

DESIGN FOR ENVIRONMENT AND FORM FINDINGS THROUGH DIGITAL FABRICATION

Stephanus Evert Indrawan

Interior Architecture Department, Ciputra University, UC Town-Citraland Surabaya
Email: sindrawan@ciputra.ac.id

ABSTRACT

The material processing for the needs of architectural, interior and furniture products were done manually all this time. Woodworking machinery (one of them is CNC) and CAD-based software were only been maximized as supporting tools to increase the speed of working process, resulting the outcome products were limited to manual working outcome only. This recent research on form processing aims to maximize the optimal use of material in the contexts of achieving structural ability and complex form. Plywood material becomes the focus in this research, due to its most frequent use in architecture, interior, and product design. With its texture that resembles the characteristics of original wood and its sheet-shaped form, this plywood material is easy to process and environmentally friendly. Digital fabrication enables the designer in design process and simulation through software to shorten the prototyping process which usually took loads of materials, thus can reduce the materials waste. The project that presented is an example of design production with physical examples.

Keywords: Digital fabrication; design; architecture; interior; products.

INTRODUCTION

Digital Design and Digital Fabrication is set of activities in processing geometry models and data through intensive use of computer. Digital fabrication is a manufacturing process where the use of machine is controlled by computer (Computer Numeric Controller). Besides discussing the application of CNC on the models, this research also reviews in general the design process and product through Design for Environment rubric. The followings are general explanation on the Digital Fabrication and Design for Environment.

Initially, digital fabrication laboratory was known as Rapid Prototyping Labs. At the end of 1990s, this kind of laboratory was mostly found in reputable architecture schools. Obviously, there were things behind the drastic change of this laboratory. In 1923 and in 1928, László Moholy-Nagy delivered a very important concept in Bauhaus education, namely the introduction to art, science and technology in the learning process. László Moholy-Nagy (1938) was one of the Bauhaus professors of Hungarian nationality who was very enthusiastic about industrial processes that affect material quality. His notion is referenced in a book entitled "Von Material zu Architektur (1992)" (translated into English under the title "The New Vision" (1938). The method he states is quoted as follows:

Teachers and students in close collaboration are bound to find new ways of handling materials... materials through actual experience of its

properties, its possibilities in plastic handling, in tectonic creation, in work with tools and machines such as is never attained through book knowledge in the usual school exercises and the traditional courses of instruction (1938:23).

After World War Two, or after the era of Bauhaus, many professional vocational schools (such as Bauhaus itself) merged with universities, resulting in the presence of science in Simon learning content:

It is ironic that in this century the natural sciences almost drove the sciences of artificial from professional school curricula, a development that peaked about two or three decades after Second World War (1998:111)

Later on, the architecture learning began to develop with the content of science, while the concept of traditional learning was left behind. This triggered the emergence of Design Methods Movement in the 1960 where the complexity of spatial program increased and architecture evolved towards the realm of operational research, artificial intelligence and computer technology. The aims of these changes are: (1) designing better by understanding design process; (2) involving people outside the discipline to cooperate together; (3) using computer to finish repetitive parts of a design process (Gregory, 1971).

In a traditional architecture process, the design process is not run scientifically and systematically. The design process is generally explorative is explorative and through a process of trial and error. The