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Design Thinking with Scene2Model

NEMO Day: DigiFoF Edition

April 16, 2021

Presenter: Dr. Wilfrid Utz

OMiLAB gGmbH, Berlin, Germany



MOTIVATION

Motivation

How to Conceptualize, Implement, and Deploy New Business Opportunities in the Digital Age, e.g.

Need

Warranty cost generally increases exponentially with the increase of duration of warranty cover

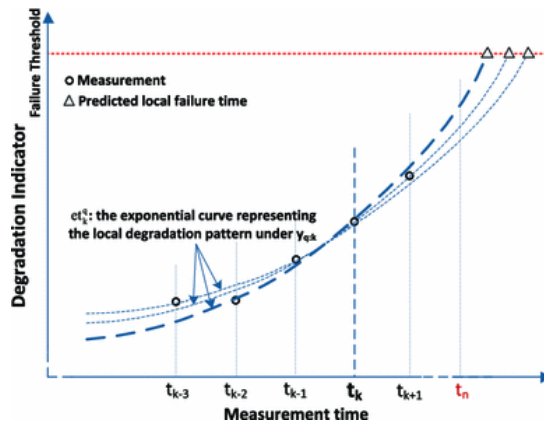
Alternative

Long duration warranty or periodic replacement

- Drawback: high price

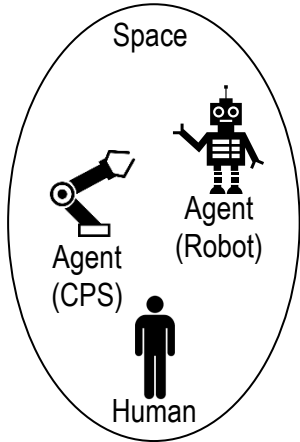
Value Proposition

Automatic replacement of parts based on smart models using real-time monitoring



The Challenge

Both are needed for
Innovation



...provides **capabilities** for
real world operations...

**Intelligent
Environments**
Are constrained
by accessible
knowledge assets

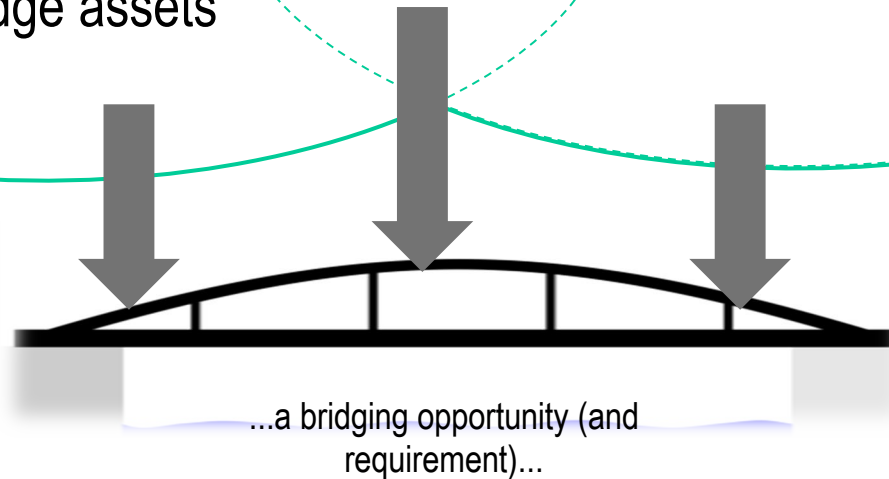


Is there a sensible middle
ground?

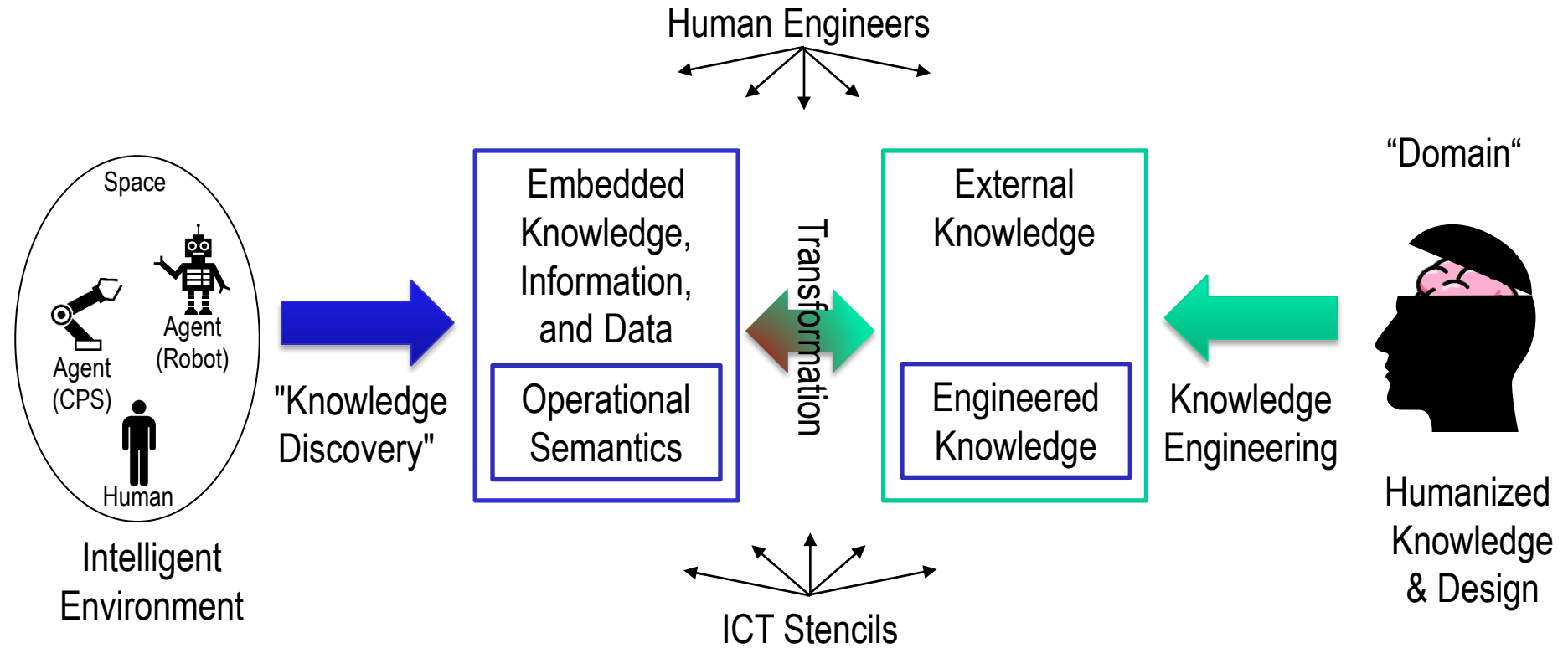
“Domain“
captures
knowledge
and design



...advocates **freedom** of
Idea Generation...

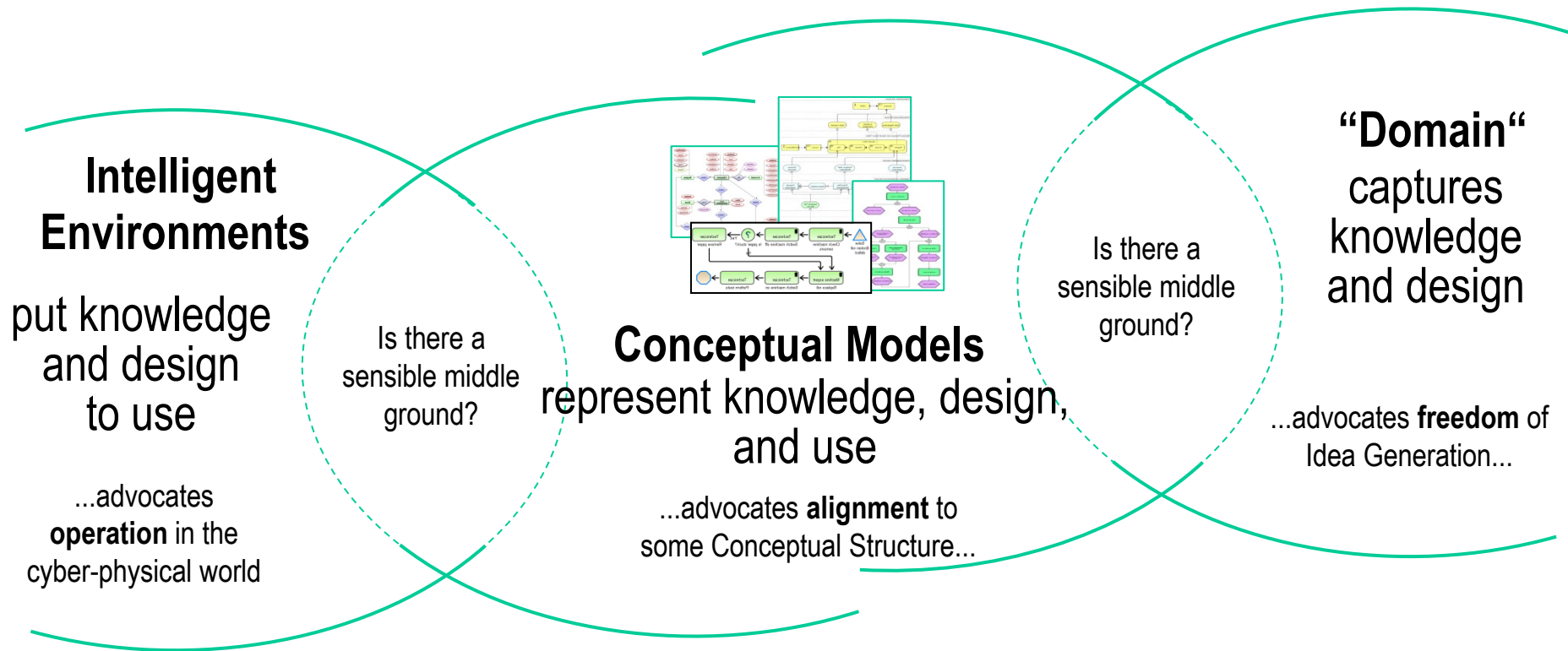


The Problem



**Problem: potential for misalignment;
does not scale as human resources are scarce**

Approach



**A Unifying Highly Descriptive Modelling Environment
for the communication of Everything to Everything
e.g. Service Design and Industrie 4.0**

THE OMILAB CONCEPT

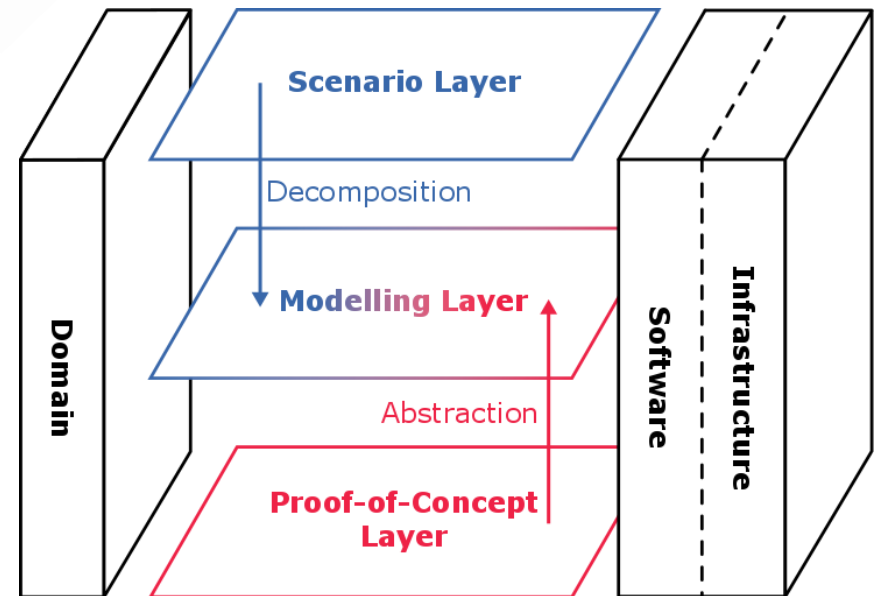
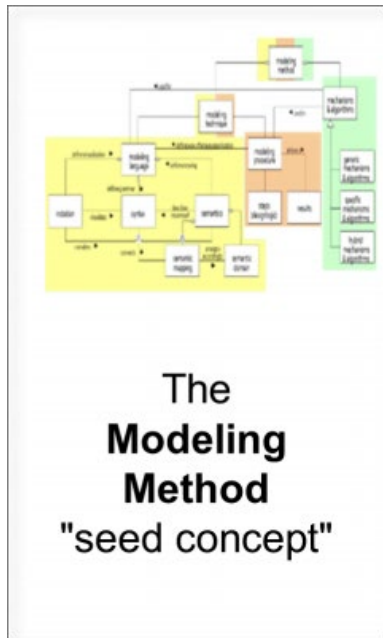
OMLAB[®]

Concept

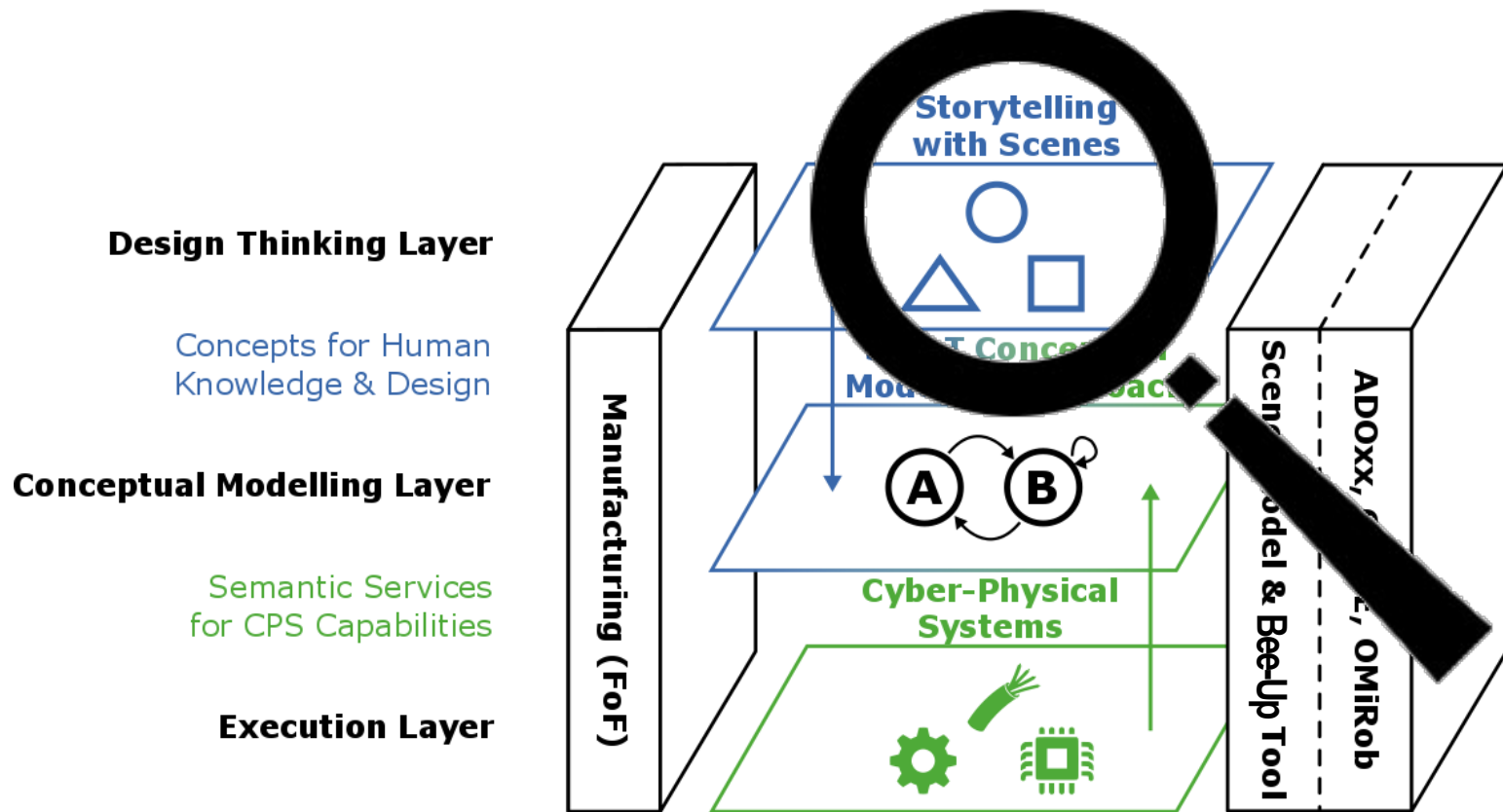
Domain-Independent
Invariants



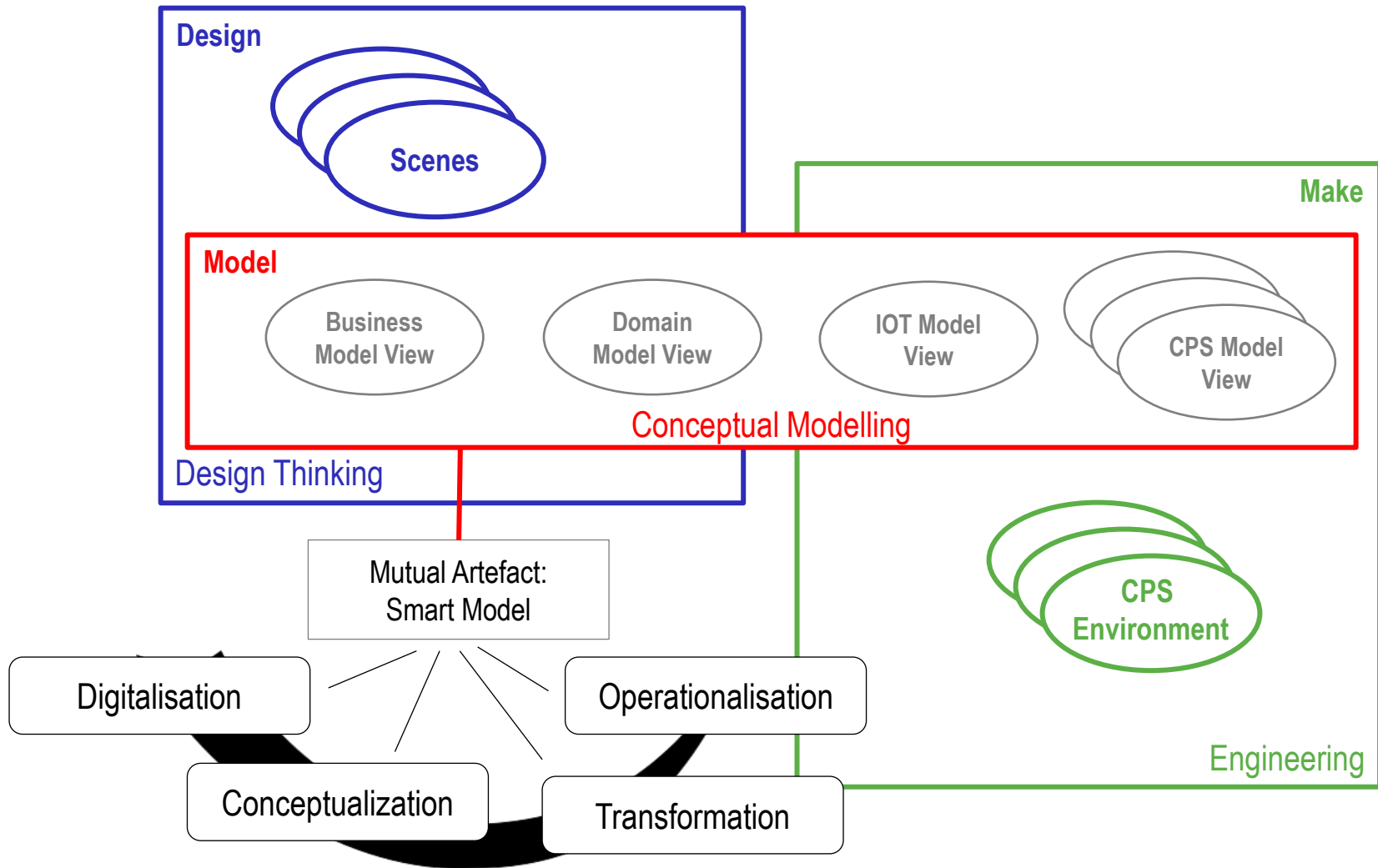
Digital Product
Design Lab



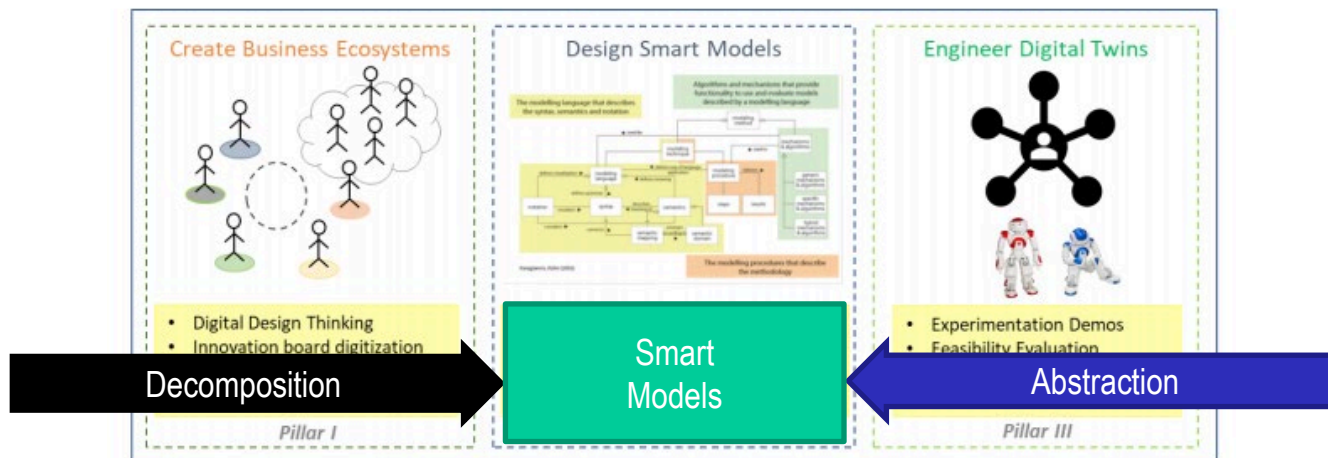
Concept Instance



OMiLAB APPROACH: DESIGN – MODEL – MAKE



Pillars of the **OMLAB**® Digital Innovation Environment



Approach

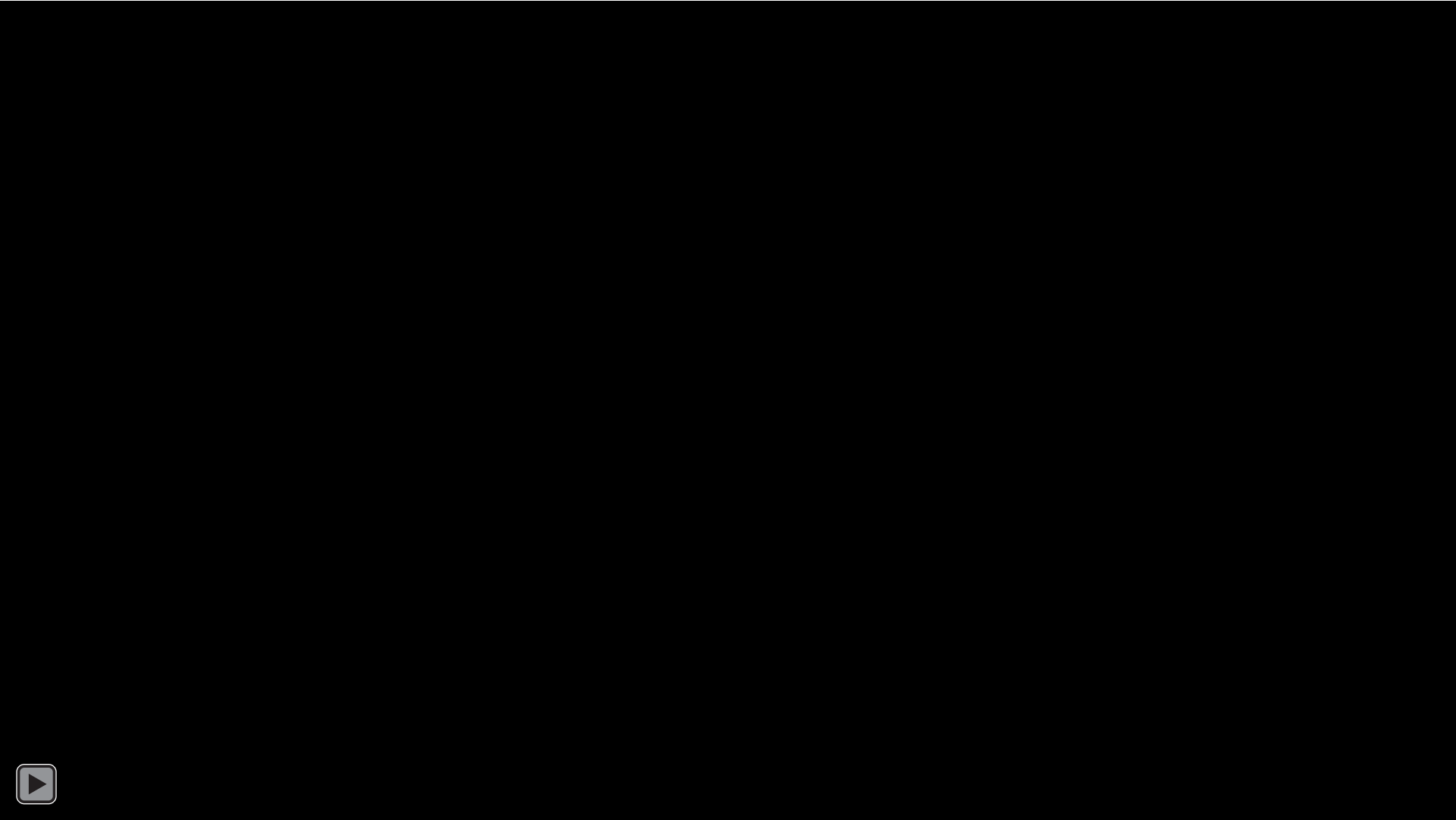
Business Ecosystems, Design Thinking, Digital Twins, Conceptual Modelling, Artificial Intelligence

Technology

ADOxx, bee-up, Olive, Scene2Model, Text2Model, CoChaCo, ADOScript in Visual Studio

ROS Robot Operating System, Raspberry Pi, W3C Semantic Web, Microservices

Download:
<https://www.omilab.org/brochure/>



OMiLAB[®] Industrial Digital Innovation Environment

1

CREATE
BUSINESS
ECOSYSTEMS



DESIGN
SMART MODELS

2

ENGINEER
DIGITAL TWINS



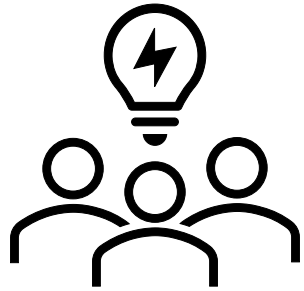
3

Get in touch
info@omilab.org

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member of

OMILAB[®] Value Proposition

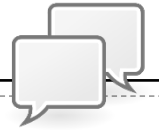


Use →

Digital Innovation
Workshop Facilitation
(on-site, in the lab)



Typical 2 days



Environment and Infrastructure @ BOC Be.



Expert Facilitators



Establish

Scene2Model: Software Tool (Free, Open Use)

Download available at:

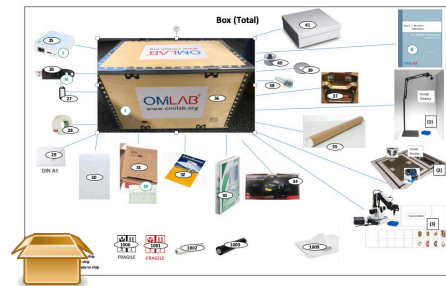
<https://austria.omilab.org/psm/content/scene2model/info>

Environment and Infrastructure (DIY)



OR

OMiLAB Innovation Corner @ ON-SITE



DESIGN THINKING

Characteristics

- Human-centered
- Promotes Creativity & Teamwork
- Iterative Steps
- Interdisciplinary teamwork (creative spaces, physical co-location, different disciplines)
- Creative (Simple, intuitive tools for unrestrained imagination)
- Agile
- Iterative Steps (“Fail early, fail often”)
- Tangible results (Minimal Viable Prototype)

One Method for Design Thinking: Storytelling

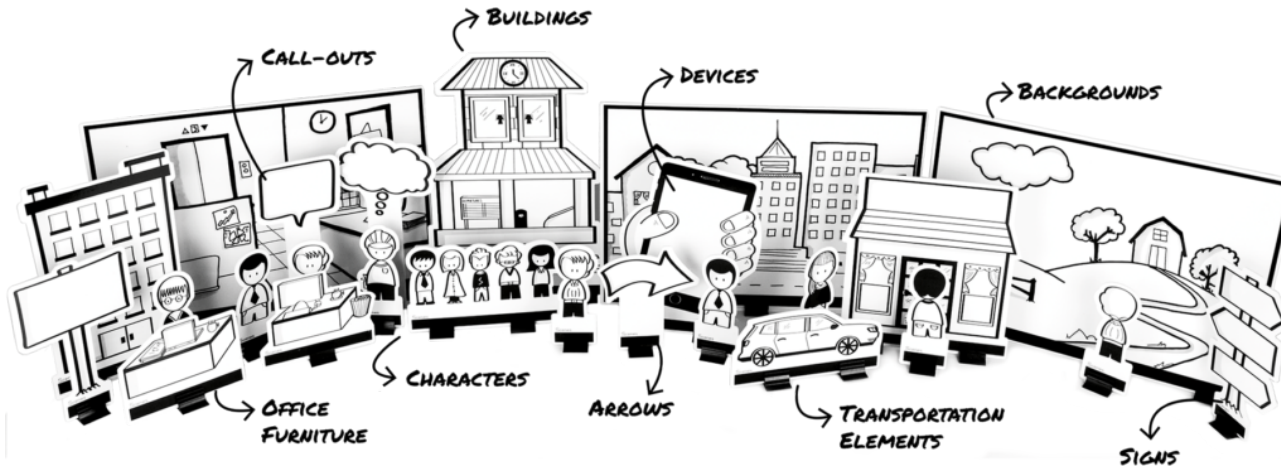
- It is an “essential human activity” for sharing experiences.
- Storytelling helps explain the interconnections among people in situations and settings, teaching broad lessons that **engage real human beings**.
- **Empathy** is an essential and fundamental component in the process of storytelling.
- Stories generate questions and questions expand the breadth and depth of stories, leading to **innovative thoughts and ideas**.
- Storytelling becomes an important **tool for feedback**, which is the basis of the iterative process of prototyping that lead to solutions.
- Forms: digital storytelling, visual storytelling, storyboards, scenario generation, storytelling through videos, skits or plays, animation, talk and image, text or image.

Storyboard

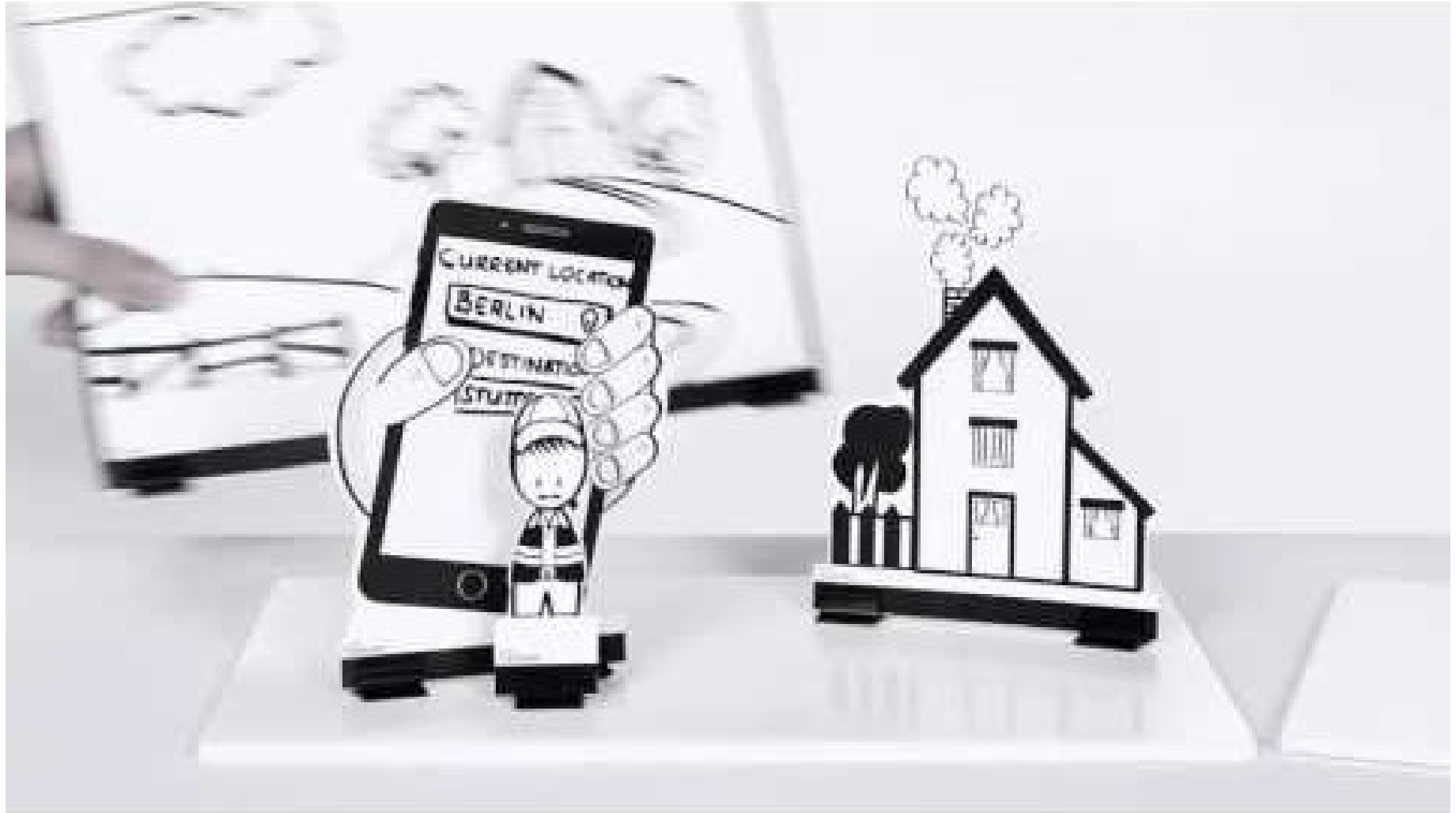
- A storyboard is a **part of storytelling** and is used for **visualizing and organizing ideas**.
- The storyboarding process was developed in Hollywood during the early 1930s for the first animated films.
- Using a storyboard transforms your information into a **visual story** and allows people to **experiment with changes** in the sequence or storyline during the creative process.
- Each scene of the film is drawn on paper and put in sequence on a large board. The team can see and arrange the order of the film before it's made.
- **Companies** (IBM, General Electric) **developed storyboarding as a planning tool** to coordinate the construction of proposals, reports and presentations.

SAP Scenes

- SAP Scenes is an **instrument to create storyboards**.
- Scenes is a tool and a method to create **storyboards about products** and services fast, collaboratively and iteratively.
- It empowers business leaders and professionals of all industries to shape their ideas and scenarios in the form of fun illustrative stories without the need of refined drawing skills.



SAP Scenes

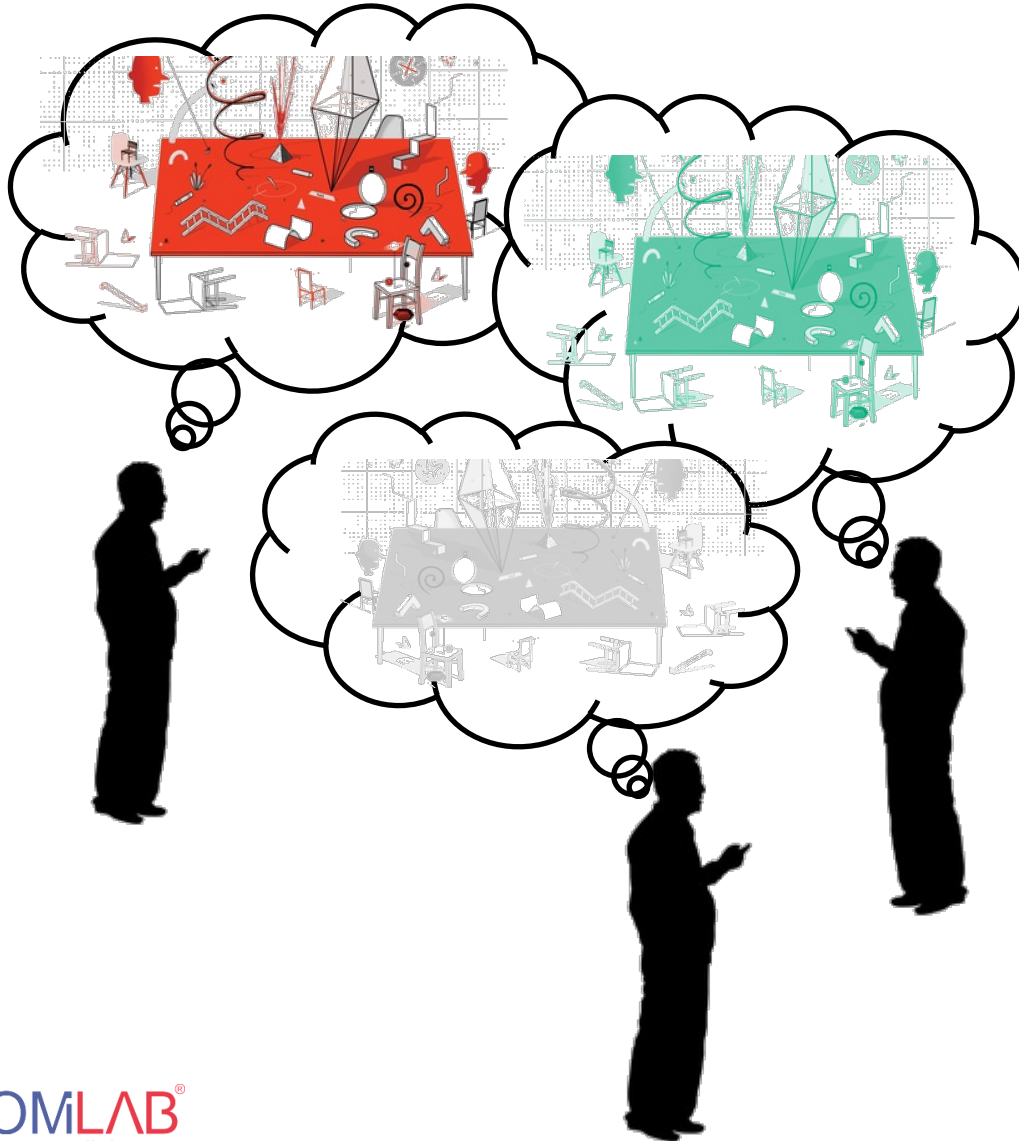


How to build Scenes

- Granularity
 - One scene should show one interaction relevant to the service/product you are providing
 - The number of objects is not limited (however think what is necessary for the service/product – don't get literal)
 - The scene should contain enough information to be understood outside the innovation team (i.e. consider how to document and share information)
- Order
 - The scenes depict the customer's story (i.e. they will generally be ordered by sequence in time)

DESIGN2MODEL

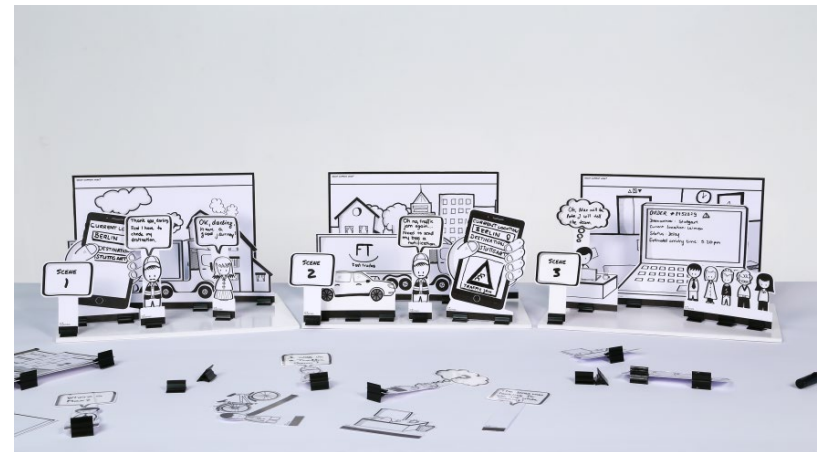
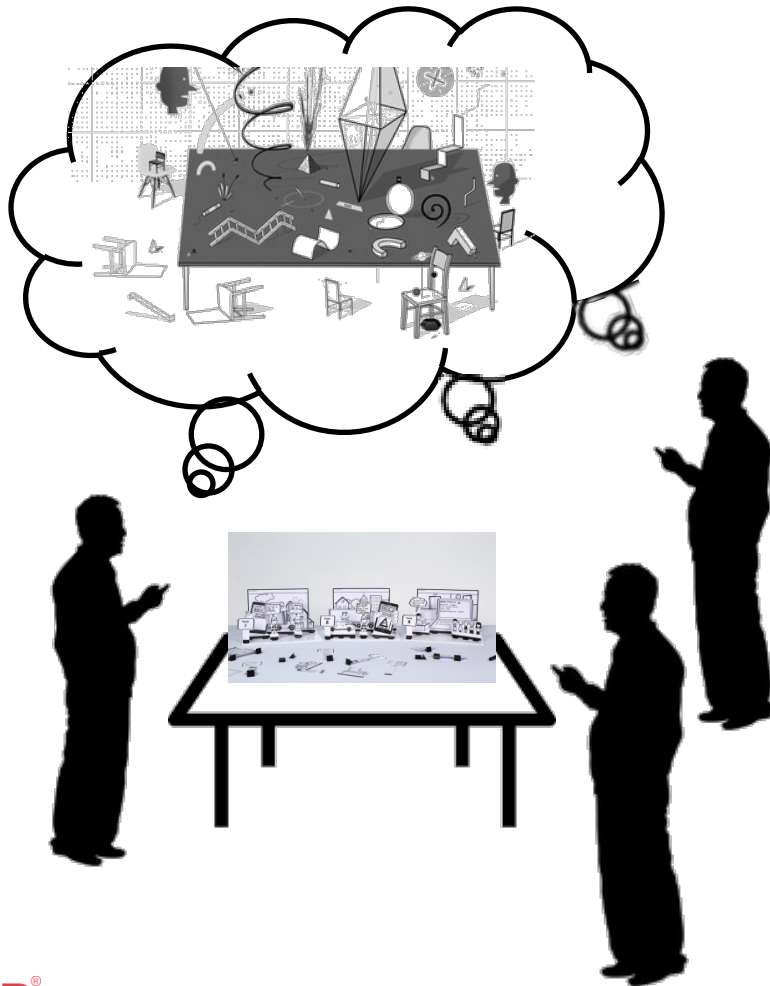
Design2Model Approach



- Humans engage in design thinking
 - Potential for problem solving
 - Abductive, creative, intuitive, innovative, ...
 - Based on humanized knowledge and wisdom
 - Supported by design thinking methodologies

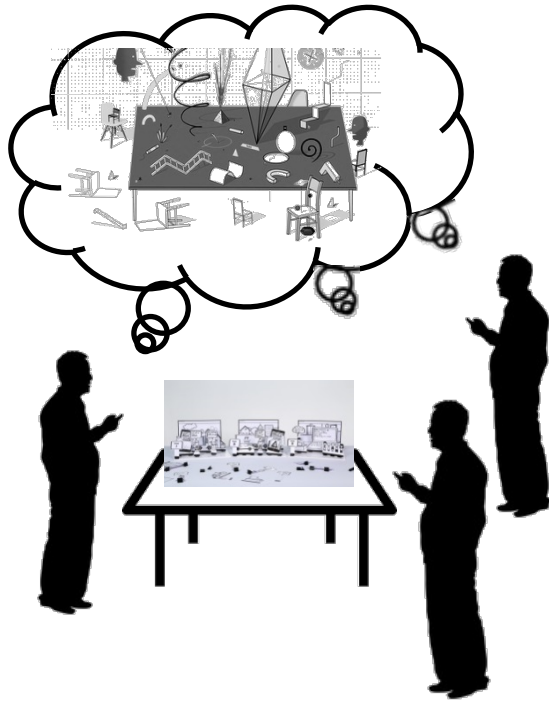
Design2Model Approach

- Humans build design artifacts (e.g., to understand end-user requirements)
 - Rapid Prototyping
 - Storytelling
 - Post-It Collaboration
 - Modulo
 - ...



Design2Model Approach

Design Artifacts



Limitations for

- Agile
- Space and time independent
- Consolidated
- Traceable
- Operationalized
- ...

Design2Model Approach – The Scene2Model Case

- How to overcome the limitations?
 - Through digitalization of design

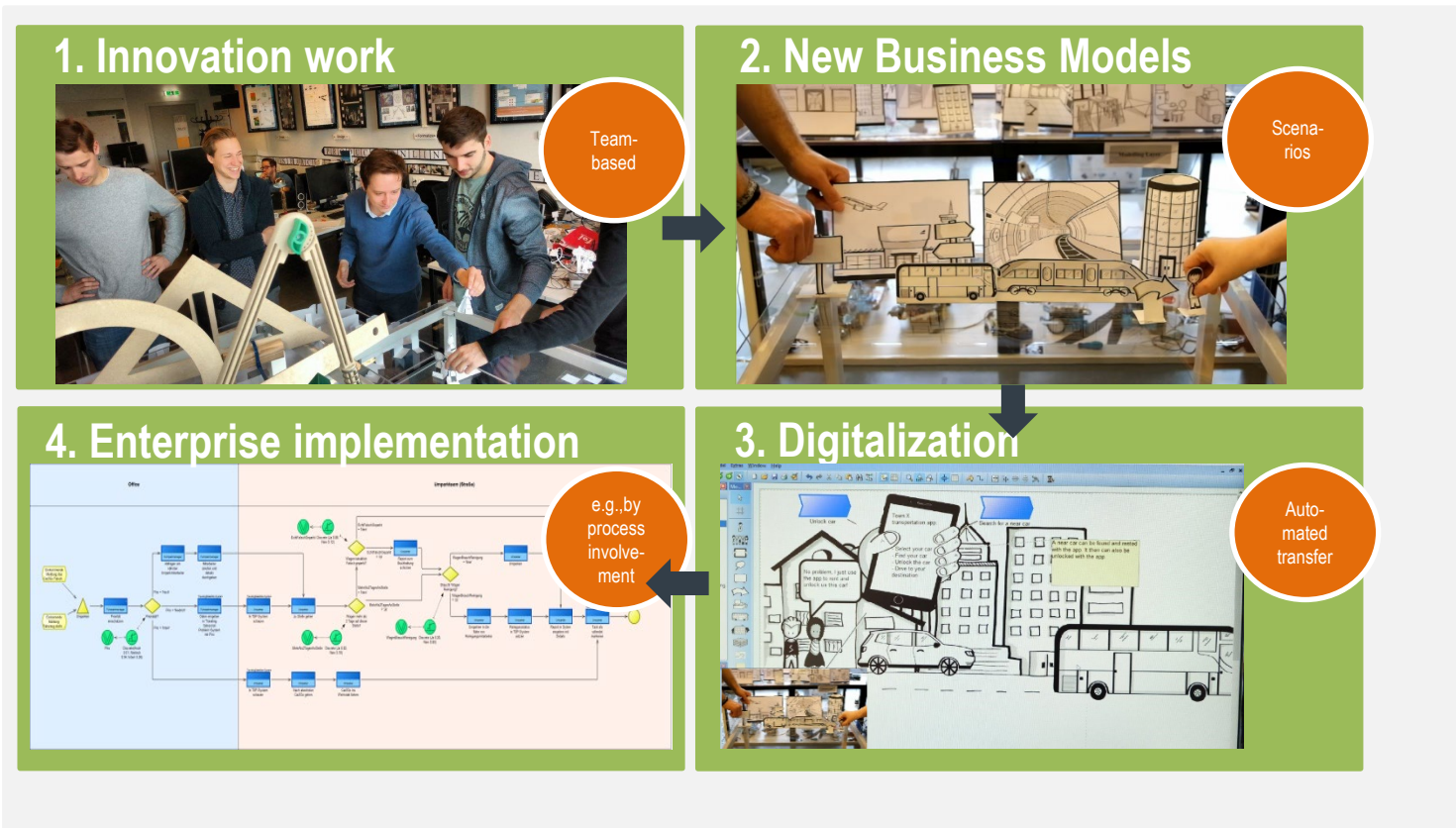
From haptic design artefacts....

- Innovative idea
- Prototyping with SAP Scenes: Storyboards
- Design Thinking artefacts: Haptic Results

...to software supported conceptual models

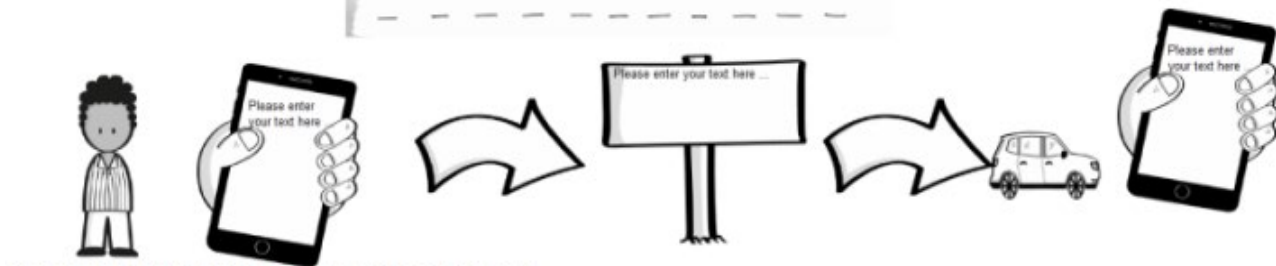
- Enterprise model extension
- Semantic links: Ontology
- Decomposition

Bridging Design Thinking and Conceptual Modelling in the Scene2Model Case



SCENE2MODEL TOOL

From the physical scene to the digital model

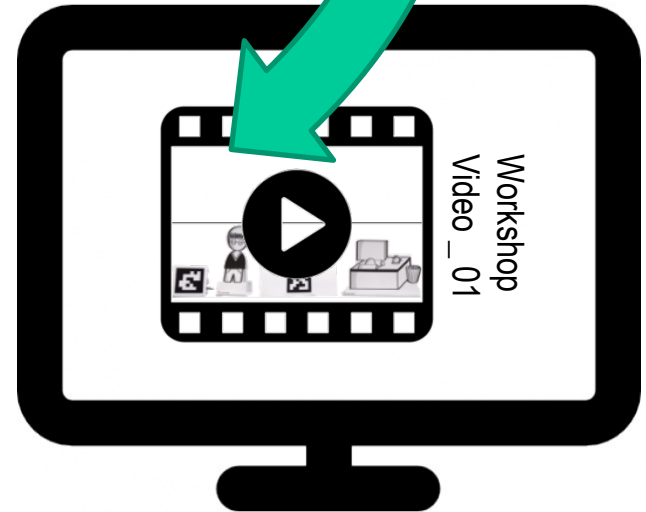
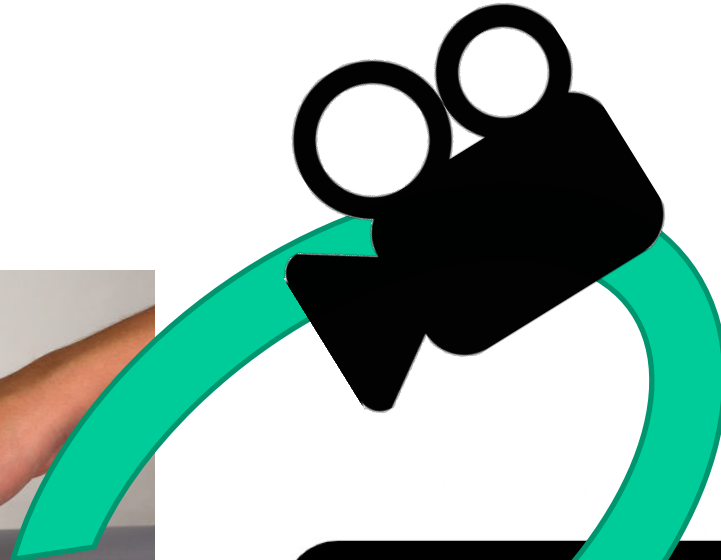
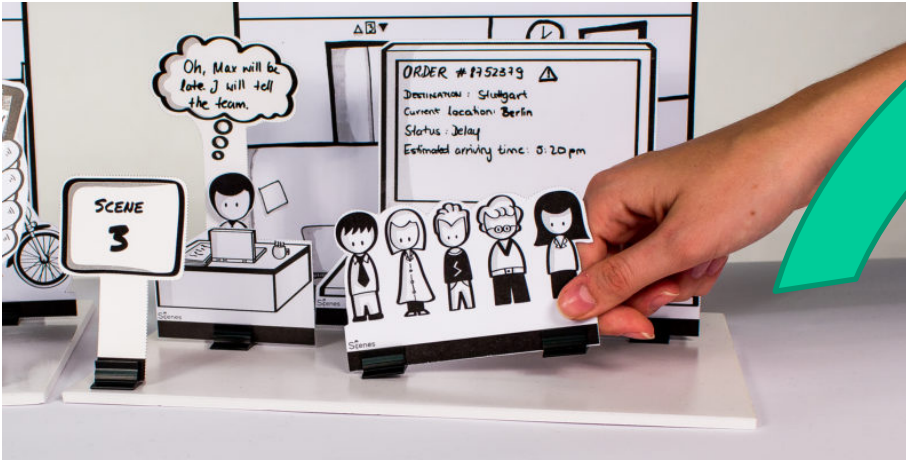


Information of the picture licenses can be found in the objects' notebooks.

The Scene2Model Tool

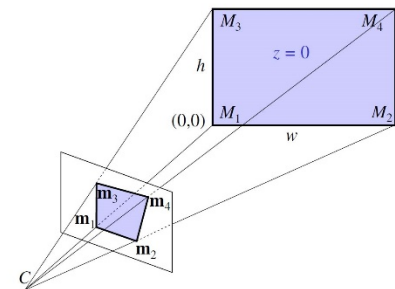
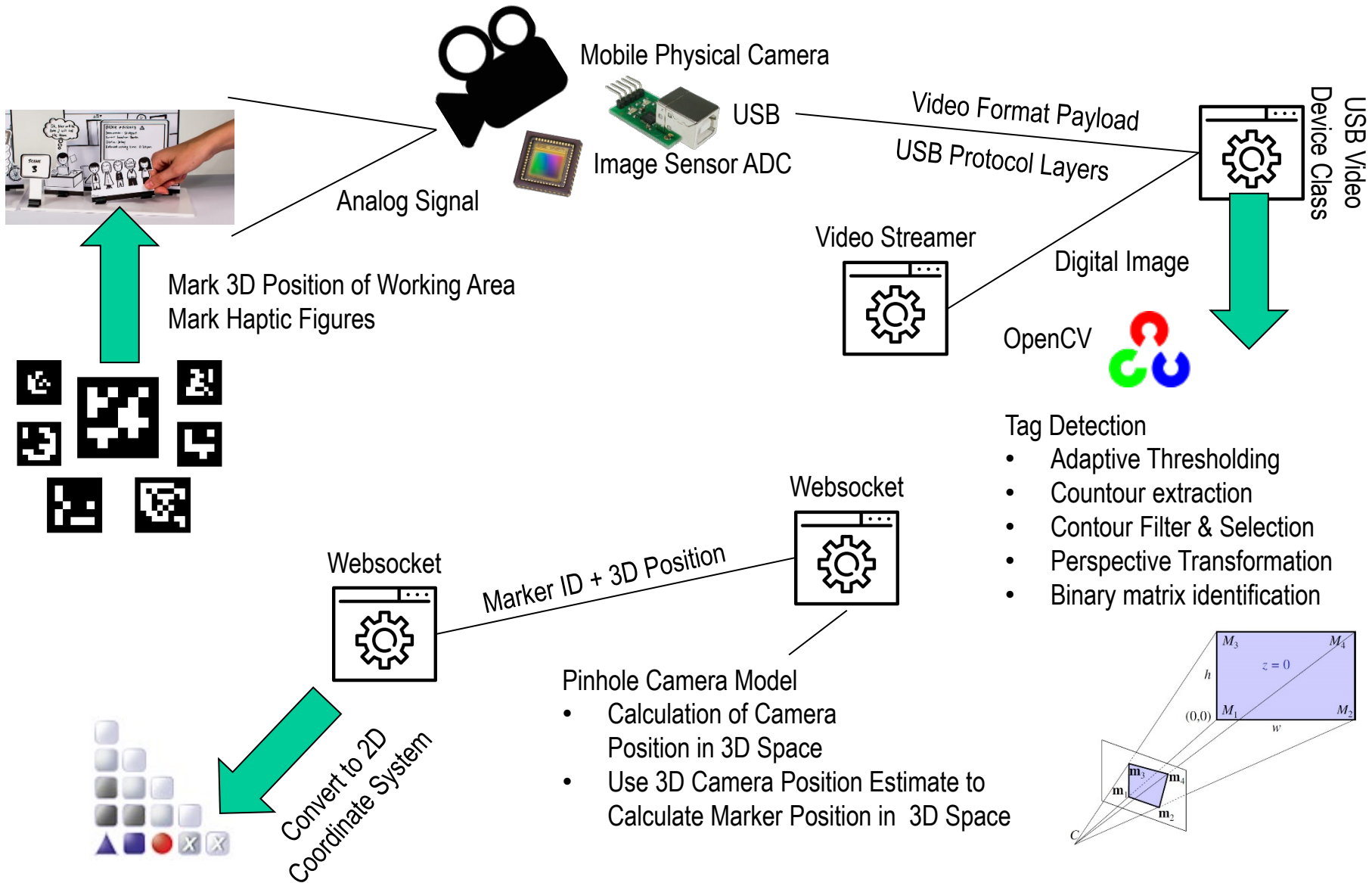
1. Digitalize Design

Haptic Scenes



Digital Design Artifact

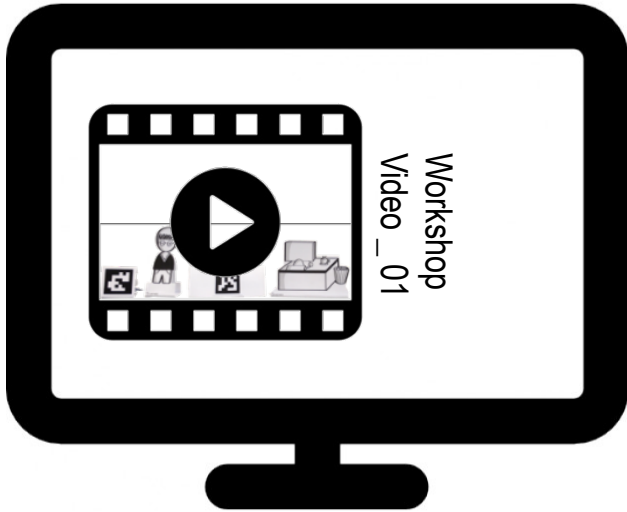
The Scene2Model Tool



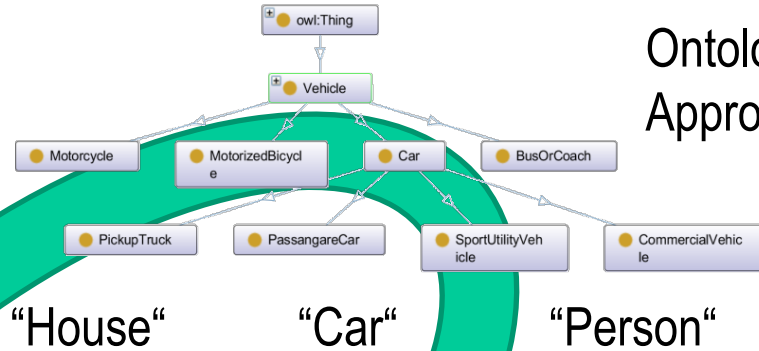
The Scene2Model Tool

2. Classify and Enrich with Semantics

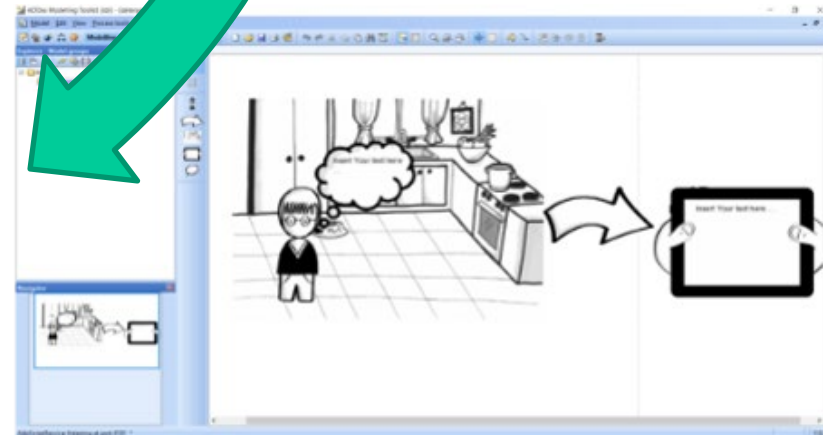
Digital Design Artifact



Video
(Iconic Representation)



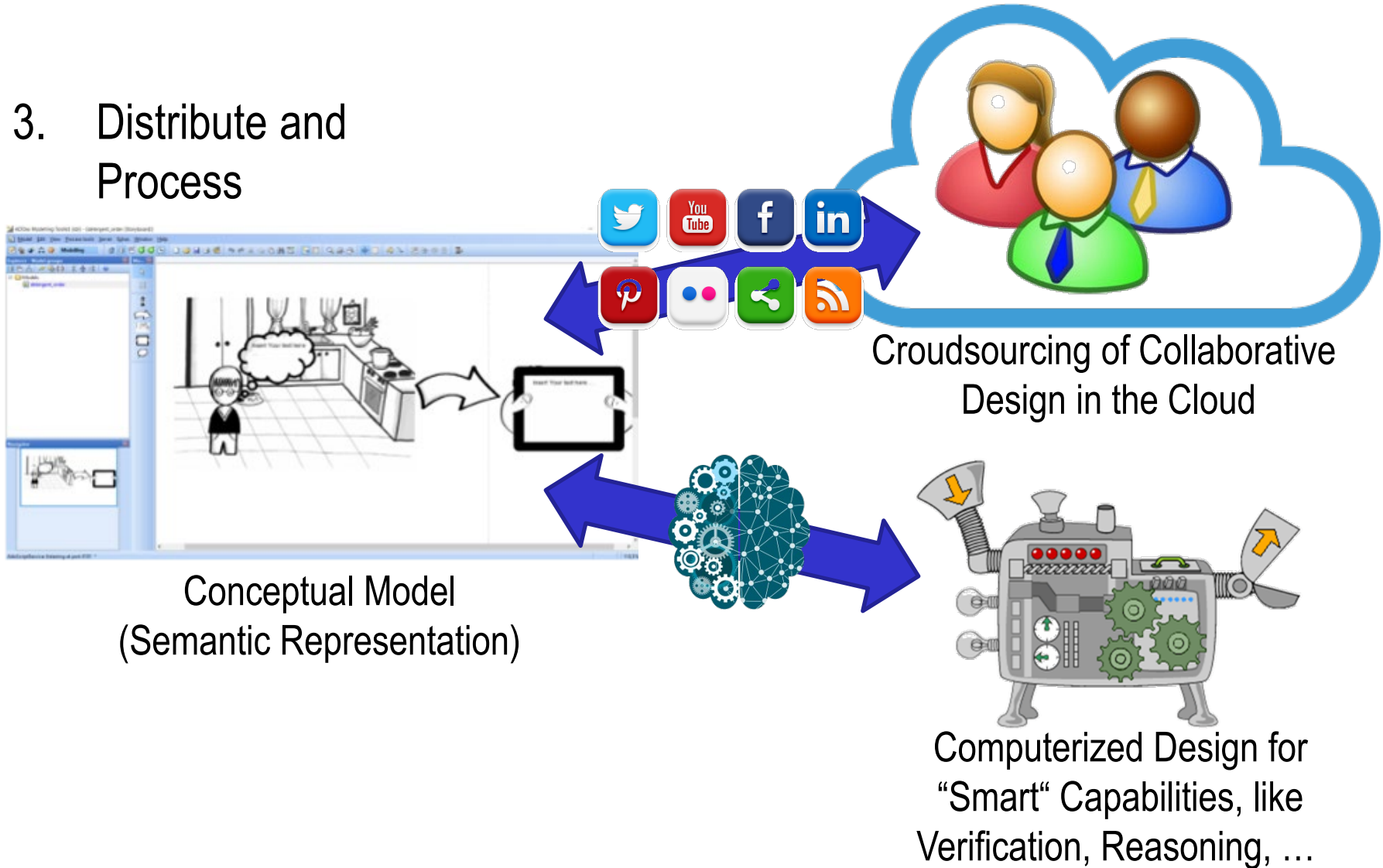
Ontology-based Approach



Conceptual Model
(Semantic Representation)

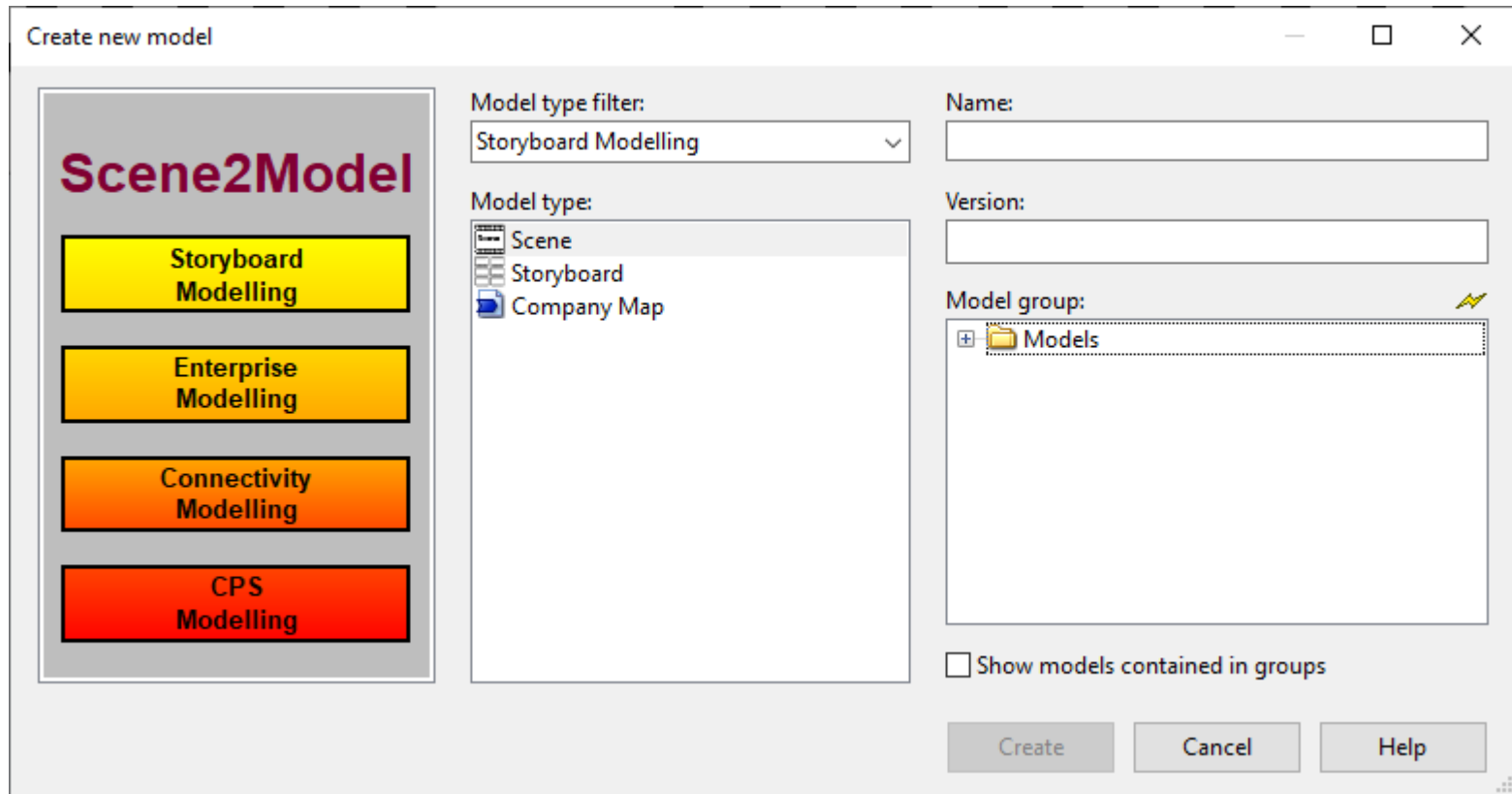
The Scene2Model Tool

3. Distribute and Process



USED MODELLING LANGUAGES IN SCENE2MODEL

Overview



Scene

- The used modelling language conceptualizes the scene figures in order to enable the – automatic – import of physical scene models using a camera into a conceptualized model.
- The scene modelling language consists of:
 - Character
 - Team
 - Device
 - Sign
 - Arrow
 - Furniture
 - Transportation-Element
 - Building
 - Accessory
 - Background
 - Process
- All objects can be referenced with “has relation” to indicate a strong dependency. The process element can be linked with “executes” to link the process execution to a particular element.

Scene

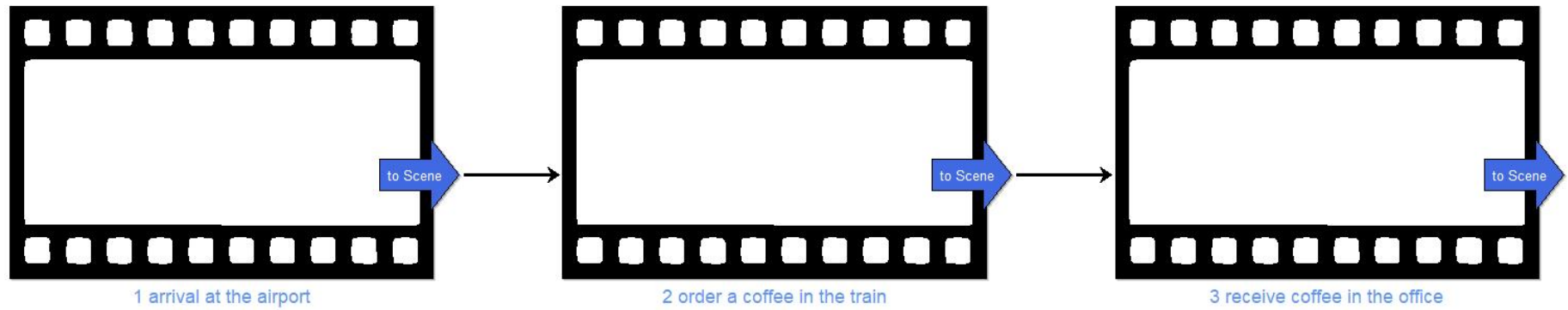


Information of the picture licenses can be found in the objects' notebooks.
airportbus to train

Story Board

- Groups the various scenes into a consistent story board
- Individual scenes can be seen as sub-models of the overall story board
- The story board can be seen as the aggregation of a set of individual scenes.
- The story board modelling language consists
 - Element “Scene”
 - Relation “next scene”
to indicate a sequence in which the scenes are foreseen to be executed.

Story Board



Company Map

- Identifies the processes that are needed to execute the scenes
- Individual process are identified in the scene models and grouped in the company map which introduces a process-oriented view
- The identified processes from the various scenes are collected and then assessed for their completeness
- The company map consists of different elements to structure the process

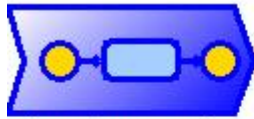
Elements

- Swim lanes (horizontally or vertically)
- Actor
- External Partners
- Performance
- Note

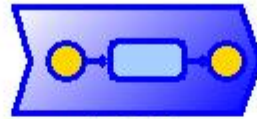
Relations

- Has process
- Value flow

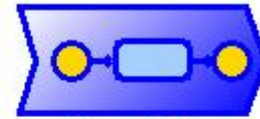
Company Map



airportbus to train



order Coffee



deliver Coffee

THE SCENE2MODEL TOOL IN ACTION

Scene2Model Tool



DOWNLOAD SCENE2MODEL

Download the tool

1. Visit

<https://austria.omilab.org/psm/content/scene2model/download?view=download> and download the tool for your operating system.

Scene2Moodel supports:

- Windows XP, Vista, 7,8
- Fedora 28, 29
- MacOS Mojave (10.14.2)
- Ubuntu 18.04 LTS, 18.10

2. Extract the package to a local folder

3. Run „setup.exe“ from the extracted folder to install the tool

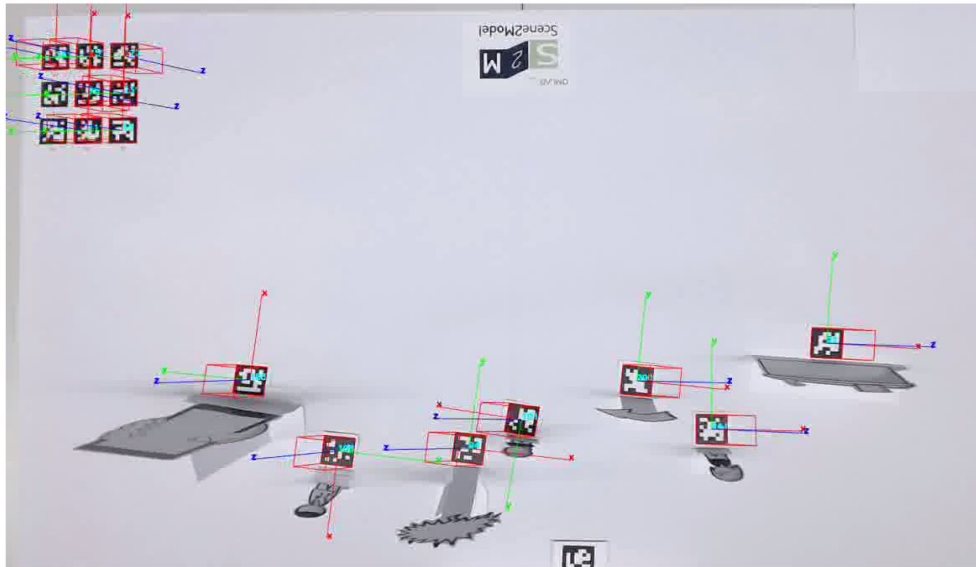
4. In case of issues related to the setup, please visit ADOxx-installation guide or the FAQ on installation issues for detailed instructions and solutions or have a look at the support documents in the “dbinfo” folder.

- ADOxx.org, <https://www.adoxx.org/live/installation-guide-15>
- ADOxx.org, https://www.adoxx.org/live/faq/-/message_boards/category/19633

GETTING STARTED WITH SCENE2MODEL

Preparation

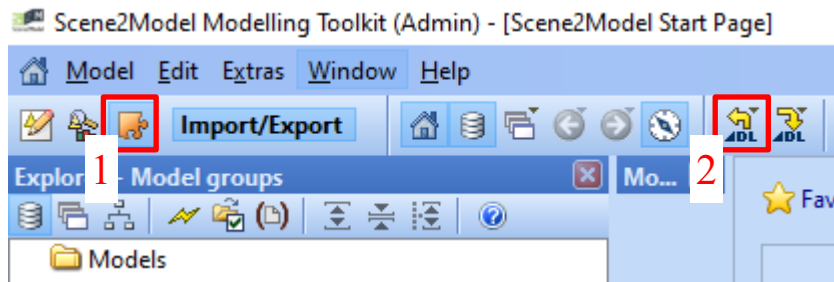
1. Place the canvas on a table. The canvas needs to contain the reference tags for the QR codes of the figures
2. A USB camera should be able to capture the QR tags.
To test if the camera captures the tags, connect it to the Raspberry Pi and open <http://<RaspberryPi-IP>:8090/> in a web browser (replace by the actual IP address)



Display in the web browser

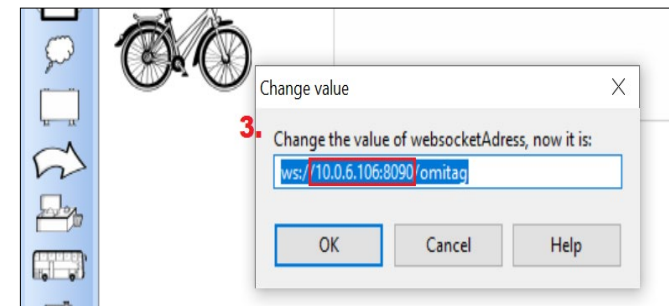
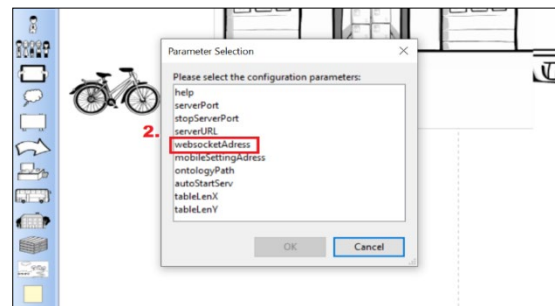
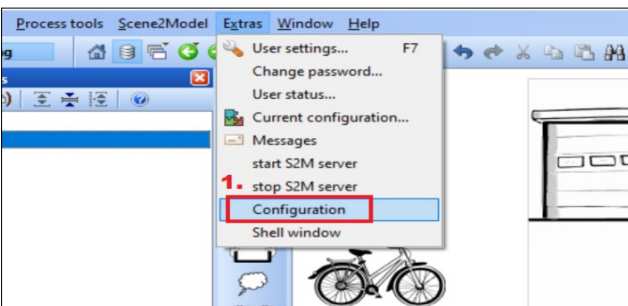
Test Scenario

1. Download the test scenario (ADL file) from <https://austria.omilab.org/psm/content/scene2model/downloadlist?view=downloads#43>
2. Import the ADL files into the Scene2Model tool
3. You can play around with the test scenarios – adapt them, extend them, link them, create new models



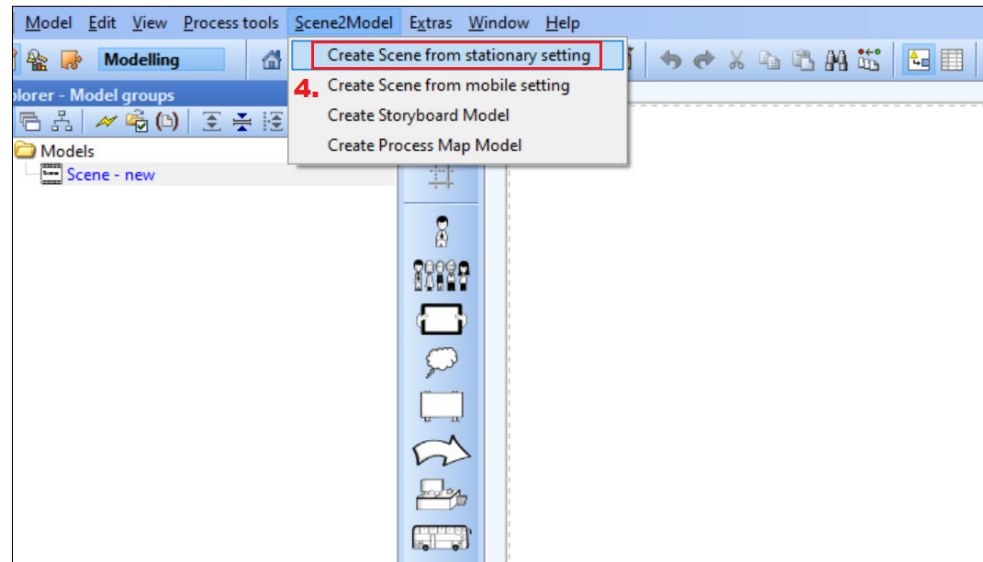
Create your own digital scene from physical a physical scene

1. Switch on the Raspberry Pi and connect it to the camera. Ensure that the camera is active.
2. Check if the IoT Adapter on the Raspberry Pi is up and running by accessing the web-server on: <http://<RaspberryPi-IP>:8090/> (replace by the actual IP address)
3. Run the S2M Modelling Tool as an administrator
4. Ensure that the server that connects the Scene2Model tool and the tag recognition software is active. The menu called “Extra” in the Scene2Model tool allows to start and stop the “s2m” server.
5. Go to Extras, then Configuration
6. Here, go to the WebSocketAddress and change the IP-address to `ws://<RaspberryPI-IP>:8090/omitag` and click OK.



Create your own digital scene from physical a physical scene

- If everything is up and running, import the image in a new scene model using the Scene2Model menu and “Create Scene from stationary setting”.



- The software will recognize the figures that you have placed on the canvas and import the scene.

Additional Information

- In order to run workshops in parallel, it is possible to consider a client-server installation of the Scene2Model environment. The results of each workshop group can then be shared with the other groups during the workshop.
- Extensions may be foreseen to support the analysis of the models of the past to identify similar models or identify common patterns.

You are now ready for your first Design Thinking
Workshop Using Scene2Model with SAP Scene Figures

Self-control questions

- What are the key concepts of design thinking?
- How to transform a design into a model?
- What is the Scene2Model Design Thinking Tool?
- What modelling languages does the Scene2Model Design Thinking Tool offer and how to use them?
- How to create a model based on a physical scene which was developed in a design thinking workshop?