

GOLEM Integrated Microelectronics Solutions GmbH

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Workshop 2: Circular Economy (SPIRE, Raw Materials and
Water)

Description of the Organization



GOLEM Integrated Microelectronics Solutions GmbH, Austria is RDI SME implementing advanced methods of digital transformation, Smart Sustainable IoT Systems empowered by the novel ICT platform PharosN. The RDI addresses growing social needs in novel digital services and ICT tools providing holistic, user friendly vision of the increasingly complex interlinked urban and enterprise processes, its results, quality and sustainability. The applications: Smart factories, Smart connected assets, Sustainable circular economy with nexus of Environment, Energy, Water, Waste, Transportation and other industries. As UNIDO partner GOLEM provides smart ICT tools for sustainable inclusive development in green metropolitan areas, industries and circular economy (<http://unido.org/pharos>)

Research interests overview



Development of an unified open access architecture integrating multiple ICT platforms to support automatic collecting of all relevant big data and its transforming into holistic vision of ongoing processes in real time to allow citizens, businesses and public administration stakeholders checks status of processes, incentives and relevant information for actions.

Enable managing the sustainable performance of the overall circular economy in urban area as complex cyber-physical system of diverse smart systems of different stakeholders providing transparency of data and results

Develop and apply artificial intelligence methods and software for predictive analytics to support different stakeholders' operations by processing real time and historic data to provide decision makers with smart prescriptive analytics optimising ongoing performance for each circular economy process and mitigating possible undesirable impacts or inefficiencies.

Topic areas

The PharosN methodology and relevant digital transformation technology directly supports the following topic areas:

- “Smart, Sustainable and Resilient Cities” and “Energy Efficient Buildings”
- “Circular Economy (SPIRE, Raw Materials and Water)”
- “Smart Energy Systems and Consumers”

Research interests overview (*cont...*)

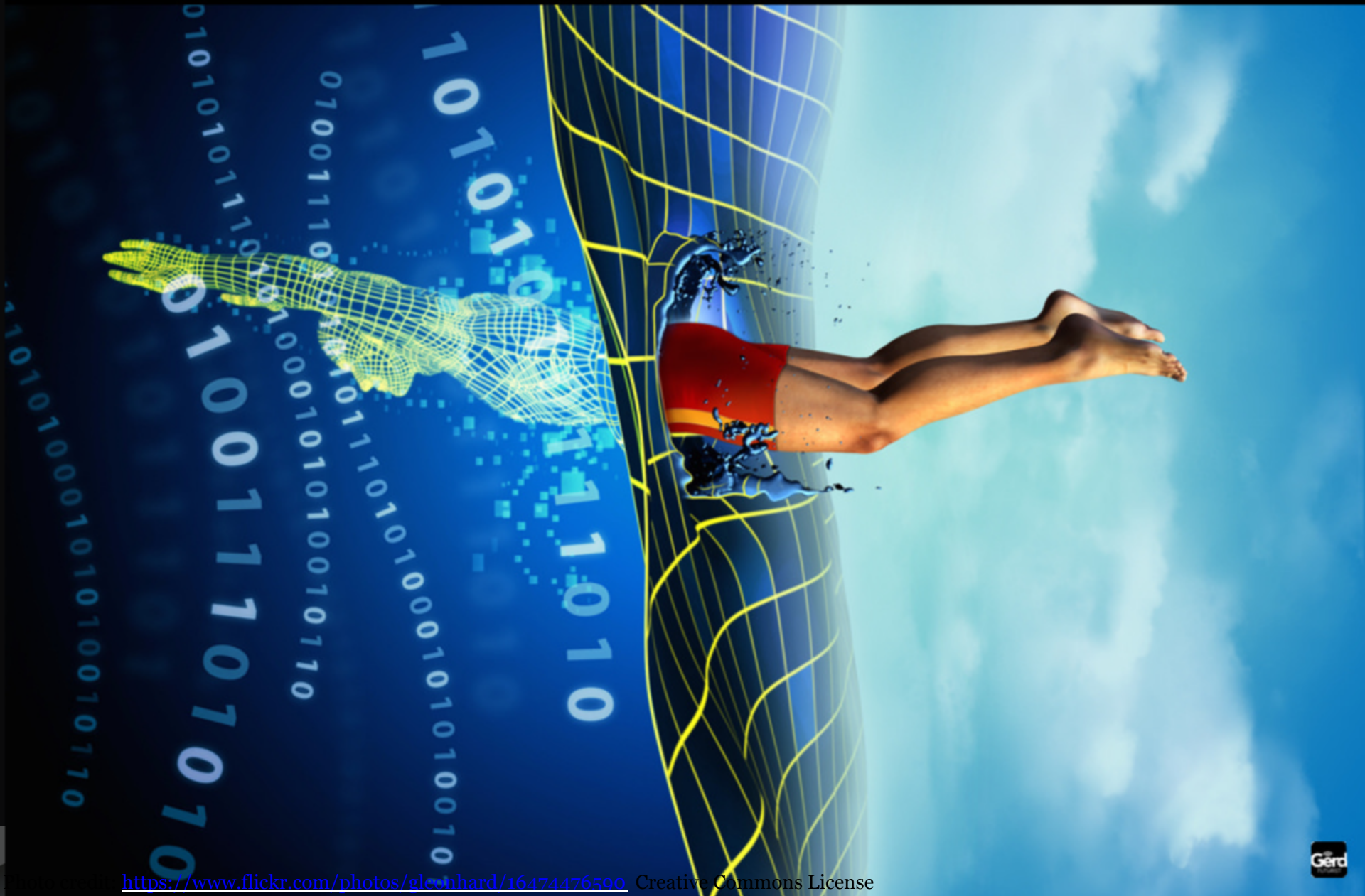


Design and prototype smart technological micro-modules enabling cost-effective assets intelligence and its integration into the whole smart sustainable system operations with LoRaWan including

- the container module: capability of detecting the container filling level (10% error for packaging, glass, paper, organic), its location and operational status;
- truck module: detect container weight, optimize routing and maintenance;
- plant module: detect percentage of rejected materials (impurities, 10% error), its processing and operational maintenance and performance results

Prototype and demonstrate these smart digital transformation solutions linked to novel technologies of waste collection, processing and regeneration in pilots to provide transparency, evidence and information support for combination of social recycling incentives, offering eco-efficient and effective systemic services to citizens and other city stakeholders

Digital transformation everywhere

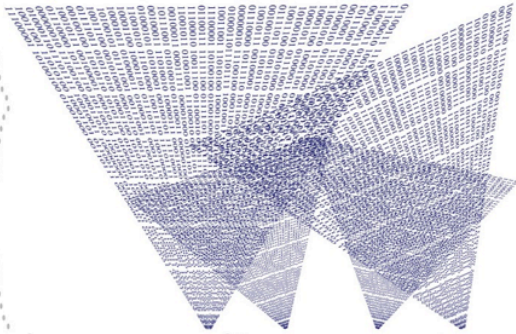


The generic ISS architecture linking the Worlds

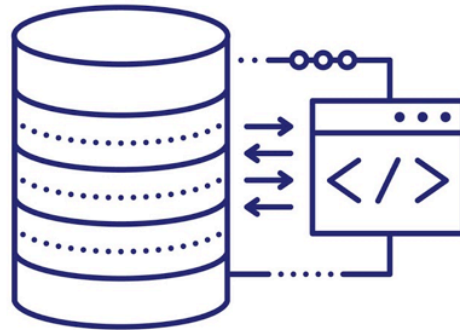


Virtual world

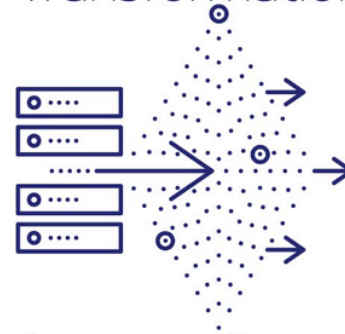
Cyber



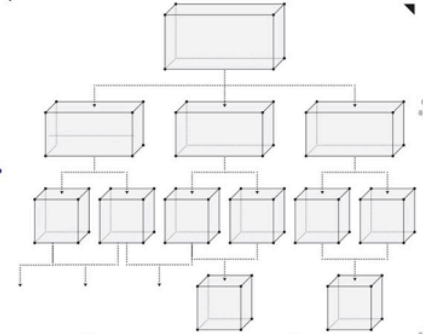
Database



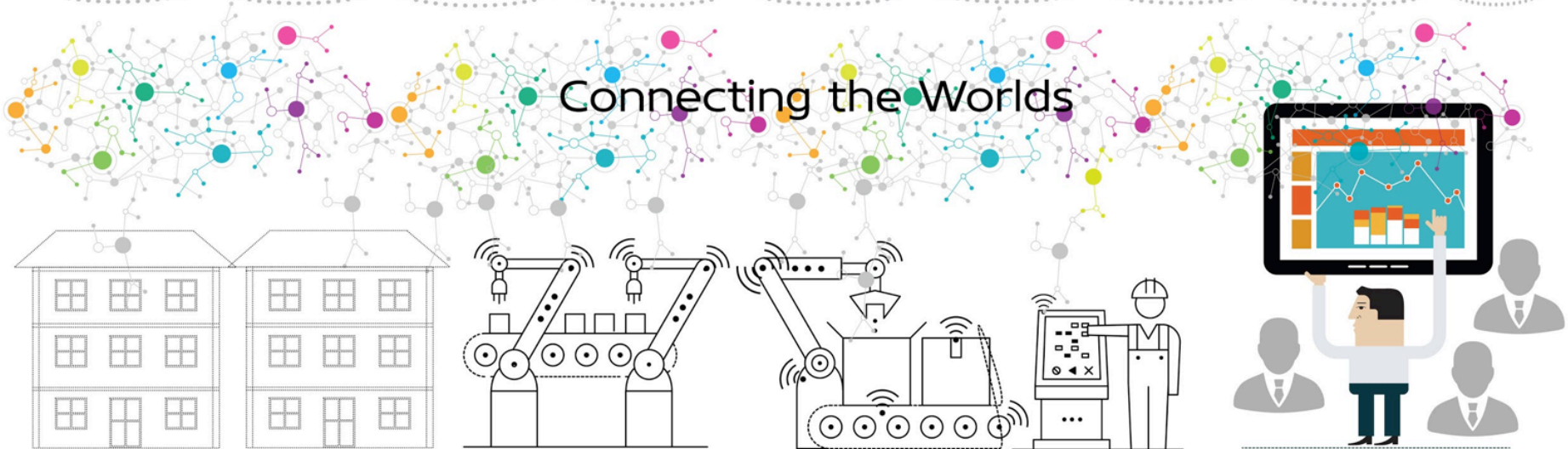
Data Transformation



OMAM



Connecting the Worlds



Physical world

Smart Connected Assets

Business Layer

TOPIC: Circular Economy SPIRE, Raw Materials, Water

PROJECT IDEA: Enabling urban communities with intelligent regeneration solutions for circular economy



Objectives:

- To RDI unified open ICT architecture integrating diverse ICT platforms and smarts assets required for implementing circular economy
- To enable easy automatic collecting of all relevant big data and it's transforming into custom information services and controls for holistic vision of multidimensional processes and its sustainability real time
- To develop and apply artificial intelligence for predictive and smart prescriptive analytics to support urban service providers by optimising performance for circular economy processes and mitigating undesirable impacts or inefficiencies
- To design smart technological micro-modules enabling cost-effective assets intelligence for intelligent operations, maintenance and its integration into smart sustainable city system
- To prototype adaptive open solutions integrating existing and novel technologies, assets and novel incentives for waste collection, processing, regeneration, reuse creating operational transparency of processes

Modeling, measuring and managing the Circle in real time



Source: European parliament

TOPIC: Circular Economy SPIRE, Raw Materials, Water
PROJECT IDEA: Enabling urban communities with
intelligent regeneration solutions for circular economy



Expected results

- TRL 7 prototypes of customizable component technologies and solutions enabling principally novel approach toward implementation of large scale circular economy processes in mid size cities based on smart digital transformation and interlinked waste collection, processing and regeneration
- Demonstration of replicable open circular economy solutions in pilots providing transparency, evidence and information support by combination of novel technology and social recycling incentives, novel business models offering eco-efficient and effective systemic services to the citizens and other city stakeholders

Consortium - profile of known partners



No	Partner Name	Type	Country	Role in the Project
01	ITENE	RTD	Spain	Coordinator
02	GOLEM IMS GMBH	SME	Austria	Digital transformation & Open model
03	FCC	IND	Spain	Technology prototyping partner
04	DBM International	IND	Italy	Incentive model, technology partner
05	Jelgava City	City	Latvia	Piloting and business models
06	Faro City	City	Portugal	Piloting and business models
07	VOLVI Municipality	City	Greece	Piloting and business models
08	Industrial Management Consulting sro	SME	Slovakia	RDI & technology partner

Consortium - required partners



No	Expertise	Type	Country	Role in the project
01	Dissemination & communication	RTD		Implementation of work packages
02	Waste recycling & processing	IND	Turkey	Technology evaluation and providing
03	Recycled economy	RTD	Turkey	Market model development, cost-benefits metrics and sustainability criteria
04	Social awareness and engagement	RTD		Study and evaluation during experimental prototyping
05	Business models and cases	RTD		Study and evaluation during experimental prototyping, pilot validation
06				
07				
08				

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