

## CHAPTER 1

### INTRODUCTION

#### 1.1. BACKGROUND

Tableware is one of the ceramic handicraft products that is currently widely used by the community as a tool to eat or decorate the room. Currently, many companies are running in the business of ceramics and porcelain, one of them is PT Nuanza Porselain Indonesia (NPI). The company is addressed in Dedegan RT.03 / Rw.05 Ngadirojo Village, Ampel District, Boyolali, Indonesia. NPI has two main brands namely Cupinari and Nuanza ceramic. Cupinari is a product made using porcelain material. This brand is dominated by human figures, animals or in the form of trophy / trophy that refers to the classical Europe. While nuanza product is made from ceramic material (stoneware). Models of this brand are dominated, among others: mosaic, tableware (teapots and cups, bowls, dishes, water vessels, sink and water barrel).

NPI in its development often receive orders or projects to design and make various kinds of ceramic products. The big project of NPI in the last three years (2015-2019) is creating tile 3D wall ceramics product with *Islamic Batik* nuance for Al-Huda Jakarta mosque interior building. This mosque has four sides with different *Islamic Batik* nuance Ornament, and all of the sides have been taken as research object, and the design process until fabrication process has been successfully reported very well by Wijayanto (2016), Gunadi and Kurniawan (2017), and R & D team of PT. NPI. After the project is done, there is a new idea between NPI and the manager of Al Huda mosque.

This initial idea is the desire mosque manager to design a unique souvenir with premium standard but still in Islamic nuance as a special souvenir from the Al-Huda Mosque for the guests in several events that organized by the mosque. This effort is also in line with the development of tourism and creative industries, where the development of design and fabrication of special souvenir ceramic tableware is expected to increase the development of religious tourism in Indonesia which is growing rapidly.

According to Yahya (2015) and Wijayanto (2016) the belief of Muslims in the use of sculpture models, humans and animals is strictly forbidden to be displayed as

a physical model or clay model. Flora models are said more representative of Muslim characteristics. Characteristic flora is also widely displayed in the style of Batik Indonesia, which displays more Indonesian flora. This flora pattern then displayed by Wijanto (2016), Gunadi and Kurniawan (2017), Yuniarto (2018), Yuniarto (2018), Julian (2018) in the process of developing the design and fabrication of wall ceramic and tableware ceramic products based on computer aided reverse engineering system (CARESystem) in the ceramics industry.

The most fundamental obstacle in making this special souvenir is the use of manual technology by hand on a special ceramic design process from NPI, so it takes a long time around one until two months the process of design and manufacture of master mold for one product. This will cause delay time in the fabrication process of ceramic dining set.

Market research is not conducted by author because based on the successes of previous researchers (picture 1.1) and also there is direct desire of the mosque manager, and based on Muslims belief, so the process of developing exclusive souvenir for Al-Huda Mosque directly took a theme of tableware dining set with Islamic patterns based on Indonesian Batik. Enhancement and simplification of Batik patterns using *reverse engineering* (RE) method. This enhancement surface are use *PowerSHAPE 2017* and *ArtCAM 2015* CAD software. The dining set model that is designed does not follow the general model, but is tetragonal (4-point) or pentagonal (5-point). To get the design result that is appropriate with Al-Huda mosque request, brainstorming is conducted by author with ceramic experts and ceramic product designer, so that later will be obtained some motifs or pattern that will be affixed to the tableware that will be design.

## **1.2. Problem Formulation**

Based on the background, the problem in this research is PT. Nuansa Porselen Indonesia (NPI) will meet the delays time in the production process of dining set with Islamic patterns. This happens because in the making process of design and mold master of product still using conventional method, and also the pattern or relief will not precision. The time project that given by Al-Huda manager is a 1/2 year. Therefore, it is necessary to develop the latest CAD design technology to design and create product prototype and mold master dining set tableware with *Islamic* nuance for exclusive souvenir Al Huda Jakarta Mosque.

### 1.3. Objective

Objectives to be achieved by the author in this thesis is to get some important design parameters in the design process of ceramic tableware with dining set type with Islamic batik pattern and get a prototype of finished products. In addition, author in cooperation with PT NPI aims to get the latest innovation about the design of tableware in order to survive and compete in the ceramic industry market.

### 1.4. Scope of Problem

The scope of problem of this research are:

- a. Process design products from 2D to 3D CAD. In this research, the author focused only on CAD processes, while for the CAM process until fabrication process would become part of the *CARESystem* team.
- b. The method used for collecting data is *Computer Aided Reverse Engineering* for Ceramic Products (*CARESystem\_CP*) conventional. The *CARESystem\_CP* process is done by directly measuring the ceramic product to be redesigned using a ruler and a slider.
- c. The machine that will be use is CNC YCM Milling machine which is available in Universitas Atma Jaya Yogyakarta, especially in Laboratory of Production Process.
- d. Software that will be used in the design process of 2.5D CAD using *ArtCAM 2015*, emboss process of 3D CAD using *PowerSHAPE 2017*. Both software is made by Delcam Company, where this company cooperate with Universitas Atma Jaya Yogyakarta, especially Laboratory of Production Process, therefore the University has an official license to operate the software.
- e. Process verify of 2.5D model using *Netfabb Basic* software.
- f. The pattern using Islamic Batik nuance, because this product is an exclusive souvenir for Al-Huda Jakarta mosque.
- g. *Islamic Batik* motif or pattern that will be use comes from Masjid Al-Huda Jakarta which has been provided by the Mosque Architecture.
- h. Dinning set tableware is used as the master ceramic product.
- i. Islamic Batik design sketches that will be applied to tableware products have been prepared by Designer PT NPI. Because the NPI has conducted market research first, before finally submitted to author for

further processing using CAD / CAM technology that owned by the University.

- j. The calculation of Real Time Production only for products that have been completed produced using CNC YCM machine. This is caused by the change of new system applied by Industrial Engineering Program in Production Process Laboratory. Unfinished product will be done manually by NPI.

