MANUFACTURING DESIGN OF INTEGRATED SMART SCALES BASED ON INTERNET OF THINGS USING AUTODESK INVENTOR

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ABSTRACT

This research aims to design the manufacturing of integrated Smart Scales based on the Internet of Things (IoT) using Autodesk Inventor software. The primary focus is to engineer a robust and accurate digital scale mechanical structure to assist crystal guava farmers in real-time harvest data management. The method employed is Research and Development (R&D), utilizing mild steel for the frame and aluminum 6061 for the load cell sensors. Stress analysis simulation results indicate that under a maximum load of 20 kg (196.13 N), the maximum Von Mises stress value is 0.5489 MPa, which is well below the material's yield strength. The recorded maximum displacement is only 0.001412 mm with a safety factor of 15 ul, indicating very high structural rigidity. Validation from design experts using the Likert scale yielded a feasibility percentage of 88.4%, confirming that the design is highly suitable for implementation as a modern agricultural technology solution.

Keywords: *Smart Scales, IoT, Autodesk Inventor, Stress Analysis, Crystal Guava.*