M-H. TSAI, Y-C. HUS, C-M. CHIU, S-H. CHUANG. ***BIM-image-based indoor localization prototype.*** *Gerontechnology 2012;11(2):80;* doi:10.4017/gt.2012.11.02.406.00 **Purpose** In order to provide an economical indoor location detective technique, this study is uses photo images as the indoor spatial identification tags associated with the spatial information of the existing building information model (BIM), so that users can identify their locations via the camera on mobile device based on the real images. **Method** Unlike the wireless and radio frequency identification based indoor positioning techniques[1,2], this study applied the image recognition technique to indoor location detection. Three functional modules, namely, (i) BIM object location collector, (ii) spatial image management module, and (iii) vision-based location recognition module are developed. BIM object location collector takes the responsibility to automatically collect the location data from the IFC (Industry Foundation Classes) dataset of the existing BIM[3]. Firstly, the spatial image management module provides an interface to clients for collecting spatial photos in buildings, and bind them with the location data transferred from the original buildinginformation model. Secondly, the recognizable features of the spatial photos can be analyzed by the vision-based location recognition module which is developed based on the D'fusion studio[4]. According to the analyzed image features, the vision-based location recognition modulecan then recognize the frames of the visions captured by the mobile device camera. Once the frame is recognized, the corresponding spatial data can be retrieved. **Results & Discussion** Based on the designed architecture (*Figure 1*), a BIM-vision-based indoor localization prototype was developed as an android platform application running on the mobile device such as smart phones and tablets. Technique feasibility is continuously tested in the current phase. According to the basic test results, the prototype can identify the indoor locations of decorated spaces; however, once the indoor spaces lack of recognizable features, such as the empty spaces with blank and monotony walls, the recognition function failed. To overcome this defect, the Quick Response (QR) code, the trademark for a type of two-dimensional code, is used as a substitution of the photos for this prototype. Besides, since the location data is transferred from the existing building information model, data consistency can be ensured. In the future, the economic feasibility of this prototype will be analyzed to evaluate the cost-benefit ratio.

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Affiliation: Tamkang University, New Taipei City, Taiwan;
E: mht@mail.tku.edu.tw
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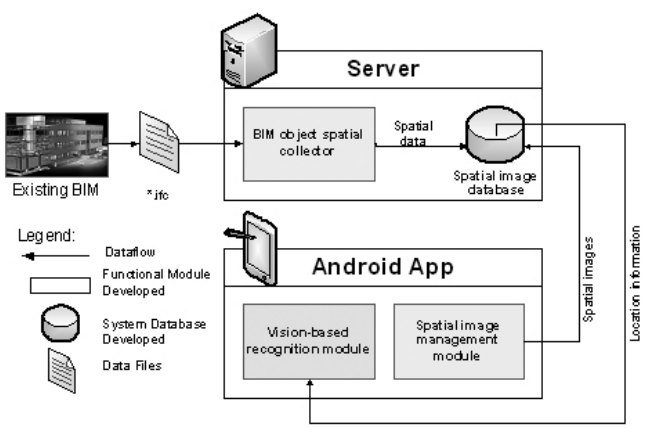

Figure 1. System architecture of the developed prototype