

# A sustainable redesign of Beaneasy's 'Dream' crib

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The assignment was carried out for the multidisciplinary design agency Marcel van Galen Design. Beaneasy is a subsidiary company of Marcel van Galen Design that designs children's furniture. The furniture line of Beaneasy has been developed years ago when production methods were less advanced than nowadays and attention for sustainable design wasn't commonplace. When looking at the 'Dream' crib of Beaneasy's furniture line, it comes to light that non-sustainable materials are used and certain types of potentially harmful paint and varnish. In addition, the current design causes a lot of material waste during the production phase. Finally, the furniture is expensive and doesn't sell as good as expected.

The objective of the assignment is to improve the sustainability of Beaneasy's 'Dream' crib. In order to achieve this objective, more durable materials, production methods and finishes have to be used and current theories about sustainable design have to be applied. Besides this objective, another goal is to sell the redesign for a lower price than the current design.

Several phases are gone through in order to achieve the objective. During the analytic phase, the current situation, theories about sustainable design, the possible application of these theories to the redesign and sustainable materials and finishes are examined. Two materials are chosen for the redesign: ECOboard and a plastic mixture of LDPE, PP and other additions. ECOboard is recyclable and biodegradable and a source for the biological cycle of the product. The plastic mixture is recyclable and is a source for the technical cycle. The finishes of these materials are modifications of the material, such as sanding or milling.

The analytical phase is followed by the design phase. In this phase, ideas are developed into concepts, of which one will be fully developed. Clay and foam models of the concepts have been realized in this phase. The final concept is also developed in SolidWorks, after which a few scaled models were 3D-printed. The organic 3D-shapes of this concept are difficult to manufacture with straight ECOboards in contrast to 3D-printing the plastic mixture, which is why 3D-printing is chosen. The final design consists of two alternatives. Either the legs are directly printed on the crib or the legs are made from ECOboard.

In the detail phase the production of each part is examined, and a cost price calculation is made. After that, the crib is also shown in its natural context so that a picture is available of what the crib looks like in reality.

The design is critically reviewed in the result section of the assignment. Whether the redesign matches the style of Beaneasy is investigated in this phase. One of the conclusions is that the grey colour that is used in the redesign matches the neutral colours of the Beaneasy. However, the overall appearance doesn't match the style of Beaneasy. Another conclusion is that the redesign doesn't conform to every requirement from the design brief. Also, it has been investigated whether the crib conforms to the theories and business models that have been mentioned in this report. Of all business models that can be used, the classic longlife model is recommended. When this model is used, the crib will be sold for the consumer price plus a deposit and the customer will become the owner of the crib. The customer can buy spare parts to ensure the longevity of the crib. If the customer no longer has any use for the crib, it will be picked up and the deposit will be returned to the customer. The crib will be unassembled, and the parts are returned to the producers, where they will be recycled.

In the conclusions and recommendations phase, it becomes clear that the goal of the assignment is achieved. The redesign is made of recyclable materials only, in contrast to the current 'Dream' crib and the materials can return to either the technical cycle or to the biological cycle. Also, all materials are easy to disassemble, which makes it easier to separate different material flows. The finishes that are used are sustainable and no paint or varnish is used. Instead of this, sanding and milling are used to modify the materials. Further, the crib is printed in the right shape immediately, which result in a big reduction of production waste compared to the current production method. The material waste that still occurs can easily be recycled, in contrast to the MDF material waste of the current design. The last conclusion is that the redesign can be put to market at a lower price than the current crib.