

- **Abstract**

The Pottery Cup production project aims at modernizing the traditional forms into an automated process of clay cup production whereby the result would greatly improve upon efficiency and consistency in the manufacture of pottery, with less reliance on skilled labor and a corresponding decreased rate of human errors. The project addresses the increasing demand for sustainable, handcrafted products and introduces a modern means of producing quality clay cups. Furthermore, automating production would promote faster production and reduced cost, thus bringing handmade pottery to a wider market.

The objectives of the project include designing an automated system for the production of pottery cups with consistency while minimizing production time and costs, and maintaining high quality that proves to be artisanal.

The project will achieve its goal by developing an "Arduino-based automated pottery cups production system." Key components include sensors, DC motors, stepper motors, couplers, drivers, and lead screws for precise motion control during clay cutting, molding, and shaping, also LCD and keypad for allowing users to input parameters. An Arduino Mega microcontroller will be the central control unit, with an ESP-32 module for wireless communication.

Our project is a first that is being worked upon in Palestine. While automation is well known in different manufacturing industries, there has not been an application where the automation of pottery cup production is studied in the region. This project provides an innovative solution especially suited to the requirements of local artisans and manufacturers, thereby providing a first-ever system that marries traditional craftsmanship with modern-day automated techniques.

The manufacture of clay cups is all done by fully automated systems with a fully automatic molding machine creating cup shapes just by inputting raw materials. The cutting station works electrically to cut the clay into more or less accurate measurements; this is followed by the molding and pressing of clay into the mold, whereupon a compressor mechanism goes down to apply pressure as soon as the clay enters the mold. This ensures the mass of clay gets evenly distributed and is shaped per the mold design. Thereafter, the movable mold base lifts, while the last step involves drawing simple designs or shapes on the surface of the cup, completing the automated process. This whole new process not only makes work easier, but lends accuracy, consistency, and creativity to one fluid operation.