

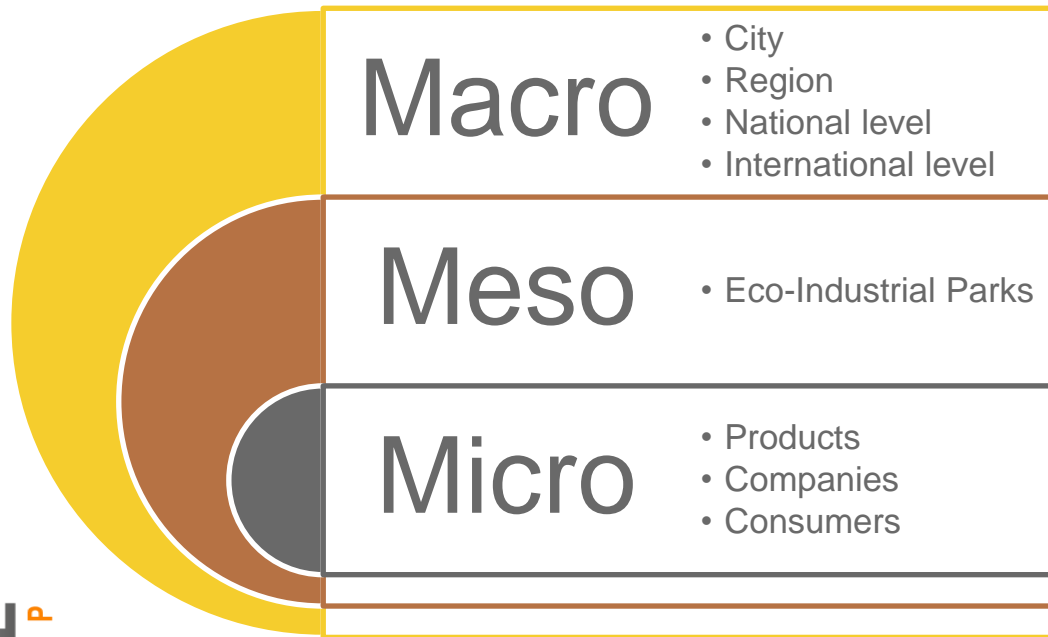


DIGITAL PLATFORMS: END-TO-END DATA INTEGRATION OF INDUSTRIAL SYMBIOSIS STAGES

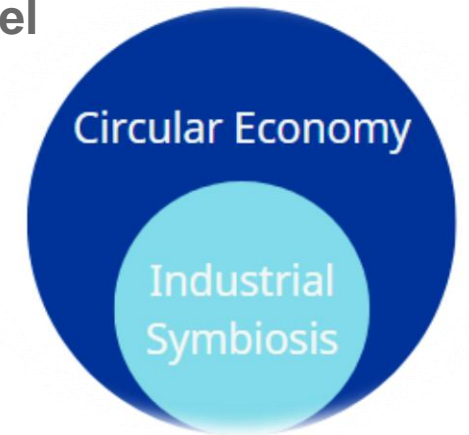
**Charalampos Manousiadis (pres.), Fotios K. Konstantinidis,
Chrysanthi Akrivou, Georgios Tsimiklis, Dr. Angelos Amditis**

**Institute of Communication and Computer Systems (ICCS),
National Technical University of Athens, Athens, Greece**

CIRCULAR ECONOMY (CE) AND MICRO, MESO AND MACRO LEVELS



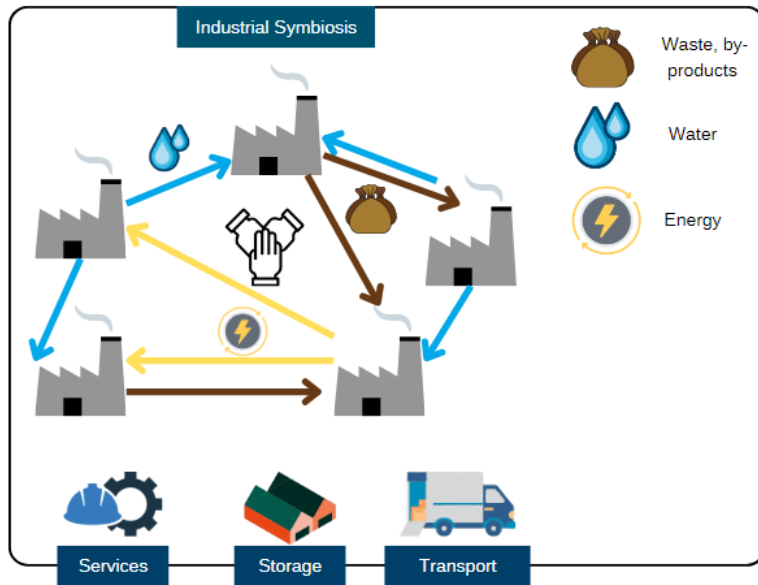
Industrial Symbiosis (IS) is practicing Circular Economy (CE) mainly in **Meso level**



CE AND INDUSTRIAL SYMBIOSIS (IS)



IS entails a sustainable, closed loop management of industrial **waste, water and energy** (in inter- or intra- firm cooperation activities) and **infrastructure or services sharing**.



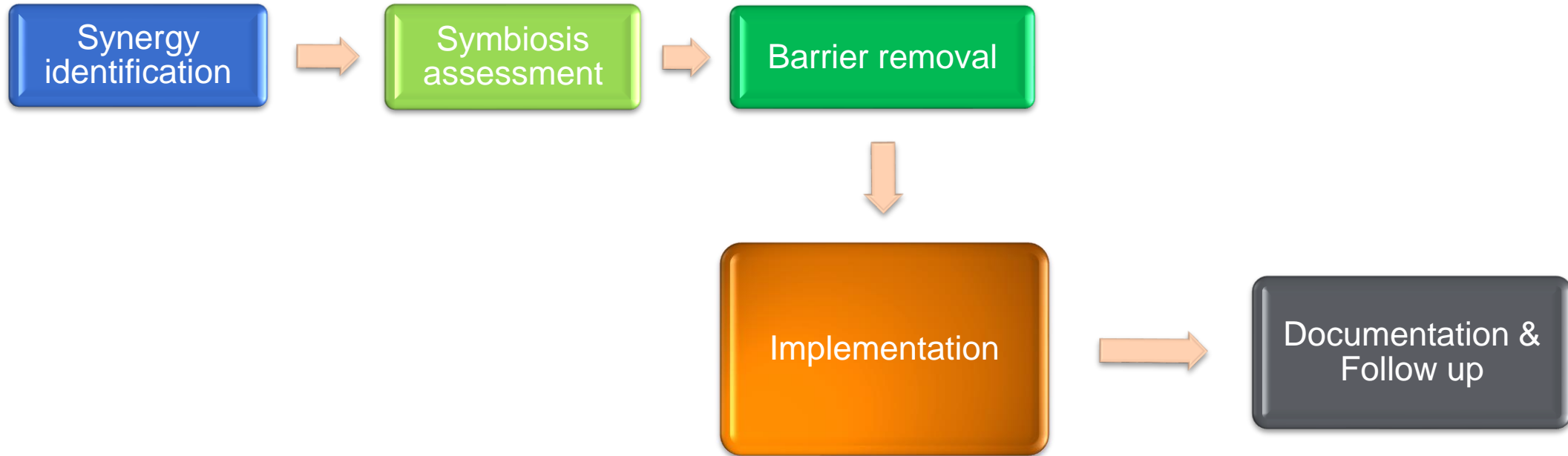
Challenges & Barriers:

- communication among stakeholders and information exchange
- data collection regarding resources (quantity, quality, supply pattern, etc.)
- accurate identification and characterization of streams

ICT tools



INDUSTRIAL SYMBIOSIS LIFECYCLE STAGES



Existing tools mainly focus on the first two stages

A gap on IS life cycle facilitation and data exchange between stages is identified




PROPOSED IS DIGITAL PLATFORM

Platform will be demonstrated in **brewing/dairy, tomato, meat and fish** industries in symbiotic chains in **Greece, Italy, Spain and Iceland**, by monitoring water, energy and waste flows.



4 Large-scale Demonstrators

-  Industrial Symbiosis 
-  Tomato Processing 
-  Meat Processing 
-  Fish Processing 

accelwater.eu

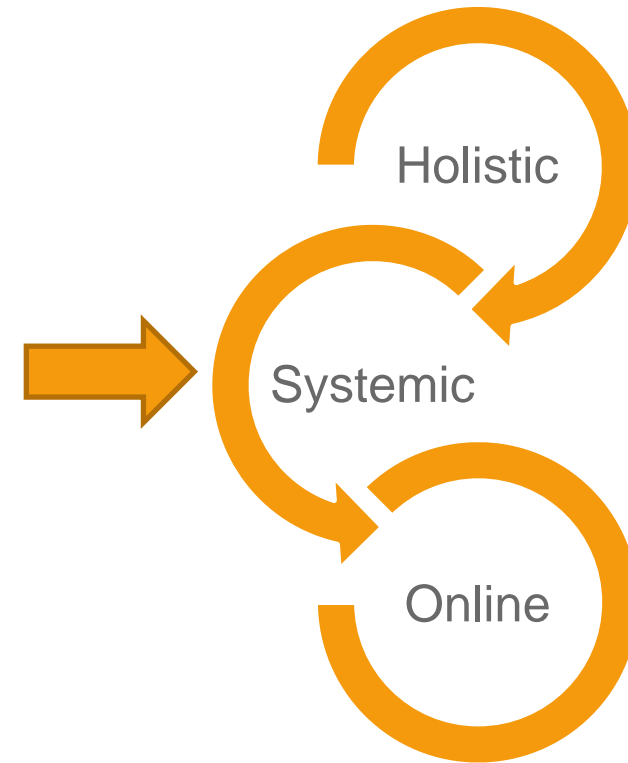
This project has received funding from the European Union's Horizon 2020 Research and Innovation programme under grant agreement No 958266



PROPOSED IS DIGITAL PLATFORM

Proposed digital platform enables:

- **intrafirm** operations' supervision by:
 - Real-time monitoring and automation of processes
 - Supporting internal management and optimization
- **interfirm** collaborations among co-located industries by :
 - Identification of symbiotic opportunities
 - Facilitating information exchange
 - Supporting optimization of symbiotic exchanges





COMPONENTS OF THE IS DIGITAL PLATFORM

- Three different components are incorporated:

IS platform



IoT-enabled Monitoring Component

- a) Monitoring and controlling
- b) Prediction and Optimization of efficiency and circularity

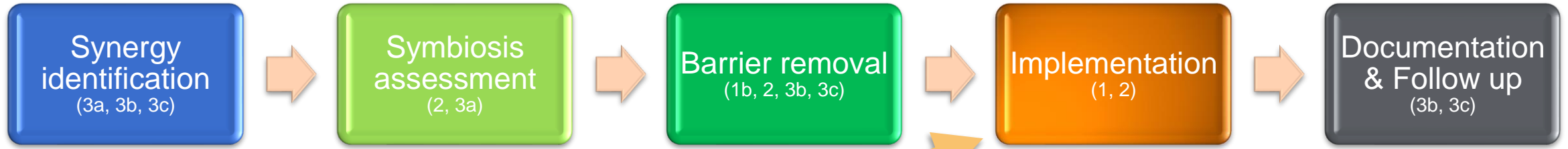
Assessments Component

- a) LCA
- b) Costs
- c) Water-Energy-Waste nexus

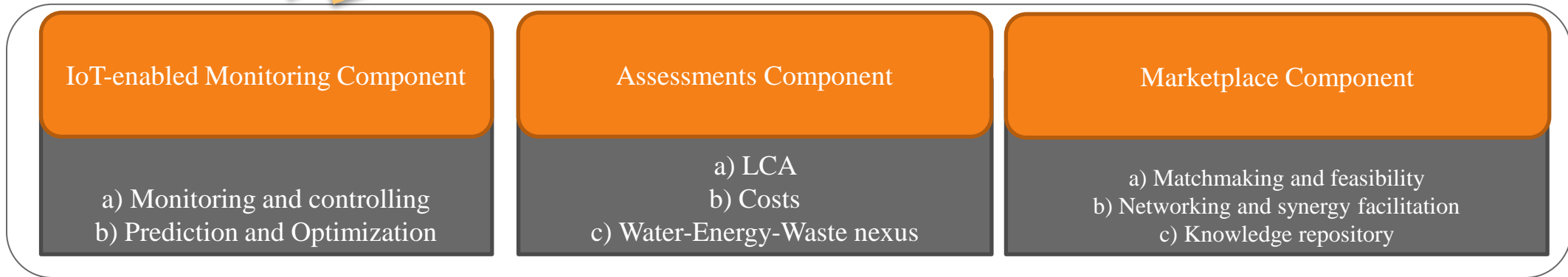
Marketplace Component

- a) Matchmaking and feasibility of potential synergies
- b) Networking, synergy facilitation
- c) Knowledge repository

IS DIGITAL PLATFORM AND IS STAGES

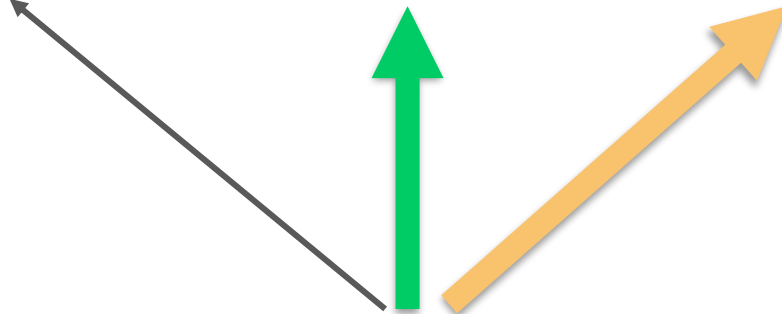
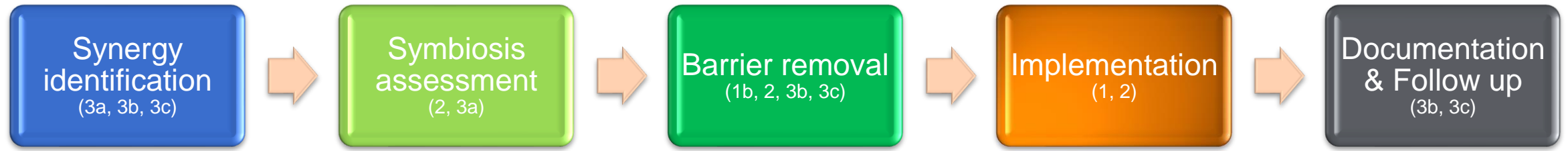


IS platform

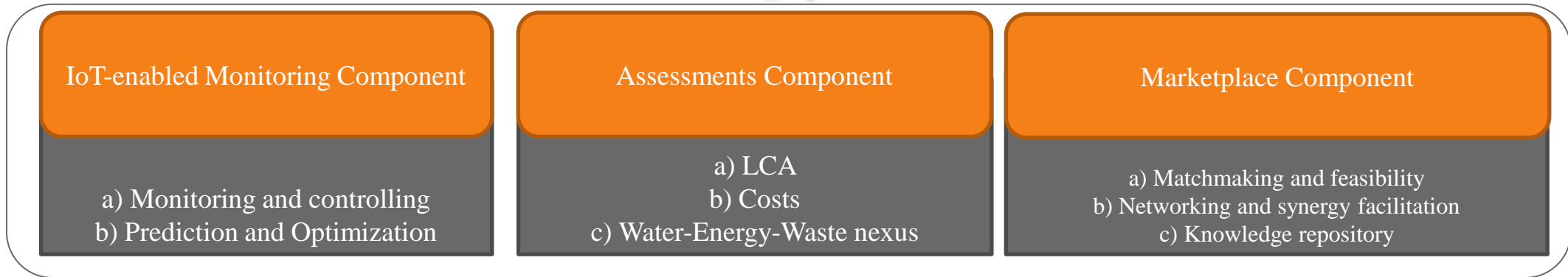




IS DIGITAL PLATFORM AND IS STAGES

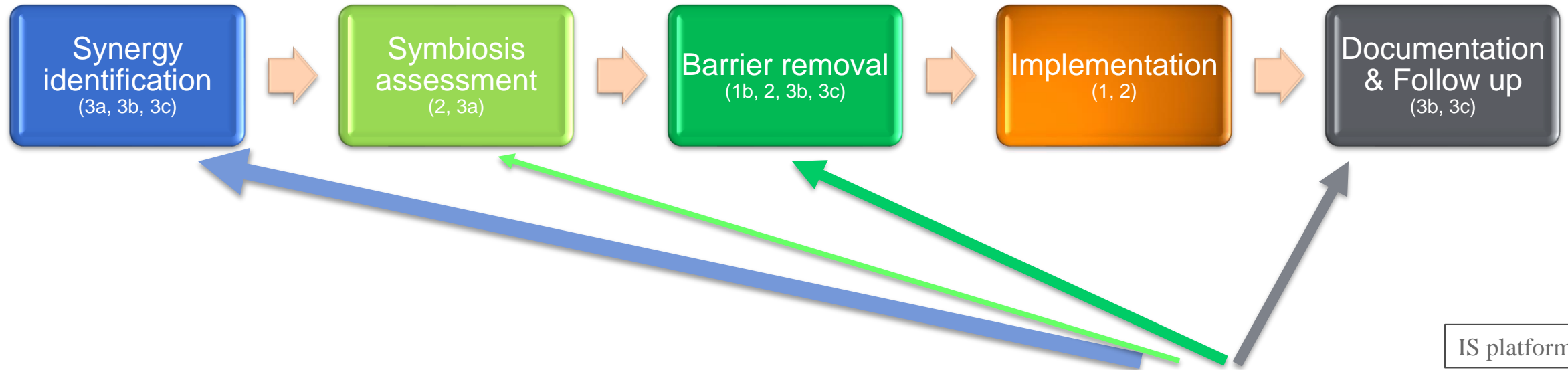


IS platform

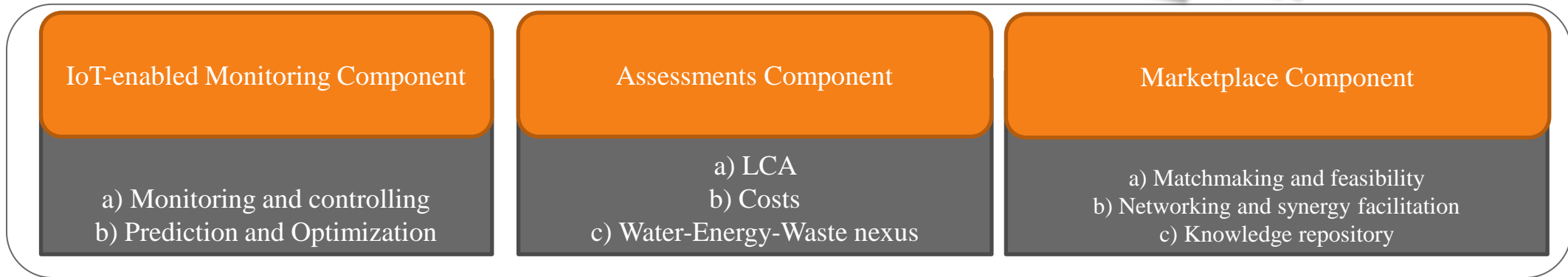




IS DIGITAL PLATFORM AND IS STAGES

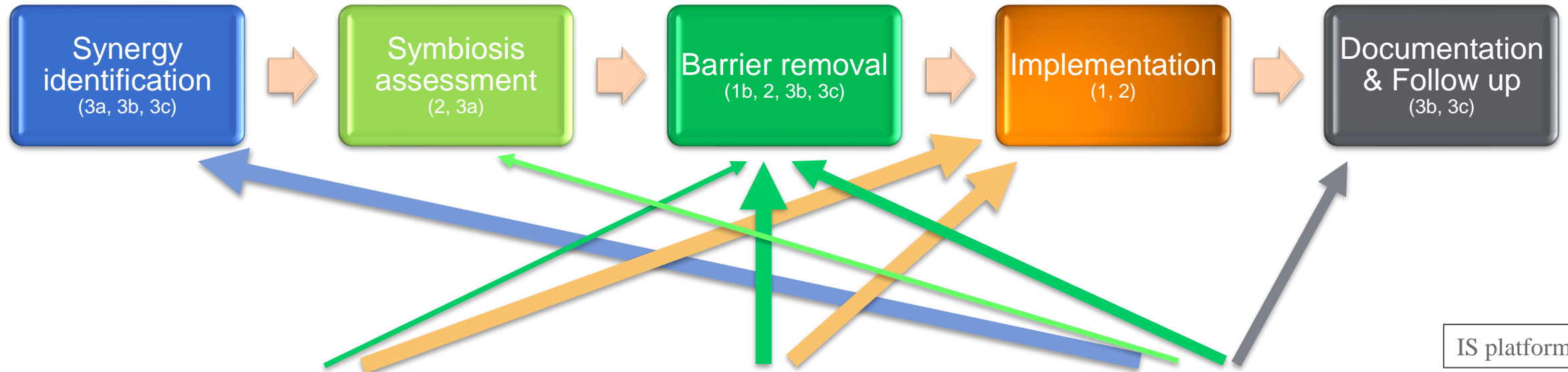


IS platform

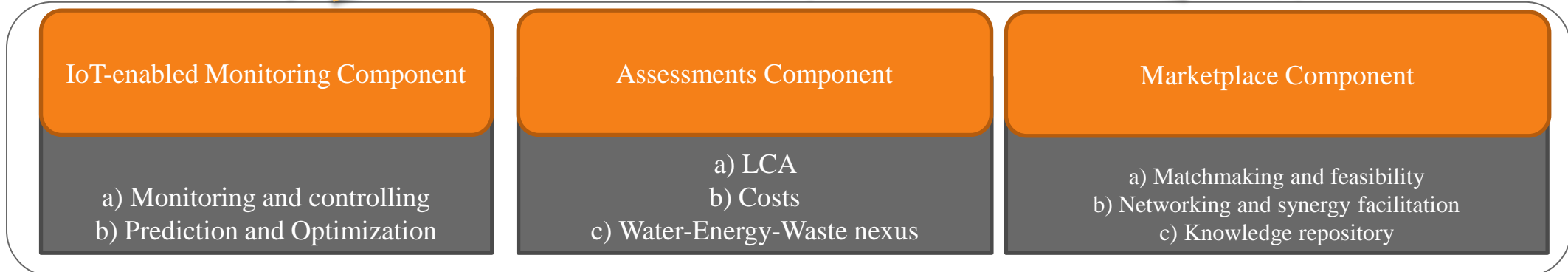




IS DIGITAL PLATFORM AND IS STAGES



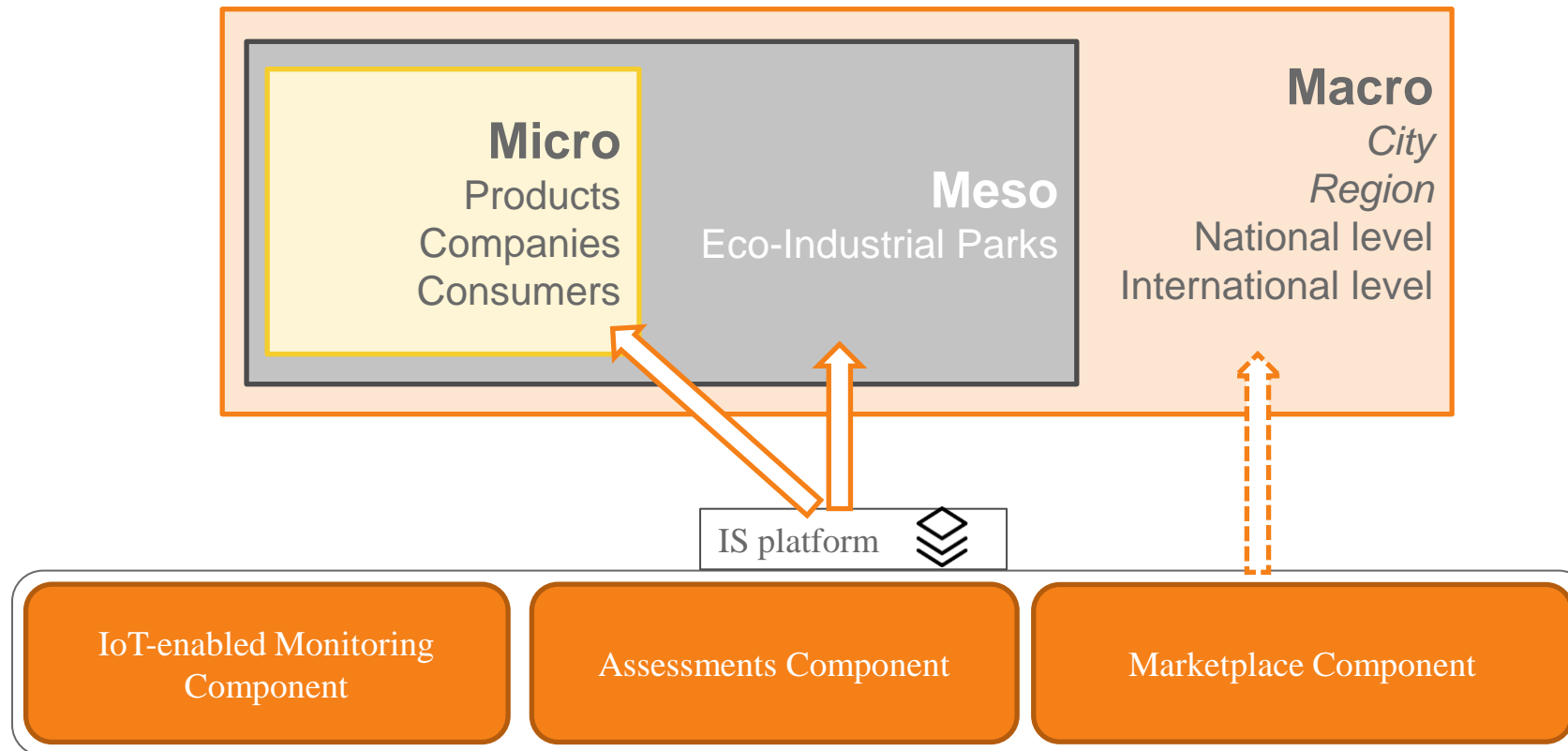
IS platform





IS DIGITAL PLATFORM AND CE TRANSITION

- CE can be supported in *micro* and *meso* levels (traditionally involving IS)
- Potentially also in *macro* level, in terms of **regional development**.

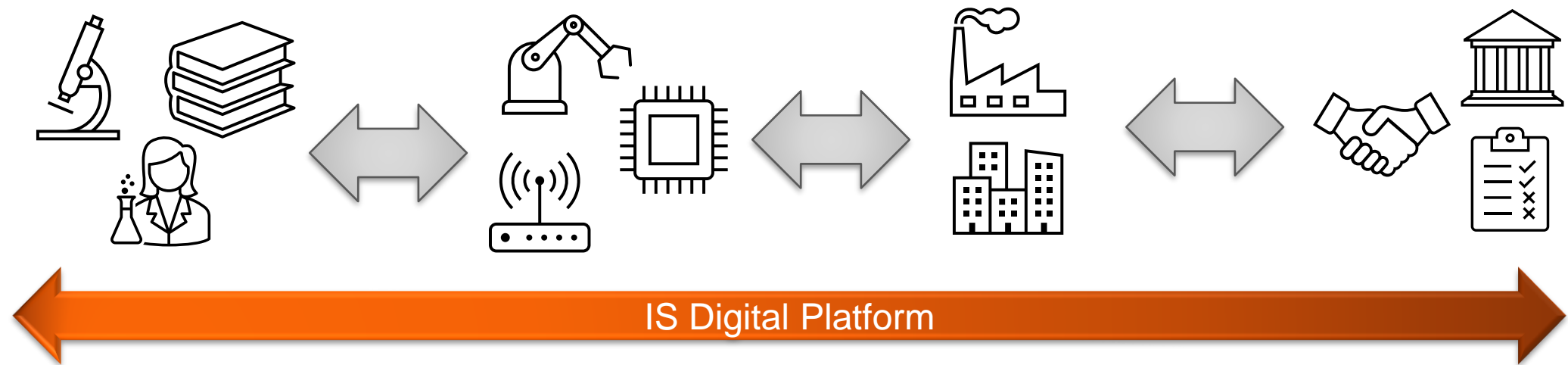




DISCUSSION

The integration of all stages into a common digital system offers end-to-end transparent information flows **connecting**:

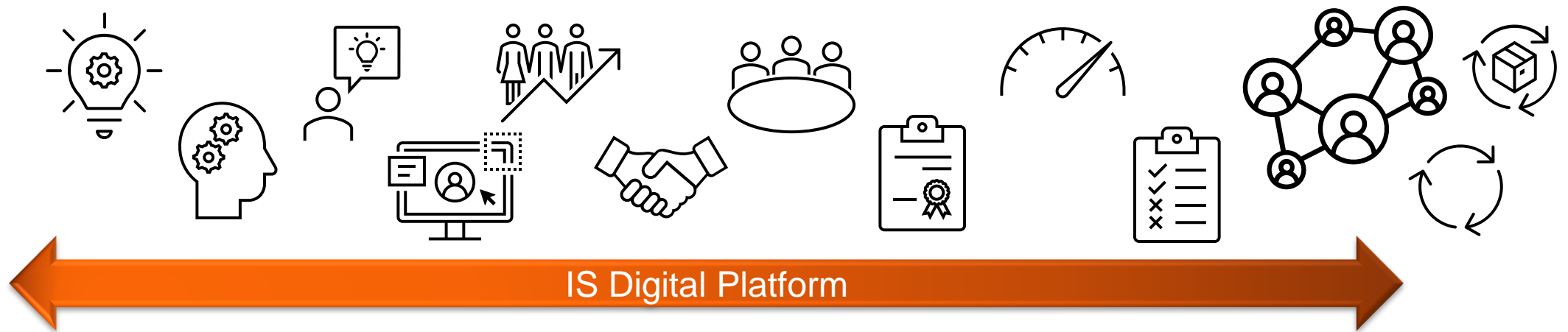
- **theory and practice:** from pilot to upscaling, from demonstration to business/legal agreements
- **research, innovation and real practice:** e.g., validating cases with real life operational data or highlighting the need of specific developments on technology.





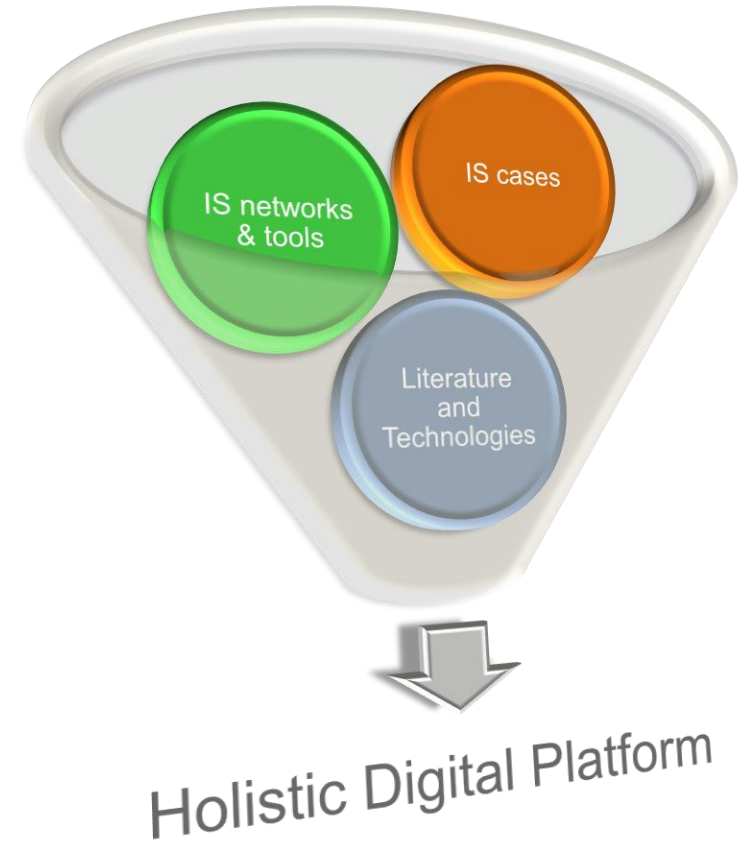
DISCUSSION

- Connect knowledge with experience & unlock opportunities
- A multidimensional **holistic test bed for IS solutions.**



CONCLUSIONS

- This work cannot be exhausted into a single project, it should include several mature digital tools, IS networks and cases running in all IS stages
- The proposed platform aims to a framework for future research by allowing activities of different IS stages interacting at the same environment providing a common language of information and forms of IS knowledge.





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Thank you!

Charalampos (Babis) Manousiadis

Researcher - Project Manager



c.manousiadis@iccs.gr



9, Iroon Polytechniou, 15773,
Zografou - Athens, Greece



<http://i-sense.iccs.gr/>



Contact us!