IV Sympozjum BPM 2024

Cel: Spotkanie i integracja w gronie ekspertów, praktyków i entuzjastów Business Process Management - wykłady, prezentacje i warsztaty

Temat Sympozjum: Automatyzacja procesów biznesowych i sztuczna inteligencja w dobie wyzwań gospodarki

Termin: 19 kwietnia 2024 r.

Miejsce: Centrum Nowoczesnych Technologii Informacyjnych, Uniwersytet Ekonomiczny w Katowicach, ul. Bogucicka 5, 40-266 Katowice

Uniwersytet Ekonomiczny w Katowicach

Europejskie Miasto Nauki Katowice 2024

CHALLENGING INNOVATION IN BUSINESS PROCESS MANAGEMENT:

OMiLAB'S DIGITAL INNOVATION ENVIRONMENT IN ACTION

Dr. Wilfrid Utz
wilfrid.utz@omilab.org

Katovice
April 19, 2024

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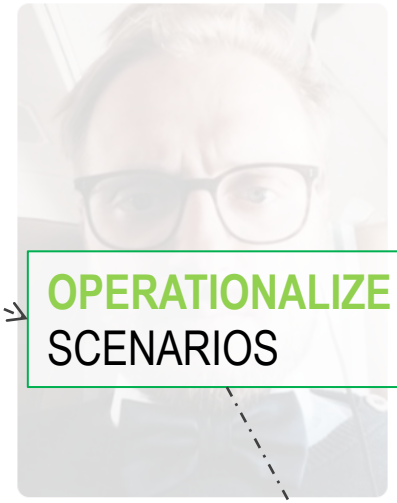
AGENDA

INNOVATION
IN BUSINESS PROCESS MANAGEMENT

CO-CREATION / DESIGN
OF BUSINESS PROCESSES

DOMAIN-SPECIFIC
DESIGN VOCABULARY - METAMODEL



OPERATIONALIZE
SCENARIOS

EVALUATE/ASSESS FEASIBILITY
THROUGH EXPERIMENTS

Agenda

Motivational Case: Smart Mobility (ISD2022 Keynote)

Design: Digital Design Thinking using Scene2Model

Feasibility Assessment: Experimentation support through Bee-Up

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Operationalisation: The OMiLAB Digitial Innovation Environment

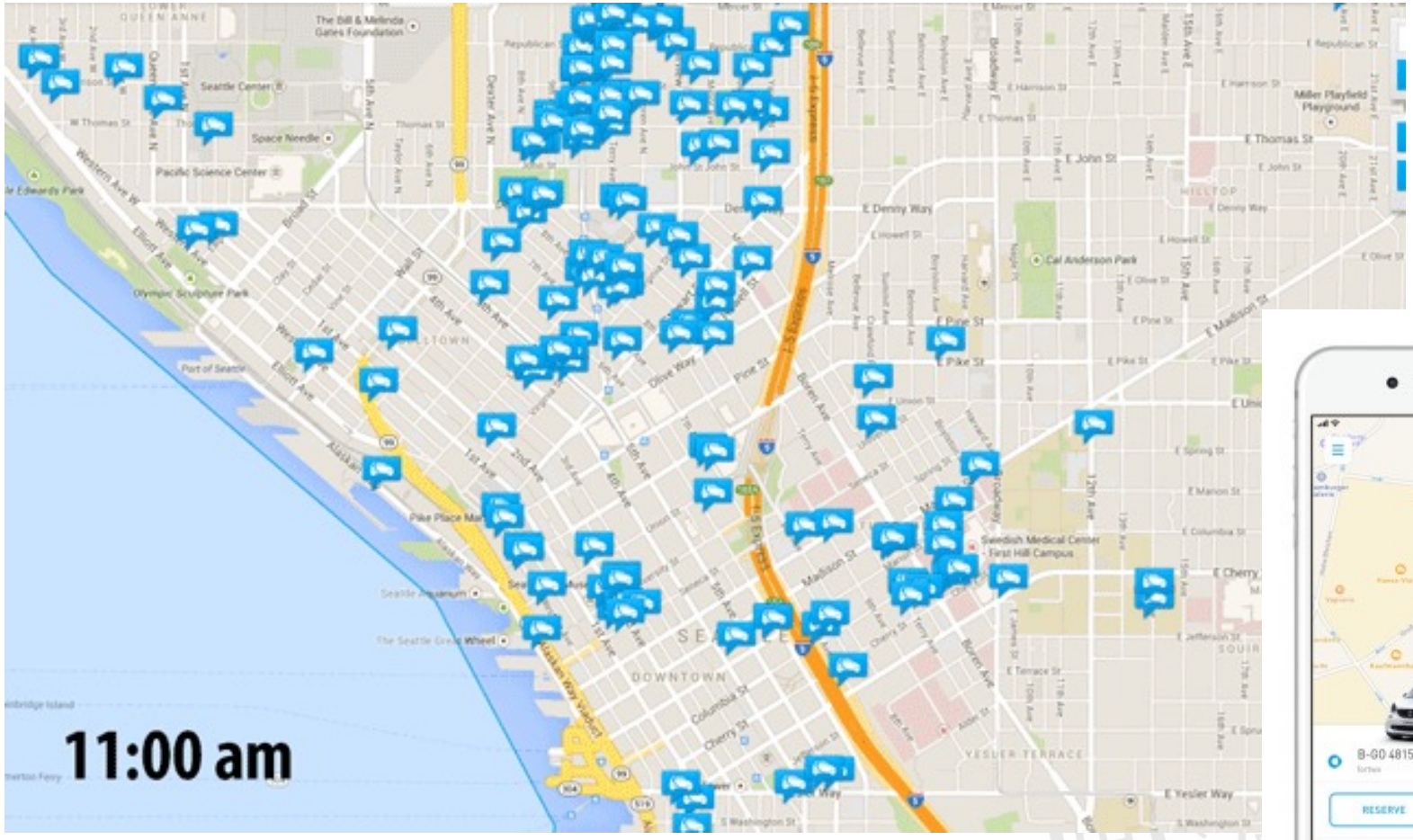
Evaluation: OMiLAB Network of Nodes and Community of Practice

Conclusion

MOTIVATIONAL CASE: SMART MOBILITY

Source: Prof. Karagiannis, NEMO Summerschool

STATE-OF-THE-ART:
On-demand Mobility



Source: Keynote Prof. Karagiannis, ISD2022

Source: http://www.landscapeandurbanism.com/2014/09/15/catch-while-catch-can-car2go/
https://www.car2go.com/AT/en/alexa/

STATE-OF-THE-ART:
On-demand Mobility

Challenge:
You find a car in close proximity

Option A:
+ Direct access (close proximity)
- Long ride/distance due to road logic in first district of Vienna

Option B:
+ Short distance
- Long commute -> search and find car

Source: Keynote Prof. Karagiannis, ISD2022

Source: https://fromstonetoscreen.wordpress.com/tag/car2go/
http://www.clker.com/clipart-map-pin-red--1.html, Google Maps

On-Demand Mobility:
A REAL SITUATION

Source: Keynote Prof. Karagiannis, ISD2022

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Source: Google Maps

On-Demand Mobility: AN AI APPROACH

Source: Keynote Prof. Karagiannis, ISD2022

Source: https://fromstonetoscreen.wordpress.com/tag/car2go/
http://www.clker.com/clipart-map-pin-red--1.html, Google Maps

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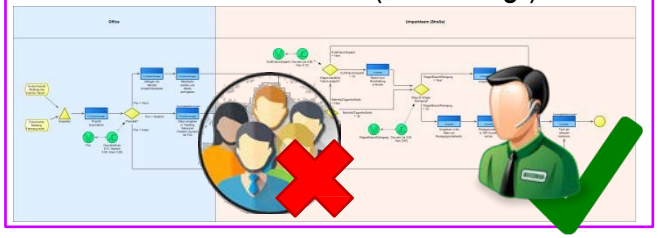
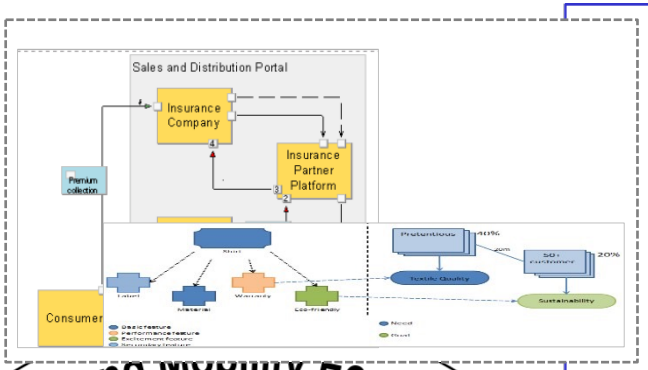
MODEL ECOSYSTEM

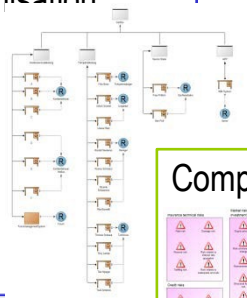
Car Maintenance Process („Refueling“)



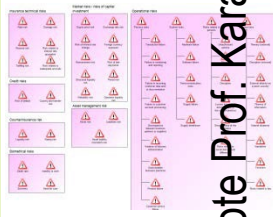
Full Service Takover by Provider



Customer support organisation



Compliance

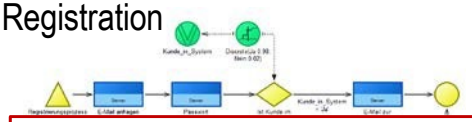


Source: Keynote Prof. Karagiannis, ISD2022

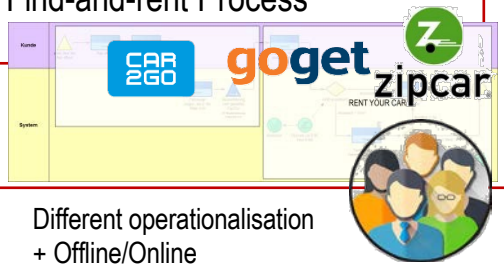
On-Demand Mobility Ecosystem

- Business Model
- Negotiation
- Service Processes
- Organisation
- Consumer Interaction
- Legal Rules
- IOT Device
- Location
- ICT Infrastructure
- Busines Intelligence

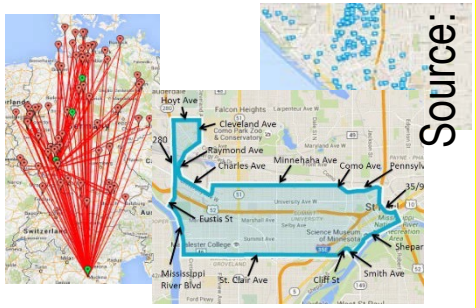
Registration

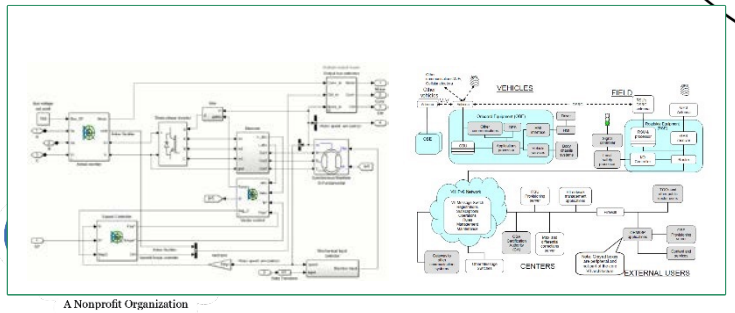


Find-and-rent Process

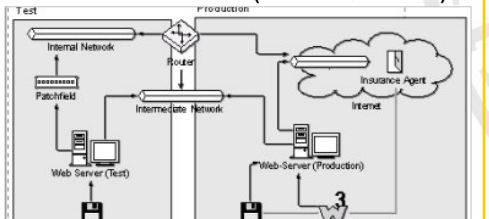


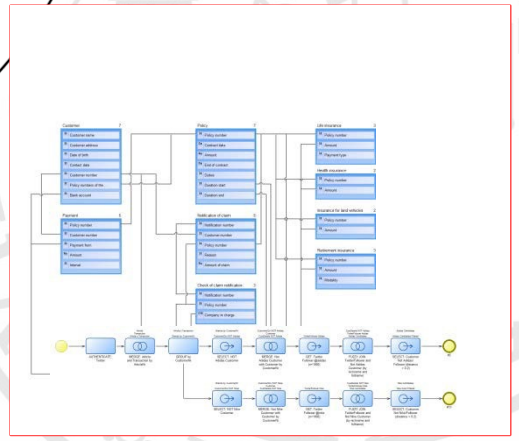
Different operationalisation
+ Offline/Online
+ Mobile
+ Call-center





ICT infrastructure (mobile, cloud)

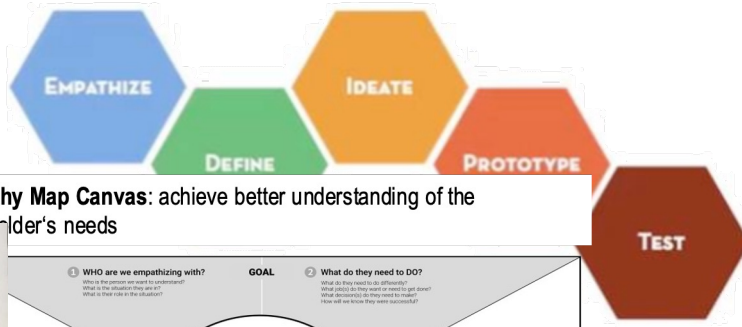




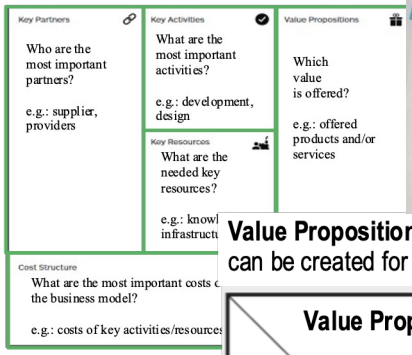
DESIGN

DIGITAL DESIGN THINKING USING SCENE2MODEL

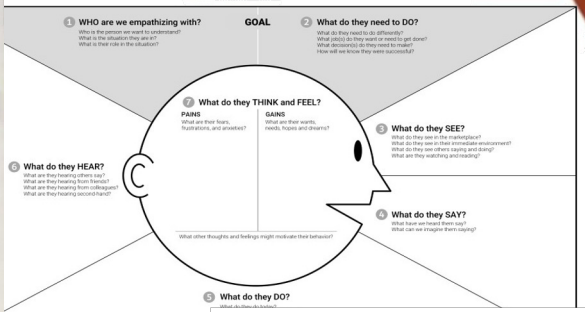
DESIGN THINKING
Frameworks, Methods & Tools



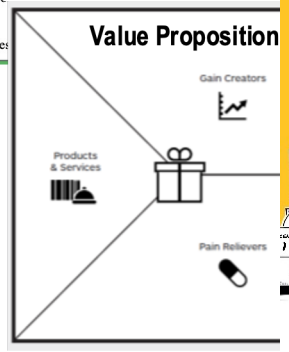
Business Model Canvas: represent grapl
(new or existing) by structuring the informa



Empathy Map Canvas: achieve better understanding of the
stakeholder's needs



Value Proposition Canvas structured representation of how value
can be created for customers

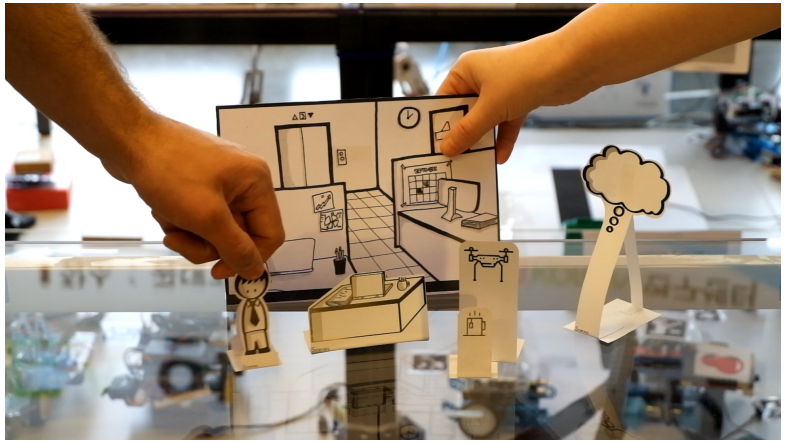


Customer Journey: identify and visualize the
touchpoints of a stakeholder with a company

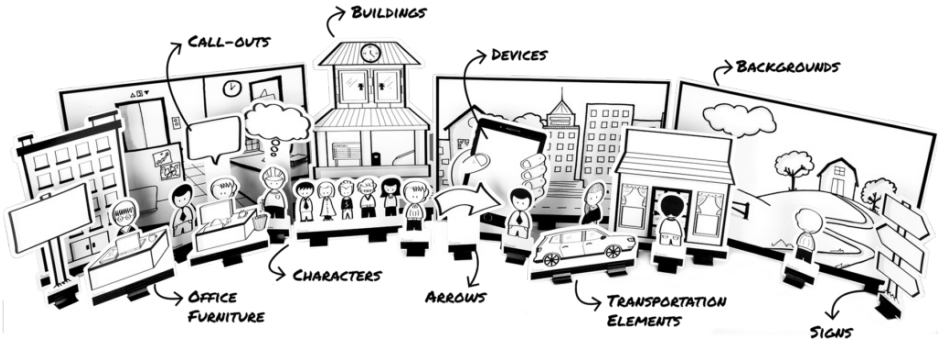
https://www.youtube.com/watch?v=FWS78KJsuQY

Design Thinking Method: Storyboarding with SAP Scenes

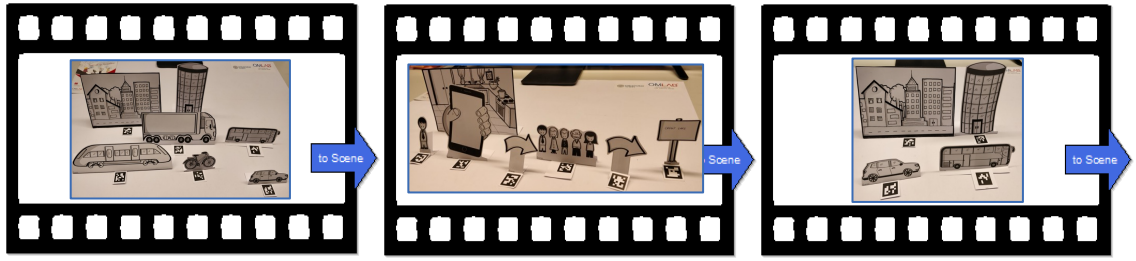
- **Scene**: the visual representation of a key moment in a scenario, built with different **haptic figures**



- **SAP Scenes**: set of pre-defined figures to build tangible scenes



- **Storyboards:** sequence of multiple scenes



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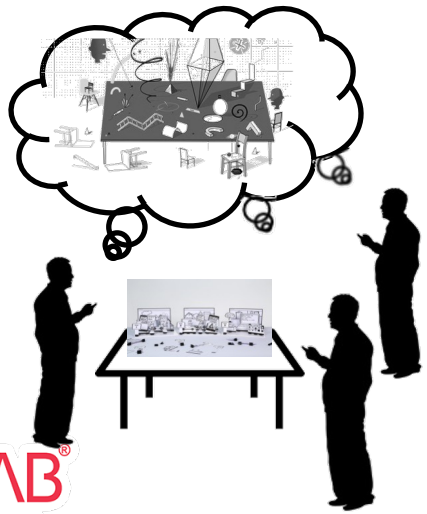
Digital Design Thinking: WHY

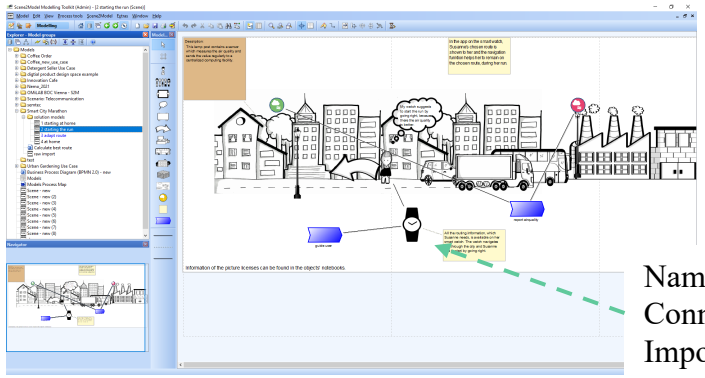
Design Thinking

- Restriction location and time availability
- Restriction number of participants
- Limitation of the tangible representation modalities (drawing skills, haptic figures, post its)
- Difficulty in sharing the results achieved
- Hard to transfer assumptions

Digital Design Thinking

- Space and time independent
- Enables innovation in distributed environments
- Adaptability of objects
- “no borders” knowledge transfer enabled
- Enrichment of domain scenario





Name: Smart Watch
Connectivity: Bluetooth
Important App: Air2Run

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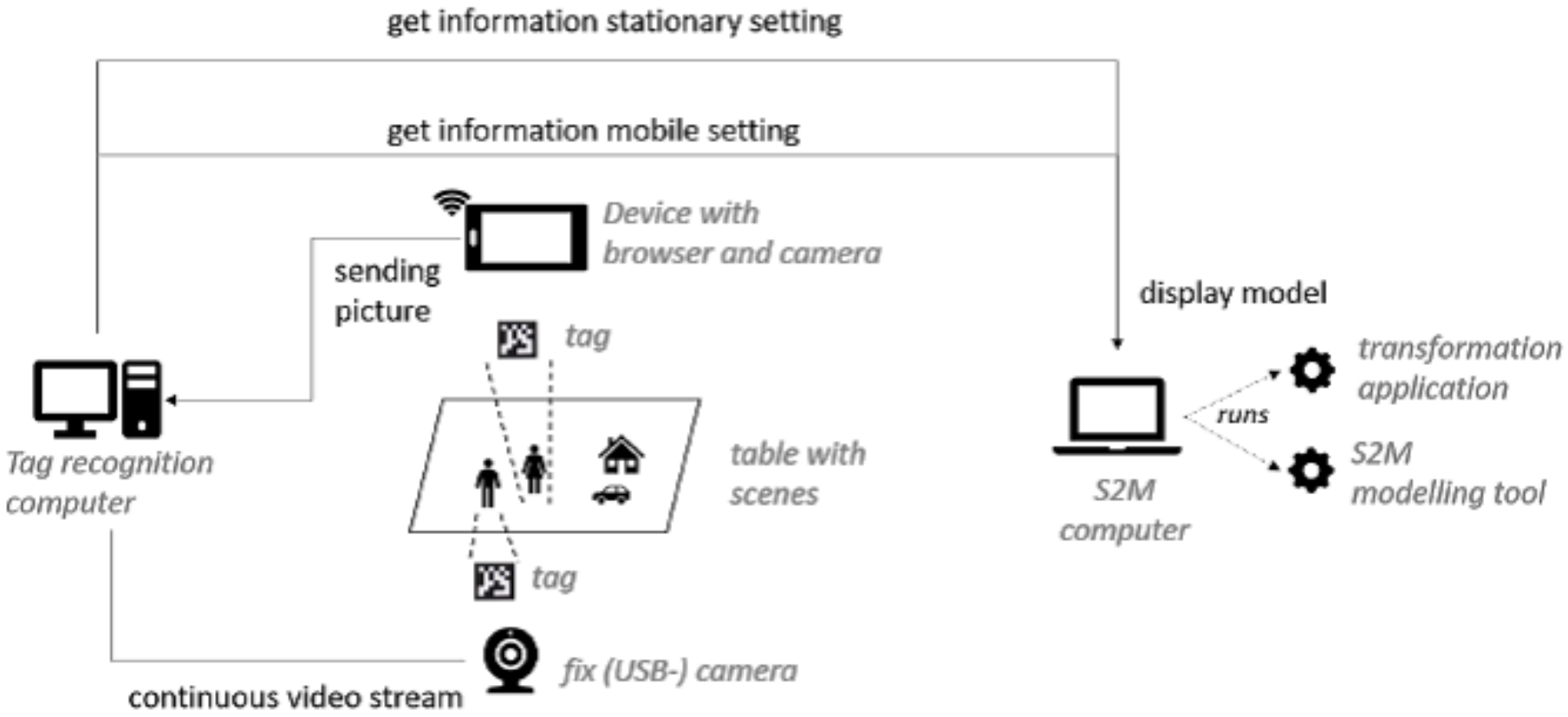
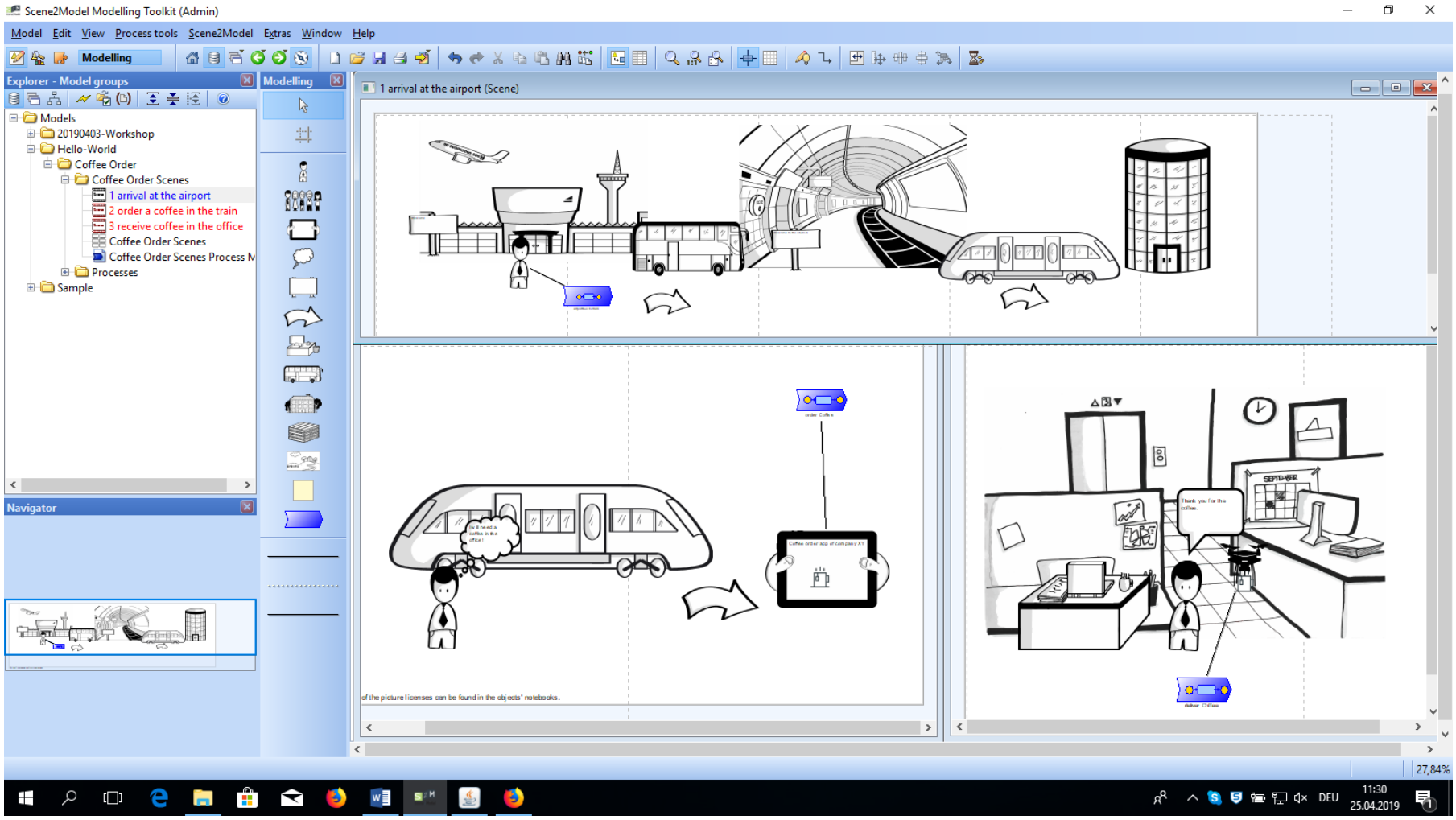
Tool Support: Scene2Model



Muck, C., Palkovits-Rauter, S. (2022). Conceptualizing Design Thinking Artefacts: The Scene2Model Storyboard Approach. In: Karagiannis, D., Lee, M., Hinkelmann, K., Utz, W. (eds) Domain-Specific Conceptual Modeling. Springer, Cham. https://doi.org/10.1007/978-3-030-93547-4_25DOI: https://doi.org/10.1007/978-3-030-93547-4_25

Scenario: Smart Grocery

DIGITAL DESIGN THINKING DEMONSTRATION



LIVE DEMONSTRATION

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USAGE: NEMO 2019

Feasibility Assessment

EXPERIMENTATION SUPPORT THROUGH BEE-UP

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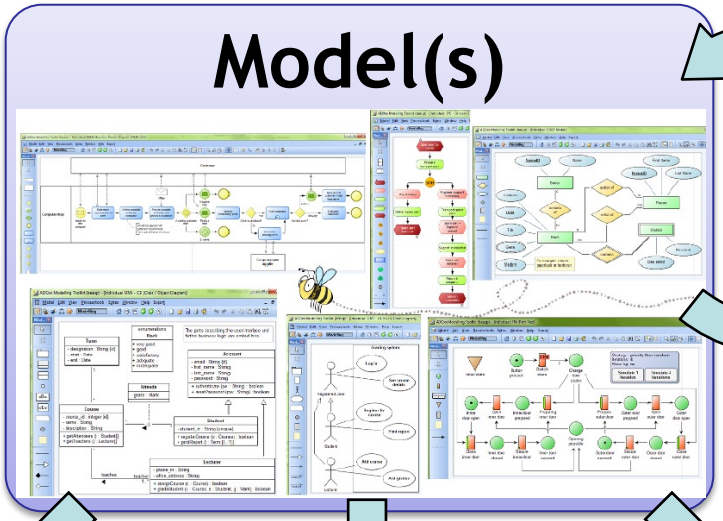
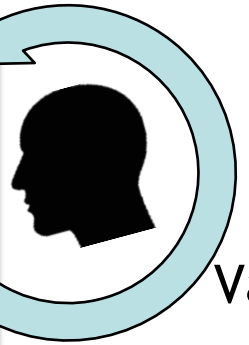
VALUE OF MODELS

Modelling





Value by itself

obtain Value through

Analysis

- Querying information

Simulation

- Capacity Analysis
- Petri Net Behavior

Transformation

- Deriving SQL Code
- RDF Export
- Models for Runtime

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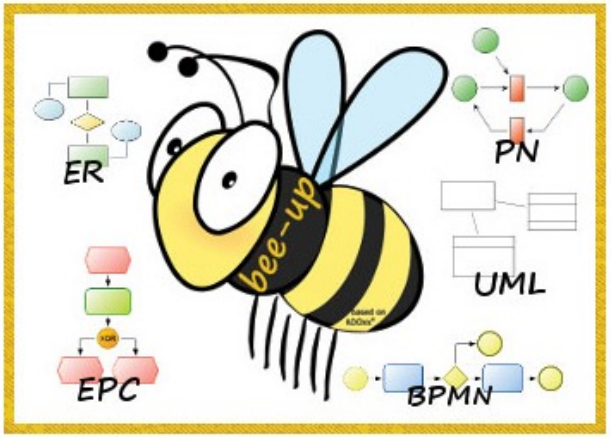
EXAMPLE: Bee-Up

Details



Bee-Up is an implementation of a hybrid modelling method incorporating and extending several modelling languages that gained wide popularity, namely the Business Process Model and Notation (BPMN), Event-driven Process Chains (EPC), Entity-Relationship models (ER), the Unified Modeling Language (UML) and Petri Nets. Bee-Up does not enforce a specific procedure when solving a problem. Instead it provides a set of different types of models and tools that can be employed according to the requirements of the task at hand.

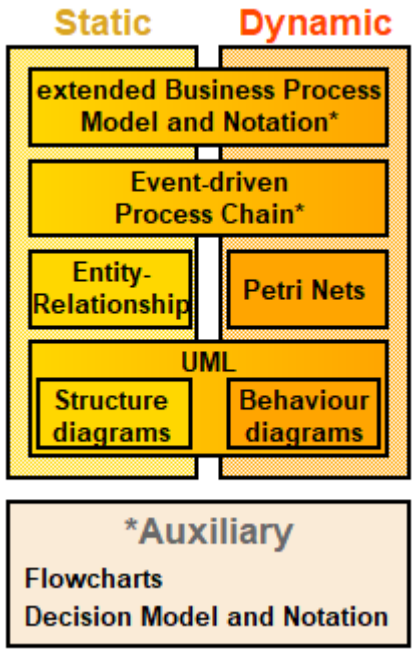
[from the Bee-Up OMiLAB page]

1. It's a tool – install it, use it, enjoy it.
2. It hybridizes several popular modelling languages.
3. It provides functionality to utilize created models.

MODELLING LANGUAGES

- **BPMN** – Business Process Model and Notation
- **EPC** – Event-driven Process Chains
- **ER** – Entity Relationship
- **UML** – Unified Modeling Language
- **Petri Nets**

- ++ Auxiliary
  - **DMN**
  - **Flowcharts**
  - **…**



Actual Model Types:

- Business Process Diagram (BPMN 2.0)
- EPC Model
- ER Model
- Activity Diagram
- Class / Object Diagram
- Classifier Pool
- Communication Diagram
- Component Diagram
- Composite Structure Diagram
- Deployment Diagram
- Interaction Overview Diagram
- Package Diagram
- Sequence Diagram
- State Machine Diagram
- Timing Diagram
- Use Case Diagram
- Petri Net
- Company Map
- Document Model
- Flowchart
- Decision Requirements Diagram
- Working Environment Model

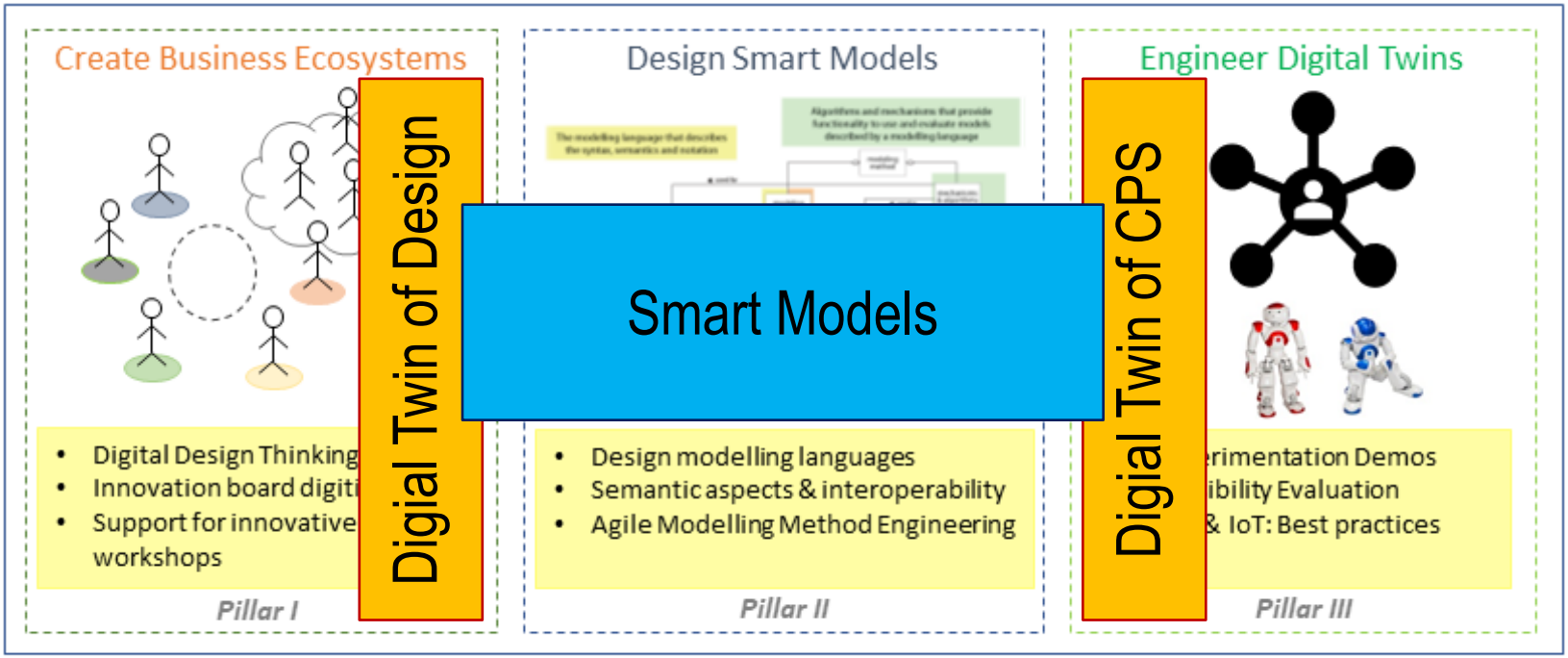
EXPERIMENTATION

LIVE DEMONSTRATION

Operationalisation

OMILAB DIGITIAL INNOVATION ENVIRONMENT

OMiLAB DIEn



Approach

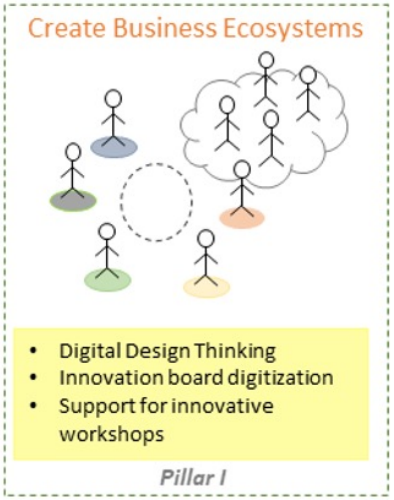
Business Ecosystems, Design Thinking, Digital Twins, Conceptual Modelling, Artificial Intelligence

Technology

ADOxx bee-up Olive Scene2Model Text2Model Voice2Model CoChaCo ADOScript in Visual Studio

ROS Robot Operating System Raspberry Pi W3C Semantic Web Microservices

CREATE BUSINESS ECOSYSTEMS



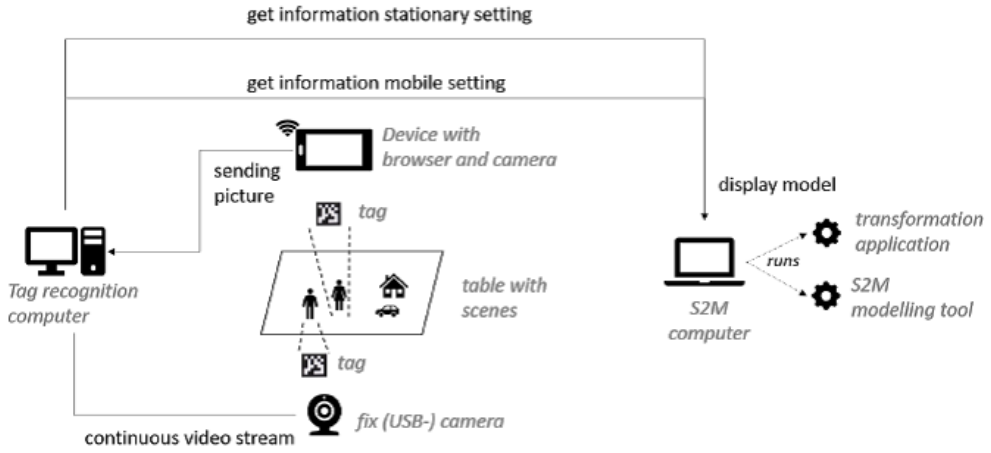
Selected **Approach**

Design Thinking

Selected **Technology**

Scene2Model

(using Rasperry Pi MicroServices OLIVE)



FOCUS: SUPPORT INNOVATION PROCESSES

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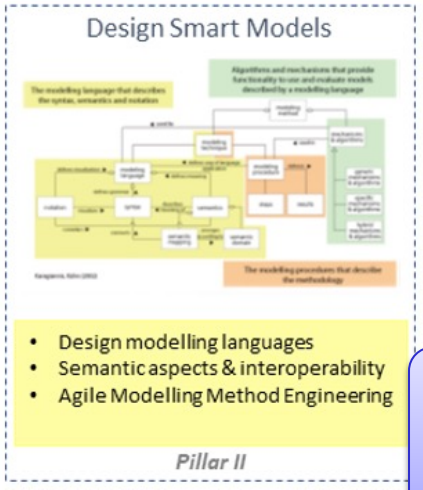
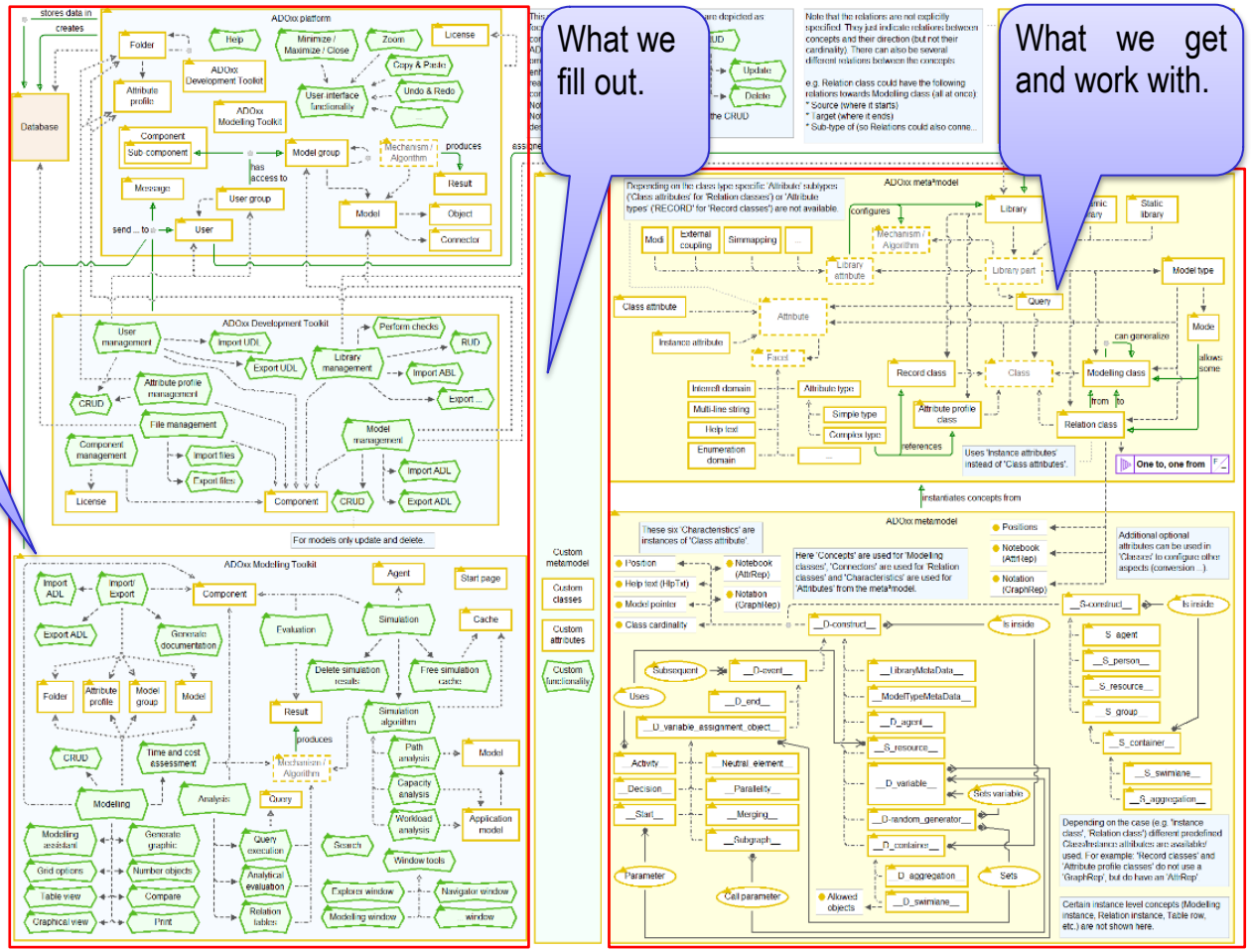
DESIGN SMART MODELS



What we get.

What we fill out.

What we get and work with.



Selected **Approach**

Conceptual Modelling

Selected **Technology**

CoChaCo

ADOxx

(using MicroServices OLIVE)

The OMiLAB Community. (2022). Development of Conceptual Models and Realization of Modelling Tools Within the ADOxx Meta-Modelling Environment: A Living Paper. In: Karagiannis, D., Lee, M., Hinkelmann, K., Utz, W. (eds) Domain-Specific Conceptual Modeling. Springer, Cham. https://doi.org/10.1007/978-3-030-93547-4_2DOI: https://doi.org/10.1007/978-3-030-93547-4_2

FOCUS: REALIZE MODELLING METHODS

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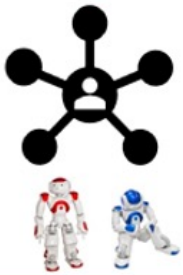
ENGINEER DIGITAL TWINS

Engineer Digital Twins



- Experimentation Demos
- Feasibility Evaluation
- CPS & IoT: Best practices

Pillar III

Selected **Approach**

Digital Twins / AI

Selected **Technology**

ROS, RPi
MicroServices
OLIVE

FOCUS: ASSESS FEASIBILITY

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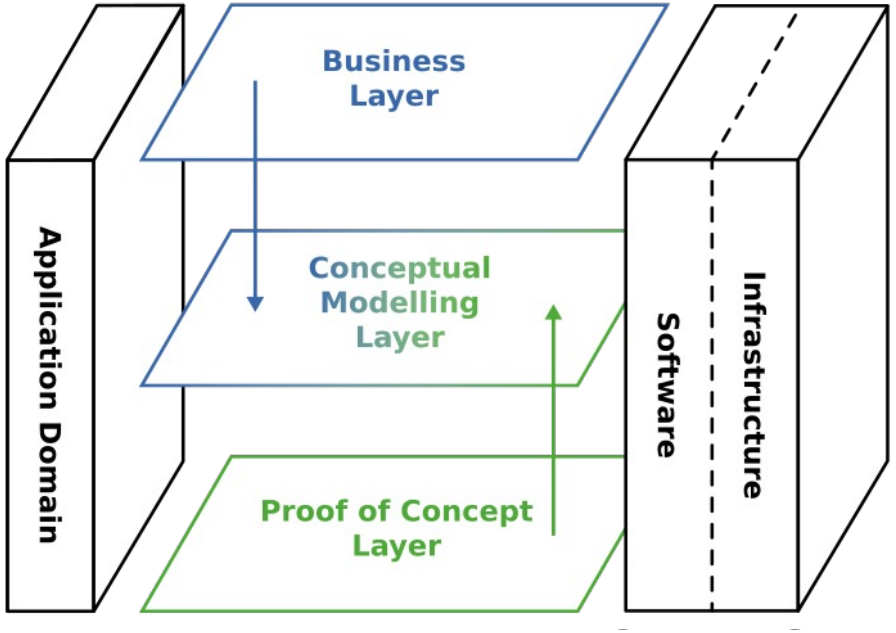
DIGITAL INNOVATION LABORATORY

- A **research and experimental spaces** for the conceptualization, development and deployment of digital innovation experiments utilizing next generation enterprise modelling.

- Project space for engineering these ideas from design to assessment/evaluation. A project is a collaborative space where individuals and teams can work together. It includes all contributions required to develop business scenarios.



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Instantiation: OMiLAB Innovation Corner

Academic

OMiLAB Innovation Corner

Industrial

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INDUSTRIAL OMILAB INNOVATION CORNER

https://youtu.be/608o2-I_J34

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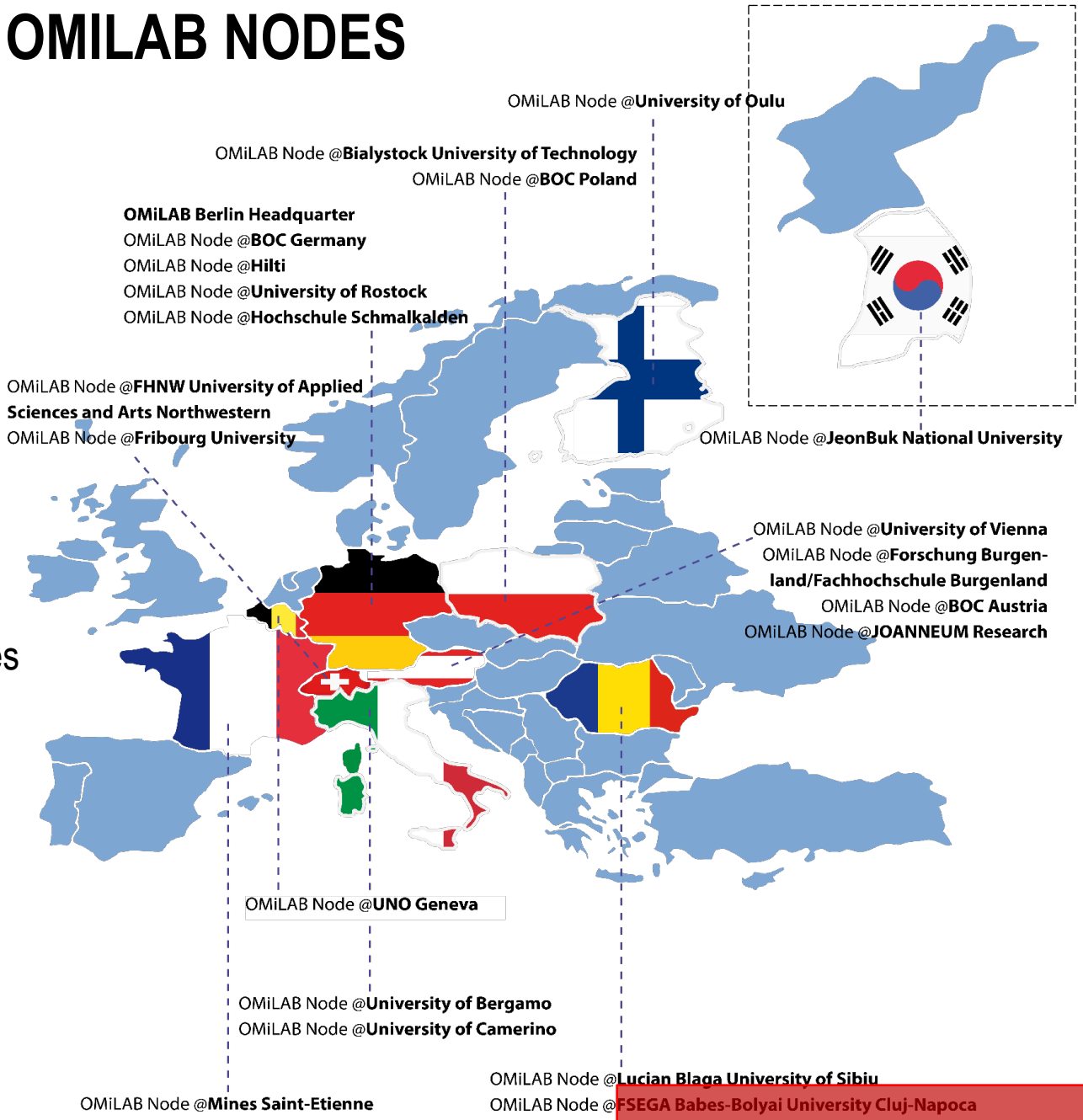
EVALUATION

COMMUNITY OF PRACTICE

NETWORK OF OMILAB NODES

As of Apirl 2024



25 OMiLAB Nodes

10 countries

2 continents

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VISIT: https://www.omilab.org/nodes/

OMiLAB: A Community of Practice

Research Projects

(EU-funded, international, bilateral)

FAIRWORK

DIGIFOF
DIGITAL DESIGN SKILLS FOR FACTORIES OF THE FUTURE

NEMO SUMMER SCHOOL SERIES

NEMO ALUMNI

Participants and Speakers

ADOxx-based Tools Developers

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Community of Practice
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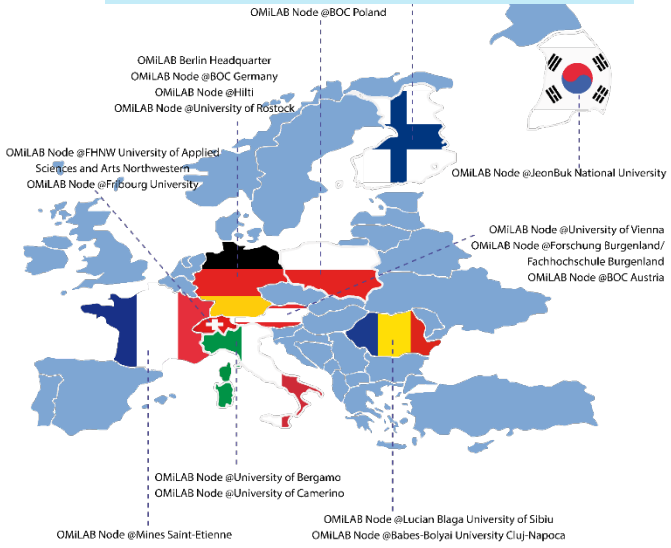
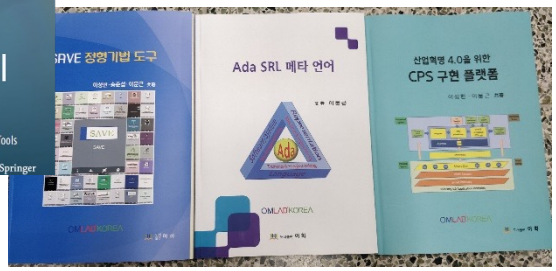
Global Network of Nodes (Academia and Industry)



Book Series (Editors & Authors), Research Publications



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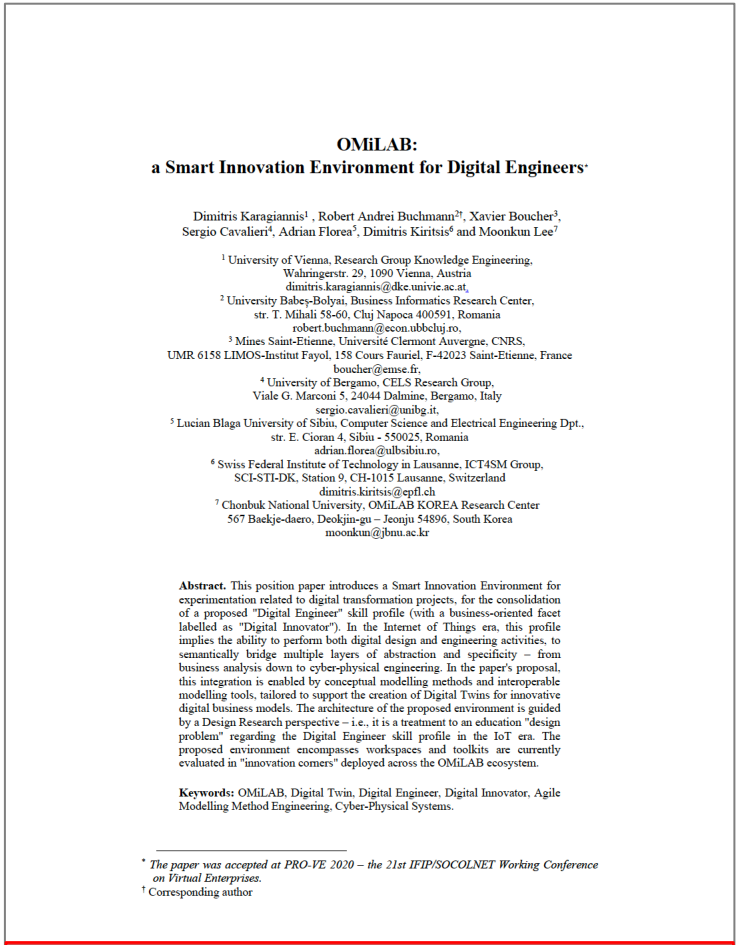
JOINT KNOWLEDGE TRANSFER:

EDUCATE DIGITAL ENGINEERS



OMiLAB:
a Smart Innovation Environment for Digital Engineers*

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Abstract. This position paper introduces a Smart Innovation Environment for experimentation related to digital transformation projects, for the consolidation of a proposed "Digital Engineer" skill profile (with a business-oriented facet labelled as "Digital Innovator"). In the Internet of Things era, this profile implies the ability to perform both digital design and engineering activities, to semantically bridge multiple layers of abstraction and specificity – from business analysis down to cyber-physical engineering. In the paper's proposal, this integration is enabled by conceptual modelling methods and interoperable modelling tools, tailored to support the creation of Digital Twins for innovative digital business models. The architecture of the proposed environment is guided by a Design Research perspective – i.e., it is a treatment to an education "design problem" regarding the Digital Engineer skill profile in the IoT era. The proposed environment encompasses workspaces and toolkits are currently evaluated in "innovation corners" deployed across the OMiLAB ecosystem.

Keywords: OMiLAB, Digital Twin, Digital Engineer, Digital Innovator, Agile Modelling Method Engineering, Cyber-Physical Systems.

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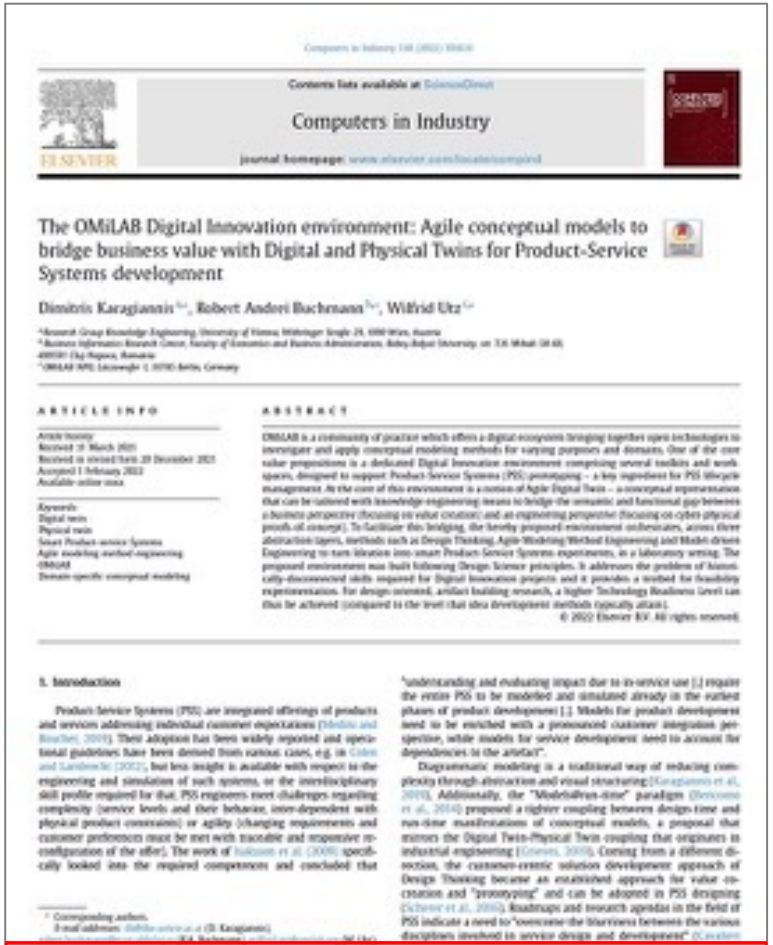
DIGITIAL AND PHYSICAL TWINS



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The OMiLAB Digital Innovation environment: Agile conceptual models to bridge business value with Digital and Physical Twins for Product-Service Systems development

Dimitris Karagiannis, Robert Andrei Buchmann, Wilfrid Utz

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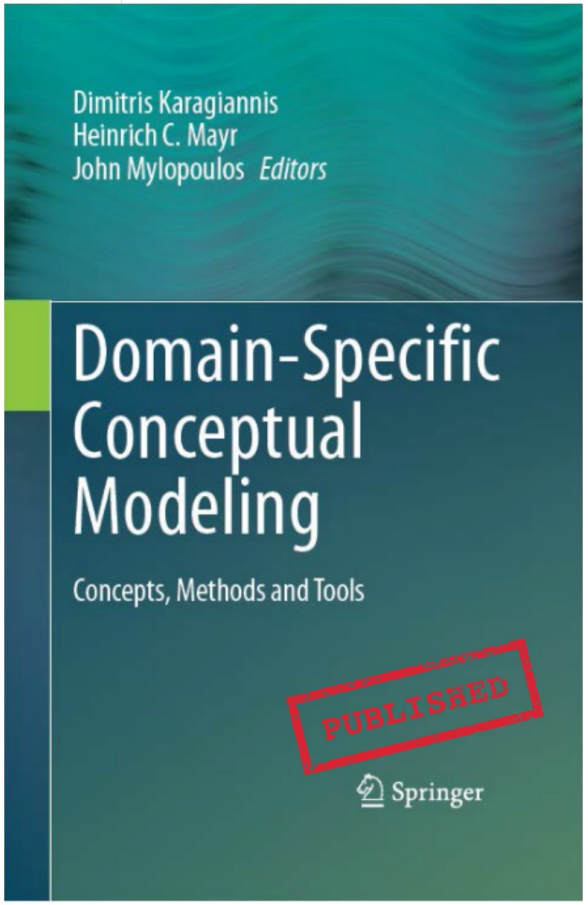

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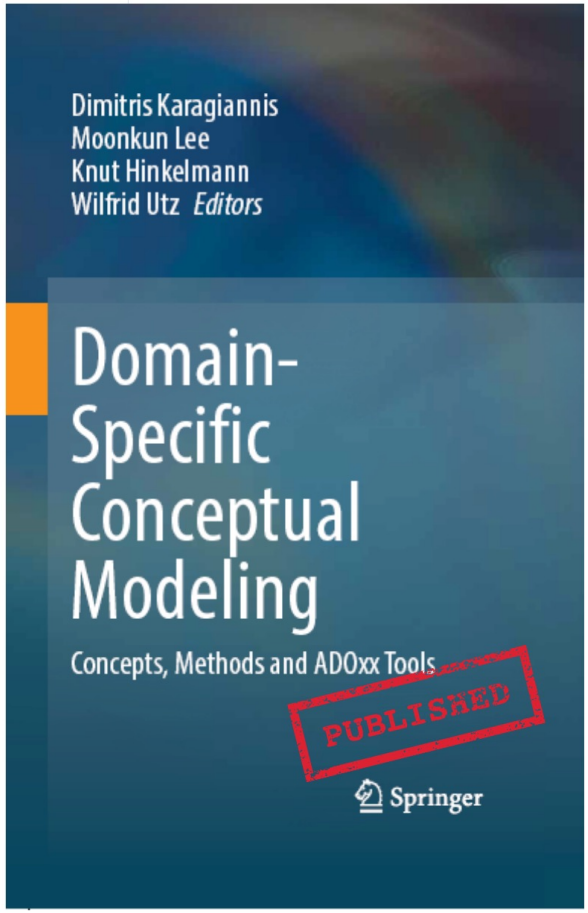

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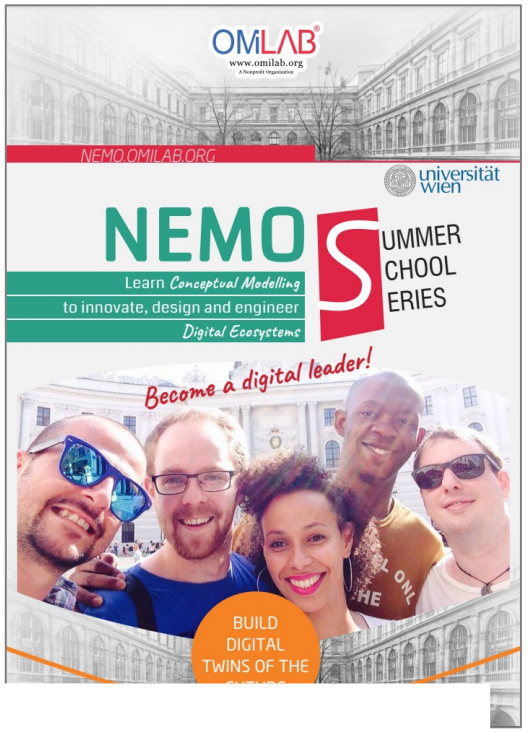

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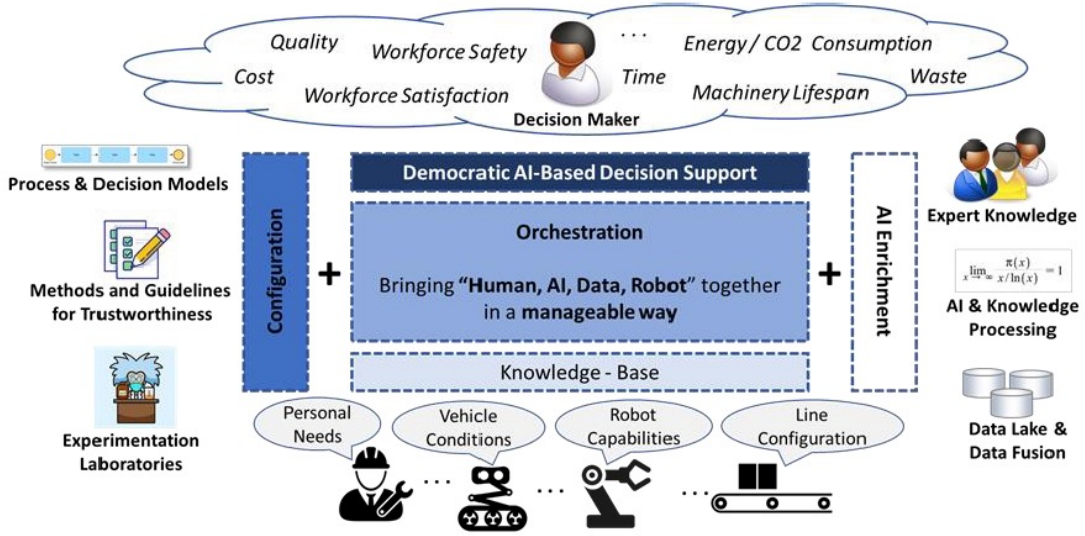

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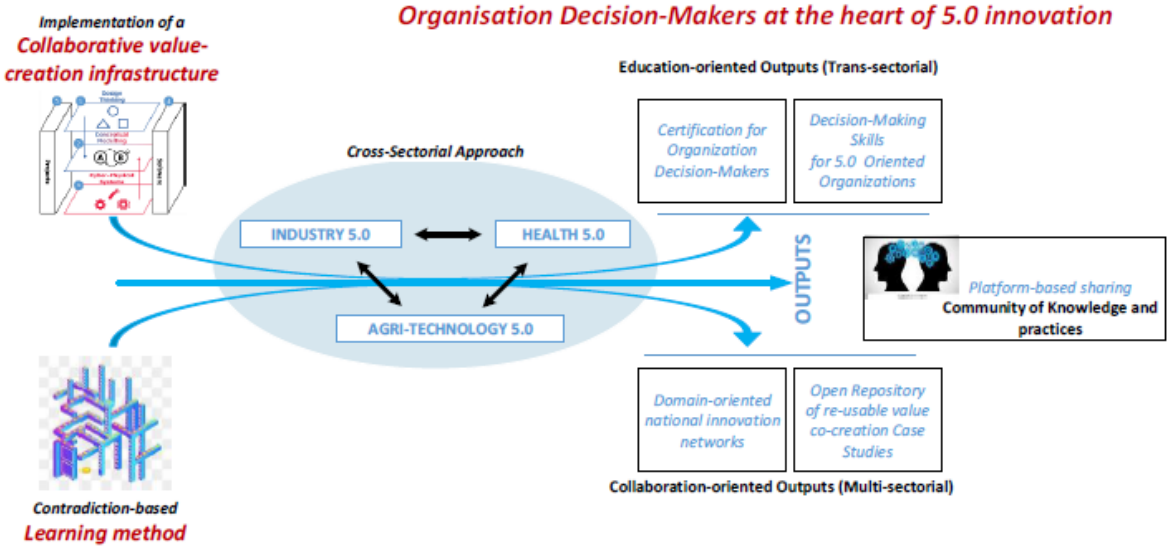

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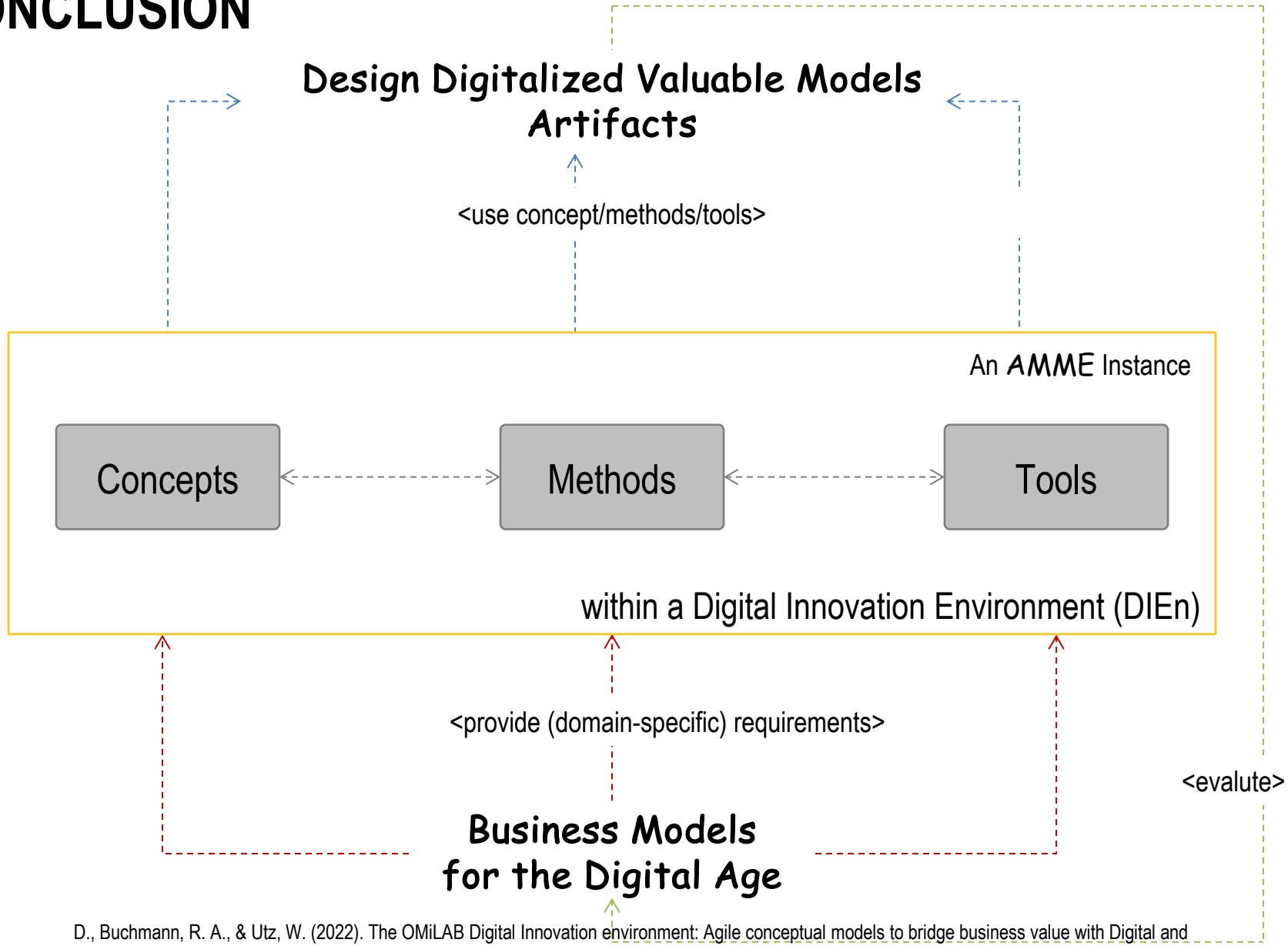

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WORKSHOP SETTING: NEMO 2023

WHAT DO YOU NEED?

1. **A methodology** (iterative modeling method engineering process)
   => Agile Modelling Method Engineering (Karagiannis, 2015*)

2. **A platform** (for agile prototyping & deployment) and **experimentation space**
   => ADOxx (adoxx.org) + OMiLAB Digital Innovation Environment

3. **A community** (users, feedback, requirements)
   => OMiLAB + NEMO Summer School series (omilab.org)

* Karagiannis, D. (2015) Agile Modeling Method Engineering, Proceedings of PCI 2015, ACM, pp. 5

THANK YOU FOR YOUR ATTENTION!

QUESTIONS?

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