

Object-Oriented-Upcycling: An object-based approach to the circular economy

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In this project we explored the notion of Furniture User Interfaces within the context of dreams and dystopias in future urban living. In this context some fundamental questions arise; How can furniture design evolve while maintaining and supporting our quality of life, together with notions of sustainability, circularity and respect for the environment in the context of an exponential population increase rate? And, how do these objects interface and co-exist within these tensions?

This paper introduces a preliminary framework to address upcycling from an object-oriented perspective. Upcycling is defined by Wegener as: “the perfect mix between ‘*upgrading*’ and ‘*recycling*’. To upgrade is to add value and to recycle is to reuse” (Wegener, 2016). This process connects with Aristotelian notions of design and productive knowledge which are concerned with something coming into being and competing standards of value (Galdon, 2019). In this paper, we are approaching this process from an Object-Oriented-Ontology. For Harman the research programme of OOO is precisely focused “to magnify the tensions between the object and its appearance to consciousness, or the object and its qualities”, by invoking “the constant formation of hybrid entities in which humans’ fuse with non-humans” (Harman, 2015). We do so by conducting a case study on furniture design. In this context, a bidirectional multi-level taxonomy is presented to address notions of design, manufacturing, sustainability, circularity and respect for the environment. Based on research findings, the authors recommend the integration of Object-Oriented-Upcycling strategies in the design process, as they insert a method for the re-materialisation of local waste into usable furniture.

This project was divided into five design phases and was implemented during four weeks. Project phases were: Research territory, Concept generation & ideation, Design development which concluded with a selected CMF (Colour, Material and Finish), Production, and Presentation. In this process a constructivist approach was implemented. Constructivism states that learners construct meaning only through active engagement with the world (such as experiments or real-world problem solving). In this study, we are presenting two case studies to illustrate the concept of Object-Oriented-Upcycling (OOU) as an object-based approach to the circular economy.

In the two cases addressed in this paper, students decided to operate with local waste as their research territory. In order to develop their concept generation and ideation, they started by mapping waste on their local area around the Royal College of Art campus. These insights directed and informed their decisions. Case 1 decided to operate with off-cuts generated by the college workshops, whereas Case 2 decided to operate with local waste generated in the eating areas; in this case the designer selected specifically chopsticks.

Case 1 approached the re-materialisation of waste by selecting an established chair typology. Then, deconstructed its components, and reconstructed them by using cut-off from the workshops. Whereas, Case 2 focused in a single object and developed a multiplicity of methods to inform the construction of a chair. These approaches resulted in diametrically different strategies to implement design outputs in the context of Object-Oriented-Upcycling. We can define these processes as top-down and bottom-up strategies in the re-materialisation of waste into functional furniture. They were articulated around two main methods which we characterise as; De-Reconstruction and Singularity.

Case 1 (De-Reconstruction) integrated a multiplicity of construction methods building from traditional furniture making joinery techniques. The challenge was to construct the chair without using glue, therefore, it could be totally deconstructed and the material could be reused again. The chair uses only nine screws to reinforce key structural elements to provide a comfortable seating experience.

Case 2 (Singularity) developed a multiplicity of methods based on traditional steam techniques. These processes allowed the student to generate a range of structural reconfigurations of the initial element (chopsticks). This development led to a modular system of construction. From this point, the student investigated structural potentialities to enhance the properties of the unit of construction. All the units were integrated by means of three perforated platforms to hold the chopsticks in place by compression, therefore avoiding the use of glue. As a result, the final implementation provided a highly robust structure-shape correspondence, while allowing the units to be disassembled for future typological reconfigurations.



Figure 1. Case 1 - De-Reconstruction (Left) by Sille Bertelsen, and Case 2 - Singularity (Right) by Jeremy Hulse

This project used chairs as representations of the everyday to address issues of waste management and circularity in the context of furniture design. In this context, De-Reconstruction and Singularity have been identified as fundamental methods to implement an Object-Oriented-Upcycling as an object-based approach to the circular economy. These methods represent two diametrically opposed perspectives for

its development which we characterise as top-down and bottom-up in this paper. In this process, local contextual research via mapping techniques and material properties identification played a fundamental role. Finally, the implementation of a multiplicity of techniques enabled a deep exploration of potential states and configurations. All these aspects resulted on high-quality structural and aesthetic outputs to enhance the value of wasted material and exemplify a new approach to waste management and circularity in the context of furniture-related products.

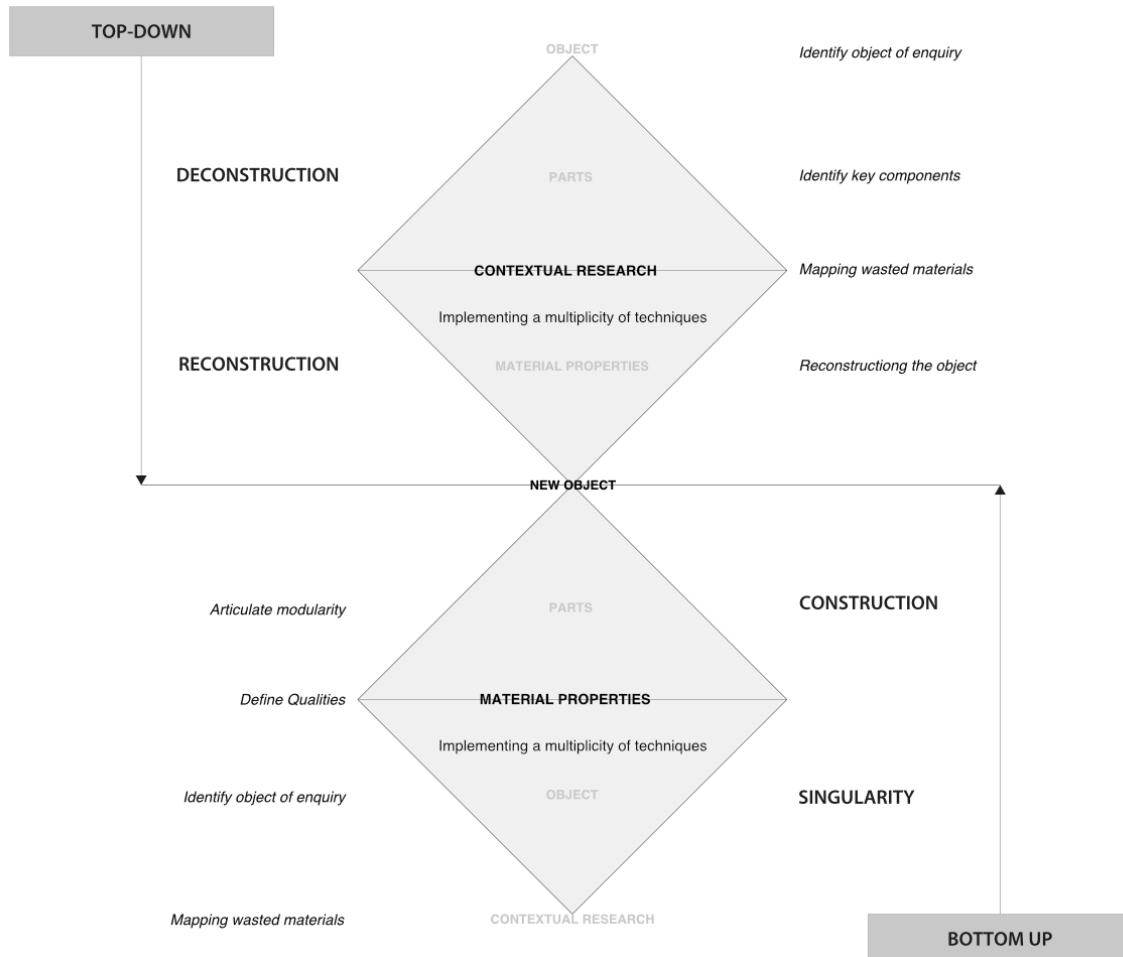


Figure 1. Object-oriented-Upcycling. Top-down versus bottom-up strategies

Based on research findings, the authors propose the implementation of De-Reconstruction and Singularity as strategies to Object-Oriented-Upcycling in the development of future modes of production to improve circularity and reduce carbon footprint by using local waste and assemblage. This approach aims to insert a sense of balance in terms of integrity between users and producers, enhancing sustainability in the manufacturing process. This approach aims to contribute to new forms of upcycling as few studies on design approaches to upcycling exist at the moment.

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