

Beyond Solutions:

Systems Engineering Models as Intellectual Capital Lego Blocks

Letter².

Daniël Malherbe

what is a system?
Complexity



the dilemma of a
model.
Provisionality and Modesty

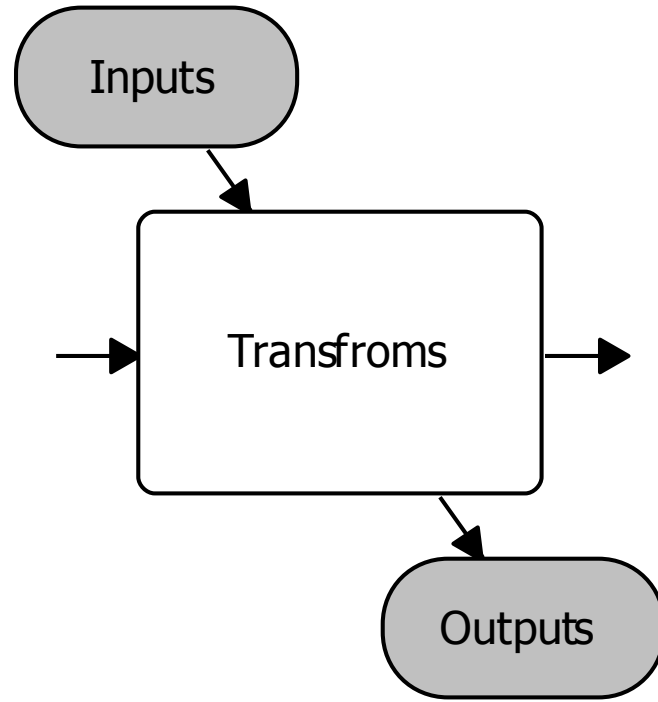


Intellectual Capital
Playing Lego



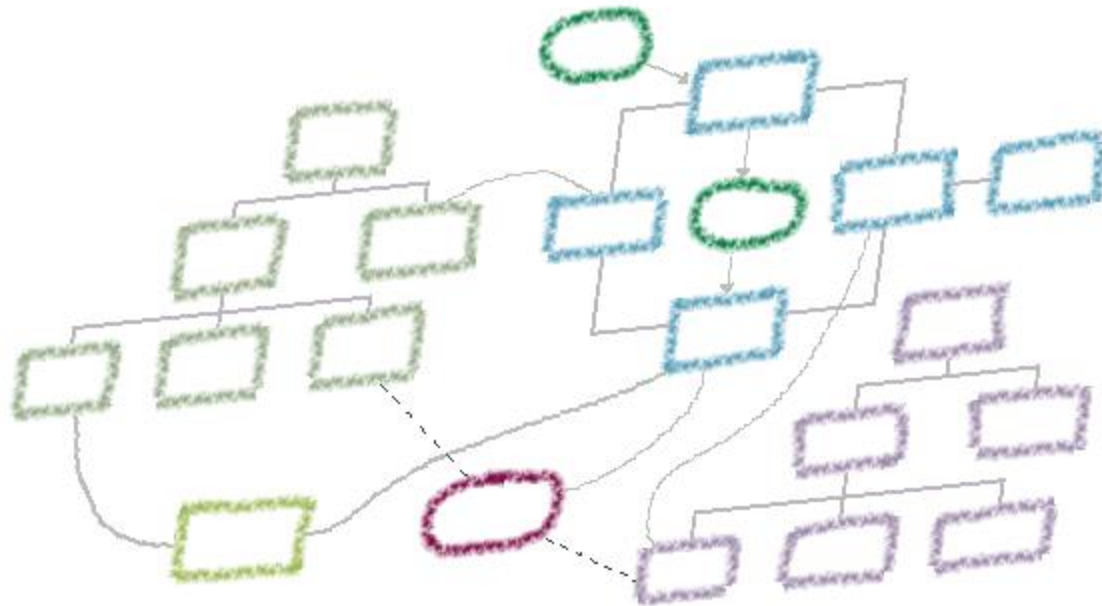
WHAT IS A SYSTEM?

a system performs a function



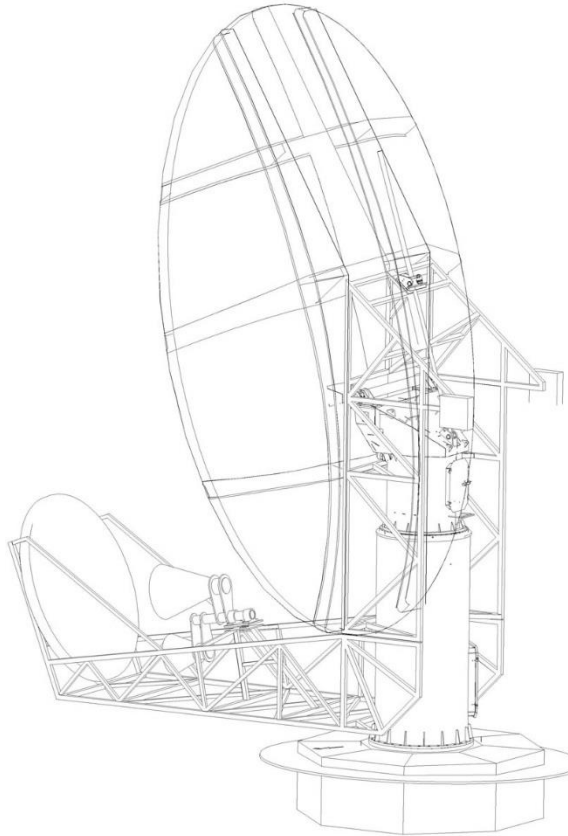
WHAT IS A SYSTEM?

a system is a collection of interacting elements with a common goal



WHAT IS A SYSTEM?

a system has boundaries



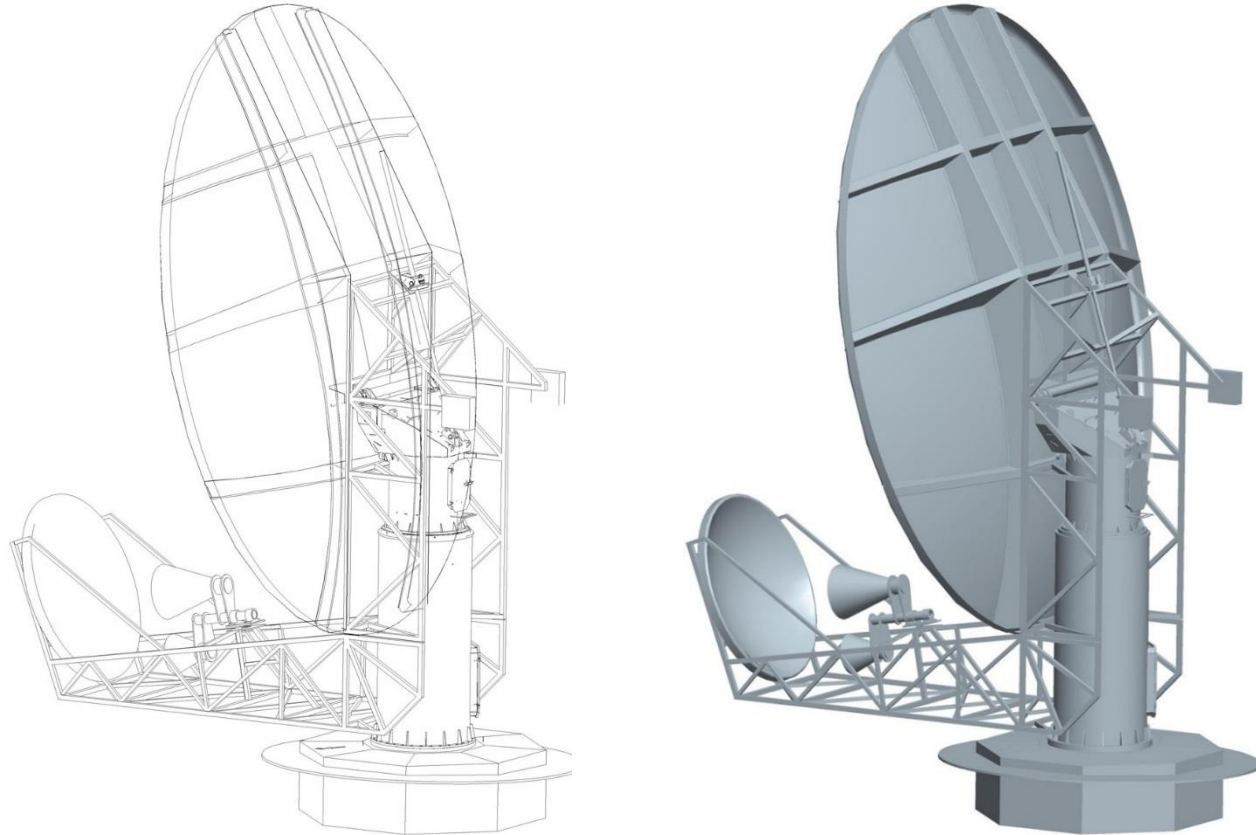
WHAT IS A SYSTEM?

boundaries create
structure



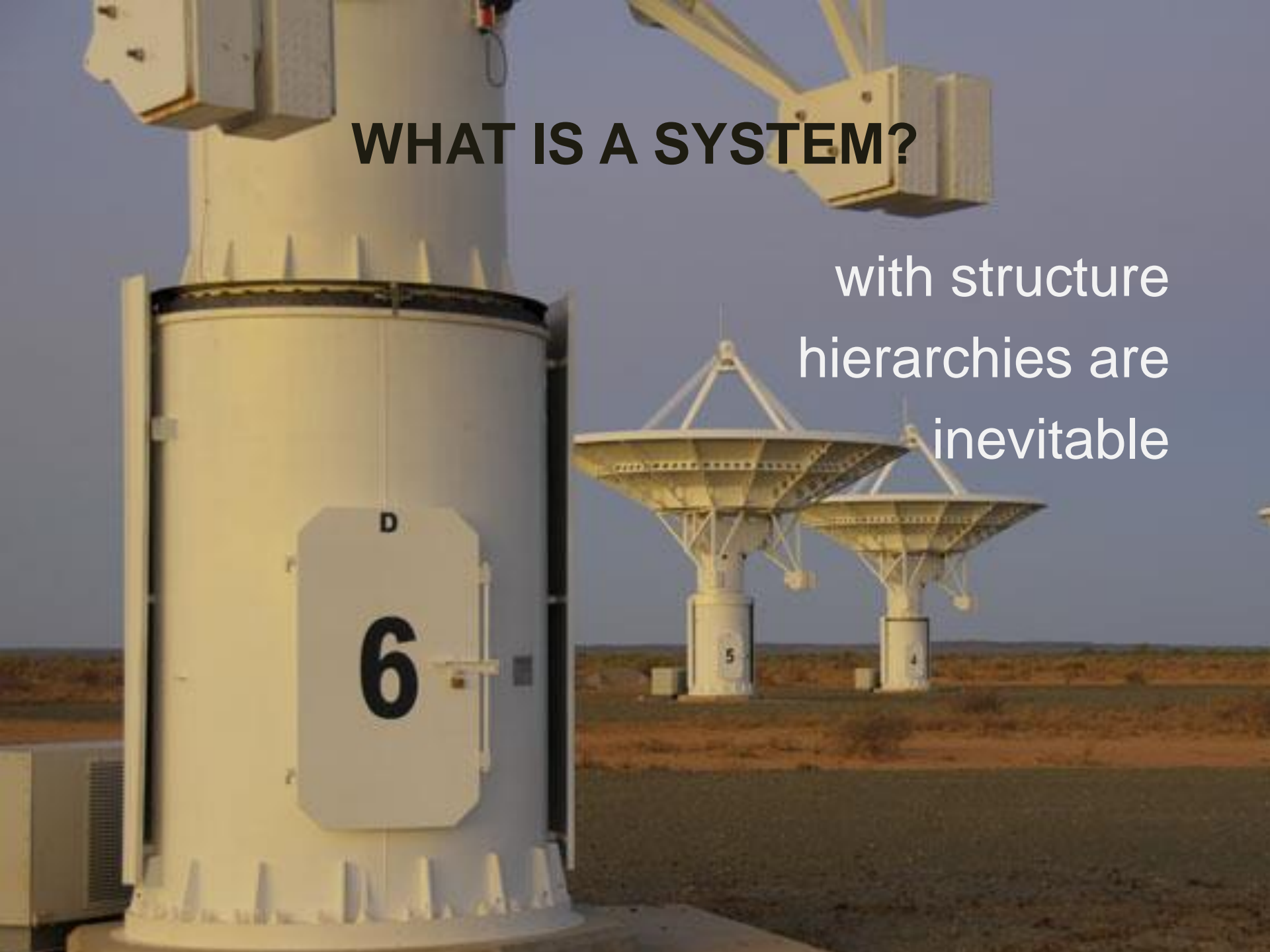
WHAT IS A SYSTEM?

the structure of boundaries is enabling.



WHAT IS A SYSTEM?

with structure
hierarchies are
inevitable





ENGINEERS

GREAT TALES OF ACHIEVEMENT AND INGENUITY

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FROM ENGINEERS TO SYSTEMS

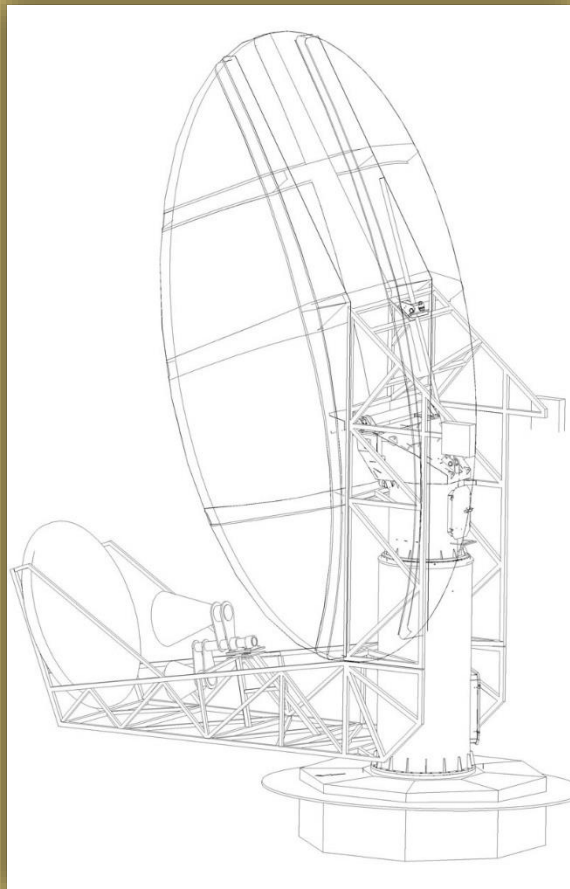
*“scientists investigate [systems]
which already is”*

FROM ENGINEERS TO SYSTEMS

*“engineers create [systems]
which has never been.”*

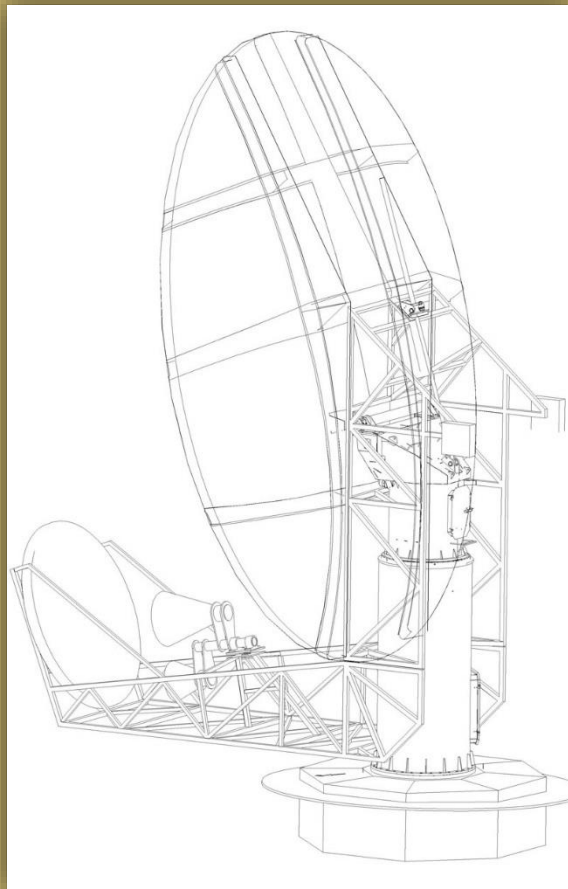
FROM ENGINEERS TO SYSTEMS

engineers model a possible system



FROM ENGINEERS TO SYSTEMS

in order to create the system

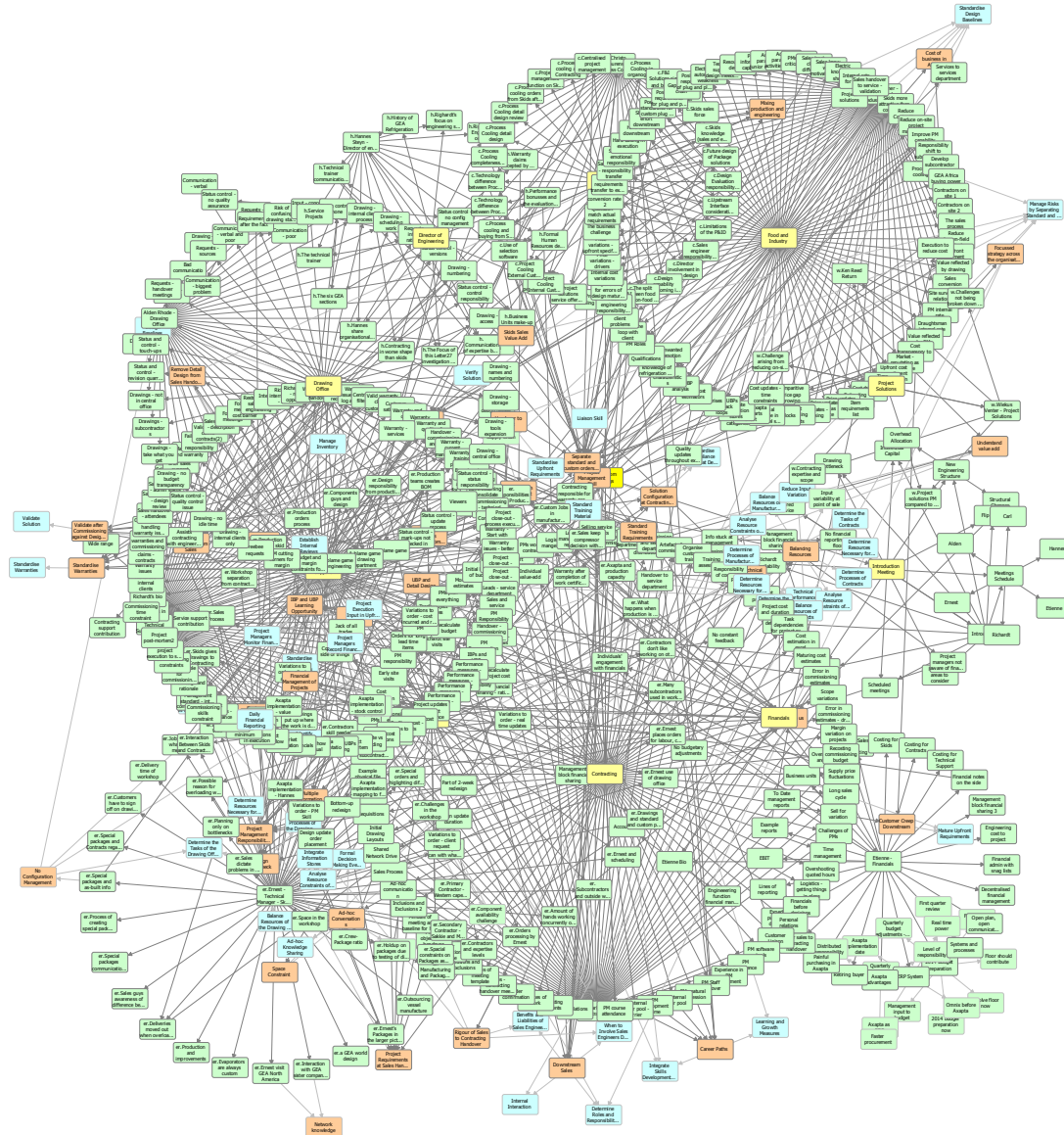


THE DILEMMA OF A MODEL

the real world is complex

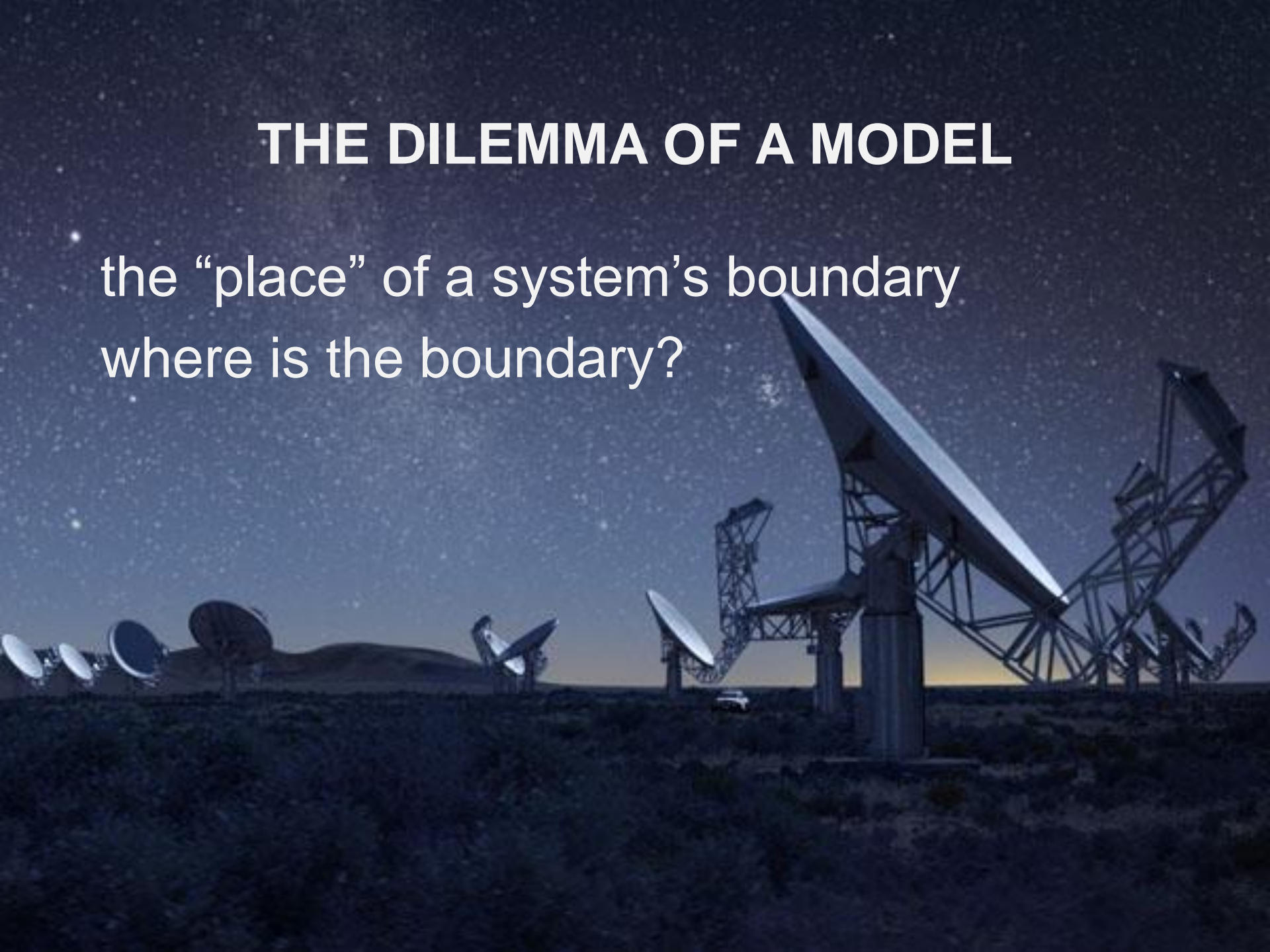


THE DILEMMA OF A MODEL



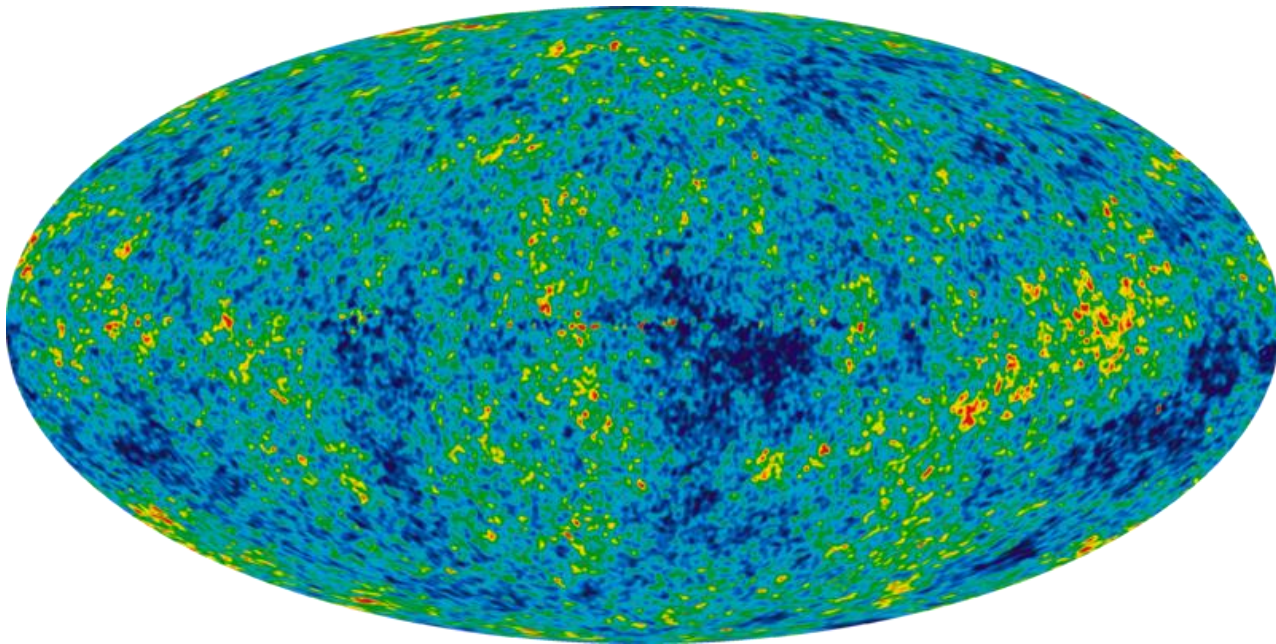
THE DILEMMA OF A MODEL

the “place” of a system’s boundary
where is the boundary?



THE DILEMMA OF A MODEL

the boundary is everywhere!



THE DILEMMA OF A MODEL



THE
UNIVERSE

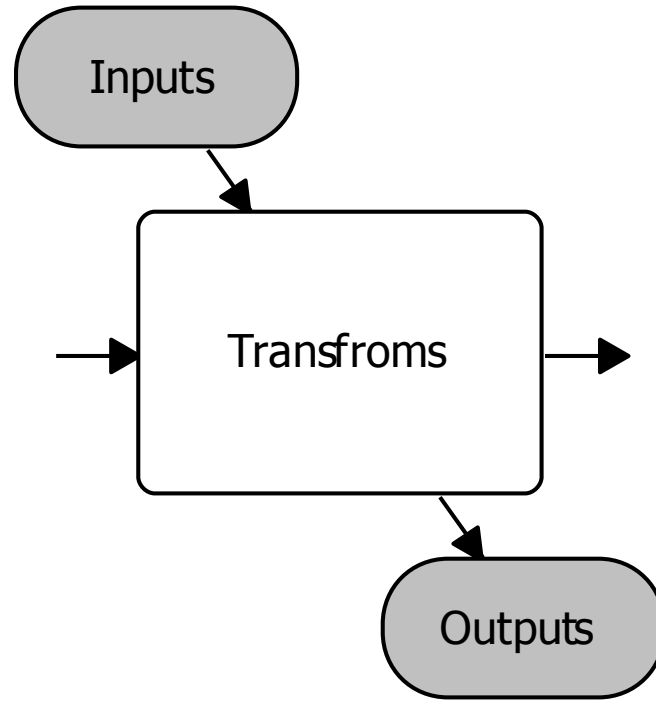
THE DILEMMA OF A MODEL

the structure of boundaries is enabling!



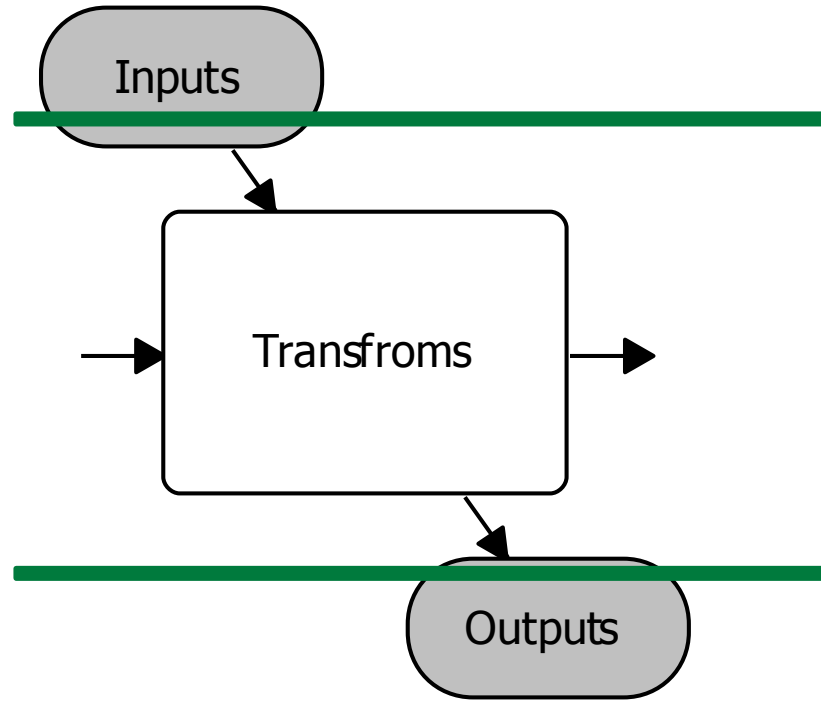
THE DILEMMA OF A MODEL

a system performs a function



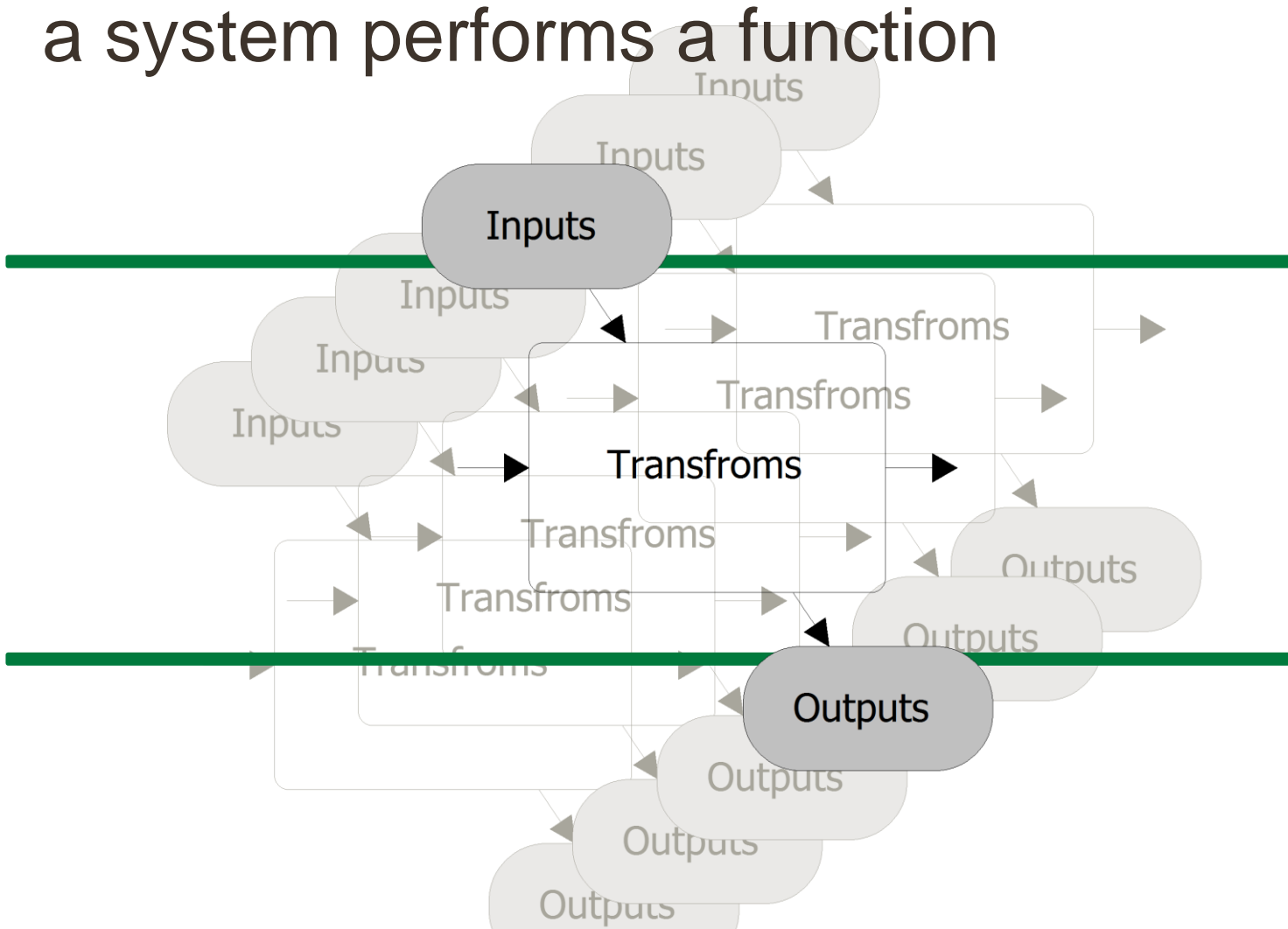
THE DILEMMA OF A MODEL

a system performs a function



THE DILEMMA OF A MODEL

a system performs a function



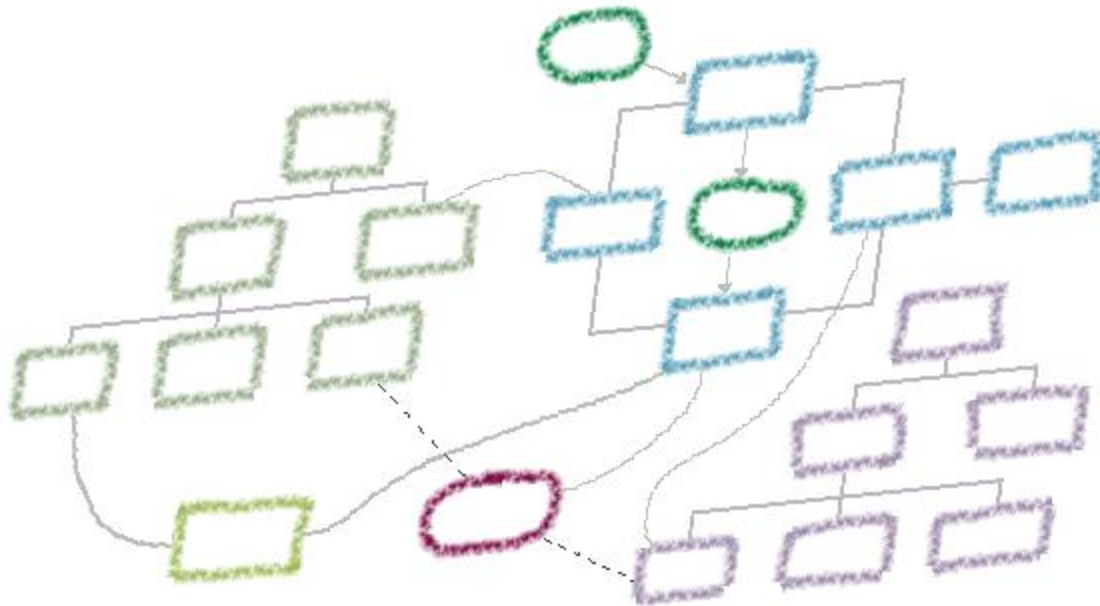
THE DILEMMA OF A MODEL

models involve choice



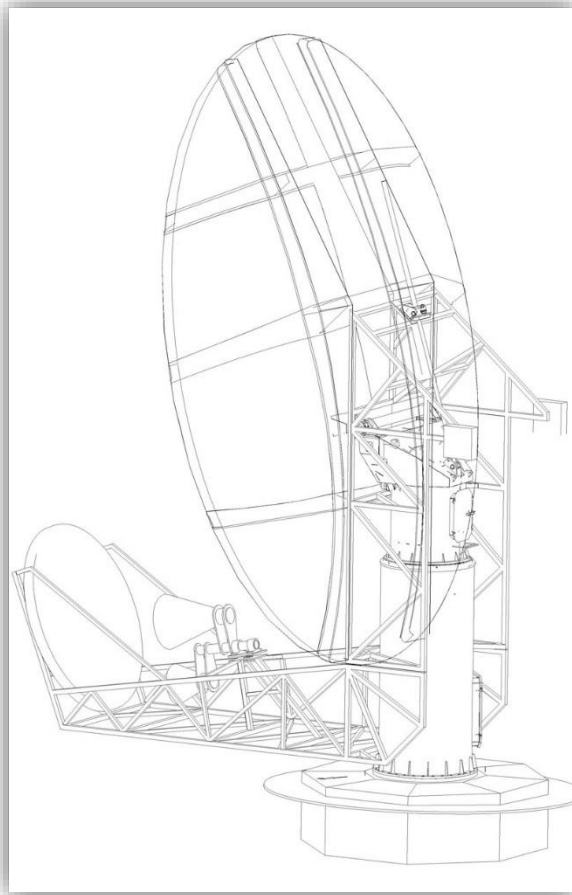
THE DILEMMA OF A MODEL

models are limited – they are not perfect

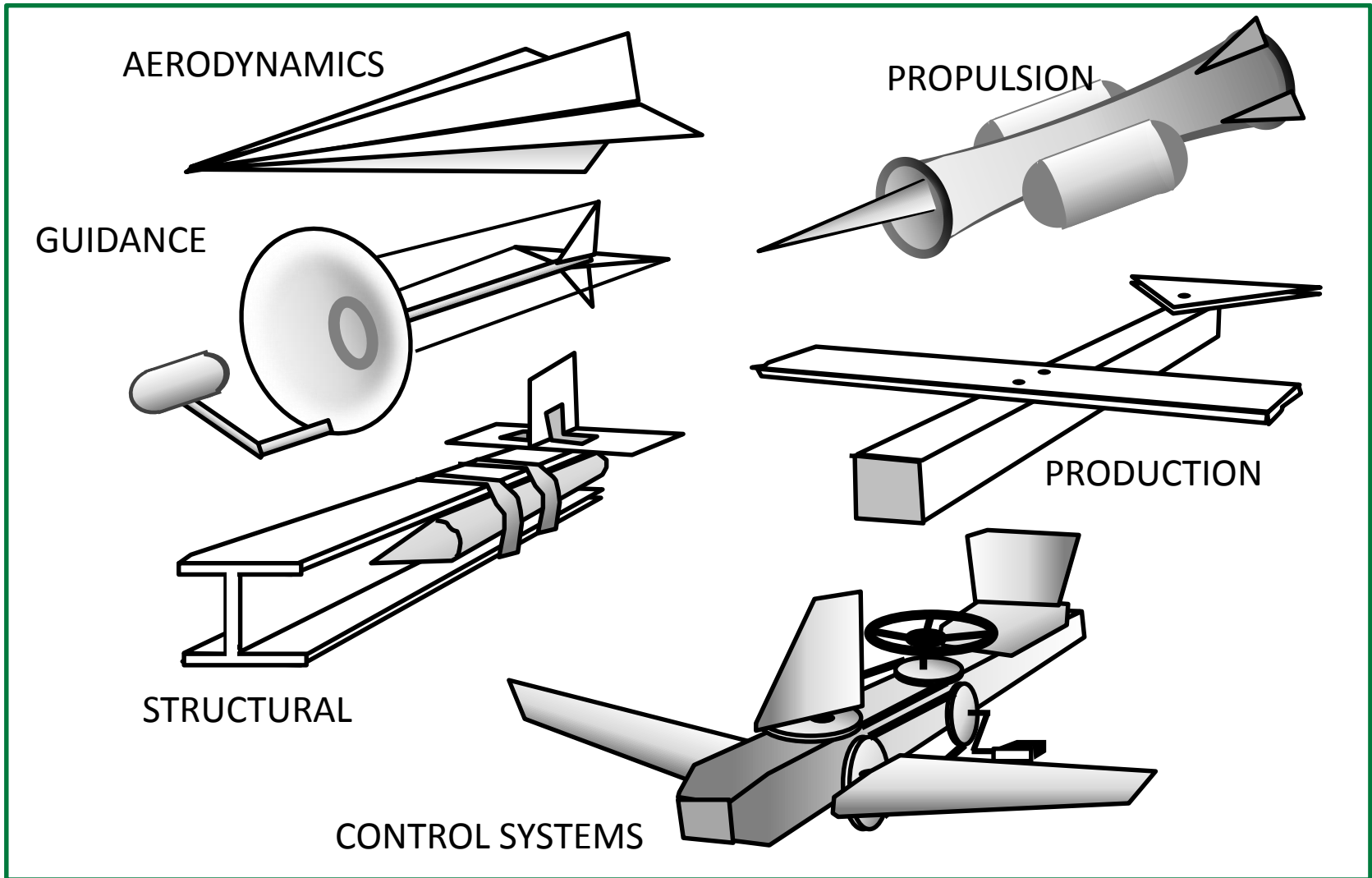


THE DILEMMA OF A MODEL

reducing complexity introduces an error



THE DILEMMA OF A MODEL



IDEAL MISSILE DESIGN FROM THE VIEWPOINT OF THE SPECIALISTS (DOMAIN EXPERTS)

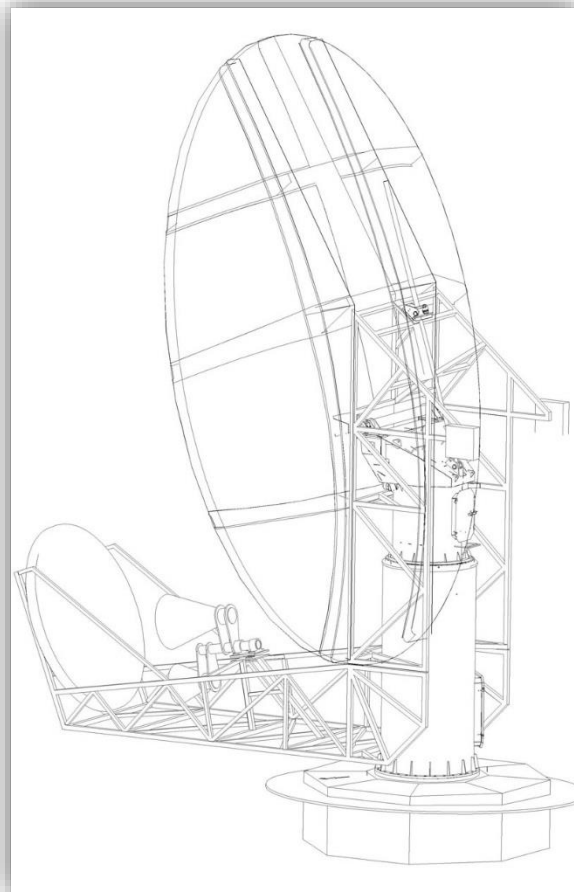
THE DILEMMA OF A MODEL

when do we model?



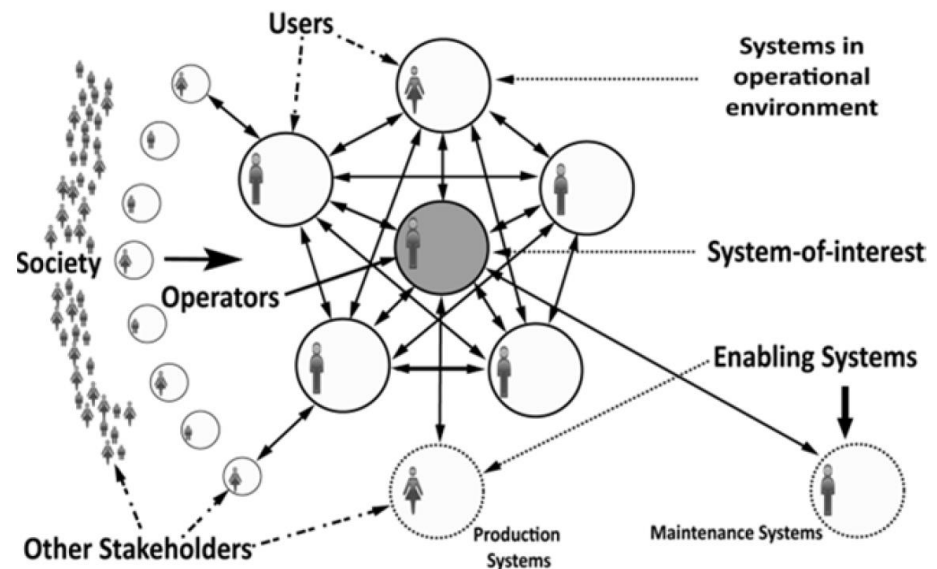
THE DILEMMA OF A MODEL

a model is provisional, be modest

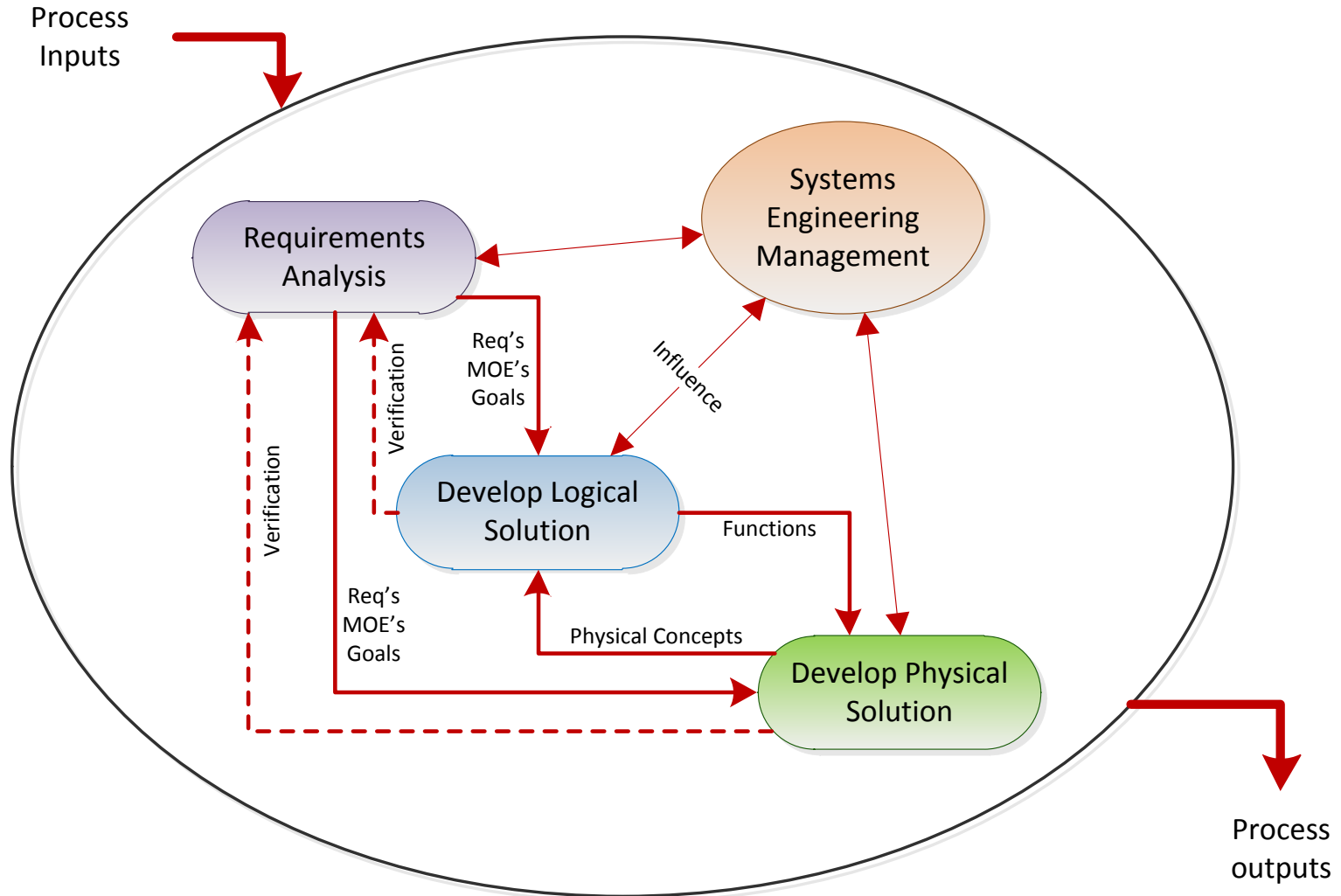


MODEL-BASED SYSTEMS ENGINEERING

It is logical approach to sufficiently describe a system so that we can make, use and retire that system in order to make people happy.

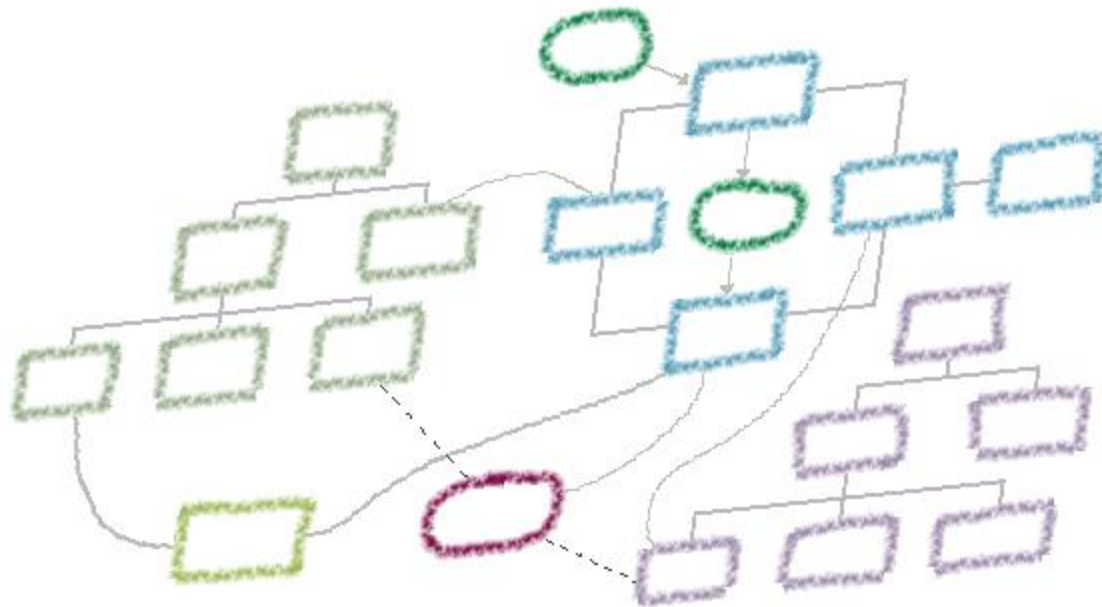


MODEL-BASED SYSTEMS ENGINEERING



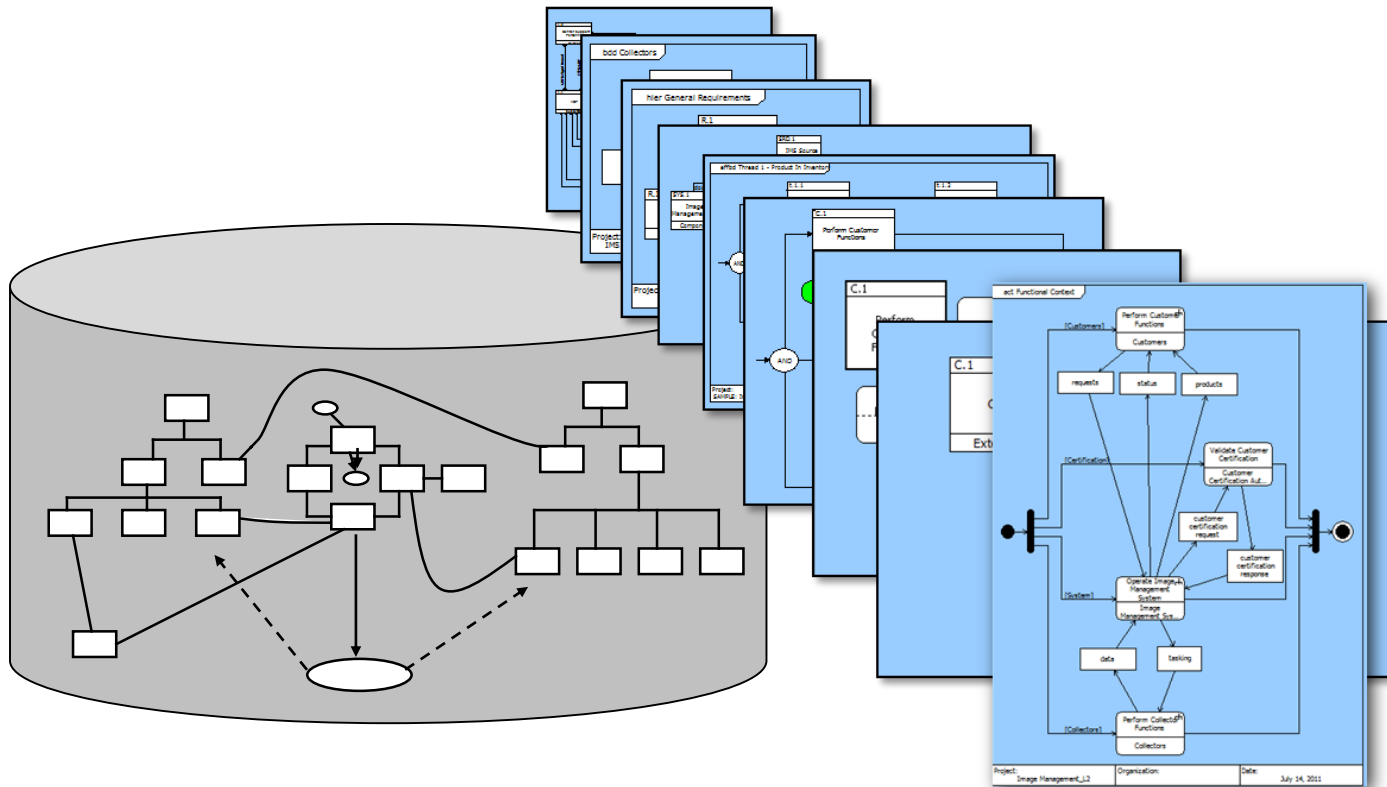
MODEL-BASED SYSTEMS ENGINEERING

a shared meta-model and modelling notation



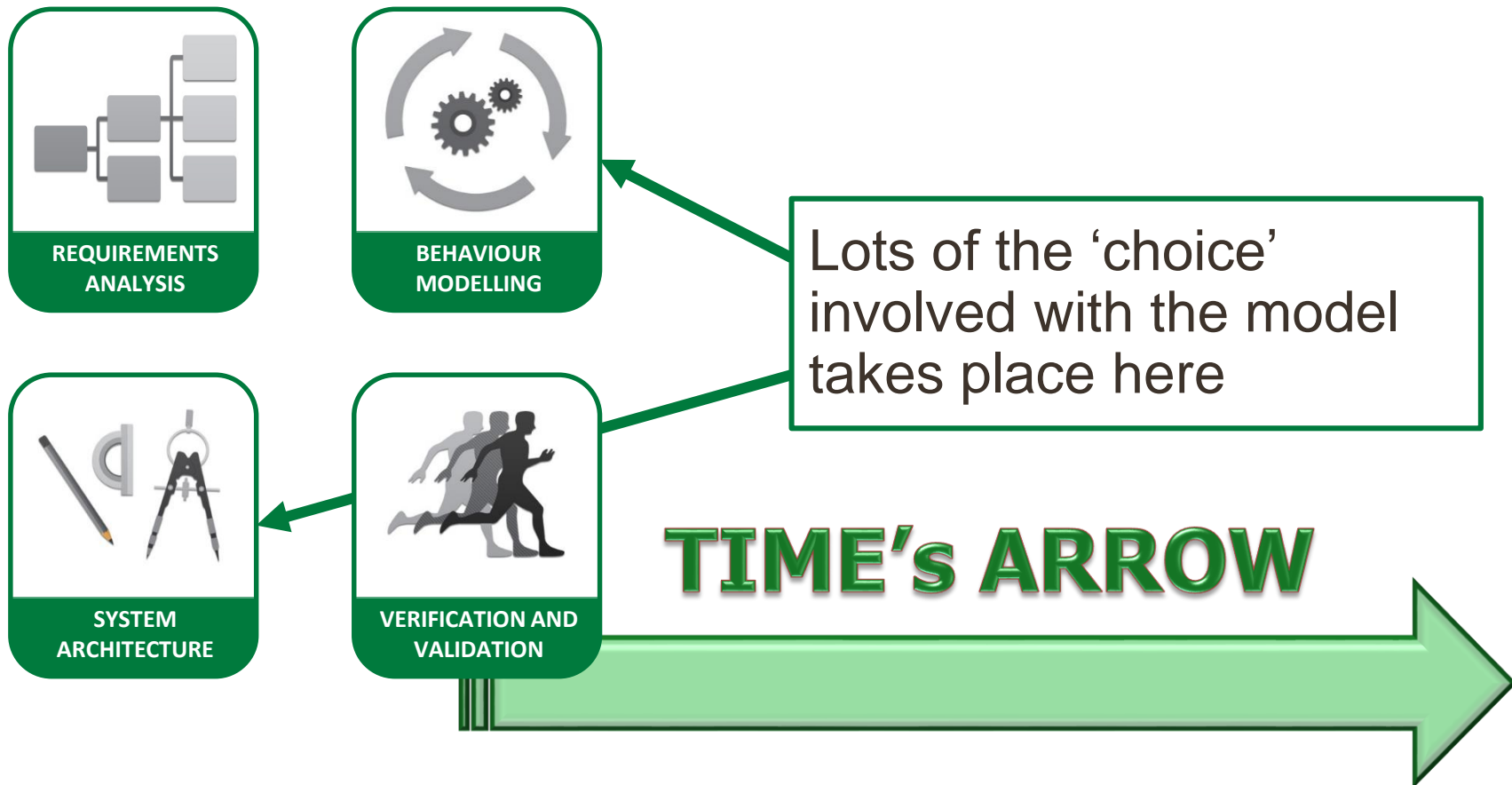
MODEL-BASED SYSTEMS ENGINEERING

a model database

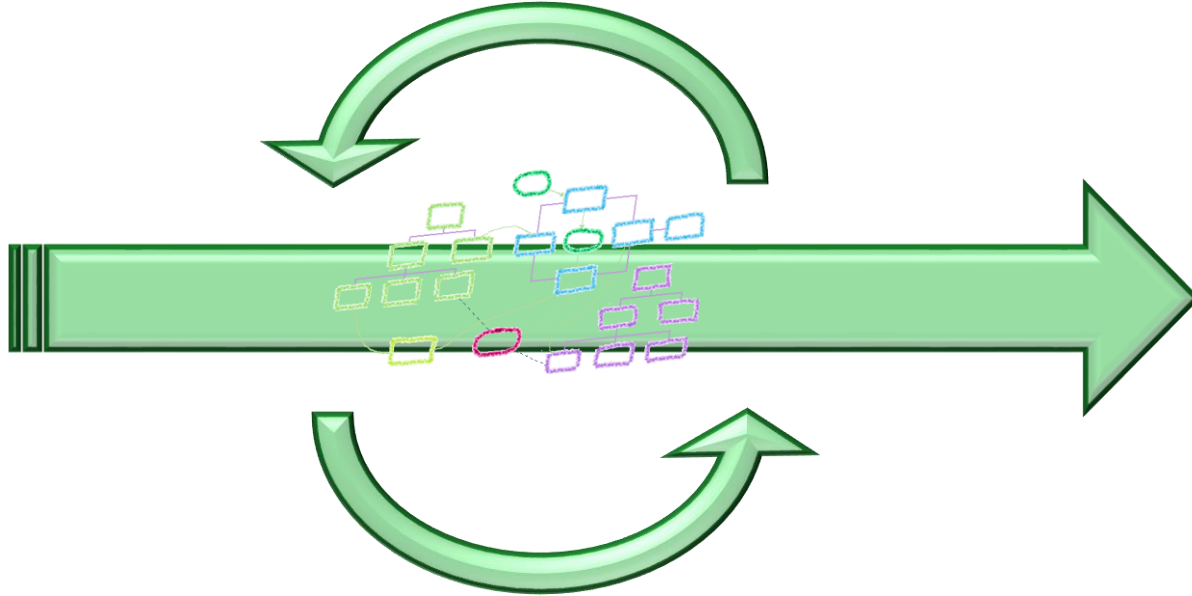


MODEL-BASED SYSTEMS ENGINEERING

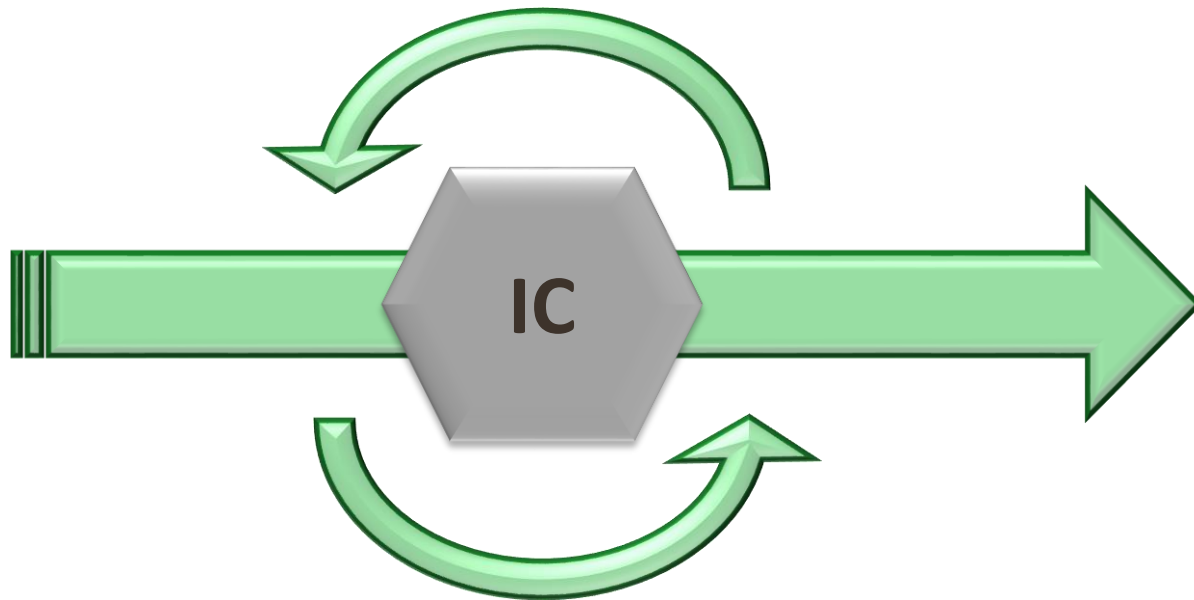
a methodology



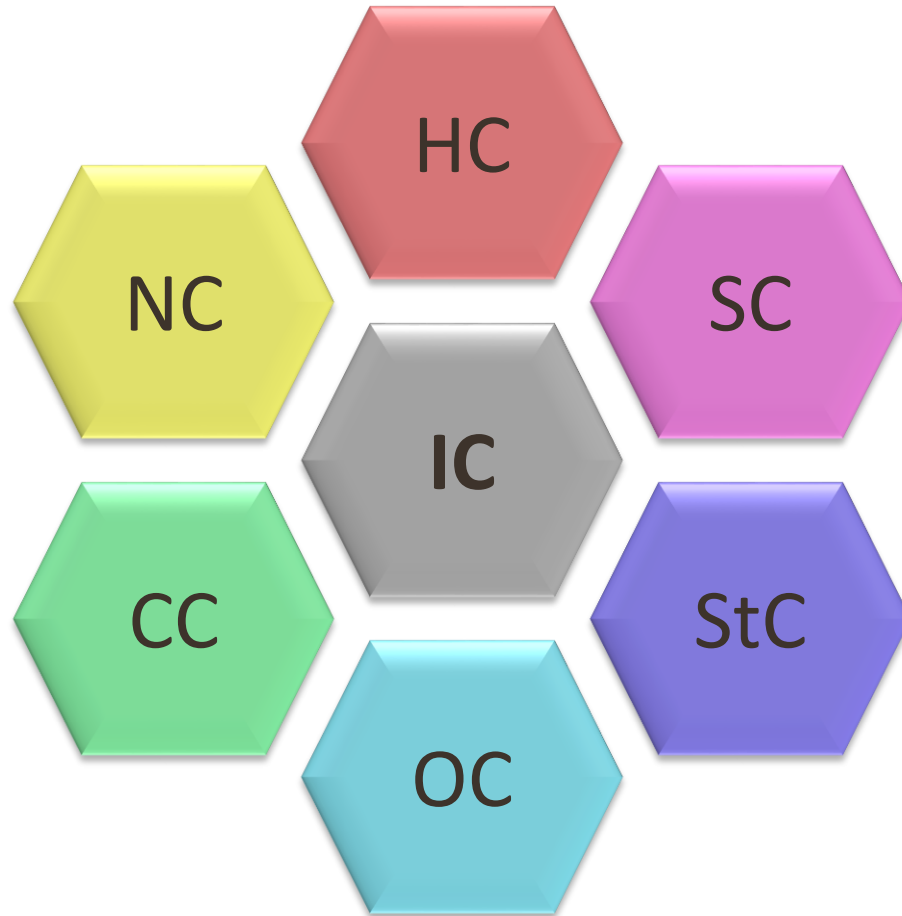
INTELLECTUAL CAPITAL



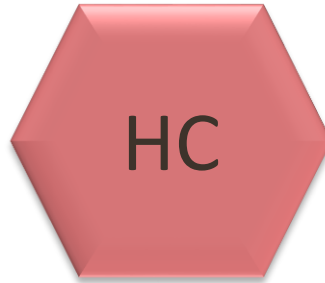
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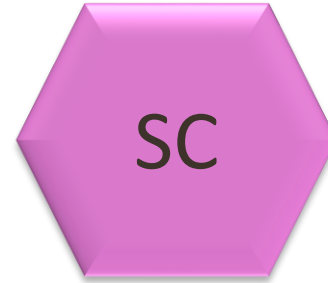
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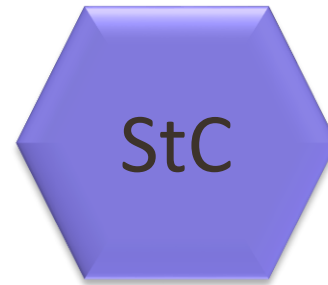
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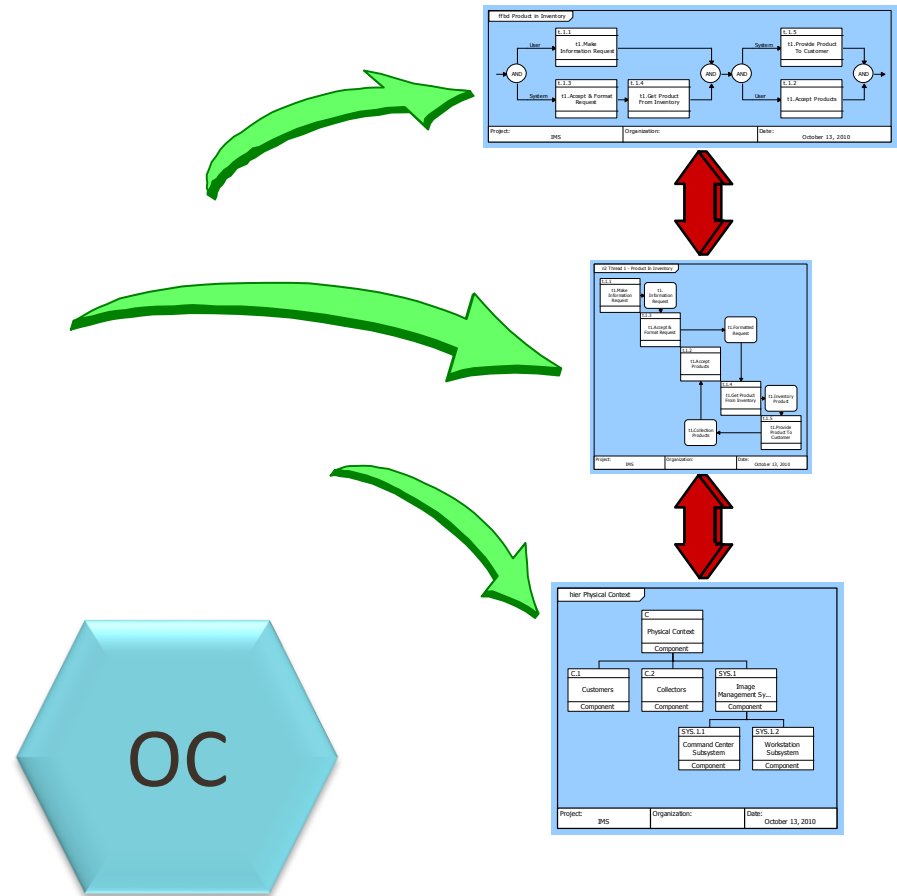
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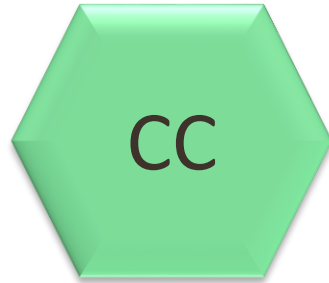
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INTELLECTUAL CAPITAL



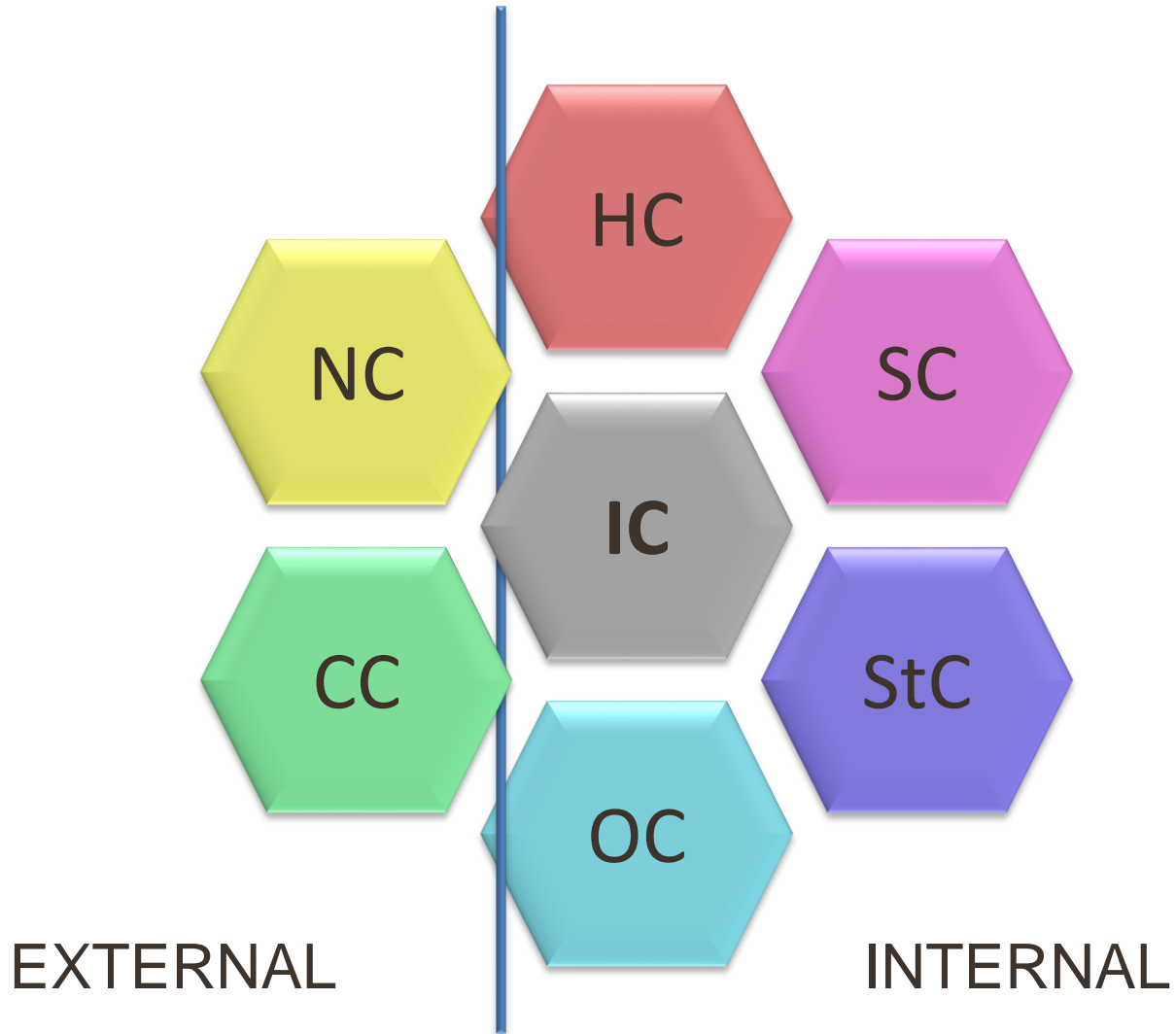
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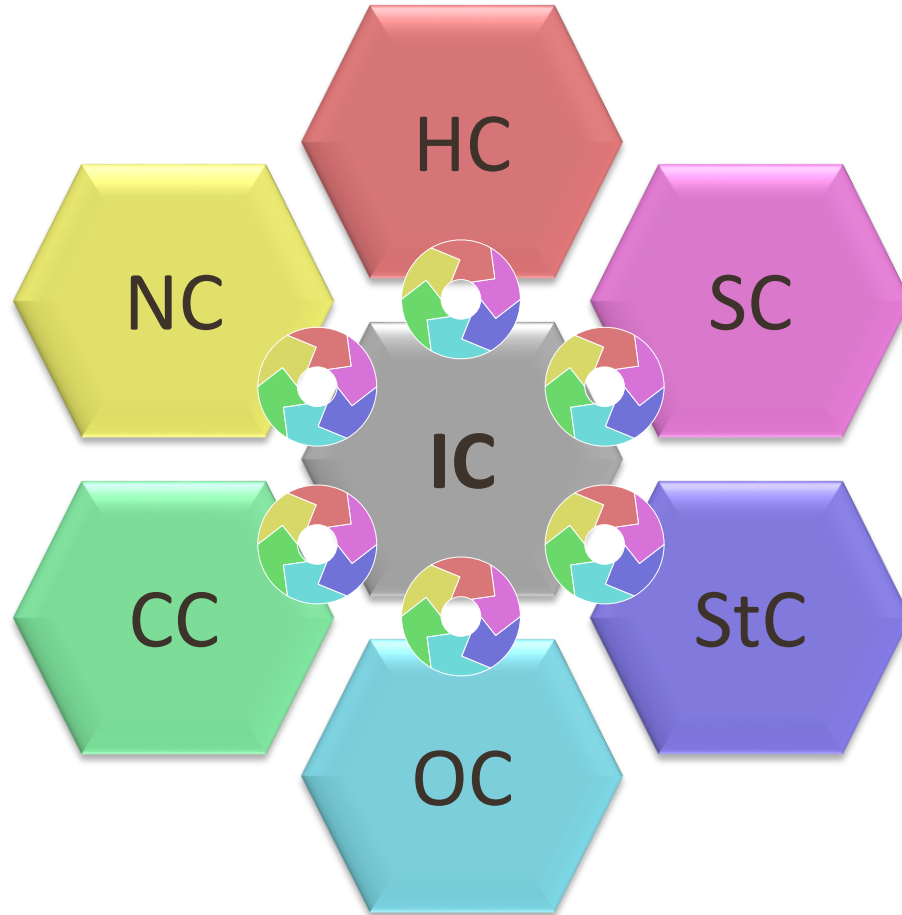
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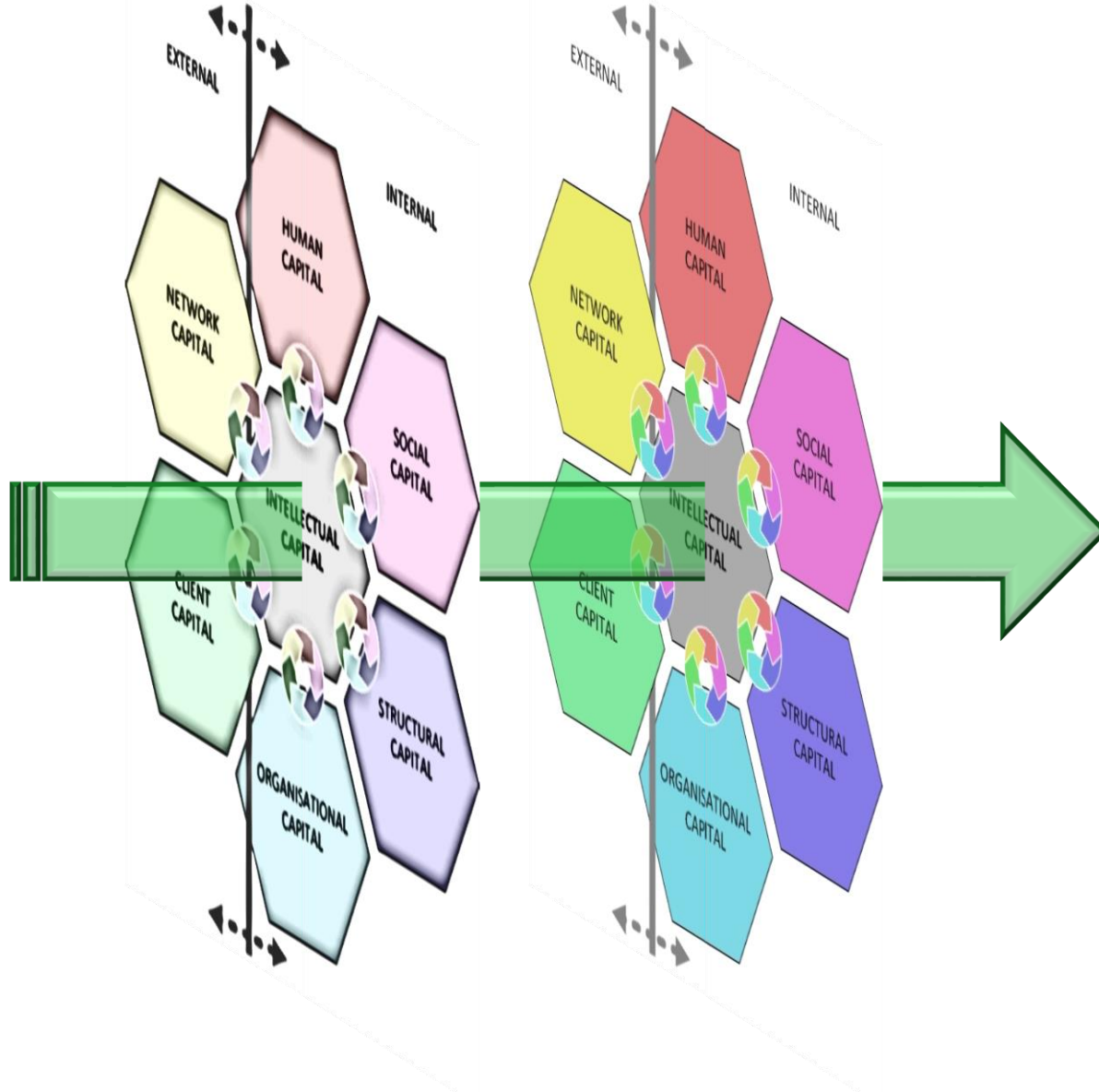
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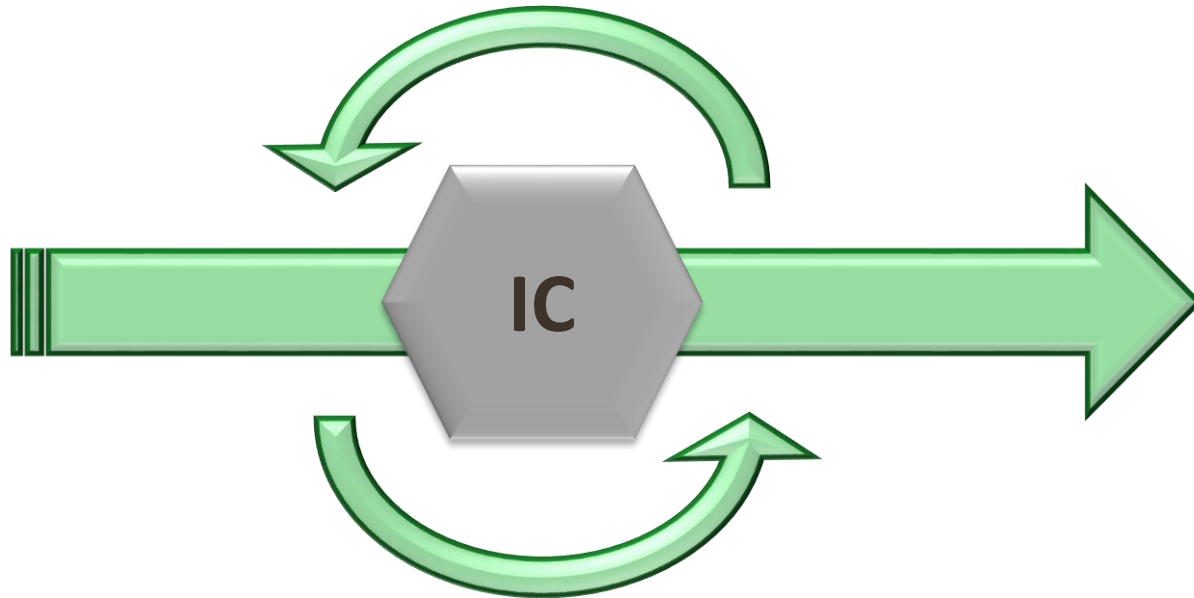
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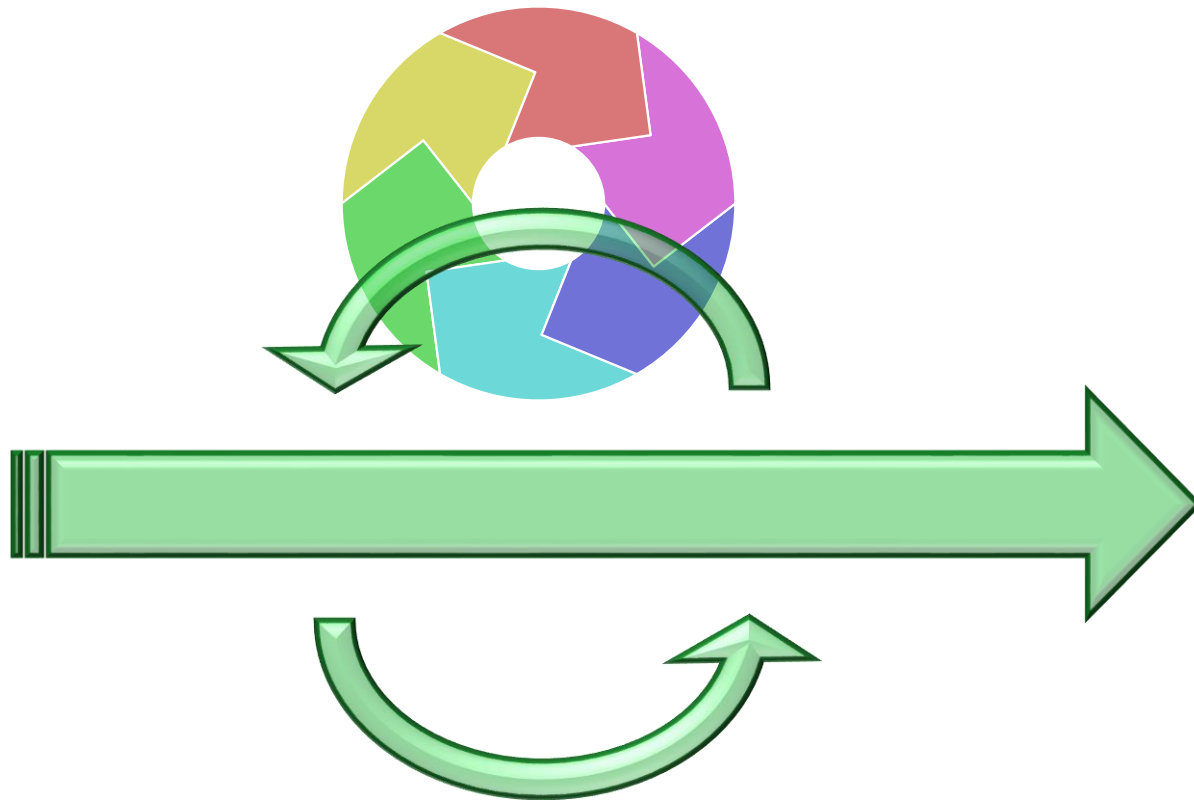
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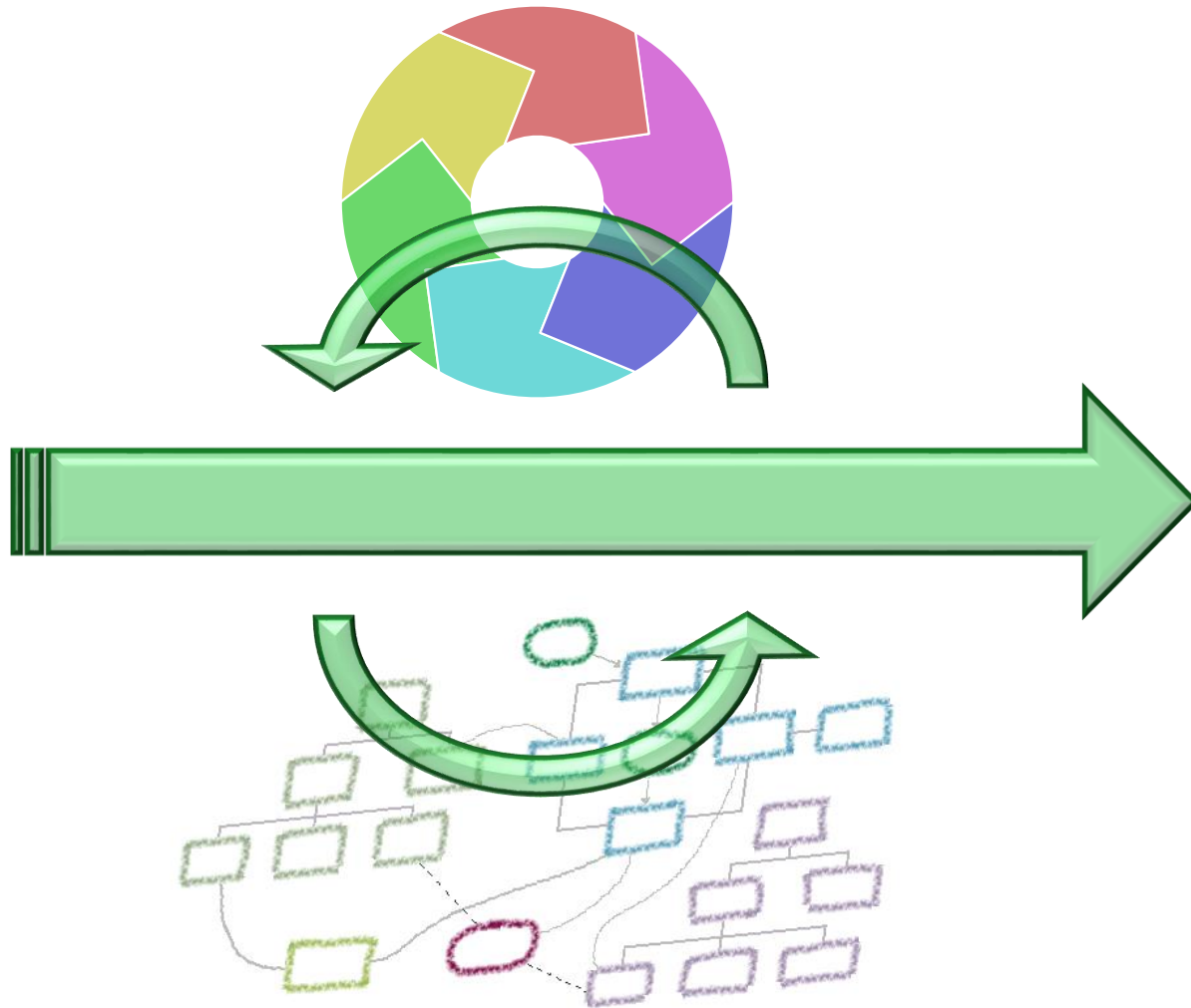
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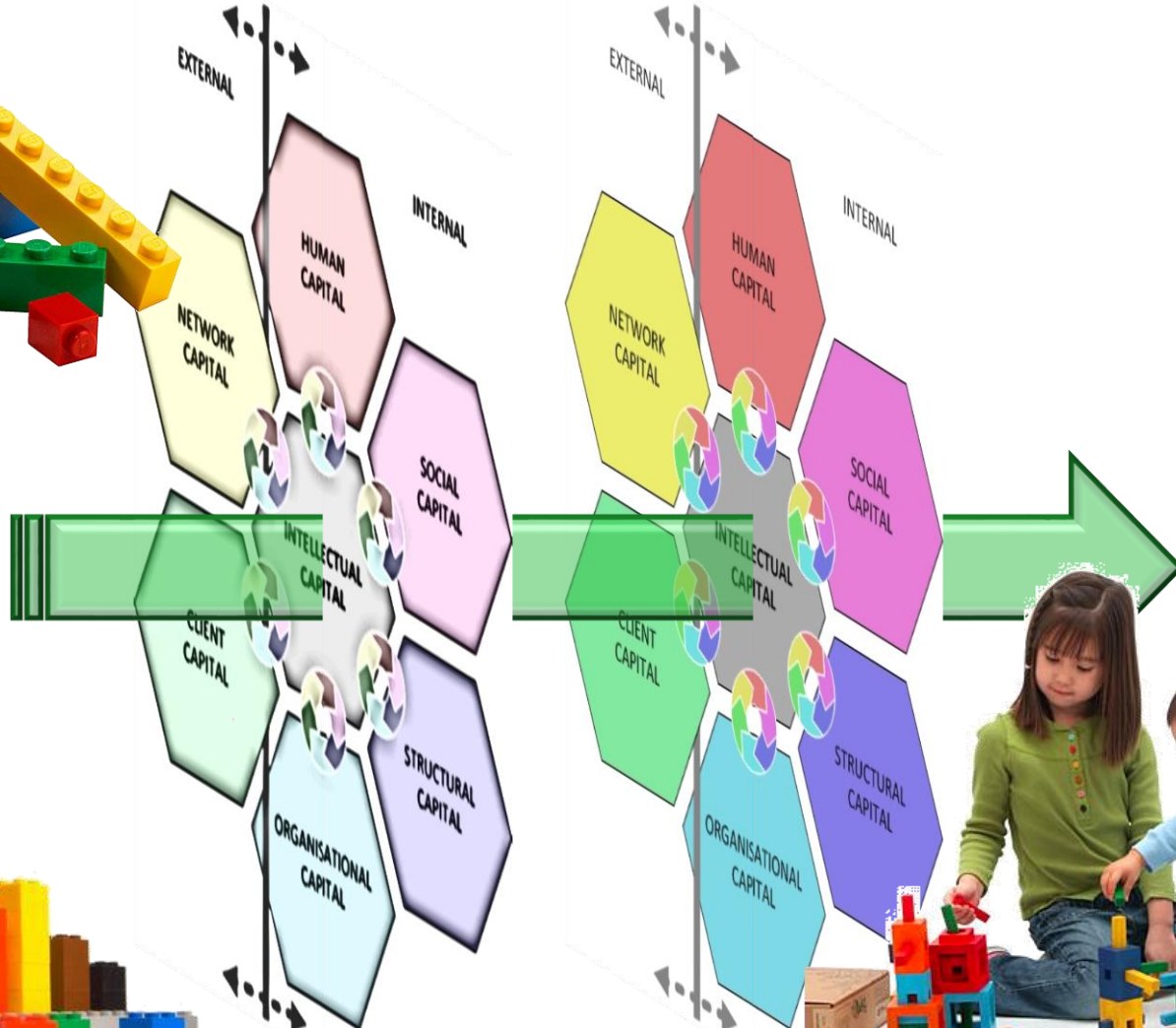
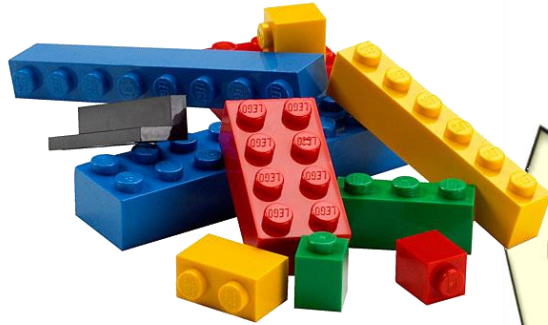
INTELLECTUAL CAPITAL



INTELLECTUAL CAPITAL



INTELLECTUAL CAPITAL



WHAT'S NEXT?

What prevents us to
revise our models?

Revise Intellectual
Capital Domains

Intellectual Capital
assets to revise
models?

Measures for
Intellectual Capital
Growth?

Implement the Idea,
learn from it!

Measures to value
models?





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