

Materials Ontology Workshop Brussels, June 29th 2018

Enrico G. Caldarola, PhD

Background

- **MSc degree** at Polytechnic of Bari (ITALY);
- **Internship and first work experience** at Knowledge Factory at **IBM ITALY** where engaged in the design of an ontology about the **internationalization** services for SMEs and developing a semantic-web application;
- **PhD** at University of Naples «Federico II» defending a thesis entitled: «*A multi-strategy methodology for ontology integration and reuse. Integrating large and heterogeneous knowledge bases in the rise of Big Data*»;
- Currently, **research fellow** at *Institute of Intelligent Systems and technologies for Advanced Manufacturing (formerly, Institute of Industrial Technologies and Automation)*, group: *EVA (Enterprise Virtual Application)*, **Italian National Council of Researches (CNR)**.

Involvement in previous projects

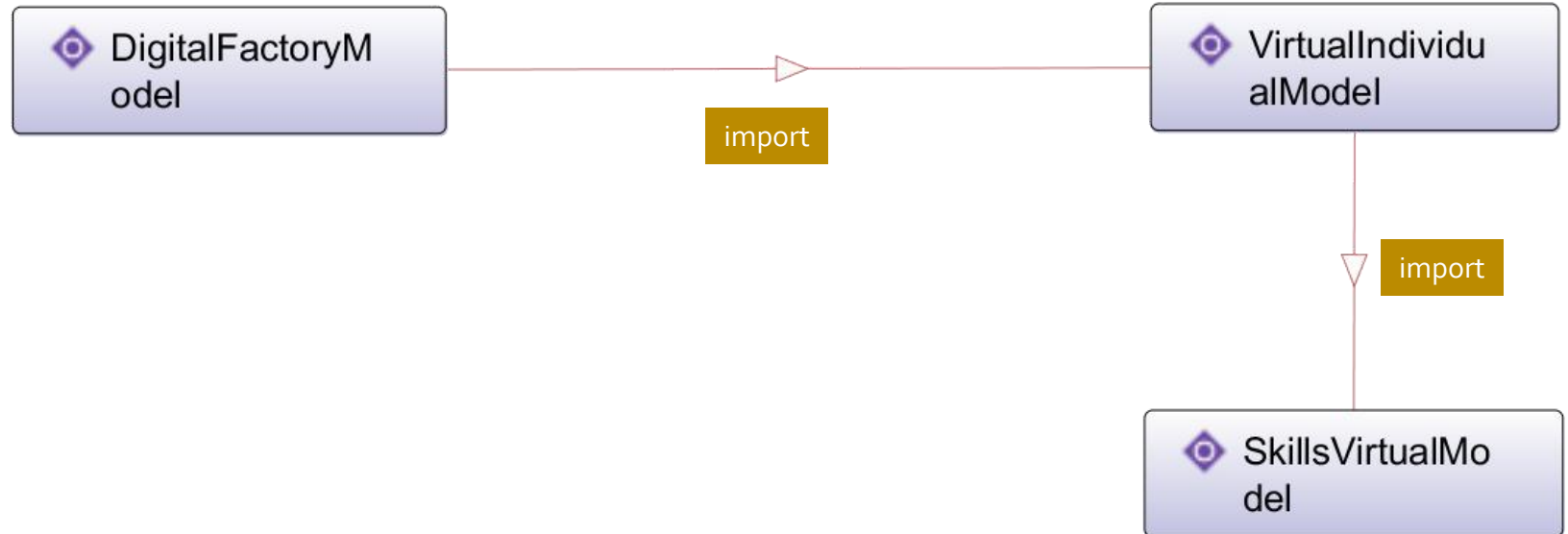
- **Inter-IoT**: European project aiming at designing, implementing and testing a framework that allows interoperability among different Internet of Things (IoT) platforms;
- **Apps4aME**: European project which aims to enhance interoperability among engineering tools used in advanced manufacturing by integrating existing knowledge models;
- **Pegaso**: European project exploiting sophisticated and engaging gamification techniques for motivating behavioral changes towards healthy lifestyles in the younger population.
- **Virtual Factory Framework (VFF)**:) aims at developing an integrated framework to implement the Digital Twin.



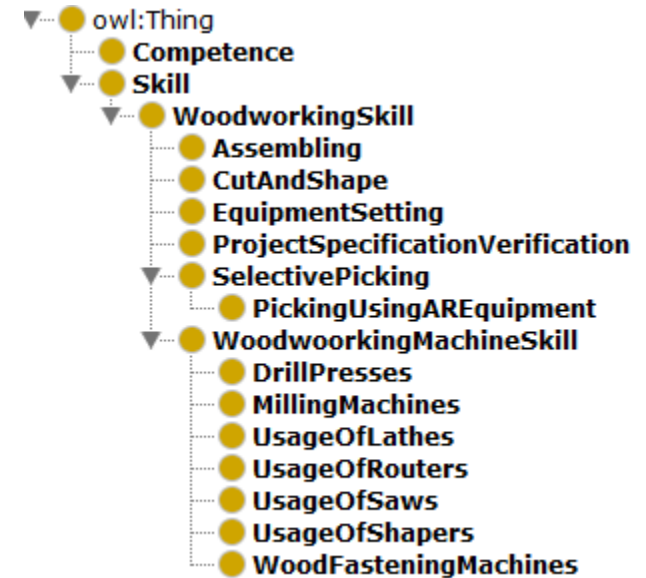
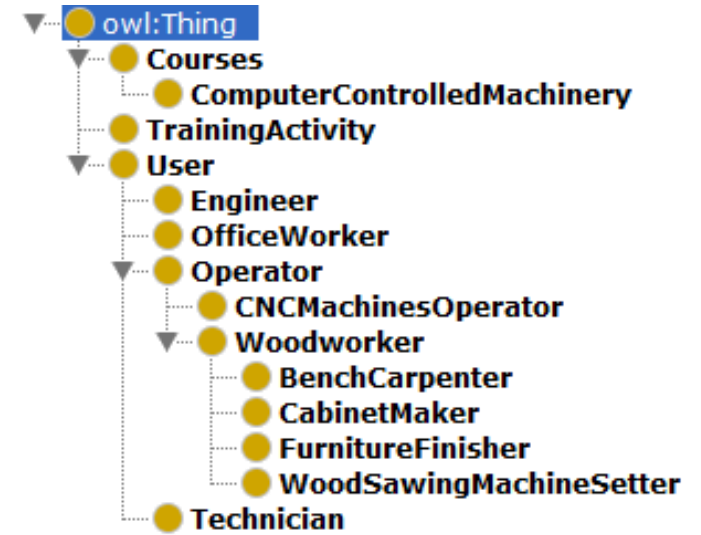
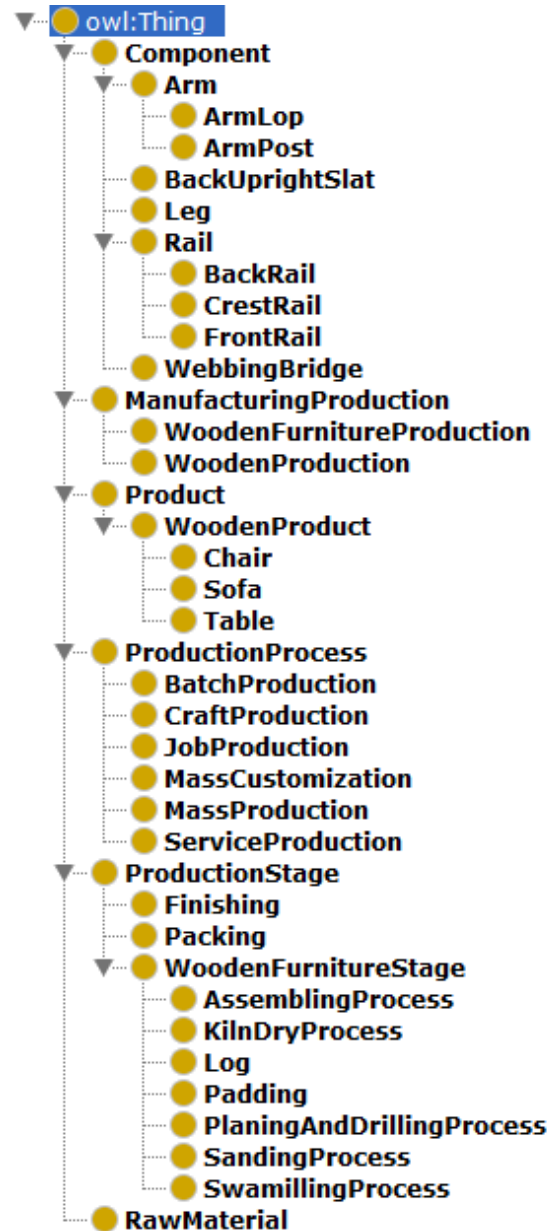
Research activities and fields of application

- Ontology **modelling** and **design** by reusing existing reference models in the literature;
- Ontology **alignment** and **integration** by adopting a multi-strategy approach combining existing techniques for ontology matching;
- **Digital Twinning** for advanced manufacturing. Implementing the Digital Factory;
- **Smart Home** and Universal Design;

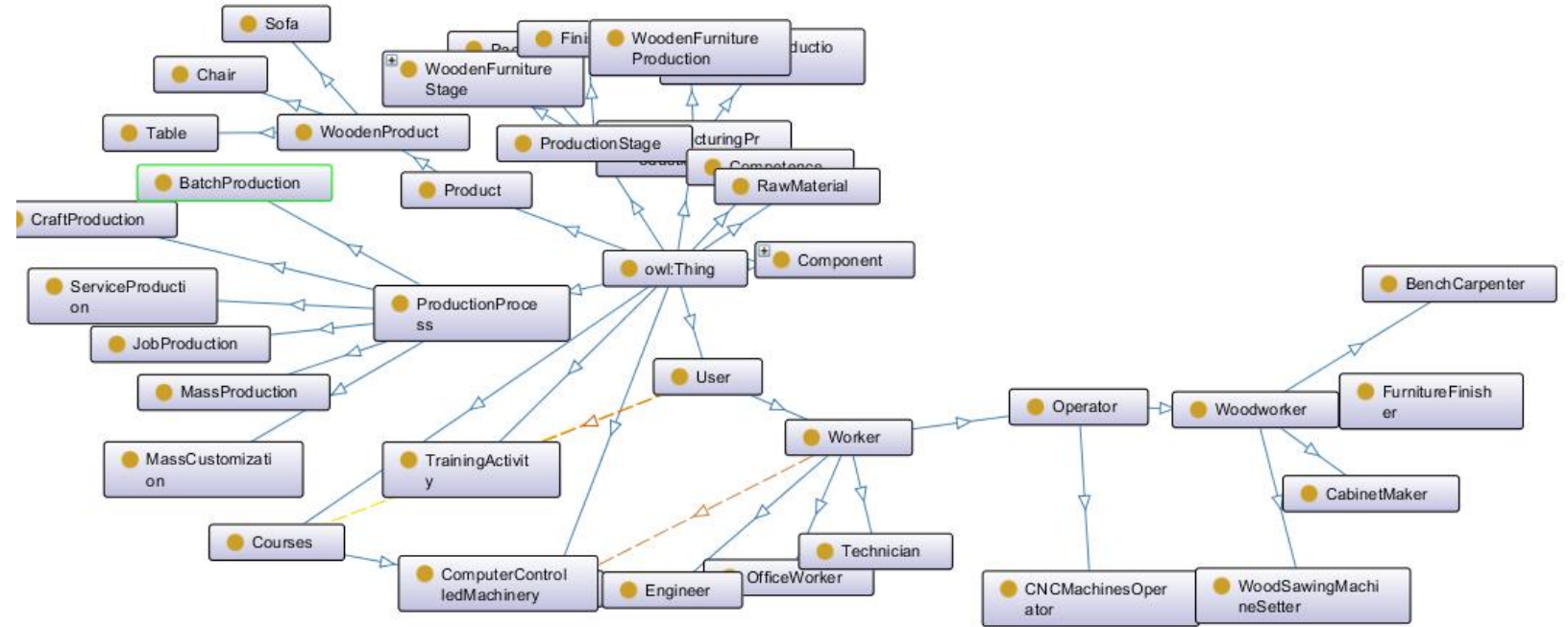
Ontology excerpts.
Digital Factory
(eKnow 2018)
import schema



Ontology excerpts. Classes hierarchy



Ontology excerpts. Logical Links



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<input checked="" type="checkbox"/>	— hasSkill (Domain>Range)

Main Publications

- CALDAROLA, Enrico G.; PICARIELLO, Antonio; RINALDI, Antonio M. An approach to ontology integration for ontology reuse in knowledge based digital ecosystems. In: Proceedings of the 7th International Conference on Management of computational and collective intelligence in Digital EcoSystems. ACM, 2015. p. 1-8;
- CALDAROLA, Enrico G.; RINALDI, Antonio M. A Multi-strategy Approach for Ontology Reuse Through Matching and Integration Techniques. In: Quality Software Through Reuse and Integration. Springer, Cham, 2016. p. 63-90.
- Modoni, G., Caldarola, E., Terkaj, W., & Sacco, M. The knowledge reuse in an industrial scenario: A case study, eKnow 2015;
- Caldarola, Enrico. "A multi-strategy methodology for ontology integration and reuse. Integrating large and heterogeneous knowledge bases in the rise of Big Data." (2017), PhD Thesis, unina.it;
- Caldarola, Enrico G., Gianfranco E. Modoni, and Marco Sacco. "A Knowledge-based Approach to Enhance the Workforce Skills and Competences within the Industry 4.0.", eKnow 2018, Rome.

Contacts

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EVA

The Human Oriented Future Factory

The main activities of the group are tackling the development and the deployment into European manufacturing companies of new and advanced human-oriented supporting tools, in order to foster the innovation in products / processes / factories for