D2.5 — Semantic database supporting at least two sub-systems

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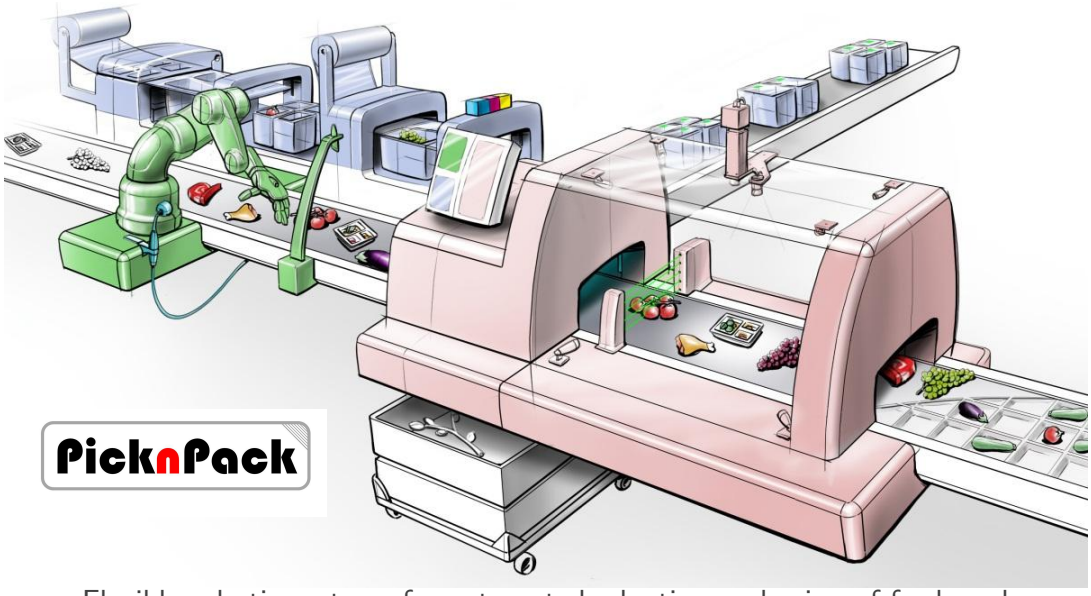

Flexible robotic systems for automated adaptive packaging of fresh and processed food products

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Dissemination level		
PU	Public	**X**
PR	Restricted to other programme participants (including the EC Services)	
RE	Restricted to a group specified by the consortium (including the EC Services)	
CO	Confidential, only for members of the consortium (including the EC Services)	

This document is about the *software* prototypes that have been developed to support the integration of various modules in a Pick-n-Pack food processing line.

The approach taken in the developments was to use the very recent and active developments in the broad domain of "the Web", as driven by major net-based companies like Facebook, Twitter or LinkedIn. More in particular, we started to use of *JSON* systematically as *semantic modelling language*, and *NoSQL* databases (such as RethinkDB, with graph-based query languages such as ReQL or GraphQL) together with *event stream* communication as the middleware. Together

The project hosts all its commonly shared and developed software on a *GIT* server, https://gitlab.mech.kuleuven.be/rob-picknpack, and access to it is via a username and password. Reviewers interested in exploring the concrete code of the prototype are invited to request a login to the GIT server by email to herman.bruyninckx@mech.kuleuven.be.

The prototype consists of the following two major components:

- the *semantic models*, in https://gitlab.mech.kuleuven.be/rob-picknpack/pnp-line/tree/json_models. These formally represent what the project uses as semantic relationships between a *plant*, a *line*, a *module* and a *device*, and which *world model* information they have to share (the shape and location of all trays of packages; the events that signal the creation of a new batch of trays, and its motion through the line; etc.)

- the *event communication*, in https://gitlab.mech.kuleuven.be/rob-picknpack/pnp-line/tree/master. This repository provides the generic communication infrastructure (based on ZeroMQ and Zyer), and the specific extensions for each of the modules in a Pick-n-Pack line. We have started with the two initial modules, namely the line controller module, and the thermoformer module; one by one, such extensions are being added for each new module that becomes available.

One of the modules will connect to the *tracing database* (WP3), by selecting the set of events and their semantic tags that are relevant for the tracing requirements of the line.

All of the above developments are highly configurable, and are designed to integrate more and more semantic tags and semantic relationships, as soon as they become available.