G-I-1

Introduction

Modelling is the way of thinking

Dr. Y. Song (Wolf)
Faculty of Industrial Design Engineering
Delft University of Technology

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IO2081 Modelling

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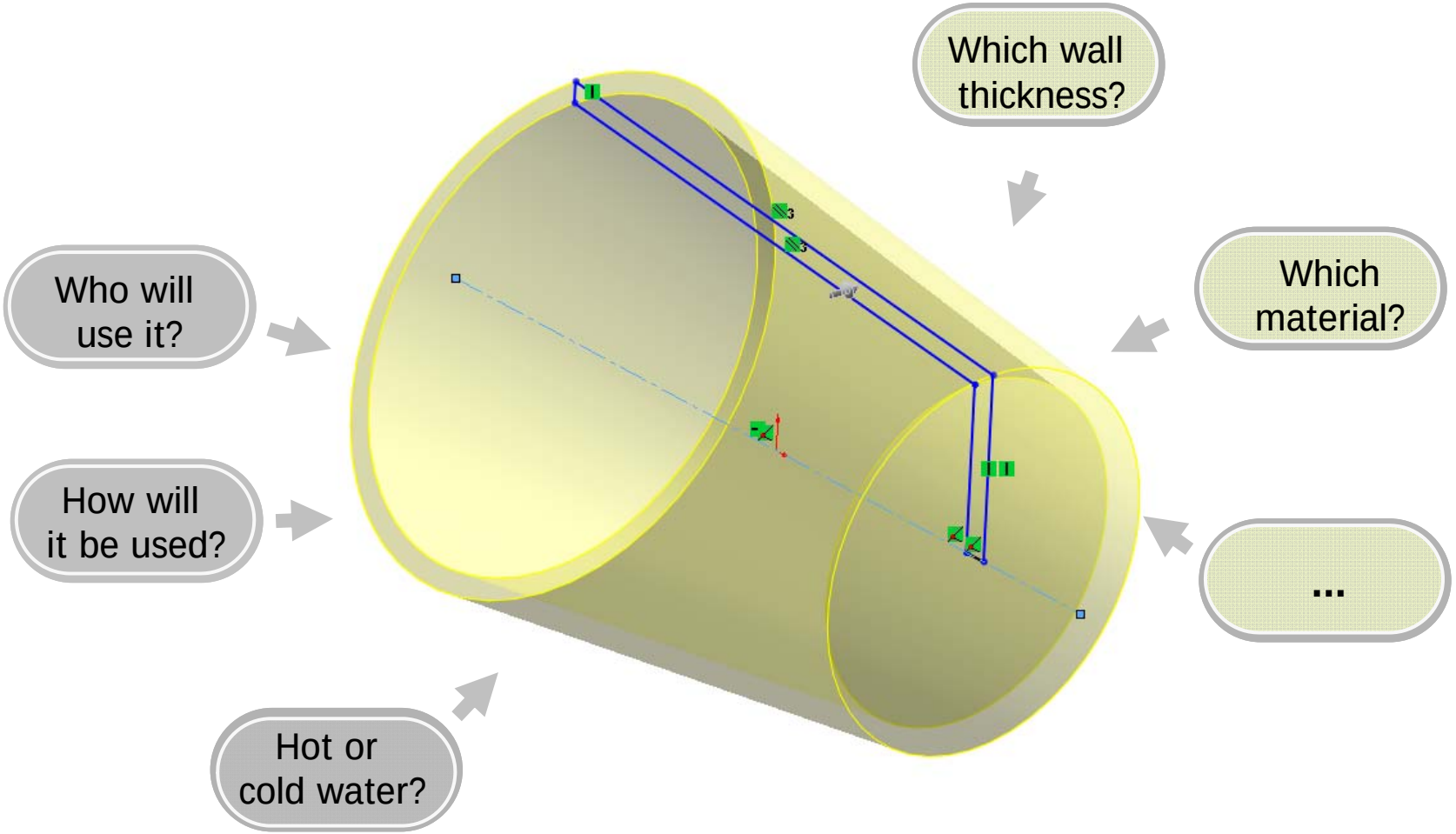
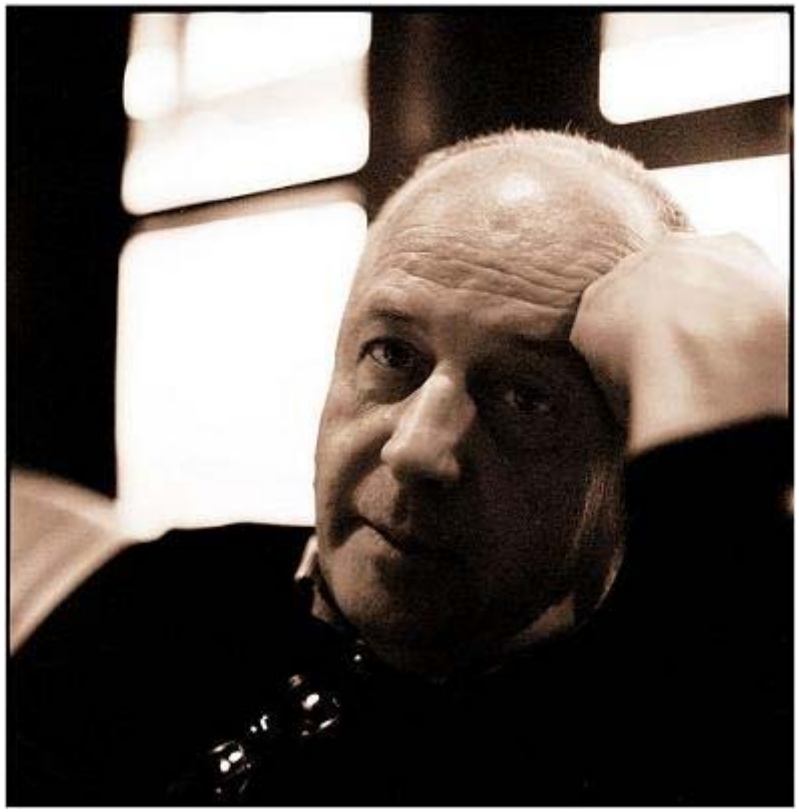
The design process is fraught with questions



We think

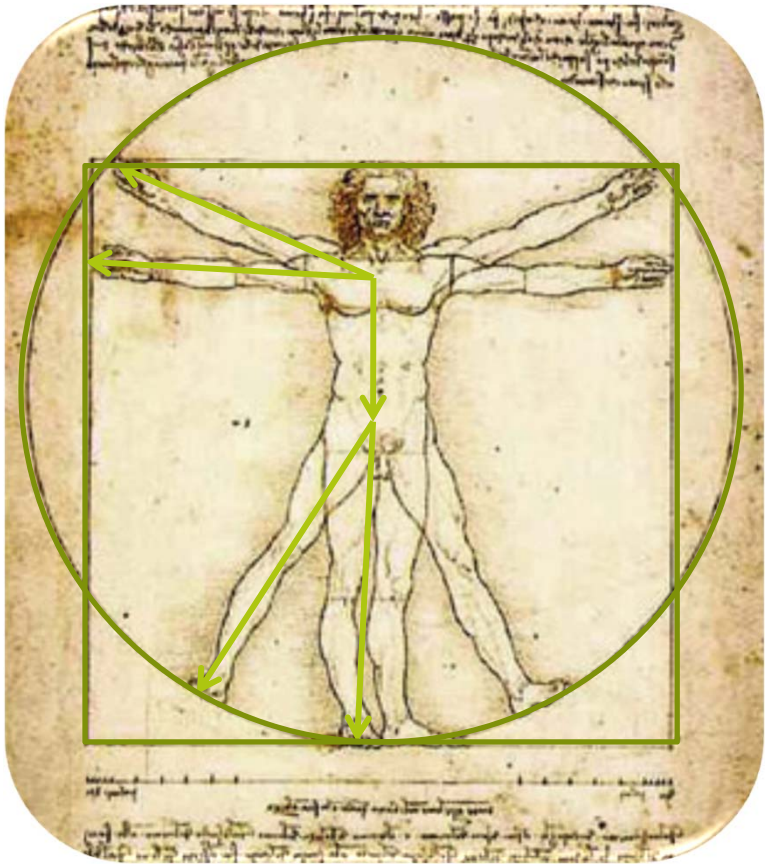


Alberto Alessi

We use abstract models to ‘touch’ our thought

like this sketched man?

no, the man is not an abstract model

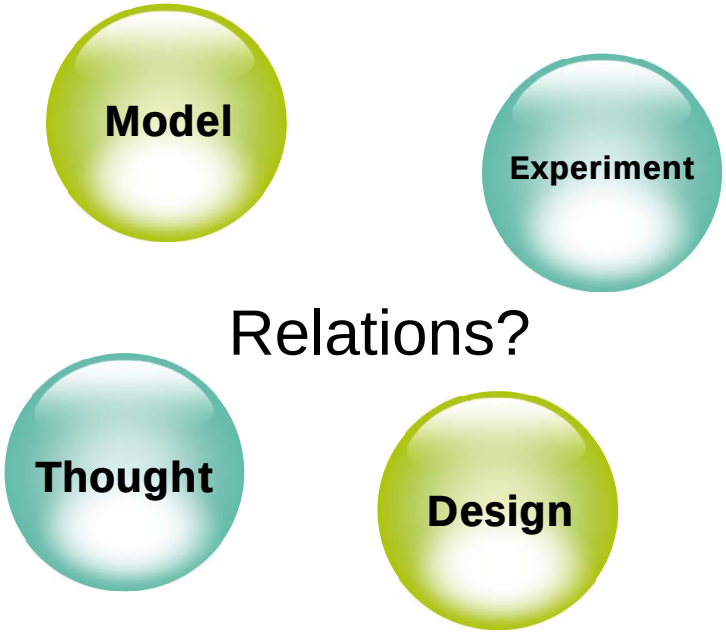


this

is da Vinci’s abstracted model (language: Eucledian calculus)

We experiment to verify both our thoughts and models

What are their relations ?



Insights

One thing to keep in mind…

Your **mind** *thinks* without you

...which is a very fortunate thing, as we shall see!

(still, it's up to you to check if it's on track)

A look under the hood: Modelling in design

what are you studying?

Case brief

choices

what exactly...?

System

what do you foresee?

choices

Thought simulation

choices

'touch' your thoughts

Build abstract model

what does your model foresee?

choices

Solve / simulate

Experience

everything you did/ saw/ felt/ remember to be true...

Compare

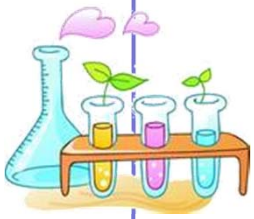
did you both agree?

Revisit **choices**

Finish!

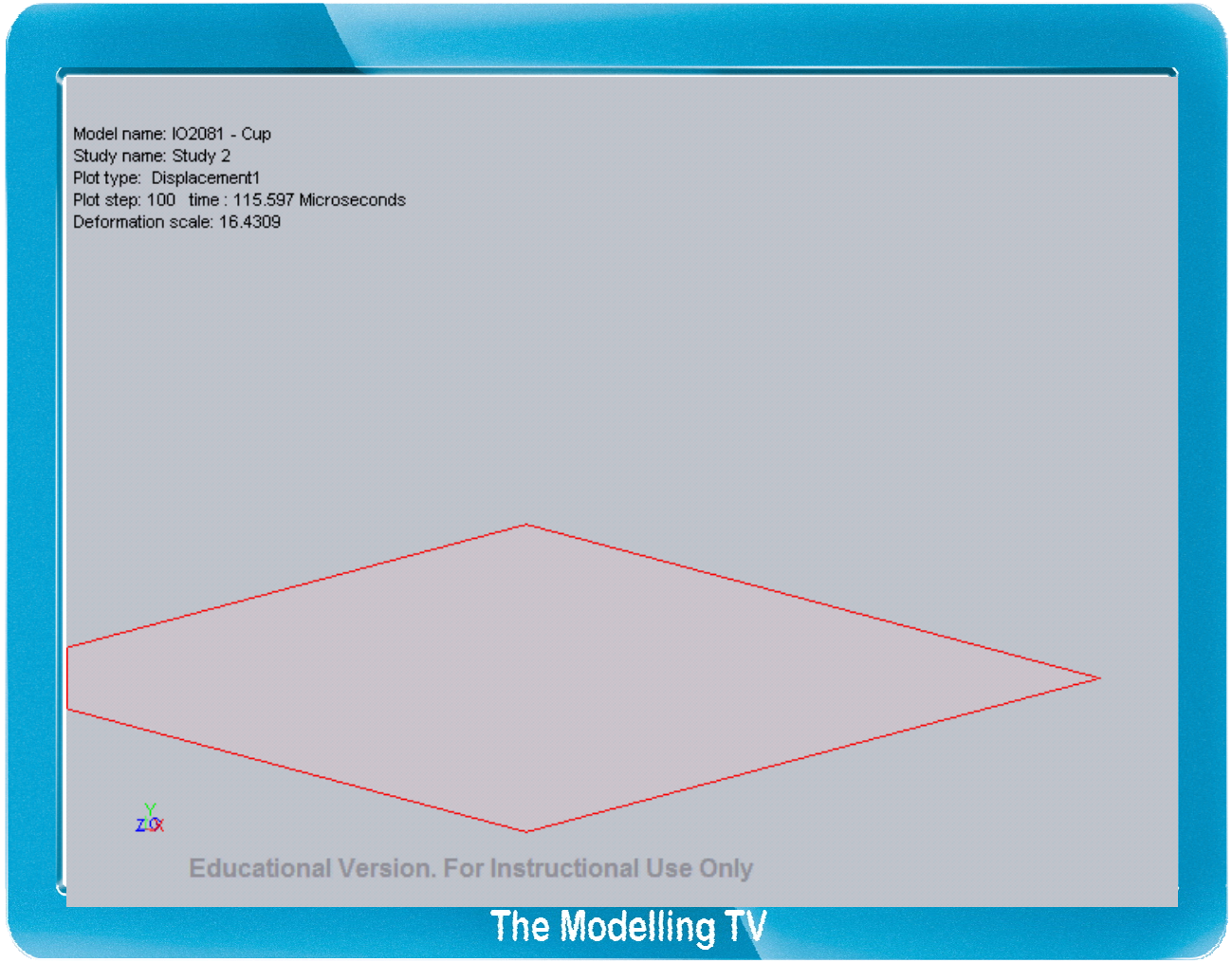
Acceptable ?

do you need more insights/ data?



Experiment

Cause & effect – The key to modelling



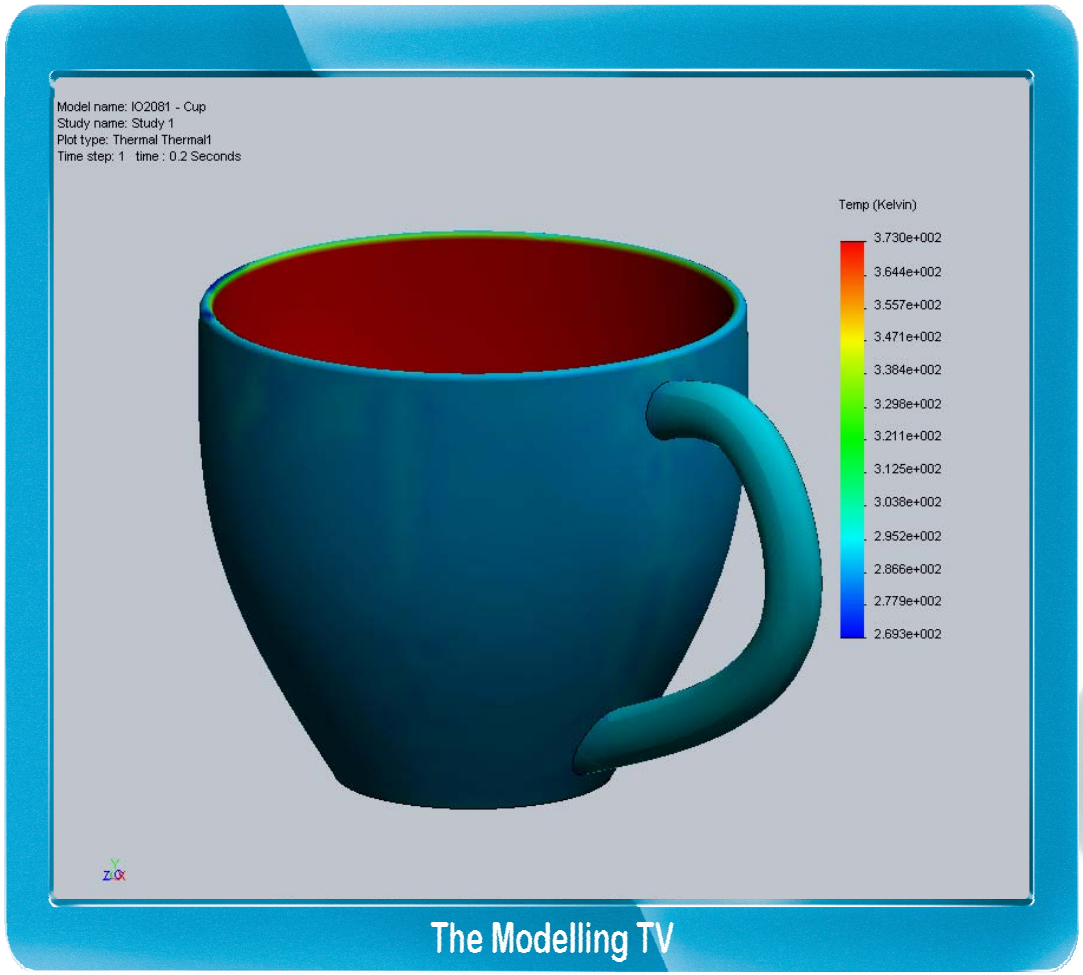
Cause & effect – The key to modelling

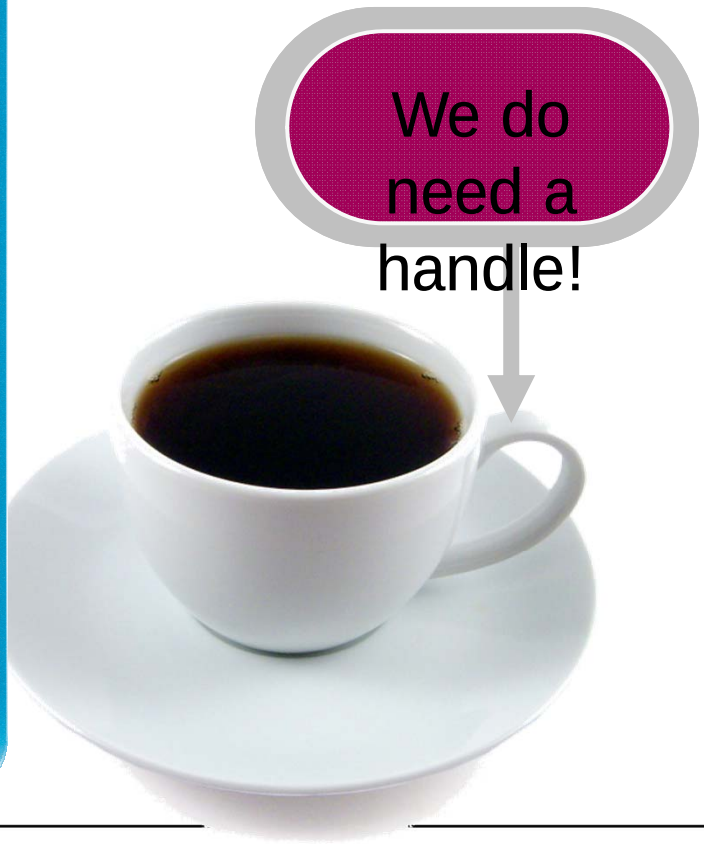
Cause	Cup falls off a table, hits the floor
Identify cause-effect relationship	What is special about falling off a table? Long distance, high speed, high acceleration at impact? etc
Understand cause-effect relationship	'It is not the *fall* that kills you, but the sudden stop at the end'... Acceleration causes large forces...
Quantify cause-effect relationship	Accelerations during impact
Effect	The cup is damaged

Cause & effect – The key to modelling

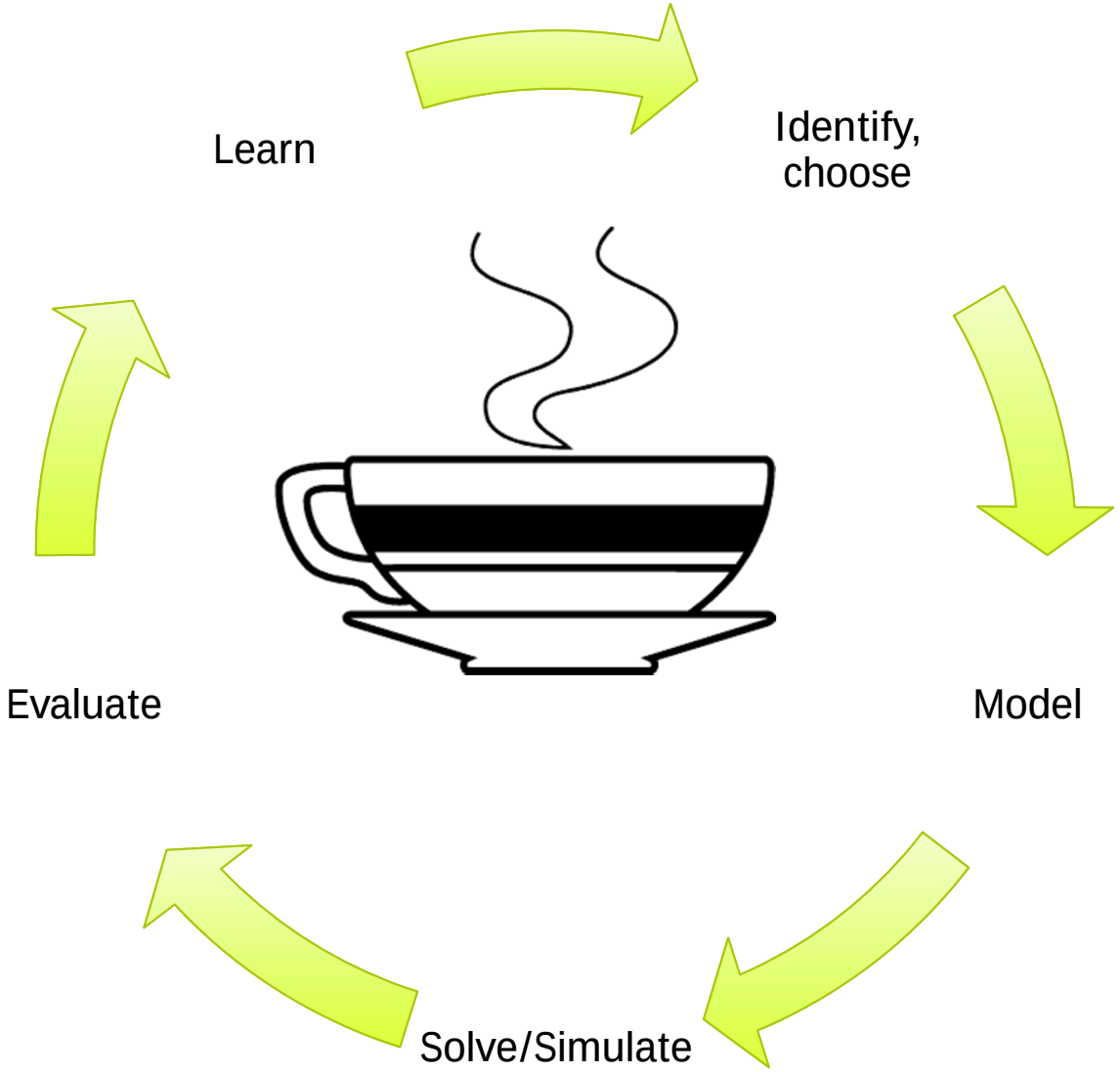
Cause	You fill a cup with hot coffee
Identify cause-effect relationship	What is special about filling a cup with coffee? High temperature, spilling, heat transfer? etc
Understand cause-effect relationship	Heat migrates across temperature gradients (temperature difference), until steady state
Quantify cause-effect relationship	Surface temperature rise with time
Effect	You burn your fingers

Modelling-simulation-design



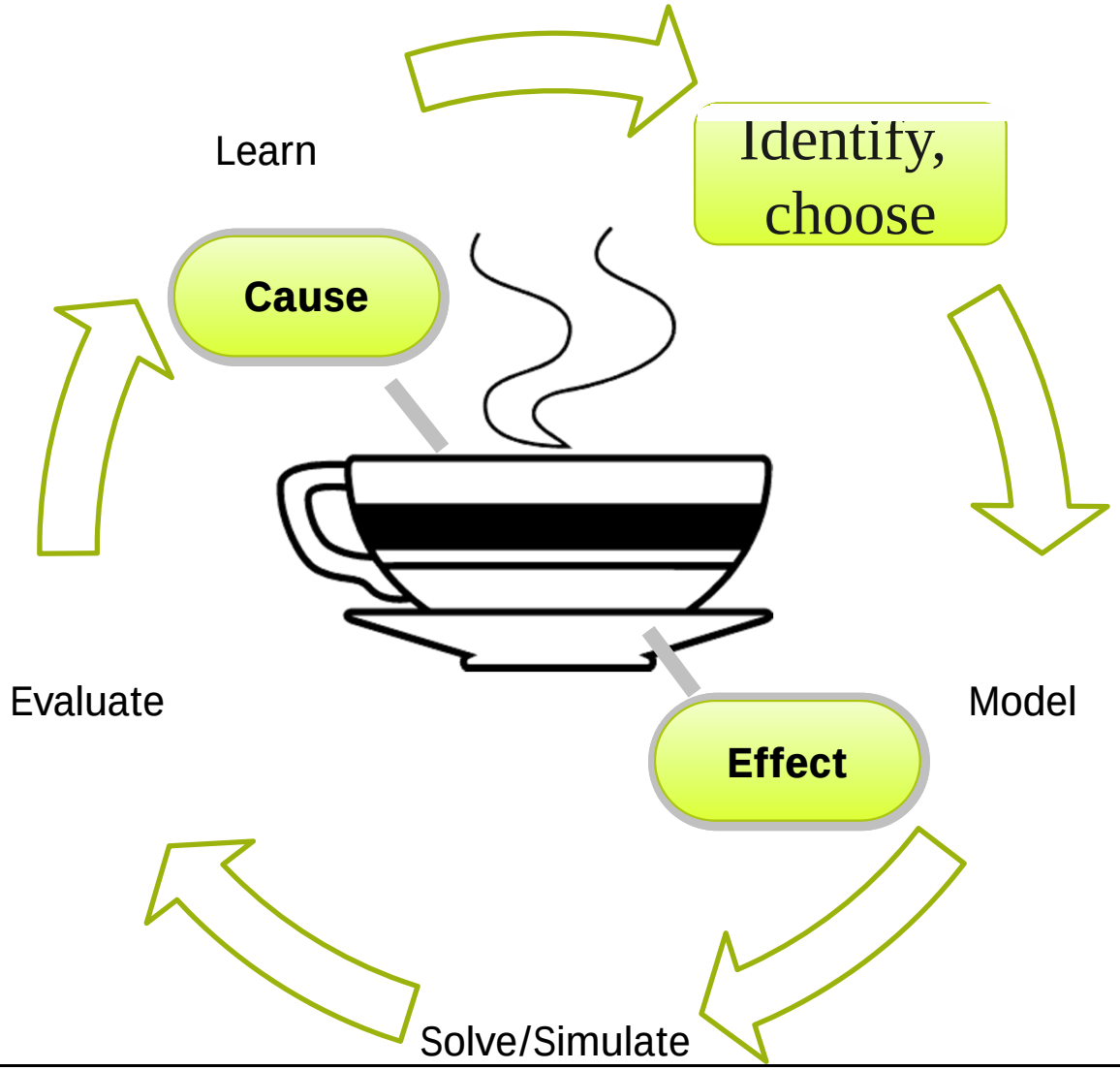


Modelling: The basic loop



Courtesy of http://crapo.senate.gov/services/ConstituentCoffee.cfm

Modelling: The basic loop



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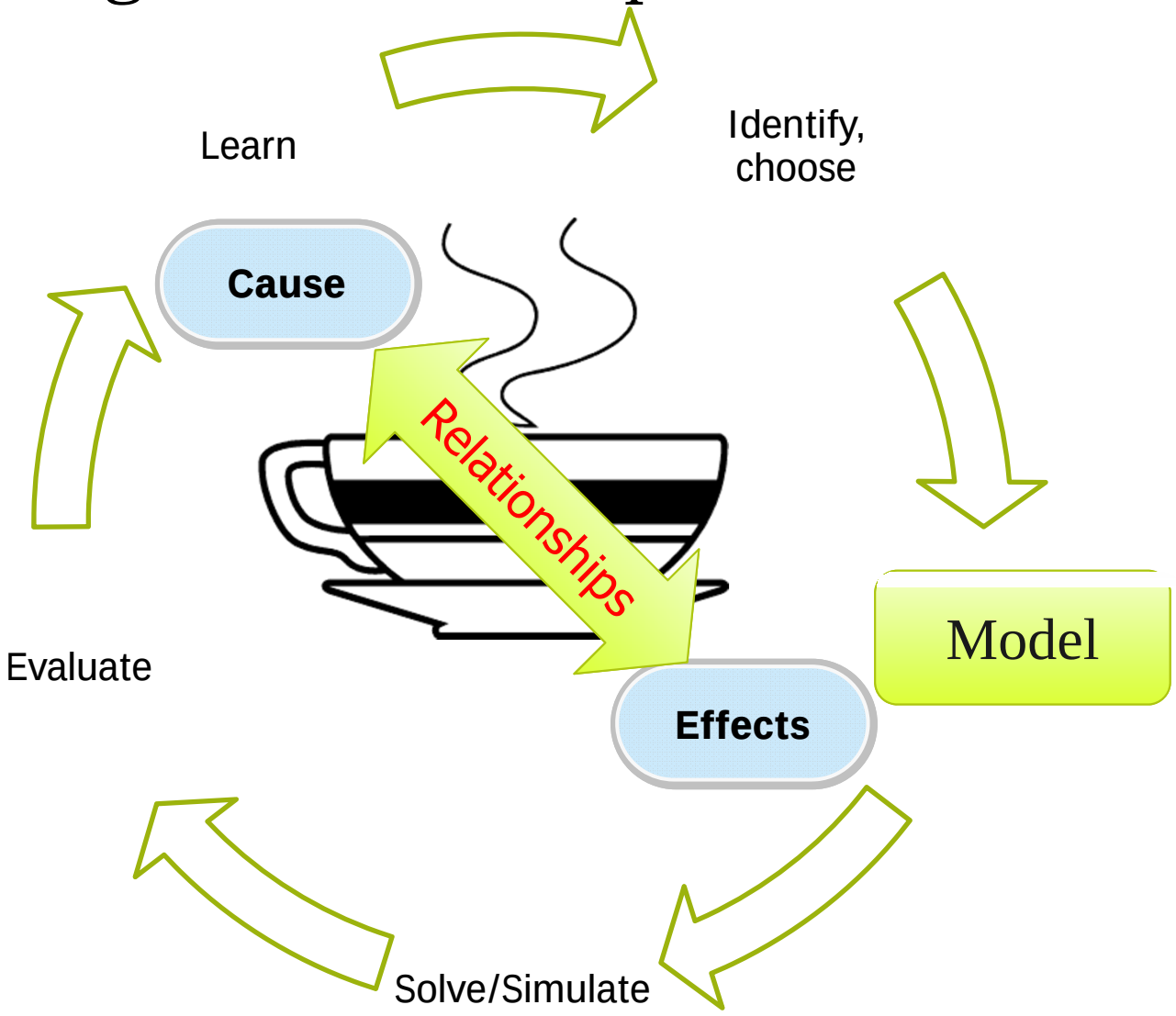
Modelling: The basic loop



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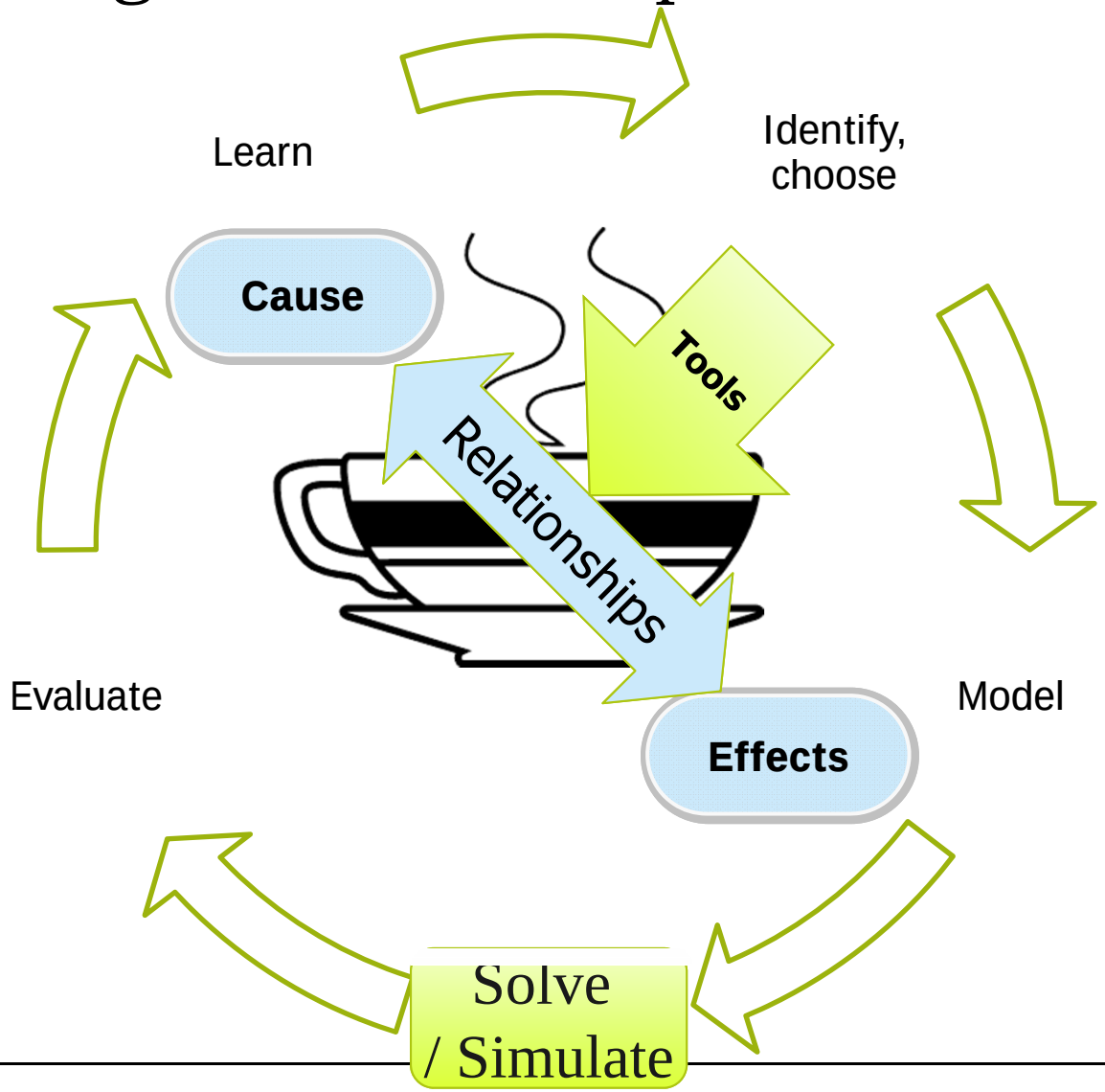

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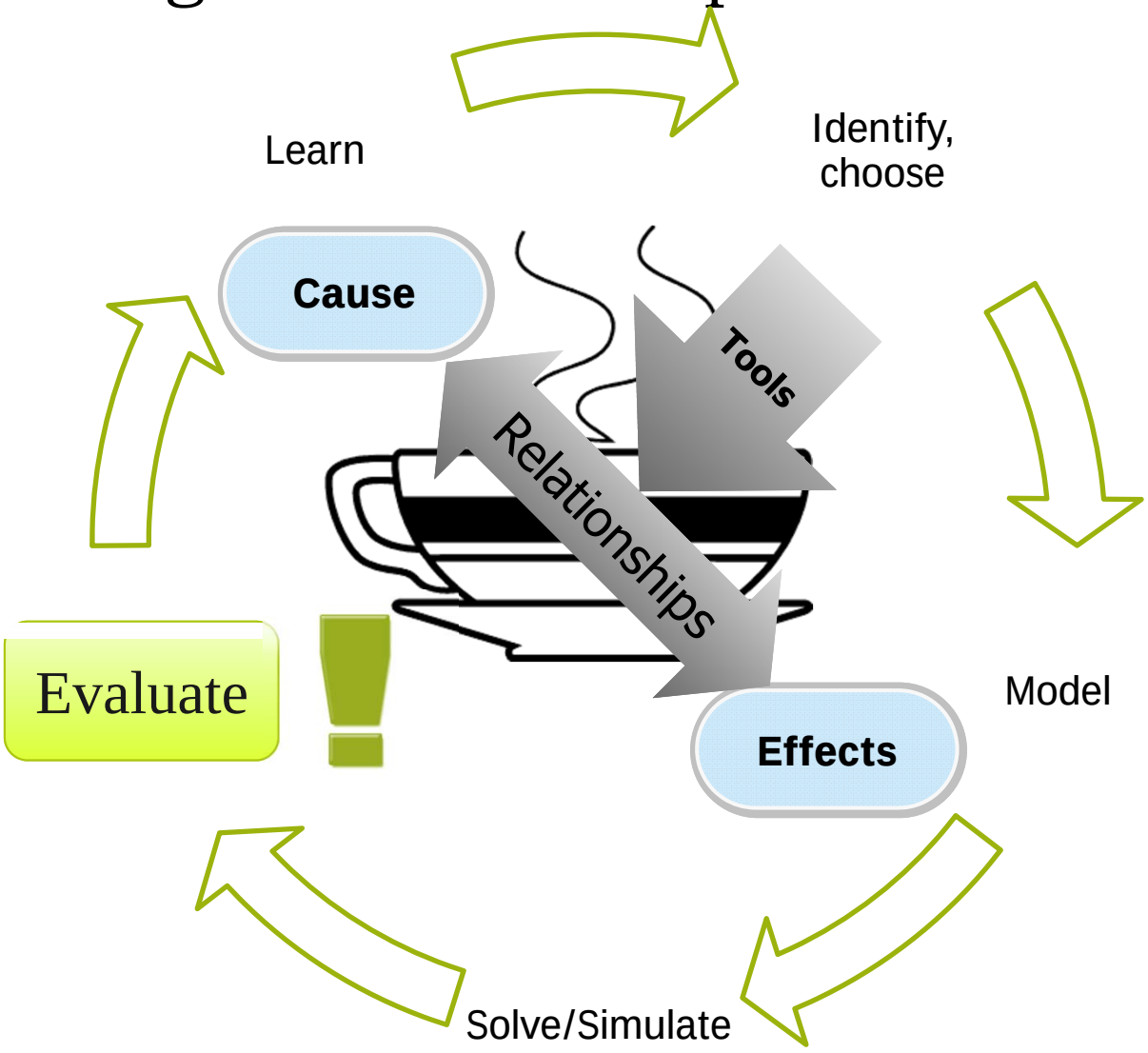

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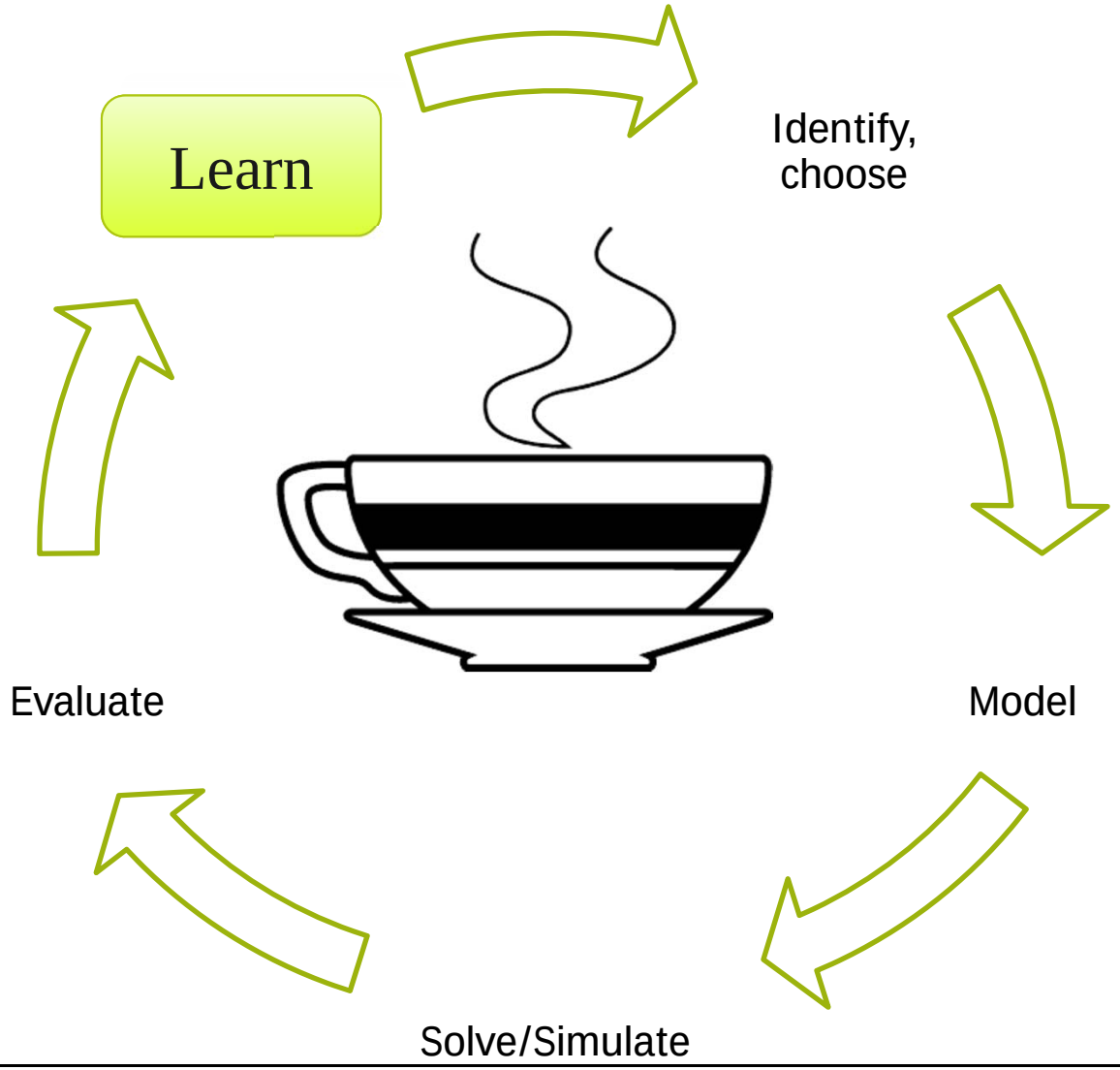

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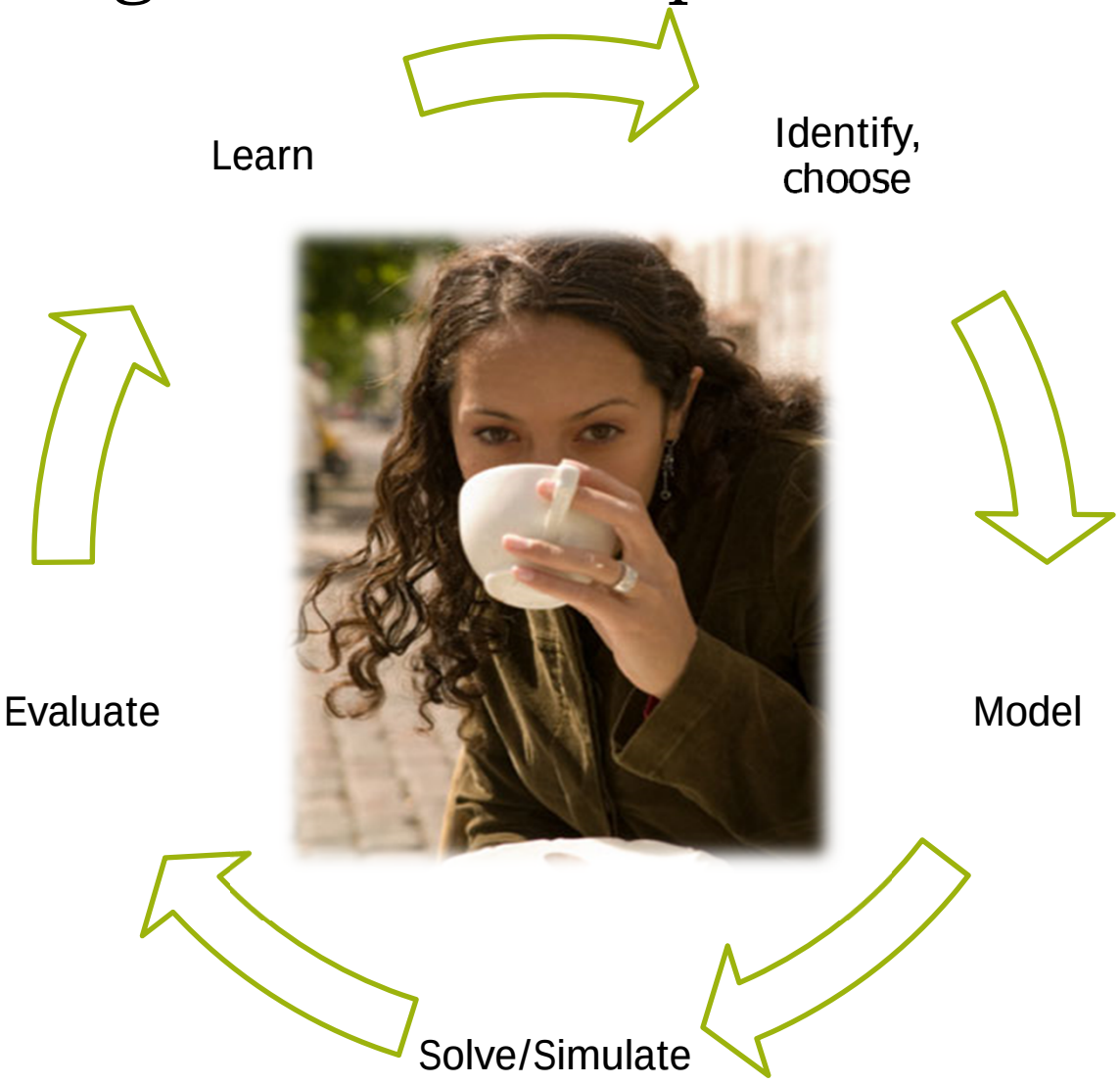
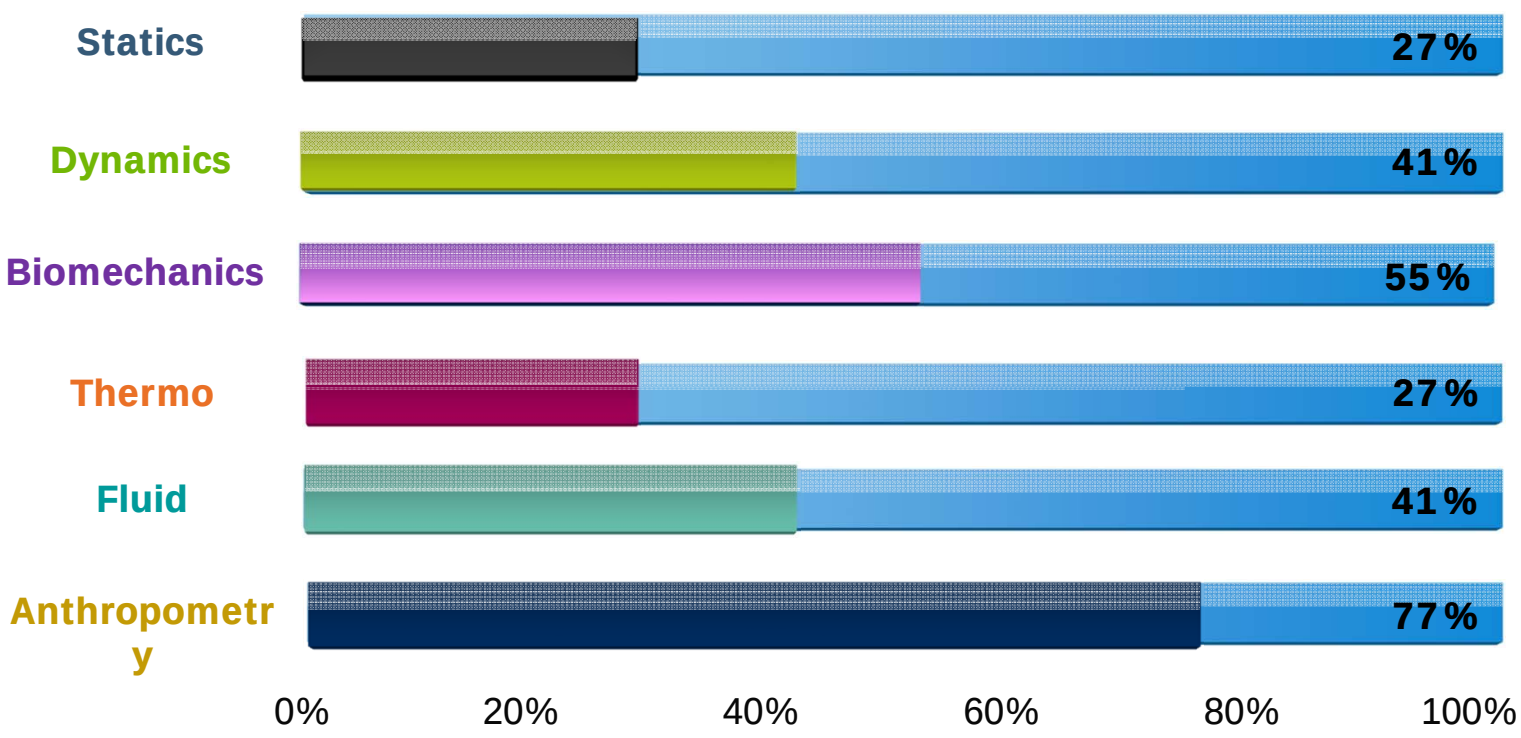


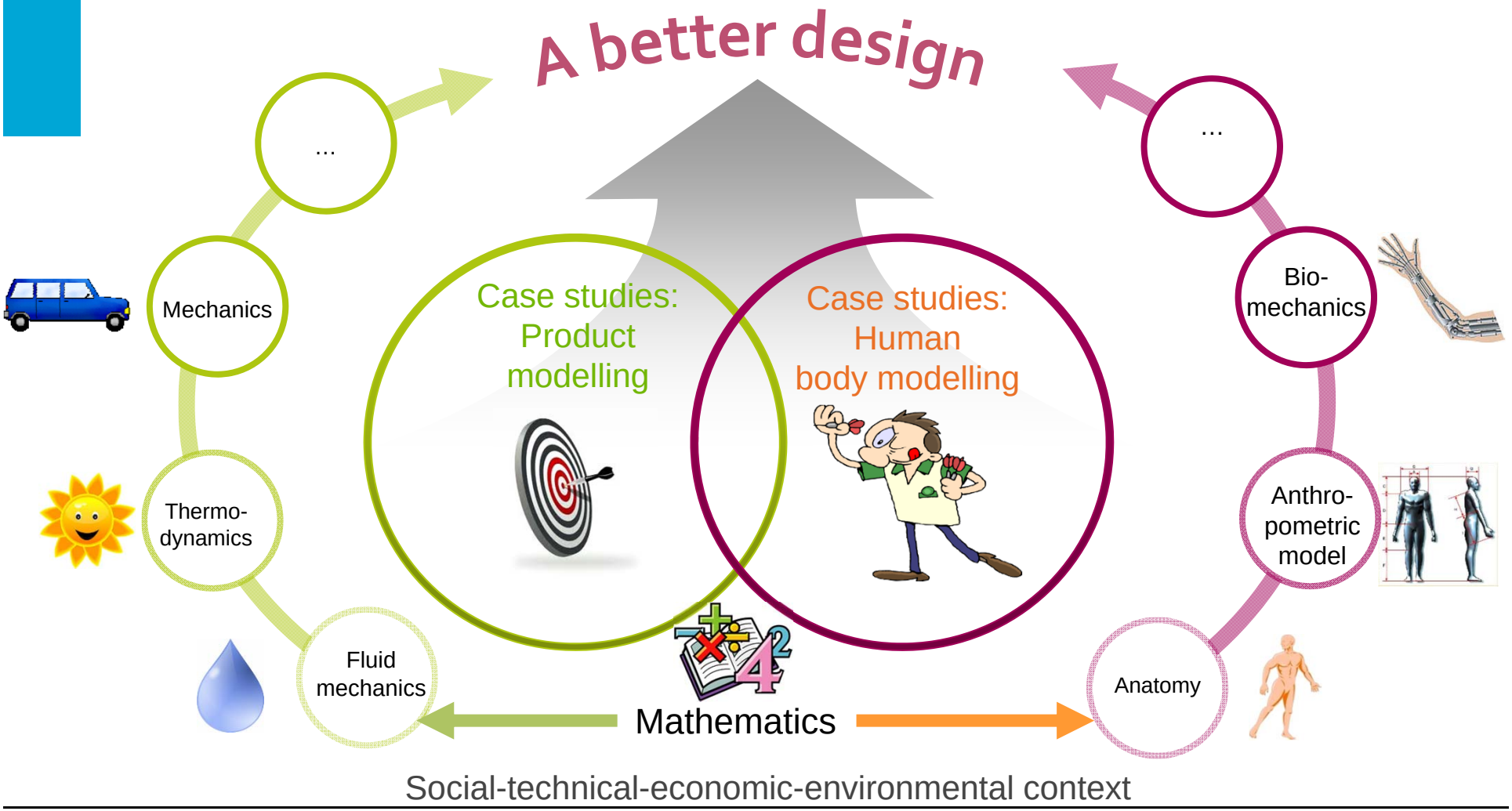
Content brief

Case studies:
Accessible knowledge with a vision

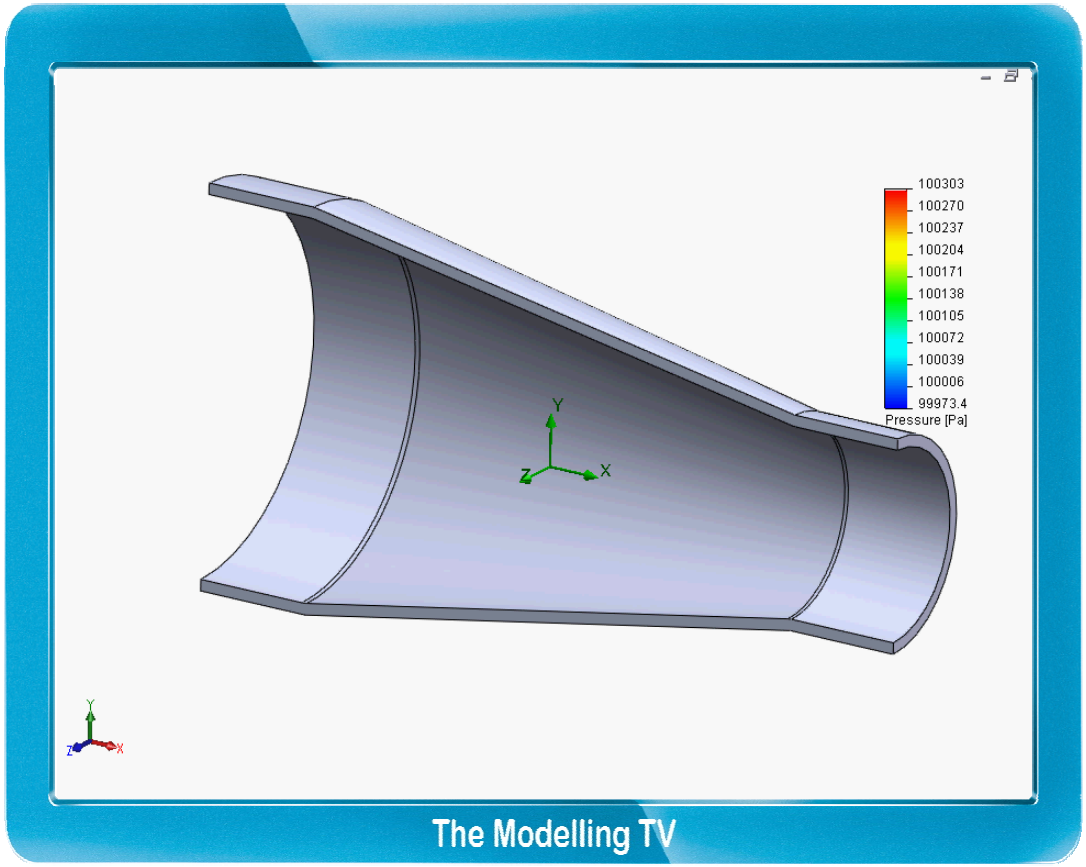
2012 ~ 2013 Advanced Embodiment Design
(Many projects cover several disciplines)

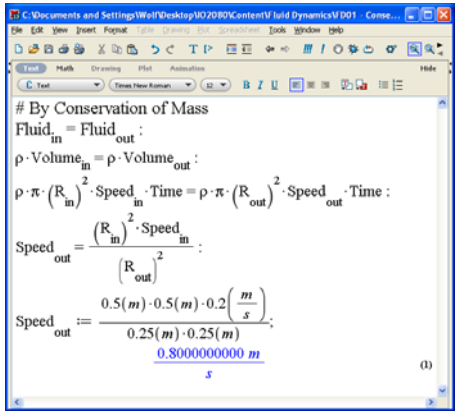


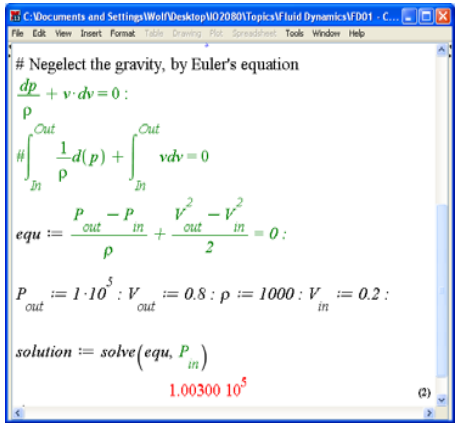
The scope of Modelling



Case studies:
Accessible knowledge with a vision







Truth → 98% accurate

Reflections

We say that

curiosity
is fun

knowledge
is power

science
is easy

computers
are tools

experience
can be harnessed

hard work
is the way to success

modelling is the way to wisdom

Upcoming on Thursday

On April 25, 2013, we will design:

i'm lovin' it™

Questions!

What did you learn today?

knowledge
is power

knowledge
is for geeks

hard work
is the way to
success

hard work
is for the
uninspired

What did you learn today?

we need handles on coffee cups, the first reason is...

they keep us from burning our fingers

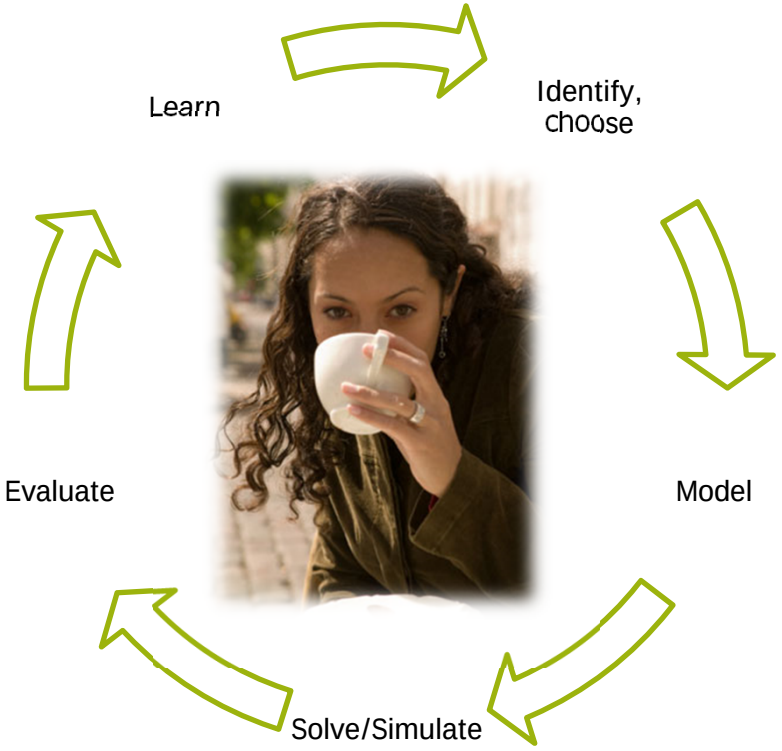
~~they look nice~~

What did you learn today?

to design a
successful product
we need to...

model
cause- effect
relationships

try a lot of
experiments



Succes

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Prof. Dr. Christos Spitas
Dr. Y. Song (Wolf)
Faculty of Industrial Design Engineering
Delft University of Technology