UNIVERSITI TEKNOLOGI MARA

SMART INVENTORY MOBILE APPLICATION USING CNN BASED IMAGE PROCESSING RECOGNITION WITH ZXING BARCODE

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ABSTRACT

Field studies and discussions with Efek Café in Petaling Jaya revealed that small café retailers in Malaysia have recurring discrepancies in stock, delays in reordering, and accidentally cause food waste due to inefficient manual, paper-based inventory systems. To tackle these issues, this research created an Android-based Smart Inventory Mobile Application. This application was designed with the Flutter and Dart languages, and it was based on a new, innovative hybrid dual-path recognition pipeline. This pipeline hybridizes the use of CNN-based barcode localization with Google ML Kit and ZXing (which is a rule-based barcode decoder). This allows the application to provide reliable barcode scanning of EAN-13 and UPC-A barcodes. This application is designed for the real-world operating conditions of a café. This application also offers the following features: inventory tracking in real time, the ability to receive notifications when stocks are low or near their expiration date, and the ability to synchronize data using Google Firebase. After functional testing and usability testing for 18 test cases, an 88.9% passing rate was achieved. Also, this application received a 65.00 score on the System Usability Scale (SUS) with 30 people, which shows that this application is a usable, practical, and inexpensive inventory management solution for Malaysian food and beverage businesses.