

## **Smart Vision-based Practical Building Defects Assessment During Defect Liability Period (DLP)**

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### **ABSTRACT**

The application of IR4.0 in real estate has been imminent due to its vast potentials in terms of time and cost saving, increased accuracy and efficiency and various usages. The detection of building defects using machine learning is one of the applications of IR4.0 that is not new to the country; however, apps that are available in the market are developed in other countries with different climates and building materials than Malaysia. Moreover, the reporting may not be exactly compatible with the Malaysian legal framework. This is important for the new homeowner who just received vacant possession and has little knowledge on how to report building defect. Moreover, the defects must be reported within the defect liability period (DLP) to be claimable. Thus, it is highly useful to develop a mobile app that is totally based on the Malaysian scenario of building defects and fulfils the need of both Malaysian professional building surveyor and homeowners.

This study aims to develop an artificial intelligence (AI) based tool for building defect detection and reporting during the defect liability period (DLP) of new housing, which can ultimately benefit the housing market due by facilitating the inspection and claims process during the statutory claims period. The scope of this research is limited to defects that can be visually detected i.e., patent defects, as these defects are readily visible to the naked eye and normally manifest during the DLP. On the other hand, latent defects normally require more than visual inspection and take time to appear i.e., beyond the DLP.

The waterfall app development approach divides the research into three stages: development, testing and finalisation. The system will use cloud infrastructure for deploying deep machine learning on the smartphone to enable a mobile system of defect detection and reporting. Existing building inspection apps in the Malaysian real estate industry are either foreign-developed or not made publicly available. Thus, this study develops a smartphone app that can be used by a wider market and is tailored for local building construction. As such, homeowners can be helped in making and substantiating claims during DLP, whilst professionals would save time when undertaking basic home inspection. Ultimately, this app would promote quality housing for all stakeholders in the country.