A.SHAHI, C.T. HAAS, J.S. WEST. ***Automated construction activity assessment using workflow-based data fusion.*** *Gerontechnology 2012;11(2):333;* doi:10.4017/gt.2012.11.02.317.00 **Purpose** For informed decisions and objective assessments of the progress on a construction site, data from a number of sources must be combined because not all the necessary information can be captured using a single data source. In recent years, a number of researchers have considered multi-sensor data fusion models in order to capture a more complete picture of the progress of a project by leveraging the information from global positioning satellite (GPS) devices, radio frequency identification (RFID), and other sources of information for tracking and locating construction materials[1-3]. However, these efforts are based on data fusion at the sensor and object levels, and therefore are not capable of tracking the progress of activities that are not directly associated with a measurable physical entity at the site, including concrete curing, installation, welding, inspection, and interior finishes. The purpose of the research presented in this paper is to provide a workflow-driven approach for the efficient, accurate, and reliable estimation of progress in construction projects. The developed workflows could then be used as industry-wide data fusion standards for many applications in the construction industry including automated construction progress tracking. **Method** The developed model is based on tracking construction activities as well as objects, in contrast to the existing models that are only based on tracking objects. Data sources include high-frequency automated technologies including 3D-imaging and ultra-wide band (UWB) positioning. Foreman reports, schedule information, and other data sources are included as well. Data fusion workflows are implemented via a distributed computing network and archived using a cloud-based architecture. **Results & Discussion** Validation of the developed workflow model (*Figure 1*) was achieved using a detailed laboratory experimental program as well as an extensive field implementation project. The field implementation was conducted using five months of data acquired on the University of Waterloo Engineering VI construction project, yielding promising results. The data fusion processes of this research provide more accurate and more reliable progress and earned value estimates for construction project activities in comparison to the existing progress tracking models and industry practices.

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Keywords: automation, 3D laser scanners, UWB, workflow, data fusion, activity tracking

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Full paper: No

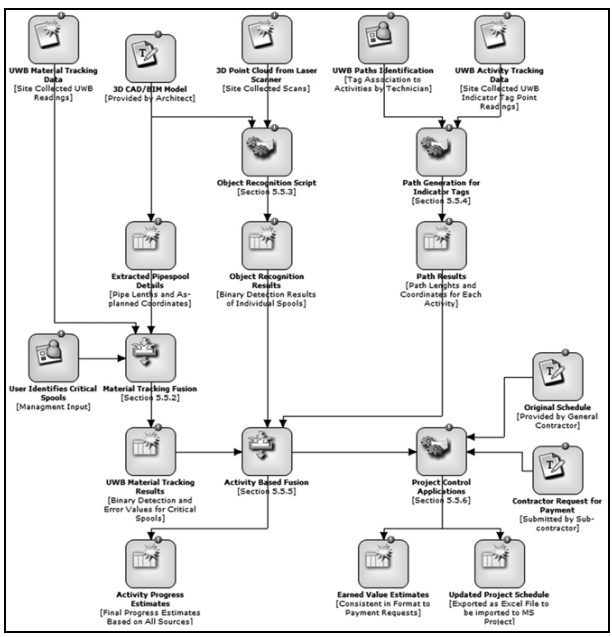

Figure 1. Developed workflow for automated construction activity tracking fusion