

# GATserve: Reducing Campus Food Waste through a Smart Engagement App for Students and Staff

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**Abstract:** Food waste is a global concern, and educational campuses are major contributors owing to overproduction, miscalculation of demand, and inefficiency in canteens. This paper introduces GatServe, a smart canteen engagement platform catering to students, staff, and administrators, which utilizes artificial intelligence and machine learning for minimizing food waste and achieving higher dining service efficiency. GatServe combines a role-based login facility separating user and admin functionality into a single platform. The user app offers convenient food ordering via text or voice search, pre-order scheduling, cart and wallet integration, and real-time seasonal suggestions. The admin app authorizes canteen managers to control menu items, track live orders, tag order completion, and access food demand driven AI-based suggestions on food demand, inventory, and customer satisfaction. Innovations include food demand forecasting employing Random Forest, inventory optimization by K Means clustering, sentiment analysis of feedback by Transformers, and weather-driven suggestions by Decision Tree-based models. Integrating operational ease with green centric functionality such as waste reporting, smart procurement, and eco- points, GatServe offers a scalable platform for minimizing food wastage and promoting campus sustainability

**Keywords:** Smart Canteen Management, Artificial Intelligence, Machine Learning, Food Waste Reduction, Sustainability

