

The Silicon Economy development projects

Co-Creation | *A collaborative ideas design process and its results*

Coopetition | *Cooperation between competitors to build strategic alliances*



Digital Load Carrier Exchange

Digitalization of Import Processes
in Perishable Air Freight Logistics

Digital Consignment
Note

Identification Service
based on Natural Features

se

Development projects

Open Dynamics

Establishing an AI-based
ETA service

Dynamic break

Supply chain execution

Modular open source IoT devices

No developments without applications



A

Agile development projects are an important component of the implementation strategy for the Silicon Economy.

In the projects at Fraunhofer Institute for Material Flow and Logistics IML, solutions and components are developed for the platform economy of the future based on specific logistics use cases. One focus is on the development of technical components for Silicon Economy services and platform components for the networking of platforms and data exchange.

The duration of the development projects is usually less than a year. On a regular basis, topics for new development projects are determined – based on previous research results and with an eye to the requirements of logistics companies. Specific use cases are processed in the projects. All research results, concerning both software and hardware, are available as open source. Partners from industry are integrated in many development projects.

Each company can pursue its specific benefit prospects in the context of the project. The Silicon Economy allows them to learn about new ways of working and thinking and to build new networks.

Platform components

ensure the compatibility of Silicon Economy platforms.

Technical components

help to set up Silicon Economy services.

IoT devices

are the hardware components.

Digital Load Carrier Device

Duration: 10 months, 7/2020 – 4/2021



VIDEO

Whether with euro pallets, small load carriers or box pallets: load carrier exchange processes still take place today in a largely analog world; in the digital world, isolated solutions predominate. That is why the »Digital Load Carrier Exchange« development project focusses on designing a uniform and as simple an exchange process as possible with regard to hardware and software.

Contact

Patrick Becker, patrick.becker@iml.fraunhofer.de

Julian Hinxlage, julian.hinxlage@iml.fraunhofer.de

Digitalization of import processes in perishable air freight logistics

Duration: 7 months, 5/2021 – 11/2021

International airports connect production sites and consumer markets in metropolitan areas throughout the world and play a vital role in high-end and express transportation, in particular where perishable freight is concerned. The project intends to ensure that customs clearance processes can be paperless. The components developed in the project are to be tried out and tested in a series of tests to be run under realistic conditions in cooperation with companies in the industry.

Contact

Oliver Ditz, oliver.ditz@iml.fraunhofer.de

Emanuel Skubowius, emanuel.skubowius@iml.fraunhofer.de



Identification Service based on Natural Features

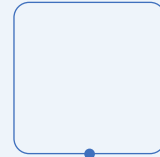
Duration: 7 months, 5/2020 – 11/2020

The identification processes for load carriers are still very time and person-
nel-intensive, as they are mainly based on barcodes. In this context, the
project is developing a fully automated recognition and identification system
for shipping units without barcodes.

Contact

Julian Hinxlage, julian.hinxlage@iml.fraunhofer.de

Jérôme Rutinowski, jerome.rutinowski@tu-dortmund.de



Building an AI-based ETA service

Duration: 10 months, 7/2020 – 4/2021

The stated goal of any logistics service provider is to provide its customers
with reliable arrival times. In the development project the scientists now
want to set up a learning system arranged in the form of an open framework.

Contact

Kai Hannemann, kai.hannemann@iml.fraunhofer.de

Alex Rotgang, alex.rotgang@iml.fraunhofer.de



VIDEO



STORY

Dynamic Break

Duration: 10 months, 7/2020 – 4/2021



STORY

Work organization and resource control in the warehouse can become more flexible through dynamic breaks organization. In the development project the scientists are developing an exemplary service that can be integrated in the IT infrastructure and the logistics processes of both a company and the transport itself.

Contact

Veronika Kretschmer, veronika.kretschmer@iml.fraunhofer.de
Norman Grünewald, Norman.Gruenewald@iml.fraunhofer.de

Supply Chain Execution

Duration: 10 months, 7/2020 – 4/2021



VIDEO



STORY

Because of the low value of each individual article within C-parts supply, logistics companies are under particular pressure to design efficient processes. At the same time, the potential for intelligent services to reduce the planning and organization effort is great. In the »Supply Chain Execution« development project, various services for the exchange of information in large supply chains and logistics networks are now being developed which will become part of the Silicon Economy as open source solutions.

Contact

Emanuel Skubowius, emanuel.skubowius@iml.fraunhofer.de
Jana Jost, jana.jost@iml.fraunhofer.de



Modular Open Source IoT-Devices

Duration: 16 months, 7/2020 – 10/2021

It is elaborate and expensive to develop IoT devices that are individually adapted to the processes and conditions of a logistics company and that capture, store, process and transmit data. Qualitative advantages and indirect savings cannot be determined and visualized without a proof-of-concept in real operation. In the »ModularOpen Source IoT Devices« development project a modular system is being developed that makes a simple configuration of IoT devices possible.

Contact

Sebastian Wibbeling, sebastian.wibbeling@iml.fraunhofer.de

Sören Kerner, soeren.kerner@iml.fraunhofer.de



BLOCKCHAIN-DEVICE

Open Dynamics

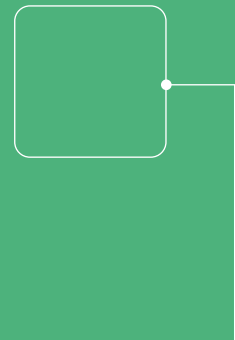
Duration: 15 months, 8/2020 – 10/2021

There are still practically no automated guided vehicles (AGV) working fully autonomously today. The few autonomous systems that do exist are proprietary and do not offer any standard interfaces. In this context, this project aims to extend a swarm robot's application area from within halls and warehouses to include outdoor areas. The main focus is on navigation and simulation as well as sensor technology and localization. The project builds on the research results and vehicle base of the LoadRunner®. The AGV, a Fraunhofer IML development, is considered to be the first component for the Silicon Economy.

Contact

Sören Kerner, soeren.kerner@iml.fraunhofer.de

Guido Follert, guido.follert@iml.fraunhofer.de



Digital Consignment Note

Duration: 7 months, 5/2021 – 11/2021

Consignment notes, as accompanying documents for freight in national and international freight traffic, are often still created manually and on paper today. No uniform layout has been established either yet. This project aims at implementing a digital service for the generation, storage and further processing of digital consignment notes for both national and cross-border transport. At the same time, an e-freight folder is being developed – a digital folder for truck transportation in which further documents can be stored in addition to the digital consignment note.

Contact

Patrick Becker, patrick.becker@iml.fraunhofer.de

Maximilian Schellert, maximilian.schellert@im.fraunhofer.de

Contact

Silicon Economy
c/o Fraunhofer Institute for Material Flow and Logistics
Joseph-von-Fraunhofer-Straße 2-4
44227 Dortmund
www.silicon-economy.com
info@silicon-economy.com



Gefördert durch:



aufgrund eines Beschlusses
des Deutschen Bundestages

Strategy Development:

Dr. Michael Schmidt,
michael.b.schmidt@iml.fraunhofer.de

Network + Knowledge transfer:

Andreas Nettsträter,
andreas.nettstraeter@iml.fraunhofer.de

Community Management:

Christian Prasse,
christian.prasse@iml.fraunhofer.de

Marketing an Communication:

Ellen Sünkeler,
ellen.suenkeler@iml.fraunhofer.de

As of August 2021