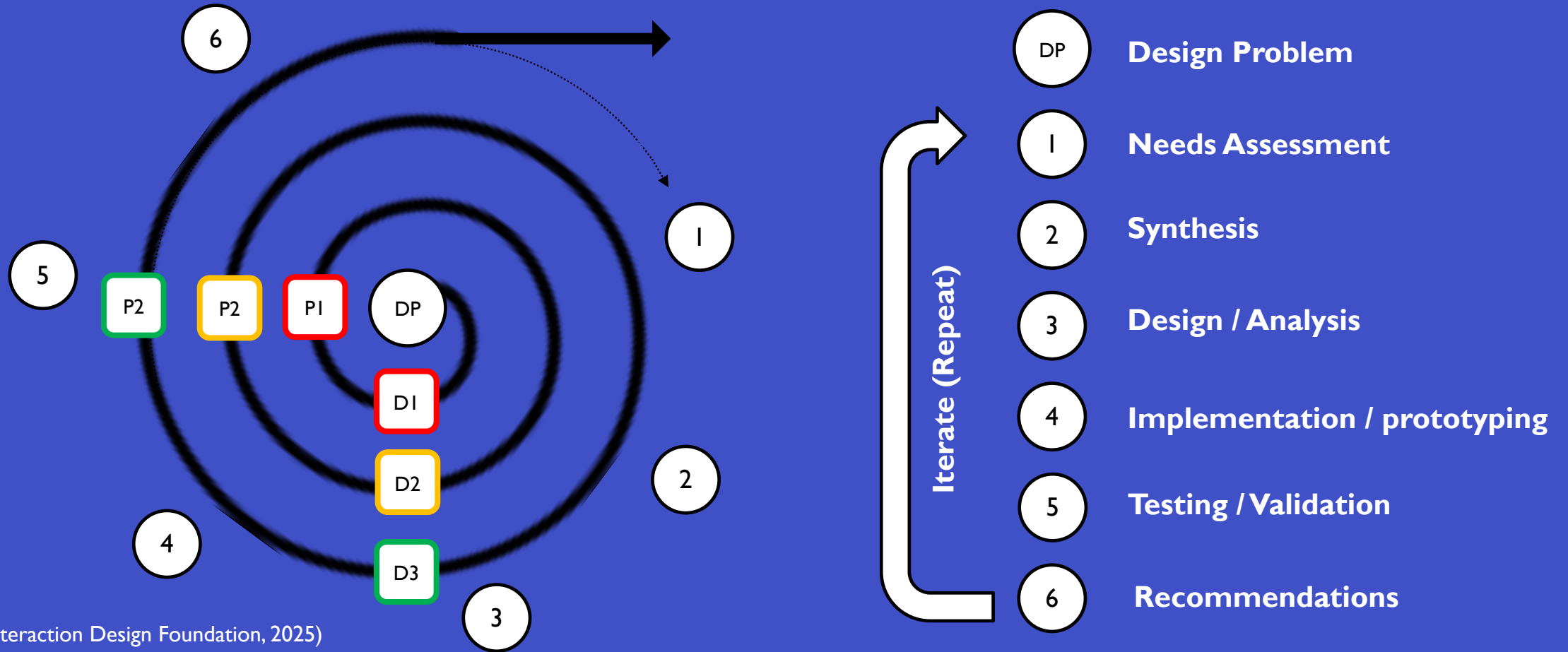
(Meadows & Wright, 2008)

“As our world continues to change rapidly and become more complex, **systems thinking** will help us manage, adapt, and see the wide range of choices we have before us. It is a way of thinking that gives us the freedom to identify root causes of problems and see new opportunities.” (Meadows & Wright, 2008, pp. 1-2)

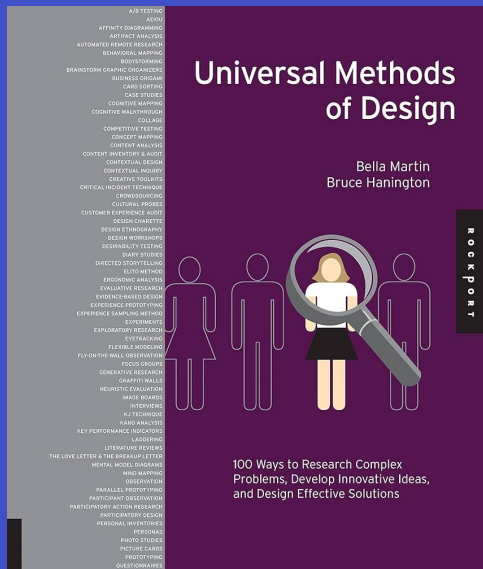


(Acaroglu, 2017)

ITERATIVE DESIGN PROCESS



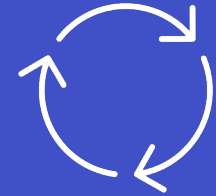
USER-CENTERED DESIGN



(Martin & Hanington, 2012)



Identification of problems based on usability, accessibility, and sustainability

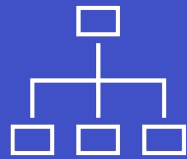


Empathy-driven focus on understanding user needs, behaviours, and preferences



Utilizing an iterative design process to maintain user engagement

LIBRARIES AS SYSTEMS



Comprised of **specialized subsystems**—such as acquisitions, collections development, user services, technical service, and special collections—that have their own processes and functions that contribute to the overall system’s goals.



Library systems can be **complex** and it is challenging to understand all of the processes that occur. Some subsystems are a mystery to those that do not directly interact with it.



Library workers have **specific roles, skills, and backgrounds** that influence how they operate within the overall system—people are **not** strictly confined to a specific subsystem!



A systems thinking approach centers seeking a **holistic understanding** of the system and the **diverse perspectives, areas of expertise, and experiences** each person brings to the system.

THANK YOU

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