INSTITUTE FOR SYSTEMS
AND COMPUTER ENGINEERING,
TECHNOLOGY AND SCIENCE

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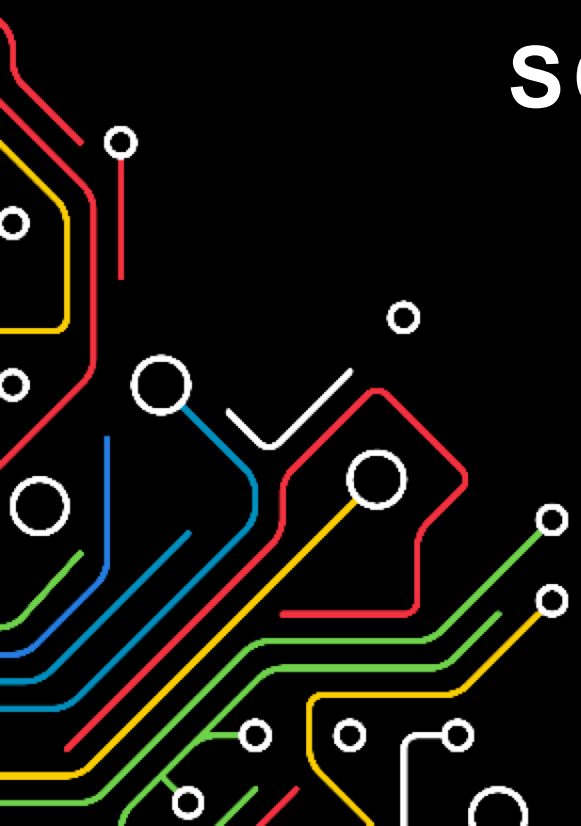
CEGI

SCOPE AND ACTIVITY FOR 2023

CCI/2023-02-24



from knowledge
generation to
science-based
innovation

CEGI

- The center is an international reference in business analytics through decision support systems for service and operations management, contributing also in service design and innovation, performance assessment and asset management.

UNDERSTANDING AND DEVISING CEGI STRATEGY (2022)

Interviews with CEGI researchers

Relationship with CEGI
- What do I expect?
- How do I contribute?

CEGI positioning
- Core areas
- Emergent areas

CEGI organization
- Governance
- Human resources
- Funding

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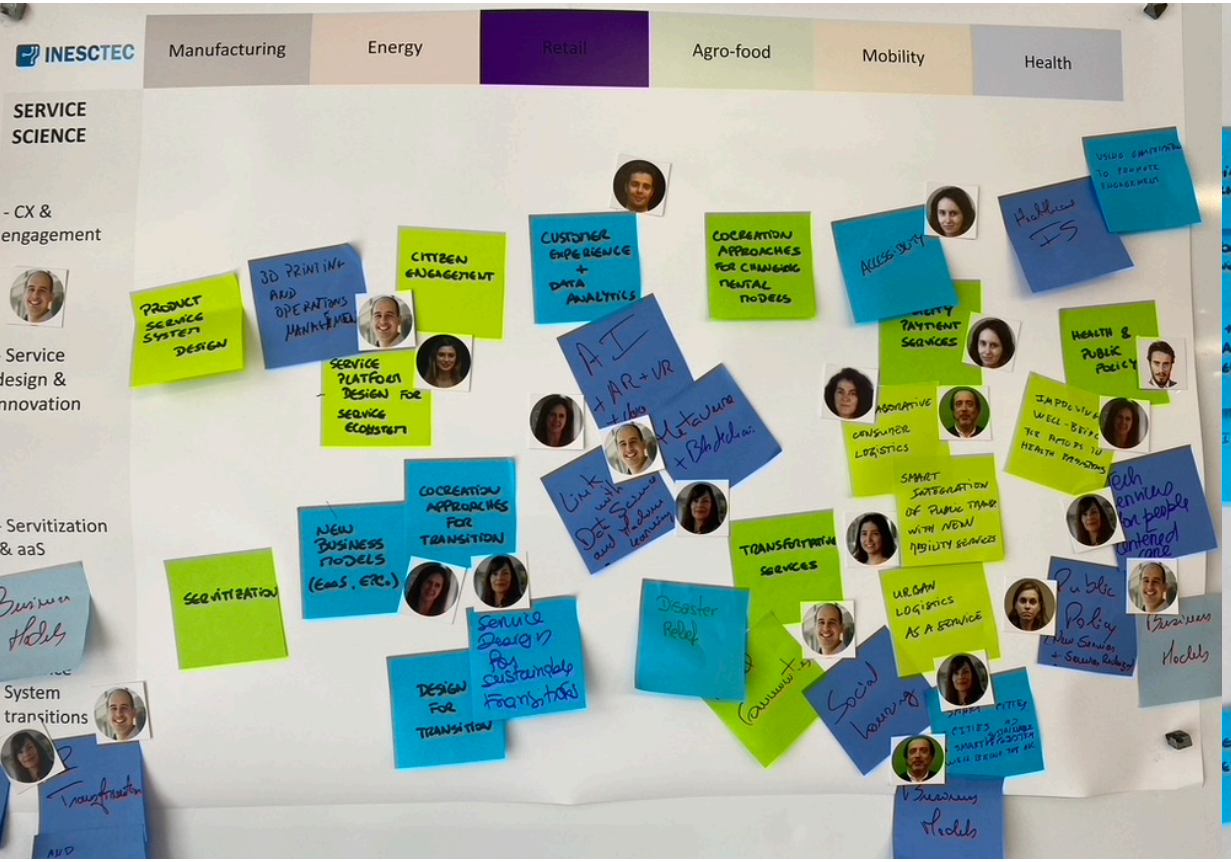
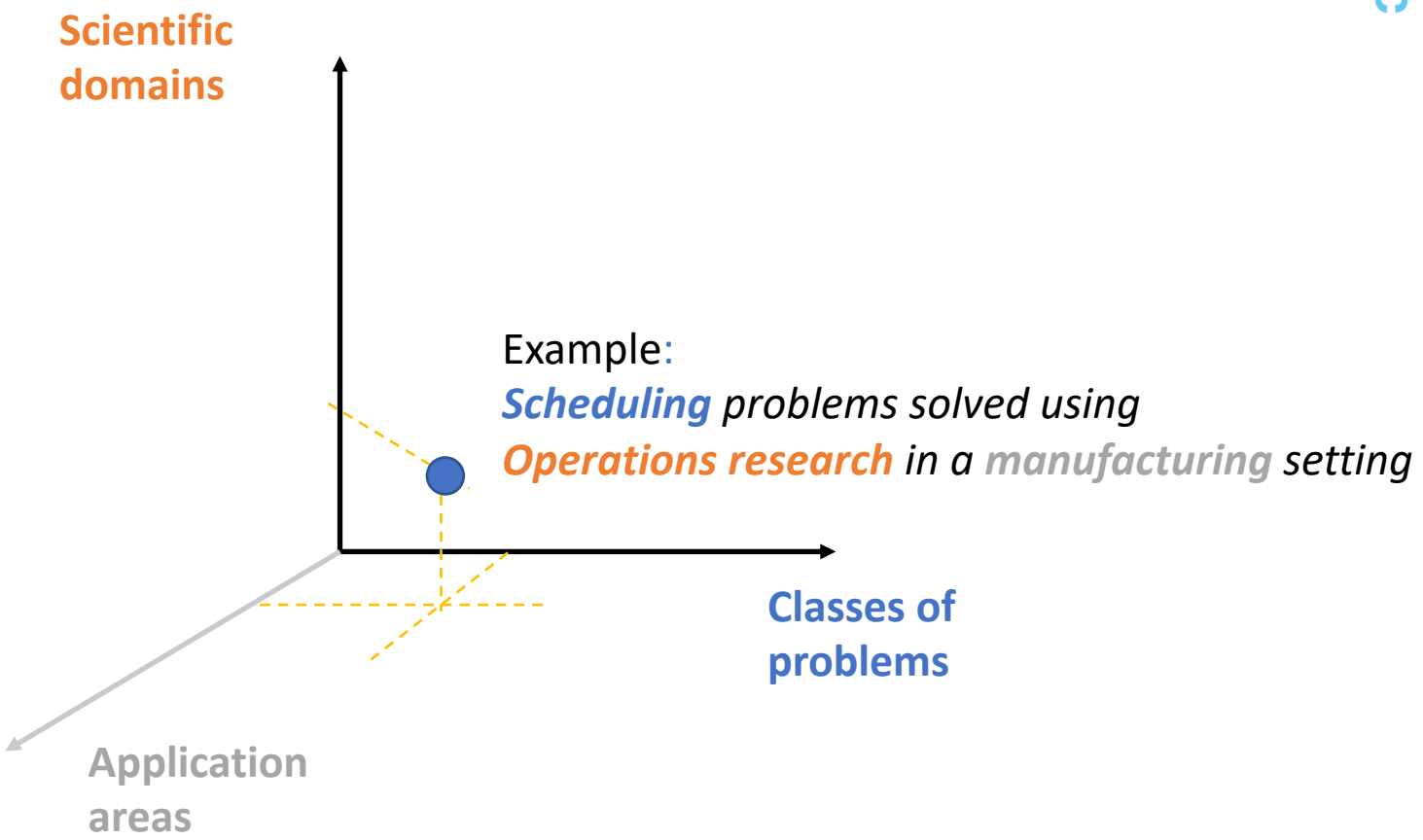
CEGI RESEARCH LINES

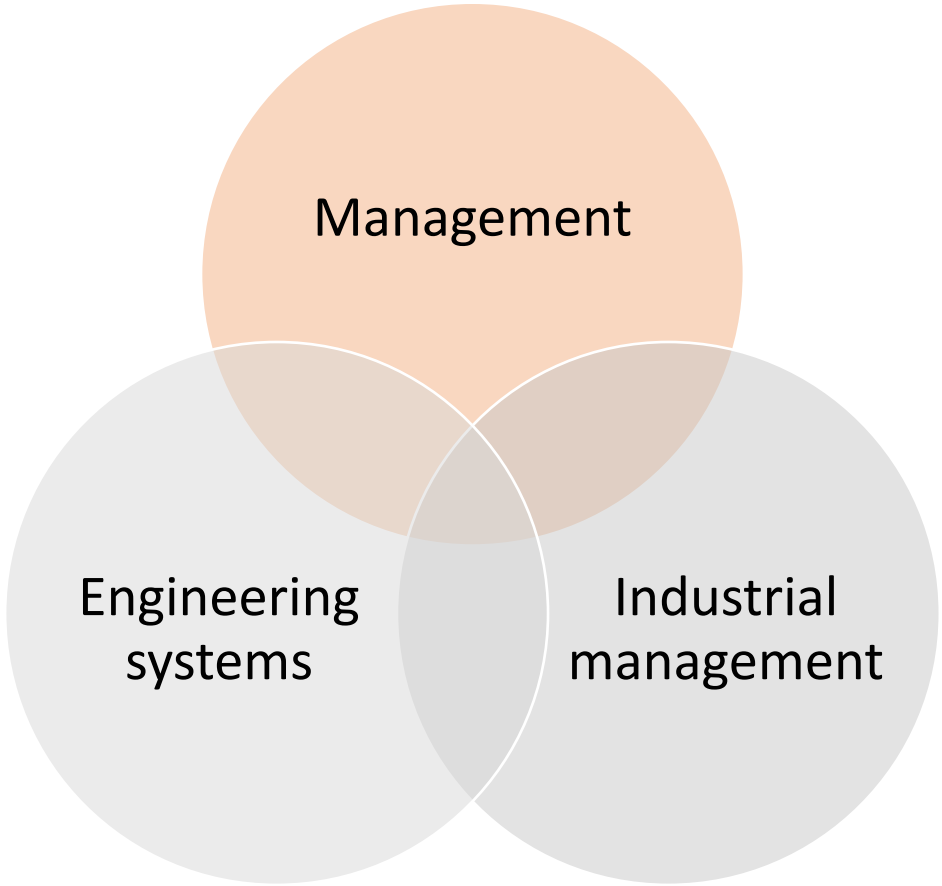


POSITIONING CEGI RESEARCH

- Three axes for communicating research:
  - **CEGI scientific domains**: at the multidisciplinary intersection of industrial engineering and management
  - **CEGI expertise in classes of problems**: from understanding to operating *(classes of problems)*
  - **CEGI application areas**: industry domain specific knowledge



CEGI DOMAIN – SYSTEMS ENGINEERING AND MANAGEMENT



FCT scientific domains

systems engineering and management

CEGI scientific domains/ competences		CEGI scientific challenges/ emergent areas
Service Science	Human Centered approaches and user research Service system design & innovation	Systems innovation and transitions towards sustainability Sustainable transitions research
Management science	Business analytics Operations Management Operations Research Performance evaluation	Advanced decision-support in dynamic, uncertain and complex environments Sustainability in business models, decision-support and analytics Systemic and high impact challenges: e.g. disaster relief, universal accessibility

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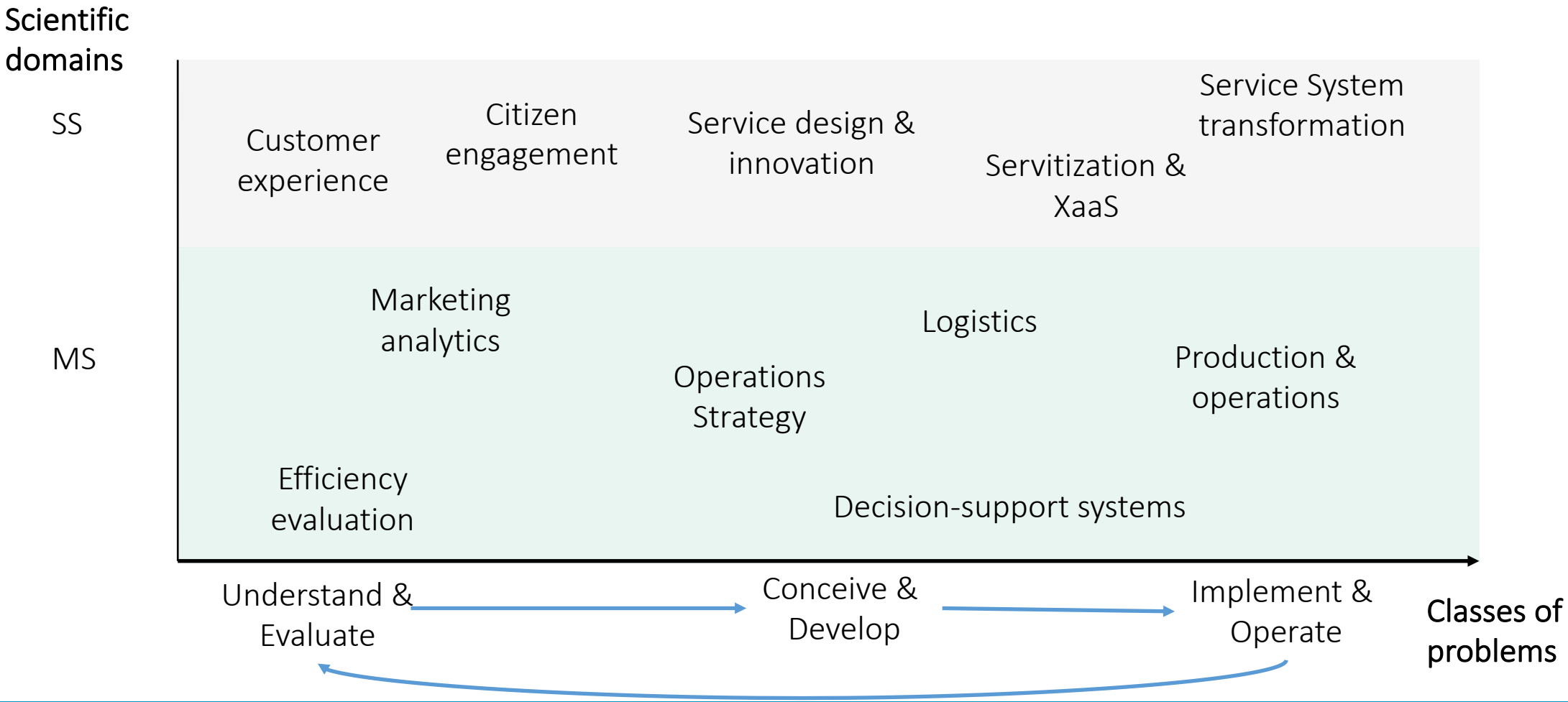
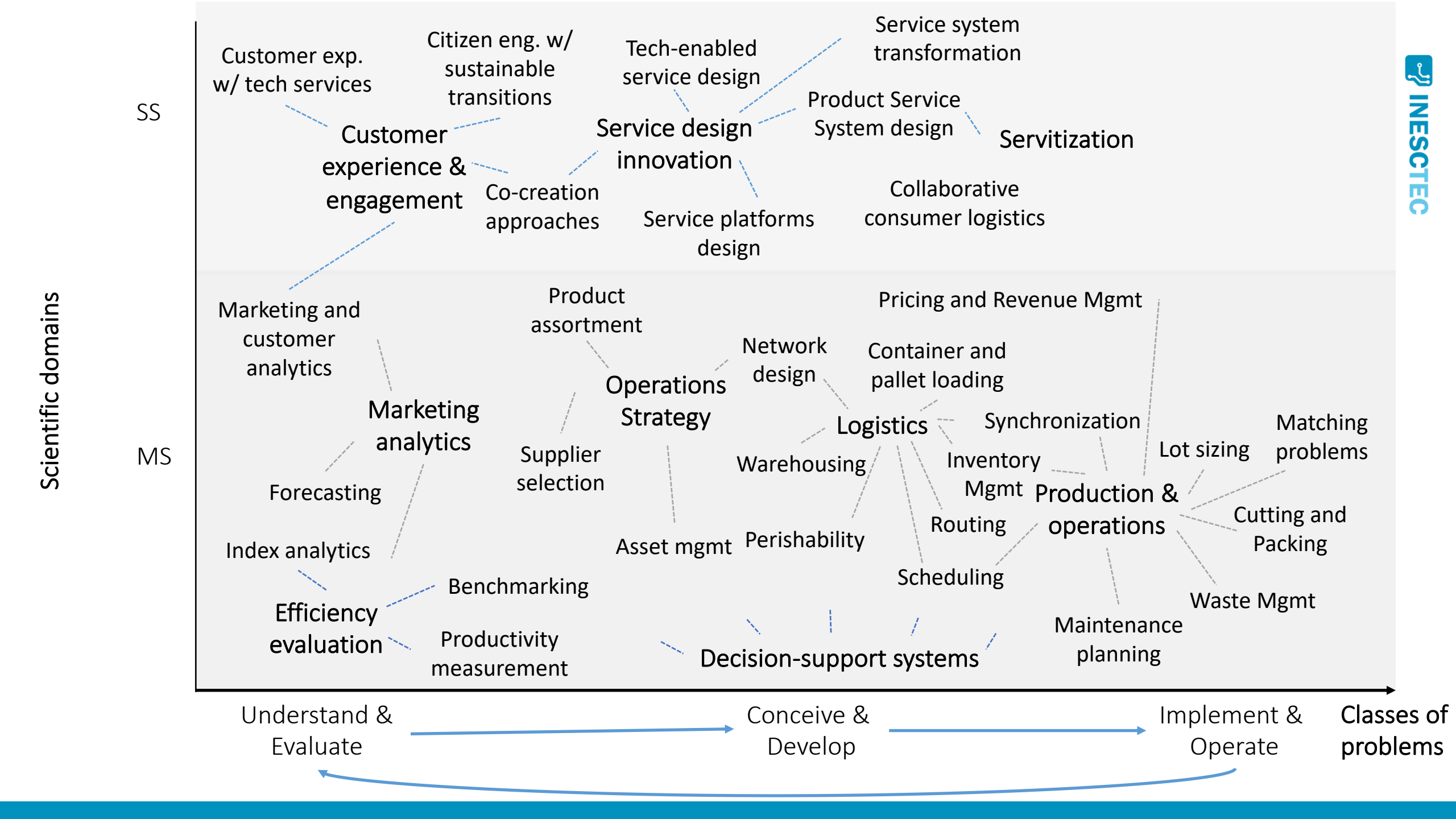
CEGI RESEARCH POSITIONING (FCT)

Scientific domains x Classes of problems




Scientific domains
SS
MS
Customer exp. w/ tech services
Citizen eng. w/ sustainable transitions
Tech-enabled service design
Service system transformation
Customer experience & engagement
Co-creation approaches
Service design innovation
Product Service System design
Servitization
Service platforms design
Collaborative consumer logistics
Marketing and customer analytics
Product assortment
Pricing and Revenue Mgmt
Network design
Container and pallet loading
Operations Strategy
Marketing analytics
Logistics
Synchronization
Matching problems
Lot sizing
Supplier selection
Warehousing
Inventory Mgmt
Forecasting
Production & operations
Cutting and Packing
Index analytics
Asset mgmt
Perishability
Routing
Scheduling
Benchmarking
Efficiency evaluation
Waste Mgmt
Maintenance planning
Productivity measurement
Decision-support systems
Understand & Evaluate
Conceive & Develop
Implement & Operate
Classes of problems
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CEGI APPLICATION POSITIONING (E.G. TECH4S)

Scientific domains x Application areas

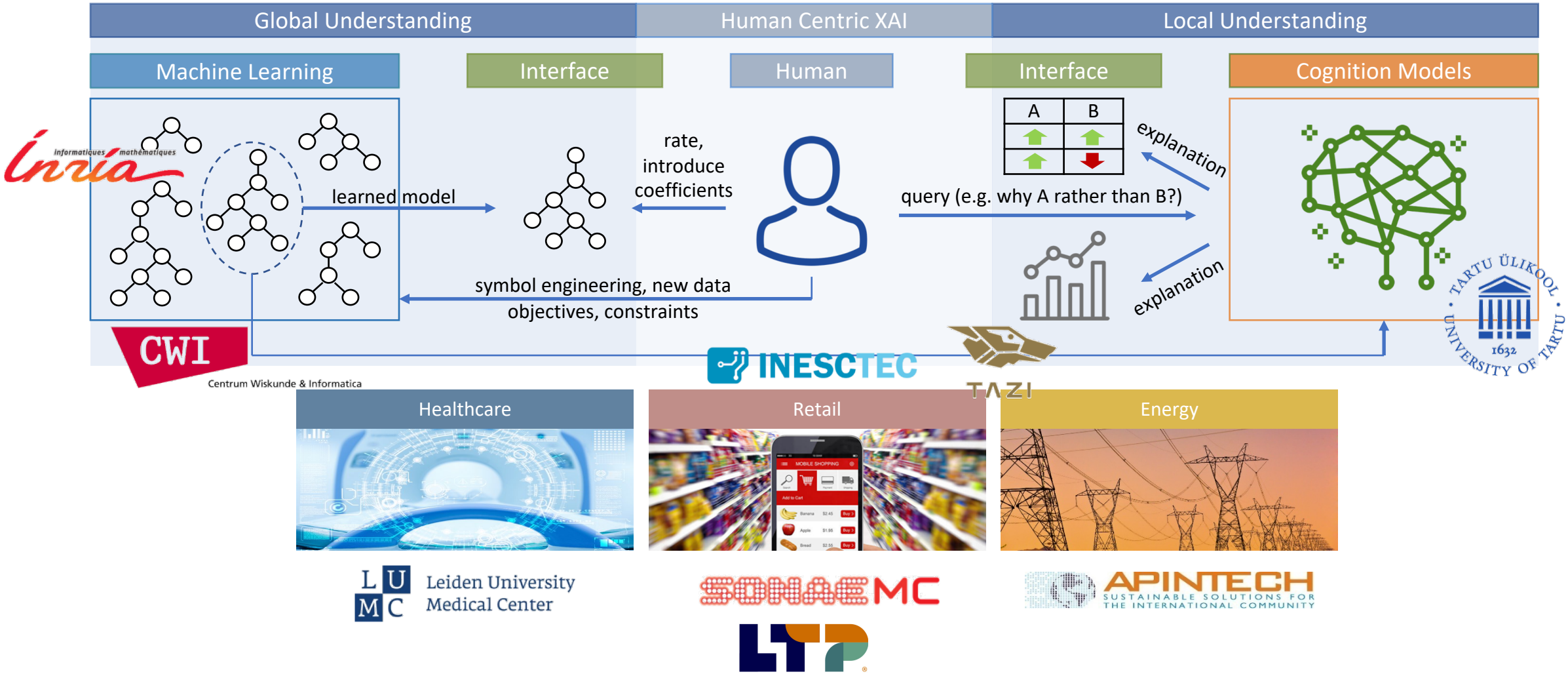
Vertical application areas

Scientific domains

	Manufacturing	Energy	Retail	Agro-food	Transportation & Mobility	Health
Service Science	- PSS design - Servitization	- Citizen engagement - Cocreation approaches for energy transition	- Customer experience - Multichannel service design	- Cocreation approaches for changing mental models - Transformative service design	- Mobility service design - urban logistics aaS - Mobile payments	- Patient experience - Tech service design for health - Public policy for health
Management Science	- Inventory Mgmt - Cutting & packing - Lot-sizing - Scheduling - Pallet & container loading - Supplier selection - Forecasting - Data mining	- Asset management - Maintenance planning - Reliability - Health index analytics - Efficiency & productivity measurement	- Product assortment - Sched & routing - Marketing & customer analytics - Forecasting - Data mining	- Perishability problems - Food waste - Marketing & customer analytics	- Sched & routing - Synchronization - Fleet mgmt - Pricing & revenue mgmt - Data visualization - Data mining - Mobility demand analytics - Logistics - KPI definition - Benchmarking tools	- Matching problems - Product assortment - Inventory mgmt - Forecasting - Sched & routing - Benchmarking

FLAGSHIP PROJECTS UNDER WAY OR TO BEGIN IN 2023

- TRUST-AI: Transparent, Reliable and Unbiased Smart Tool for AI
- Exploring Human-Centric AI for decision problems in Healthcare, Retail and Energy

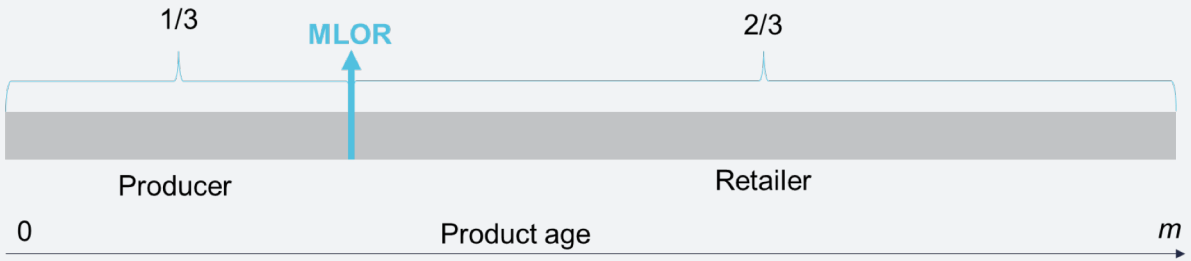


Research Questions

How does the willigness to pay of a customer varies for a product with different remaining shelf life?

What is the effect seen from placing dicounst labels due to low shelf life?

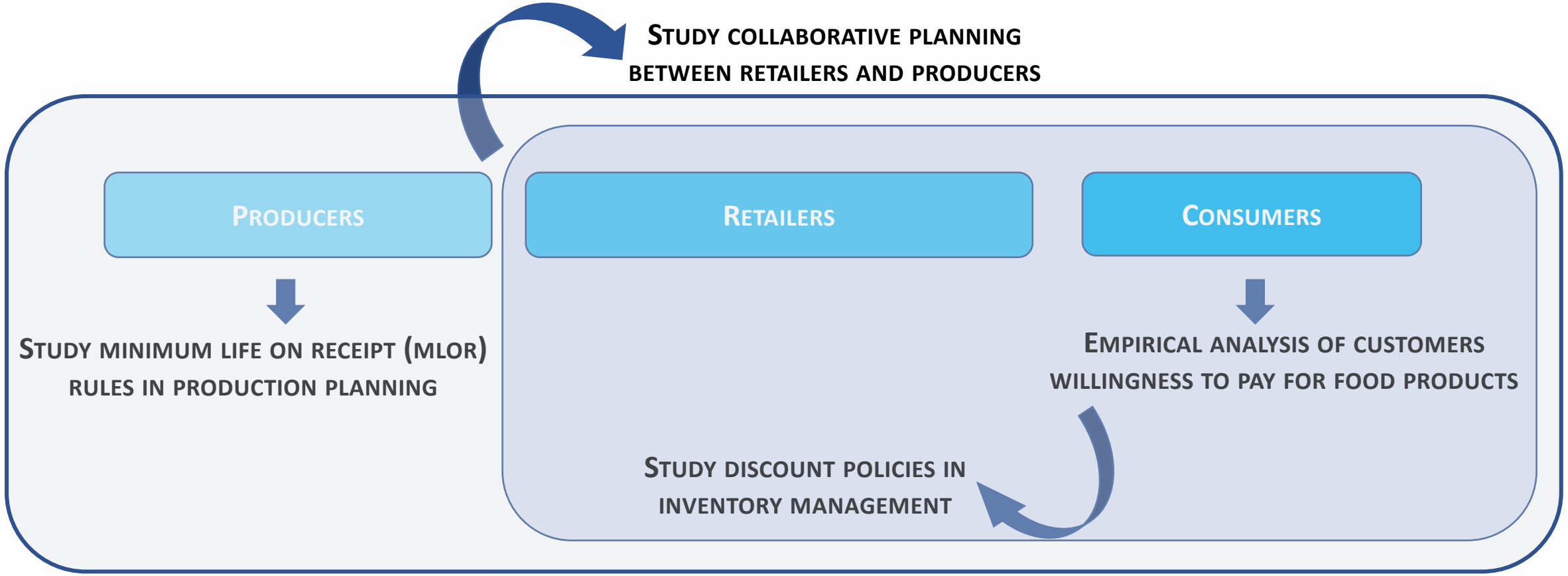
When and what price adjustment should be included in retailers' promotional policies?



How much may the MLOR rule be flexible without generating extra costs for retailers?

Which profit allocation methods work better to promote the sustaibaility of food suply chains?

BeFresh – Integrating Consumer Behavior to Improve Food Value Chains



Mendes Gonçalves

MC Sonae

Research team

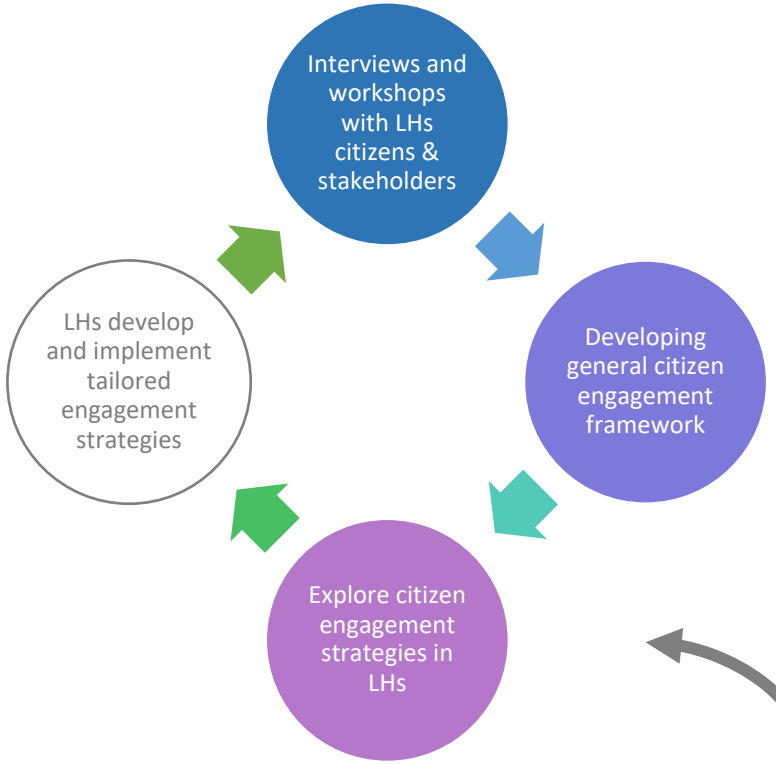
INESCTEC

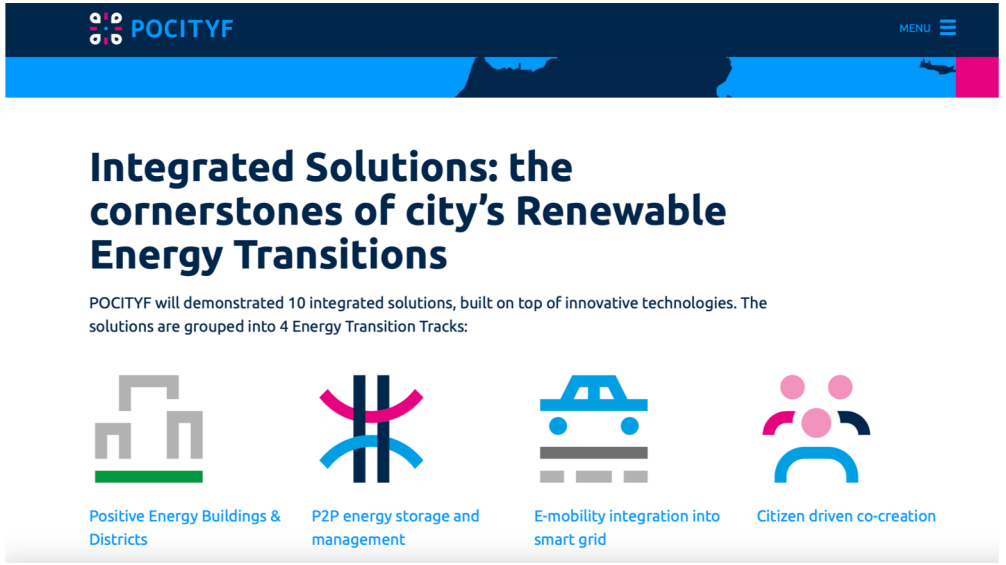
Chicago Booth

UT Dallas

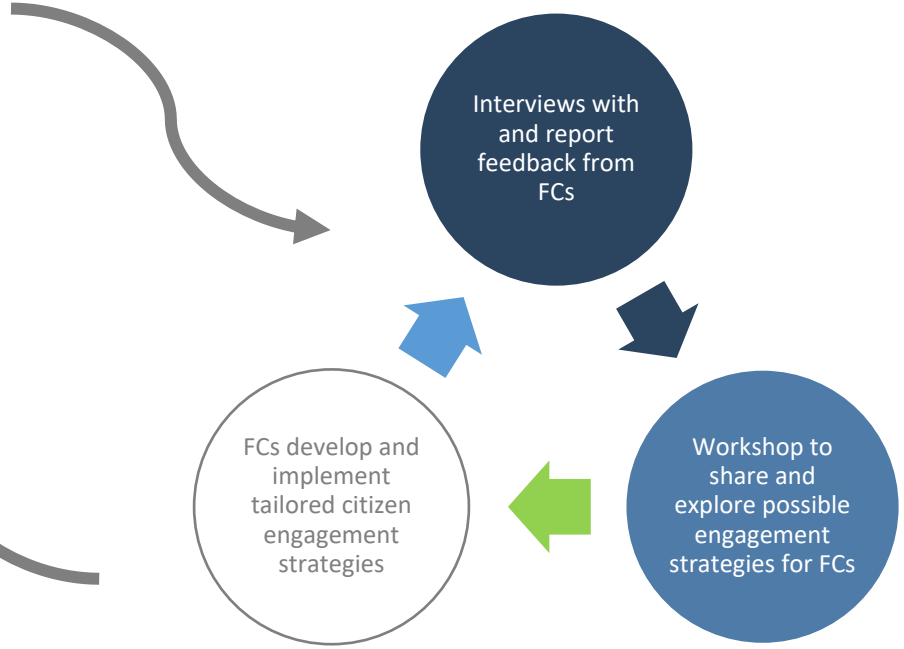
FCT Fundação para a Ciência e a Tecnologia
Ministério da Ciência, Tecnologia e Ensino Superior

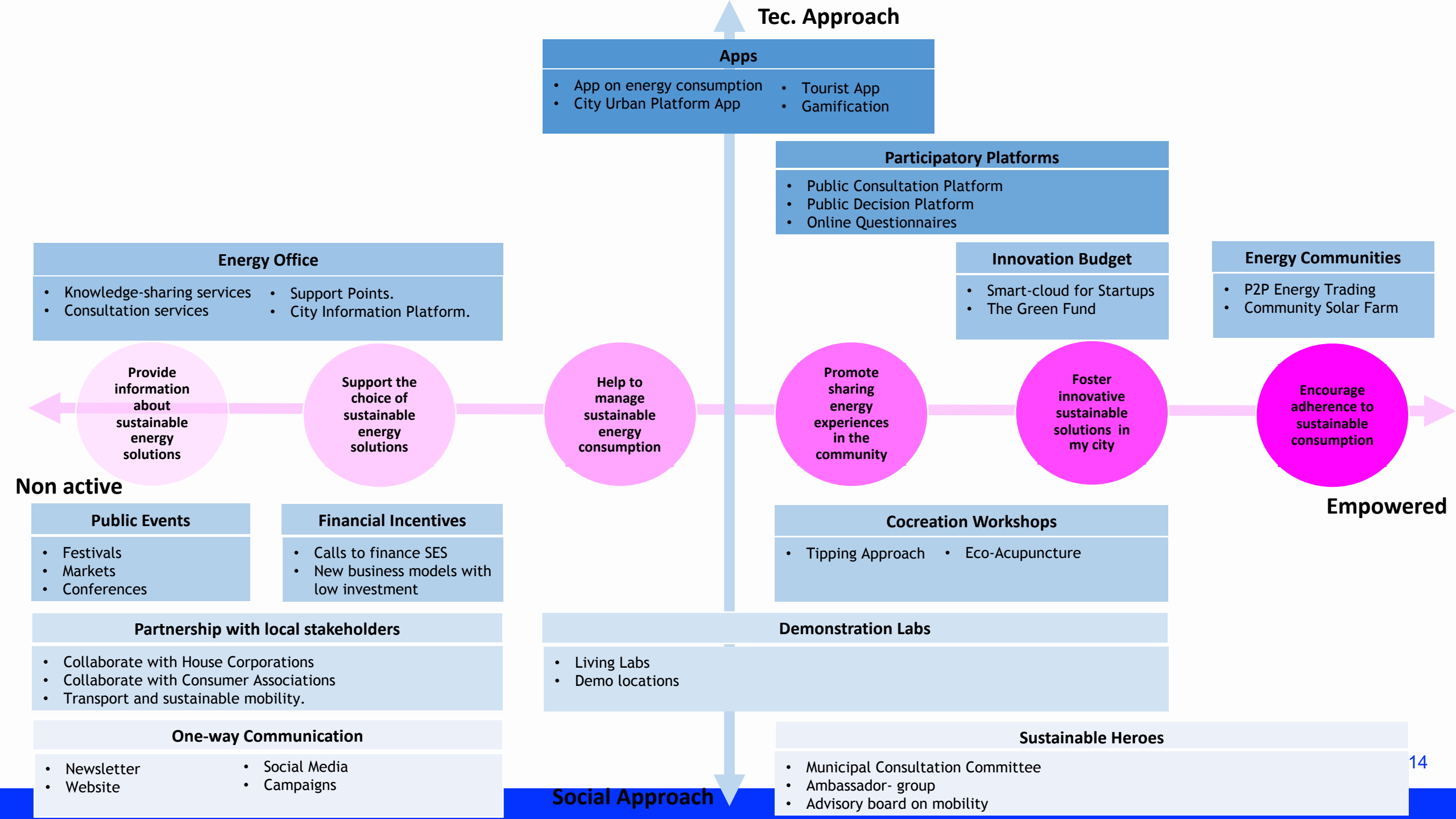
WP4 -Citizen Engagement Strategies



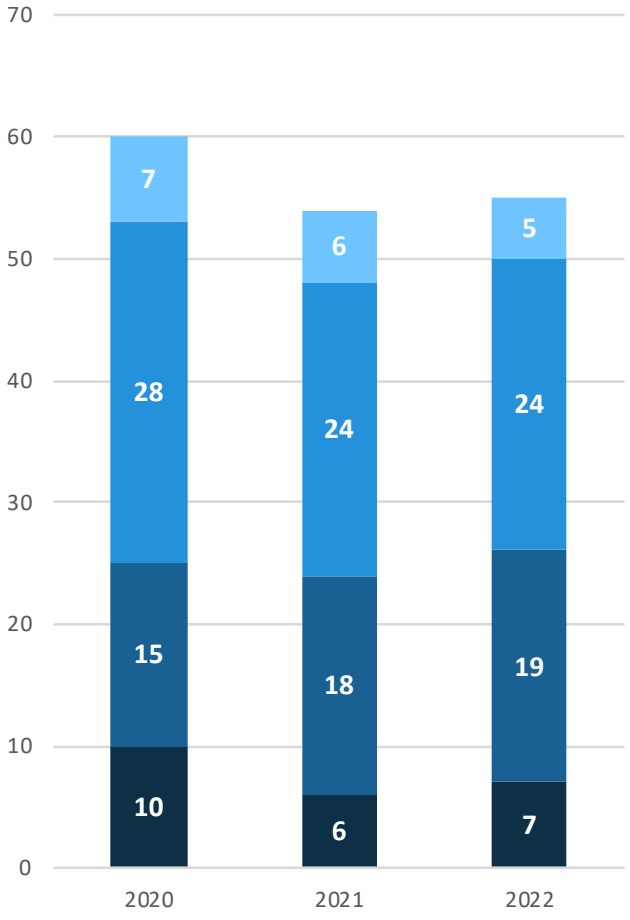


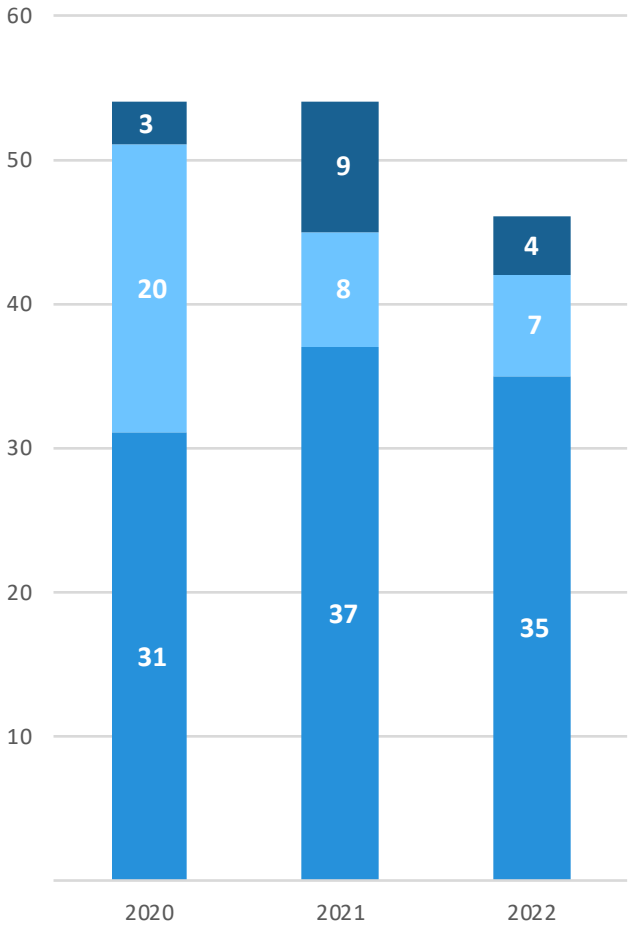
T.4.2. Training workshops with Fellow Cities

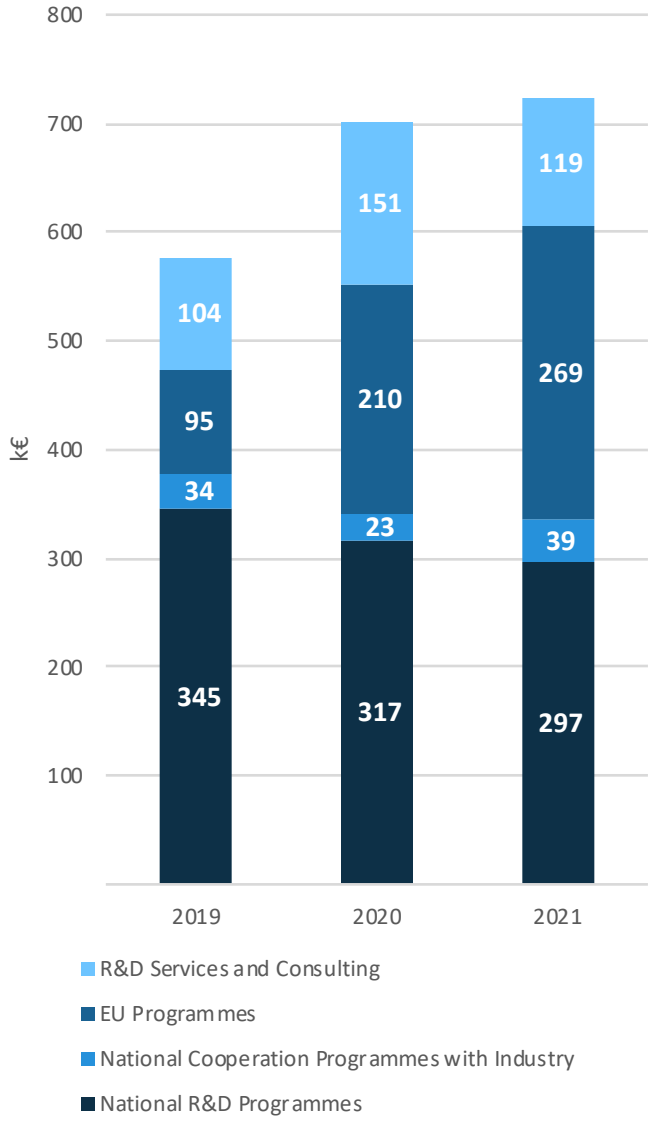



Tec. Approach
Apps
App on energy consumption
City Urban Platform App
Tourist App
Gamification
Participatory Platforms
Public Consultation Platform
Public Decision Platform
Online Questionnaires
Energy Office
Knowledge-sharing services
Consultation services
Support Points.
City Information Platform.
Innovation Budget
Smart-cloud for Startups
The Green Fund
Energy Communities
P2P Energy Trading
Community Solar Farm
Provide information about sustainable energy solutions
Support the choice of sustainable energy solutions
Help to manage sustainable energy consumption
Promote sharing energy experiences in the community
Foster innovative sustainable solutions in my city
Encourage adherence to sustainable consumption
Non active
Empowered
Public Events
Festivals
Markets
Conferences
Financial Incentives
Calls to finance SES
New business models with low investment
Cocreation Workshops
Tipping Approach
Eco-Acupuncture
Partnership with local stakeholders
Collaborate with House Corporations
Collaborate with Consumer Associations
Transport and sustainable mobility.
Demonstration Labs
Living Labs
Demo locations
One-way Communication
Newsletter
Website
Social Media
Campaigns
Sustainable Heroes
Municipal Consultation Committee
Ambassador- group
Advisory board on mobility
Social Approach

CEGI - TEAM AND ACTIVITY







HIGH IMPACT PUBLICATIONS

MITSloan Management Review

Topics | Our Research | Spotlight | Magazine | Webinars & Podcasts

MAGAZINE FALL 2021 ISSUE / FRONTIERS / RESEARCH HIGHLIGHT

Online Shoppers Don't Always Care About Faster Delivery

Analyzing online customer data may reveal that other delivery attributes matter more than how quickly an order is recei

Pedro Amorim and Nicole DeHoratius · August

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Data, AI, & Machine Learning

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Frontiers

An MIT SMR initiative exploring how technology is reshaping the practice of management.

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ELSEVIER

Omega

Volume 111, September 2022, 102643

Effective and interpretable dispatching rules for dynamic job shops via guided empirical learning ☆

Cristiane Ferreira, Gonçalo Figueira, Pedro Amorim

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https://doi.org/10.1016/j.omega.2022.102643 Get rights and content

Highlights

- One of the first major attempts at combining machine learning with domain problem reasoning for scheduling.
- Genetic Programming is applied for evolving dispatching rules that perform well in a wide spectrum of dynamic job shops.
- Interpretable rules are designed using the insights obtained from previous executions to guide the algorithmic search.
- The obtained dispatching rules were able to outperform the best combination of existing state-of-the-art rules by 19% on average.

Energy Policy 170 (2022) 113249

ELSEVIER

Contents lists available at ScienceDirect

Energy Policy

journal homepage: www.elsevier.com/locate/enpol

From smart technologies to value cocreation and customer engagement with smart energy services

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Keywords:
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Customer engagement
Value cocreation
Smart grids
ESCOs

ABSTRACT

Smart grids enable large-scale integration of low-carbon energy sources and energy efficiency. However, changing customer energy consumption behavior has been a challenge, requiring the development of services that change the way customers relate with energy to increase energy efficiency and savings in households. To this end, this qualitative study in the Portuguese energy market offers a nuanced understanding of how customer cocreate value with smart energy services, identifying three different customer value cocreation practice styles and respective engagement behaviors). Study findings reveal that while AHEM (Advanced Home Energy Management) and MEM (Mobility Energy Management) customers are willing to play autonomous roles in managing the energy consumption and production, HFEC (Hassle Free Home Energy Consumption) customers may be open to adopt smart energy services without spending time and effort in using these services.

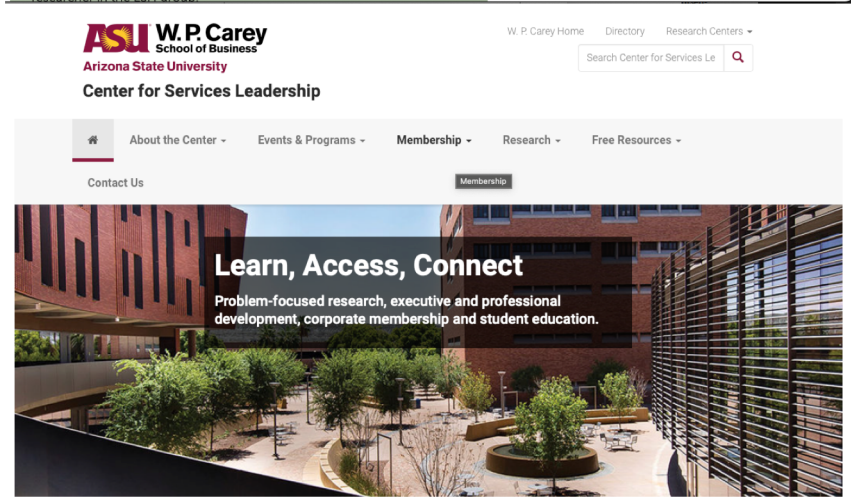
The study offers relevant implications for policy makers and ESCOs (energy service companies). Although much attention has been paid to advanced customers, a nuanced approach may enable ESCOs to reach disengaged customers, by offering tailored services that are suited to their hassle free value cocreation practice styles. Policy makers may also explore tailored, and service focused incentives to push the adoption of smart service solutions in large-scale.

OUTLOOK 2023 – NEW PROJECTS STARTING IN 2022/2023

Type	Project	Time frame
PN-FCT	CIBELE	2022-2024
PN-FCT	MOSH	2023-2024
PN-FCT	TacitRouting	2023-2024
PN-FCT	eduBEST	2023-2026
PN-PRR	InsectERA-2	2022-2025
PN-PRR	AgendaTransform-2	2023-2026
PN-PRR	Produtech R3-1	2022-2025
PN-PRR	SMARTgNOSTICS	2023-2026

MAIN EXTERNAL PARTNERS AND COLLABORATIONS WITH OTHER CENTRES - RESEARCH

- Technical University Munich
- University of Chicago
- University of Texas at Dallas
- Center of Services Leadership – Arizona State University
- Cornell University – Institute of Healthy Futures
- Karlstad University – Center for Service Excellence
- CWI's Life Sciences and Health (LSH) group
- …



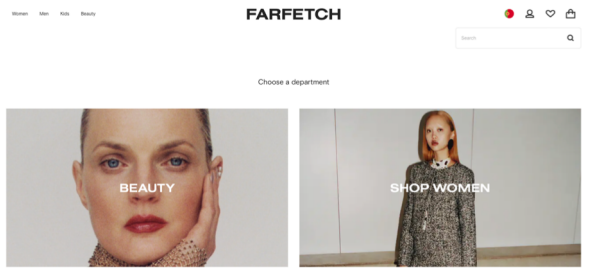
MAIN EXTERNAL PARTNERS AND COLLABORATIONS WITH OTHER CENTRES - INNOVATION

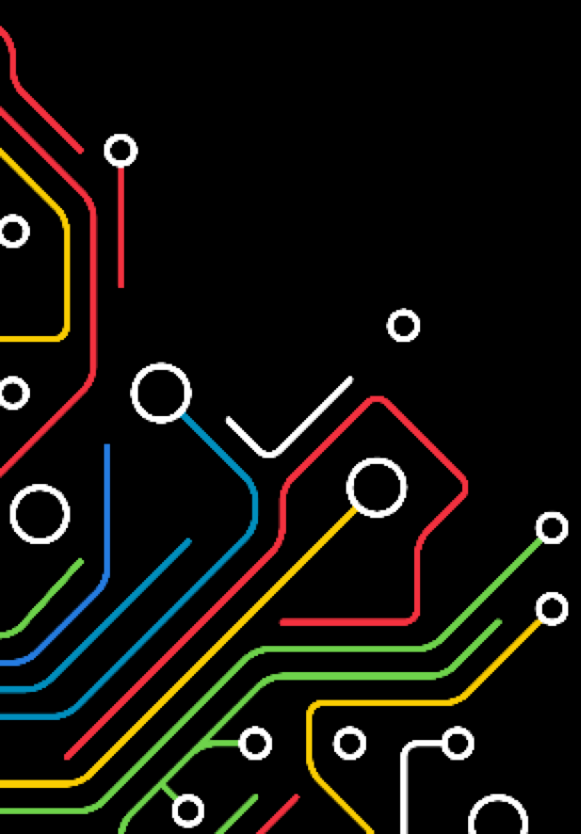
Some external partners

- Farfetch
- MCH
- EDP
- SPMS
- …

Some INESC TEC collaborations

- CESE
- CPES
- CITE
- …





THANK YOU

CEGI