Abstract— This research aims to design an effective and efficient IoT-based monitoring and composting tool, as well as integrating Gaussian Process Regression (GPR) technology to accurately predict the quality of compost products. Presented in the form of several graphs such as histograms, line charts, and linear regression graphs. The results of measurements and predictive analysis related to air temperature and Soil Moisture in composting equipment have air temperature measurement results with temperature variations in the range 22℃ to 34℃, with an average of around 27.26℃, and the highest frequency occurs in the range 25℃-26℃. Furthermore, air temperature prediction analysis shows a very high level of accuracy with a value of 99.9664%, which indicates a strong relationship between predictions and actual data. Air temperature prediction data shows a stable trend of increasing temperature until the 60th minute, which then decreases and increases again until it reaches a peak at the 90th minute. However, soil moisture measurement results show that the highest frequency occurs in the range of 47%-74%, with an average of R^2 around 60.9%. Soil Moisture prediction analysis shows a lower level of accuracy, with a value of R^2 0.8832%. Soil moisture prediction data show variations that are less consistent with actual data, indicating the need to improve this prediction model.

Keywords— Compost, GPR, air temperature, soil moisture, R^2