

# iBUS - AN INTEGRATED BUSINESS MODEL FOR CUSTOMER DRIVEN CUSTOM PRODUCT SUPPLY CHAINS



The overall objective for iBUS was to develop and demonstrate by August 2019 an innovative internet based business model for the sustainable supply of traditional toy and furniture products that is demand driven, manufactured locally and sustainably, meeting all product safety guidelines, within the EU. The iBUS model focuses on the capture, creation and delivery of value for all stakeholders – consumers, suppliers, manufacturers, distributors and retailers.

## PROJECT OVERVIEW

### DURATION



09/2015 – 08/2019

### PARTNER



- Paderborn University (C.I.K)
- University of Limerick
- Fabrica de Juguetes SL
- Juguettos central de compras scoop
- MCOR Technologies Ltd.
- ManOpt Systems Ltd.
- Daussalt Systems UK Ltd.
- AIJU: Technological Institute for Toys
- Cartamundi Digital
- WAZP
- SDRUŽENÍ PRO HRAČKU A HRU

### FUNDED BY



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### RESEACHER



Research Leader  
Prof. Dr.-Ing. Rainer Koch  
Coordination  
Anne Kruse, M.Sc.



### Objectives

Traditionally, the process of making has been linearly with a number of distinguishable steps. Internal R&D personnel designed new products, purchasing personnel managed suppliers, products were made by manufacturing (often standard products in large volume), marketing and sold products.

iBUS model changes this paradigm. Its overall objective is to develop and demonstrate an innovative integrated business model for the sustainable supply and manufacture of safe traditional toys and nursery furniture. The model is demand driven, whereby products are customised and designed online by consumers or home-based designers, manufactured locally and sustainably to order, and meet product safety guidelines.

### Procedure

For supporting the customers embedded services in iBUS was developed in the main by SME Technology providers. These services include augmented reality design assistants, design verification tools for compliance with EU product safety guidelines, analysis of environmental footprint and prototyping with additive layer / 3D printing. Subsequently, parametric engineering design principles will take the design from concept to demand. This demand will then be synchronised and optimised across the supply chain, supported by the embedded supply chain optimisation tools, to produce sustainable demand driven production and supply plans.

Manufacturers will then produce the furniture and toys in small-scale series production driven by the actual customer demand. Suppliers will have visibility of, and make decisions based on, end-customer demand. Likewise, customers will have visibility of their orders through all stages of production and delivery. The infrastructure will be cloud based using internet and social media technologies, allowing interaction and collaboration, but also accessible to homebased or small business users, promoting social inclusion. iBUS had a budget of 7.440.362€ whereas 6.065.305€ are funded by the European H2020 programme.

Main participation of DMRC was in the WP3 “Customised Product

Design Virtual Environment". Here a software system was in focus of development enabling the customer to design or adapt the product by himself. Self-designed products have to be manufacturable and to meet the European safety guidelines. Therefore, an automated safety check has to be performed by the system to ensure these requirements leading to a safe production and use. The manufacturing is supposed to be done locally and demand driven at home or at small fab shops near to the customer, mainly by additive manufacturing.

#### Latest results

Key progress of the iBUS business project during the last year of the project can be summarized as getting closer to the overall objective step by step. A first demonstrator to transfer the main idea of self-customization has been developed and successfully validated. The platform demonstrator allows customization of use cases defined in the project embedding different software solutions. Enabling a parametrization of products following specific rules has been achieved so that customers come up with individualized toys in safe borders. Design Rules as well as safety rules for to meet all requirements regarding EU regulations for toys safety have been derived considering different manufacturing processes and materials.

As a cost calculation is also in focus of the WP3 objective existing approaches have been developed further. So a formalized concept to calculate nested build jobs has been created. In the context of iBUS this is very important to achieve an accurate on-the-fly calculation so that the acceptance of end-customers for additively manufactured product can be increased by showing effects of selecting different material and therefore manufacturing processes as well as batch sizes or combination with multiple products monetary.

In the last month of the project, the web based software solution was developed further to integrate more features bringing the envisaged stakeholders closer together. Furthermore the iBUS project is looking for further use cases to validate the functionalities of the already existing modules to check manufacturability and safety issues as well as cost calculations. To bring the whole platform in a working status the demand as well as the supply network needs become broader. Interested companies are very much invited to contribute and participate from the iBUS vision by joining the special interested group. There are a lot of interesting areas for different players: From Toy manufacturers to AM and logistics service providers but also for all creative minds out there!

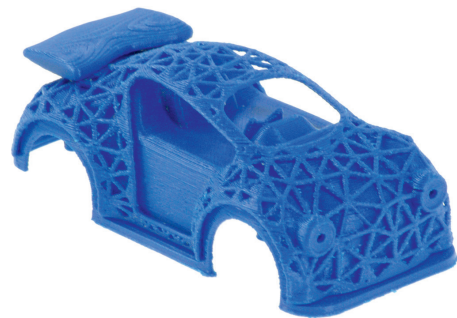


FIGURE 1 Customized toy car bodies meeting european safety requirements