



31st Annual **INCOSE**
international symposium

virtual event

July 17 - 22, 2021

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Systems Thinking: A Critical Skill for Systems Engineers

Topics



01

What is Systems Thinking?

02

What role can Systems Thinking play for Systems Engineers?

03

How can Systems Thinking be developed?



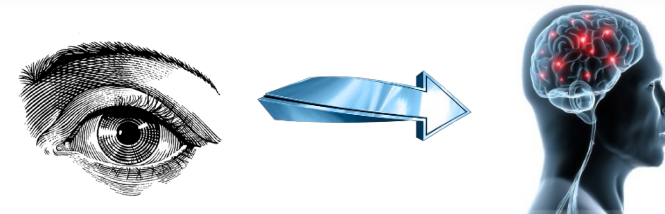
Systems Thinking



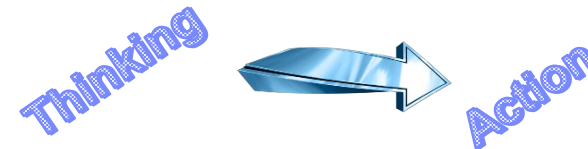
“A new way to view and mentally frame what we see in the world; a worldview and way of thinking whereby we see the entity or unit first as a whole, with its fit and relationship to its environment as primary concerns; the parts secondary.”

**Haines (1998, p. vi)*

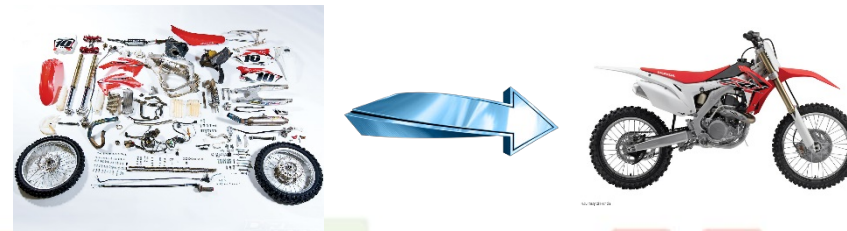
1. View and mentally frame



2. Worldview & way of thinking



**3. Relationships primary;
elements secondary**



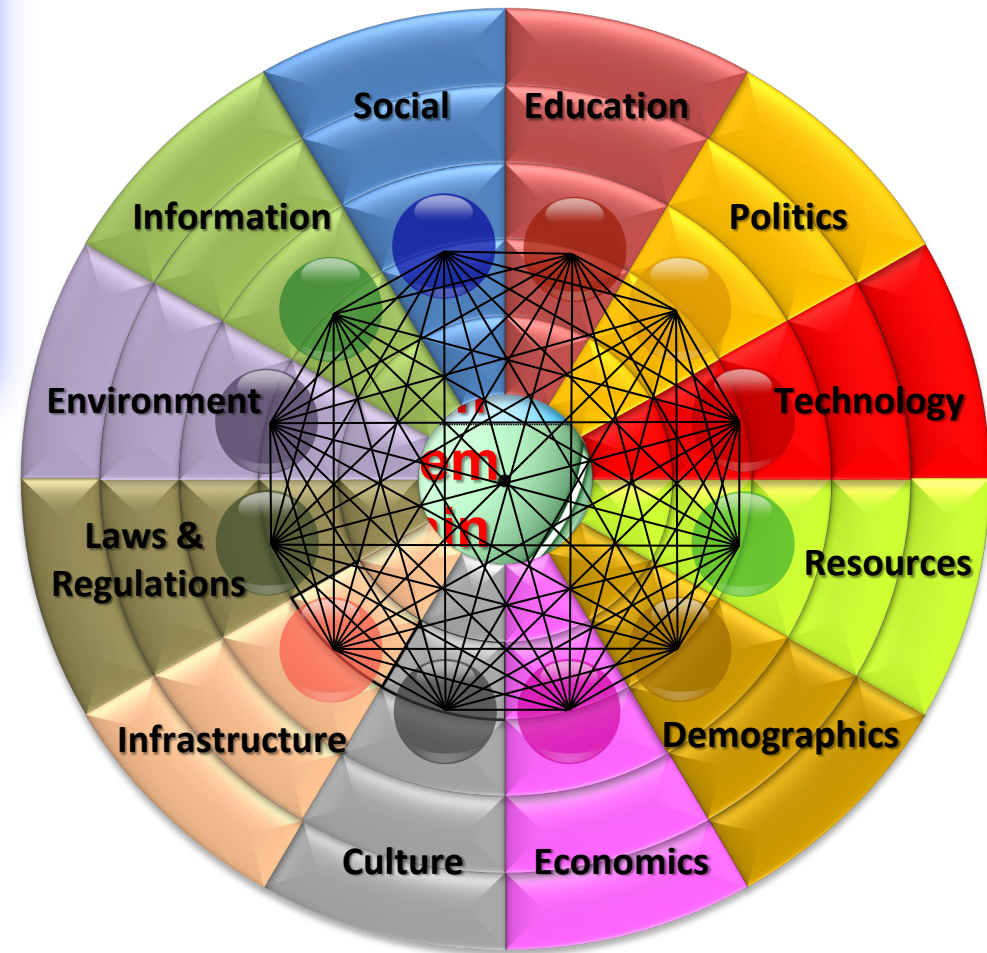
The complex system problem domain



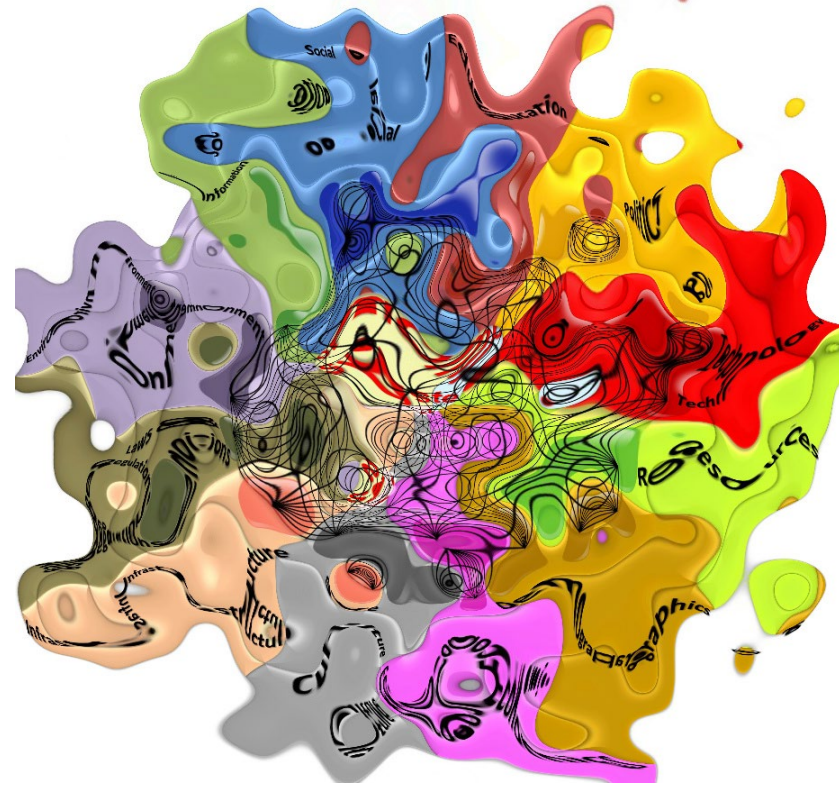
Crosses a
holistic
spectrum of
dimensions



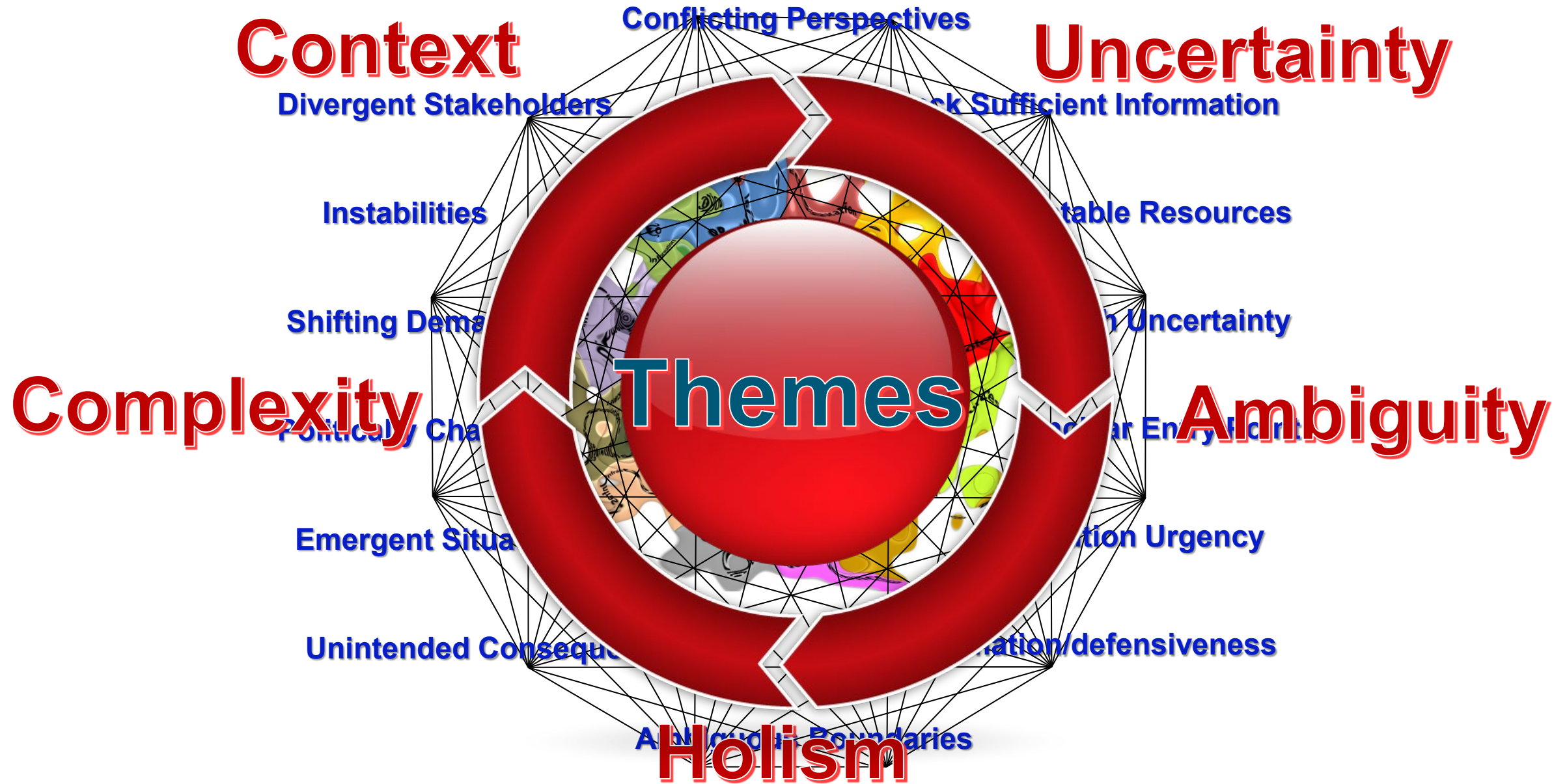
Is unique for
each
complex
system



It's a little
bit more
complex
than that



This Problem Domain can produce several conditions

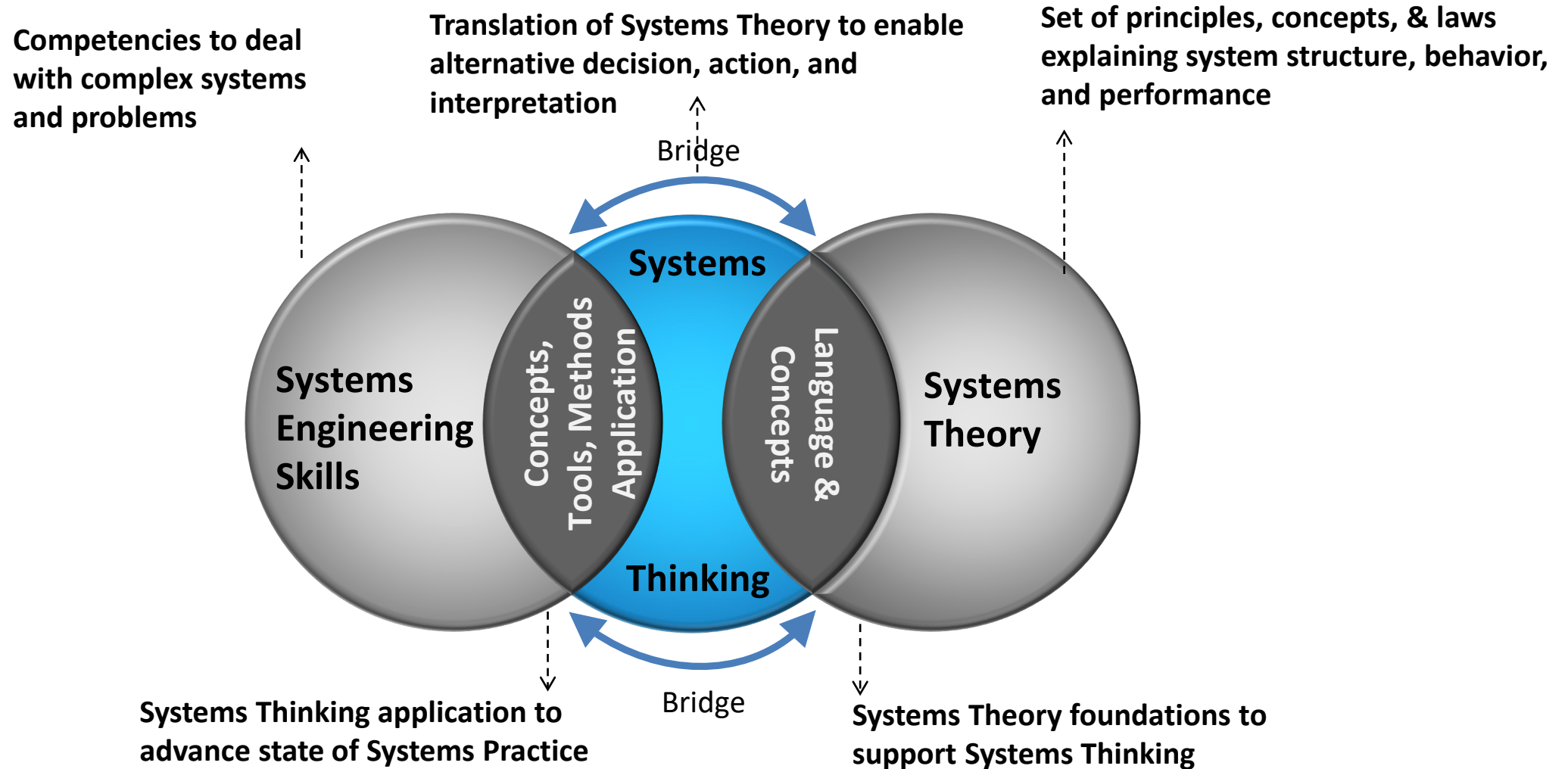


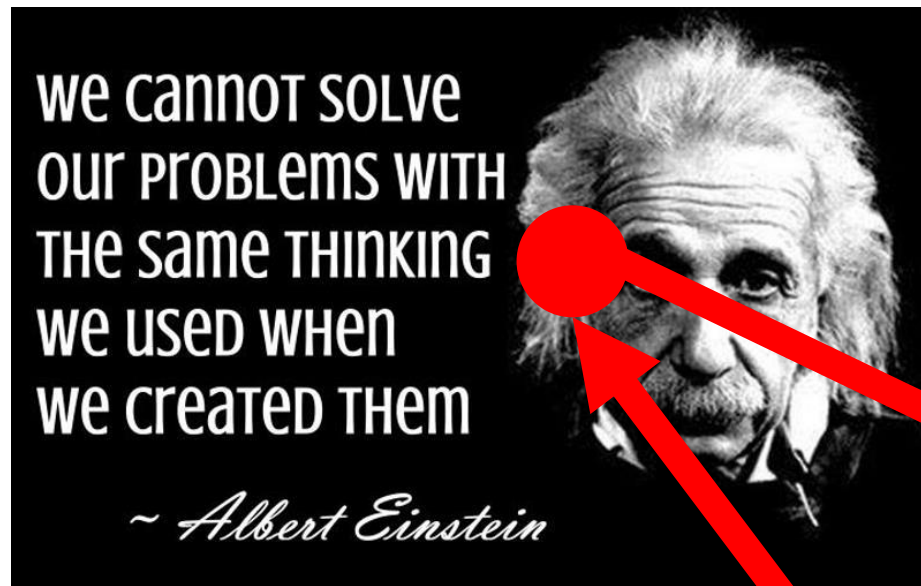


Role of Systems Thinking

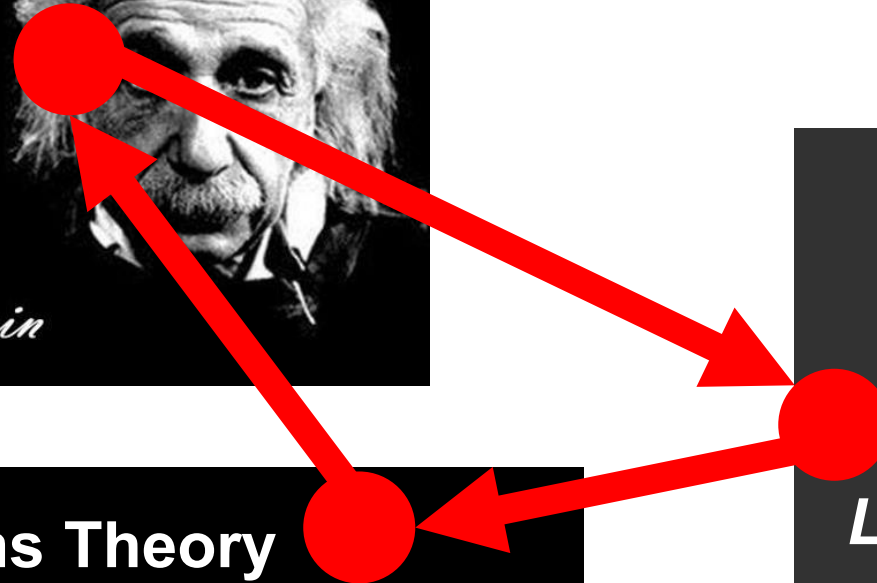
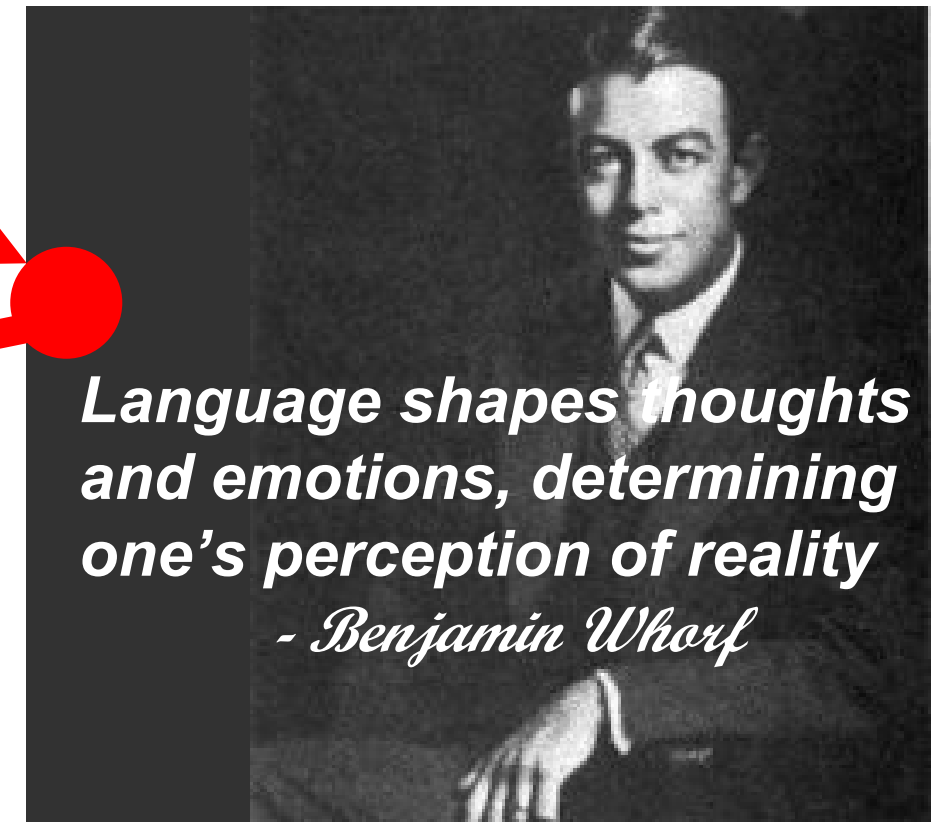


Systems Thinking Relationships

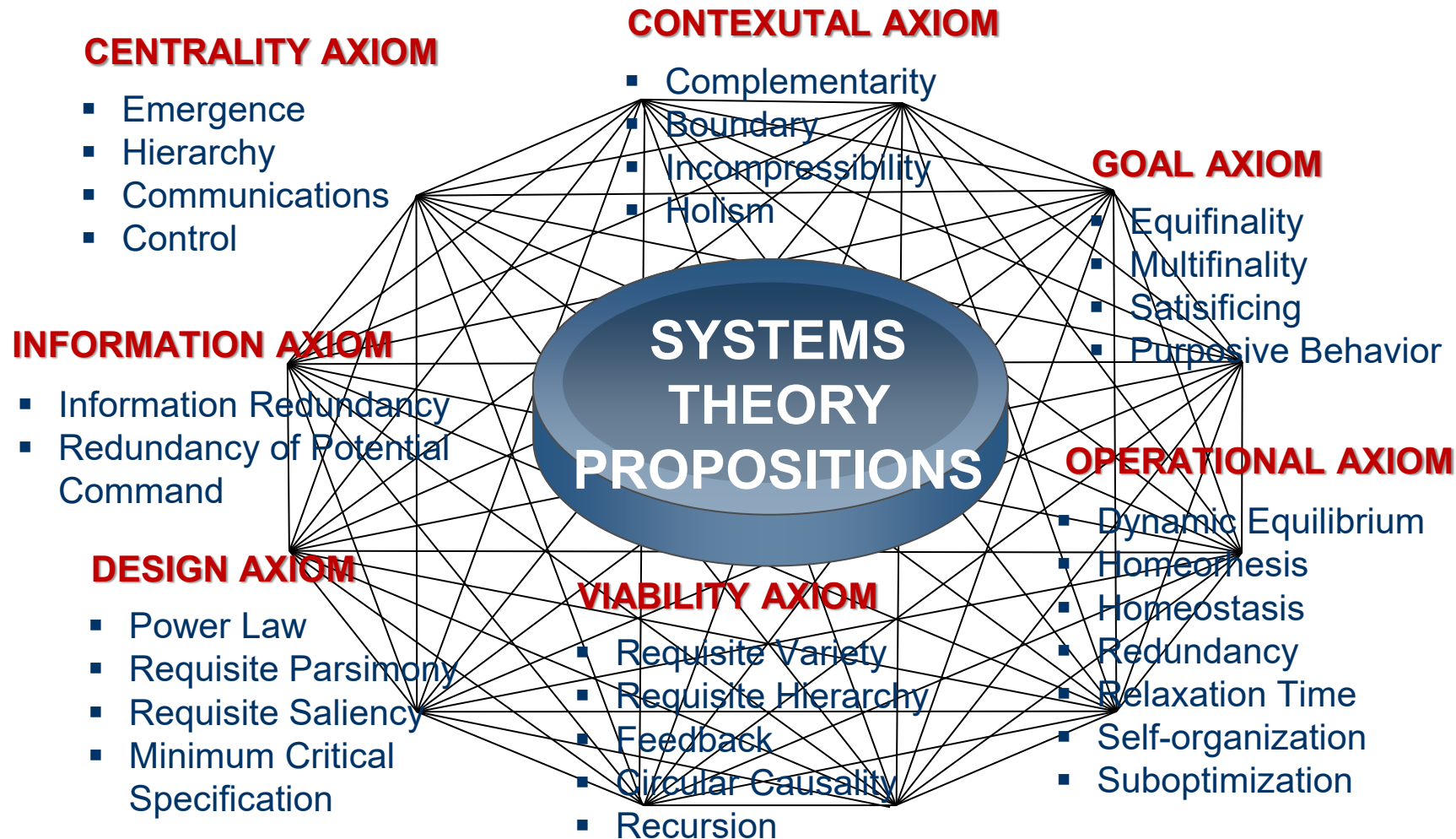




**Systems Theory
provides a language that
can inform a different
level of thinking to
address complex
problems**

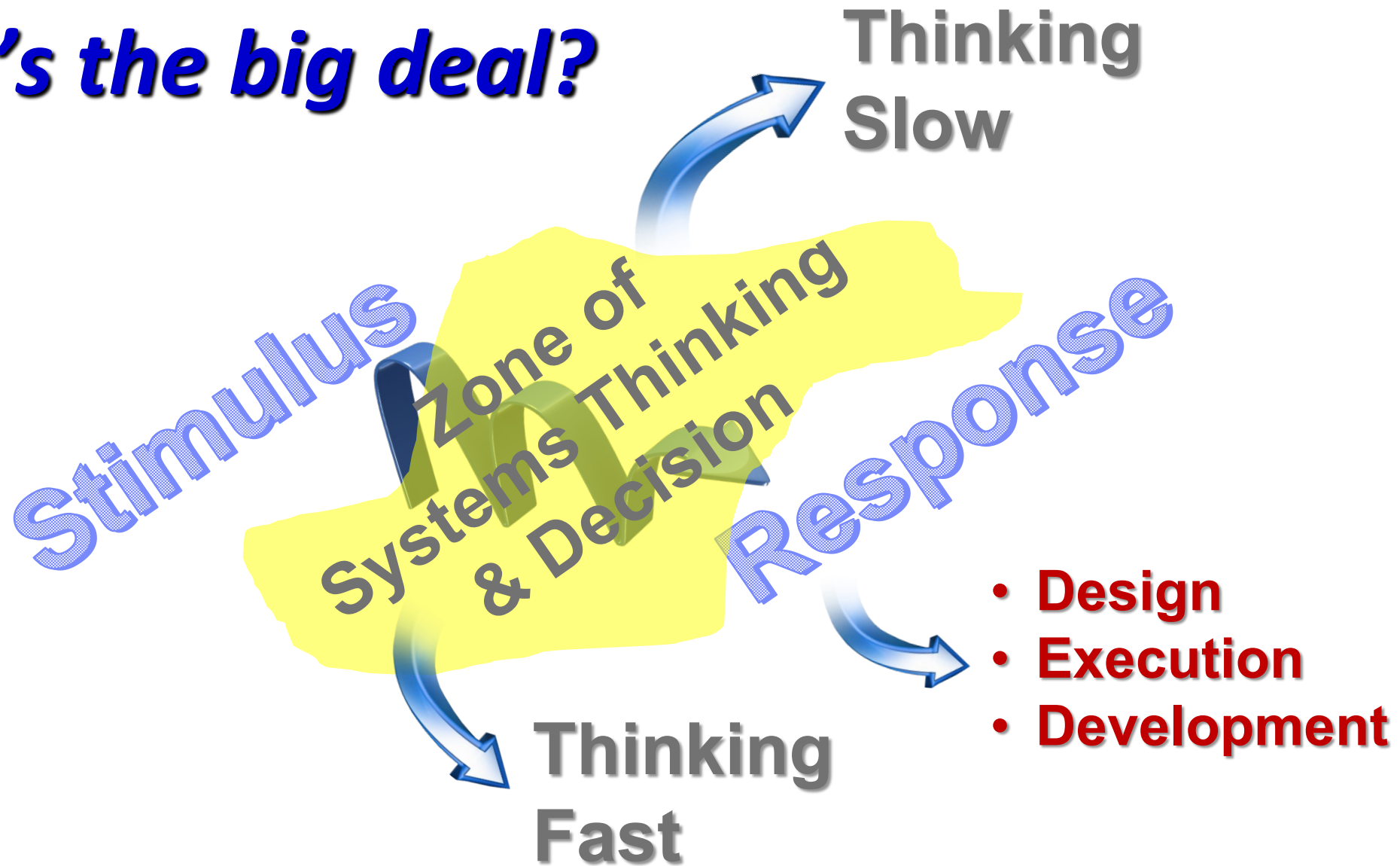


Systems Theory provides a language to drive different thinking, decision, action, and interpretation

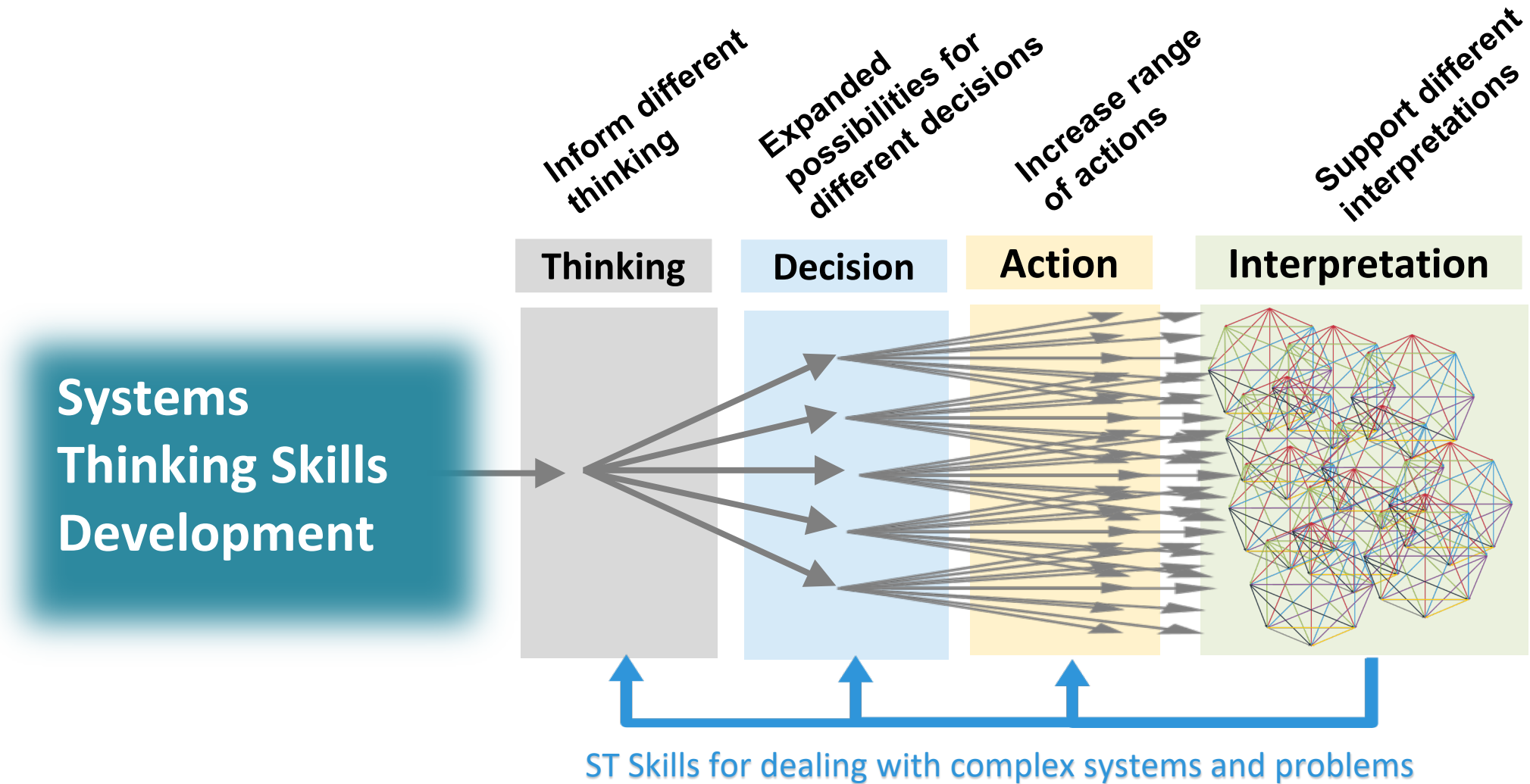


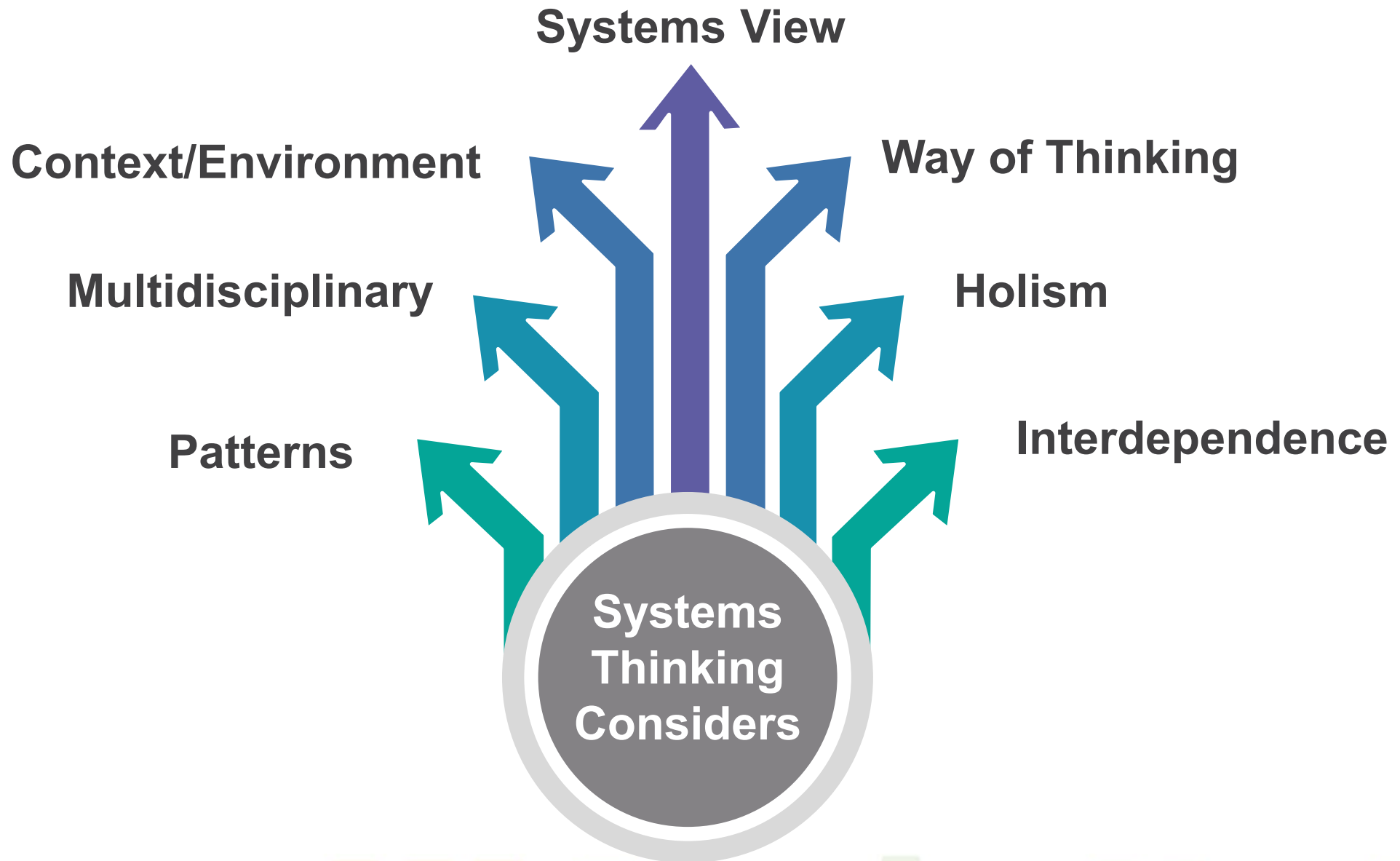
1. All systems are subject to the laws of systems
2. Always on
3. Applied without bias – equally
4. No allowances for ignorance
5. Violations - real consequences

So What? Who cares?
What's the big deal?



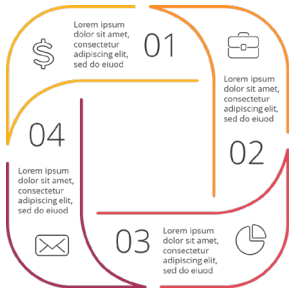
Systems Thinking Offers







How Can Systems Thinking Be Developed



**Deepening of
Systems
Maturity**

**Mastery of
Systems Theory
Language**



**Alternative Thinking,
Decision, Action,
Interpretation**

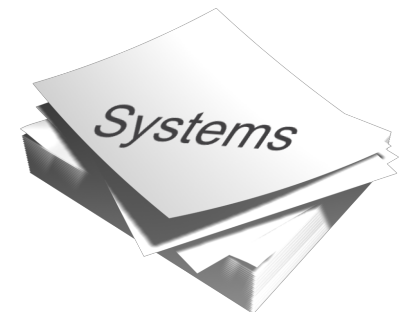
**Developing
Systems
Thinking**

**Reframing the
Familiar to New
and Novel**



**Projection to
Circumstances**

**Immersion in
Language**





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www.incose.org/symp2021