

IOT Based Strategic Solution for Tea Leaves Quality Optimization Using Machine Learning Data Model Predictions for Local Tea Industry

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Environmental factors play a major role in tea growing and plucking stages and these factors must have to be within the favourable range to get quality tea production. At present tea, pluckers cannot identify the exact duration for tea plucking and they do not have sources to identify and pick tea leaves from tea buckets without overflowing which can cause *physical* damages to tea leaves. This research addresses the above issues by creating data forecasting models that provide significant guidance to make decisions in many areas especially in tea cultivation, plucking, and transportation. Three devices were developed to capture real-time weather data namely soil PH, surface temperature, and Humidity. Above sensors data were transmitted over GPRS using a GSM module. Evaluated results of datasets with actual data values and analysed with different prediction algorithms such as Voted perceptron, Decision table algorithm, Multilayer perceptron, and Simple linear regression. After observing all the aspects, several variables, and prediction accuracy for data samples, the most relevant algorithm to build the prediction models were decided. The models were executed with a different combination of factors and analysed the output prediction result to sort the most accurate factor combination for the dataset. Models were built to predict the most suitable periods having optimum environmental conditions to pluck tea leaves, production forecasts by considering environmental and soil conditions, and transport scheduling for plucked tea leaves before quantity overflows. Above mention, the model was helped to schedule the plucking process while enhancing the quality of tea leaves. Further, this study introduced the smart tea plucking basket to control the real-time weather conditions and reduce human malpractices while maintaining optimum quality. The research recommends assessing this model with different algorithms to fine-tune the performance and to build a general model that can be applied when enhancing other quality factors.

Keywords: Internet of Things (IOT), Voted perceptron, Decision table algorithm, Multilayer perceptron, Simple linear regression