

Design of a adaptable art transport box

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For the graduation project a collaboration was done with Art Salvage. Art Salvage is a Dutch painting restorer, conservator and advisor company in Vlaardingen. The assignment they proposed was to design an Art Transport box paintings and if possible 3D models. The main objective was to make the box suitable for housing paintings of different sizes and shapes. It should be fully equipped to withstanding external influences as for example temperature changes, fluctuating humidity levels and vibrations without damaging the art-work contained inside. At the same time real-life relevant data about the condition of the Artwork had to be provided. Lastly the Art-Box had to be easy to work with.

Because of the current crisis there were few opportunities to do field research. Thus almost every information had to be gathered through desktop research.

To approach this problem first a analysis was made of the problem. By analysing how art works are packaged and transported now, how competitors transport them and which stakeholders are involved.

Currently most packaging and transport of Artworks is done very traditionally by creating an exclusive wooden crate for each painting individually. There are some exceptions of other Art transport boxes that are suited for housing different shaped paintings, but they require external transport devices and could be improved. From the analysis it became clear that the most detrimental factors to damaging painting were the fluctuation of relative humidity and temperature. These had to be kept constant for optimal performance.

The most important stakeholder in the process is the Art handler. He/she travels with the art work during transit and makes sure that everything runs smooth. Also he/she asses the condition of the art work before and after transit.

All the functions that were determined from the analysis are substituted into a morphological scheme from which the best options in fulfilling those functions were compiled into three concepts.

In the end the project resulted in the design of a slide concept. The way it works is: One places a painting on the bottom gridded foam against the back cushion. Than one slides the slides up to the point that the protruding stick touches the outer rim of the painting. Next up one locks the slides and lowers the corner pieces to the appropriate height for the painting. Making sure it is well put in the cushions of the foam. Than one locks the corner pieces and the painting is secured. To transport it one only has to put on the lid and press down on the pedal to lift up the legs.

To make sure the painting does not encounter damage for external vibrations. A light option was sought to buffer the mechanical loads out. Within result a design in which the painting is contained in an inside box which is connected to the exterior box by the means of hydraulic dampers. These are there to absorb any unwanted vibrations and evenly damp these out.

To insulate the box the material the exterior box is made out of is chosen to be a composite material. With inside PU-foam layers. Furthermore a air gap between the inside box and the exterior box posses excellent insulation qualities.

Lastly all desired data about the condition of the painting that is: relative humidity, temperature, vibrations encountered and geographic location are collected by sensors in the Box and are

transferred to the assigned stakeholders with Lora Wan. They can Access the data through an online monitoring software. Which includes a database and analytical software. The analysis of the data is then shown with the use of graphs. Which makes it easier to asses the current condition of the art work.

All in all, the project resulted in a detailed concept. Which fulfilled most of the requirements set in the analysis phase. It is recommended however to further investigate how the product can effectively be produced and marketed. Also the usability, the mechanical, climate and chemical qualities have to be tested.

