H. ALZRAIEE, O. MOSELHI, T. ZAYED. **Dynamic planning of earthmoving projects using system dynamics.** *Gerontechnology 2012;11(2):316;* doi:10.4017/gt.2012.11.02.191.00 **Purpose** The purpose of this paper is to present a dynamic planning model for earth moving operations through capturing the operations context level (scope change, skill level, etc.). **Method** Uncertainties, scope, and changes in project condition call for dynamic modeling of earthmoving operations. Static planning and scheduling methods such as CPM and PERT neglect – and are incapable of – considering project dynamics and causal-effect loops that exist between project variables[1]. In an effort to address this challenge, system dynamic modeling and simulation is utilized in this research to plan and simulate earth moving operations. The developed model consists of three modules: (i) a work flow module that focuses on work execution from excavating the material until dumping it as demonstrated in (*Figure1*); (ii) a resource module that captures the resources' interactions and estimates the required resources based on the variables governing the site condition and management requirement; and (iii) a cost module that estimates associated costs with project's operations. **Results & Discussion** The model was tested using a real case from Marzouk and Moselhi[2]. The model outputs demonstrate that including the project context variables and their cause-effect loops to the planning stage of this category of projects improves the planning process. The developed system dynamic model is expected to enhance project modelling; capturing the interactivity among its variables to provide more realistic modelling for its schedule and cost. It also can assist members of project teams to predict a variety of likely scenarios and develop suitable action plans.

References

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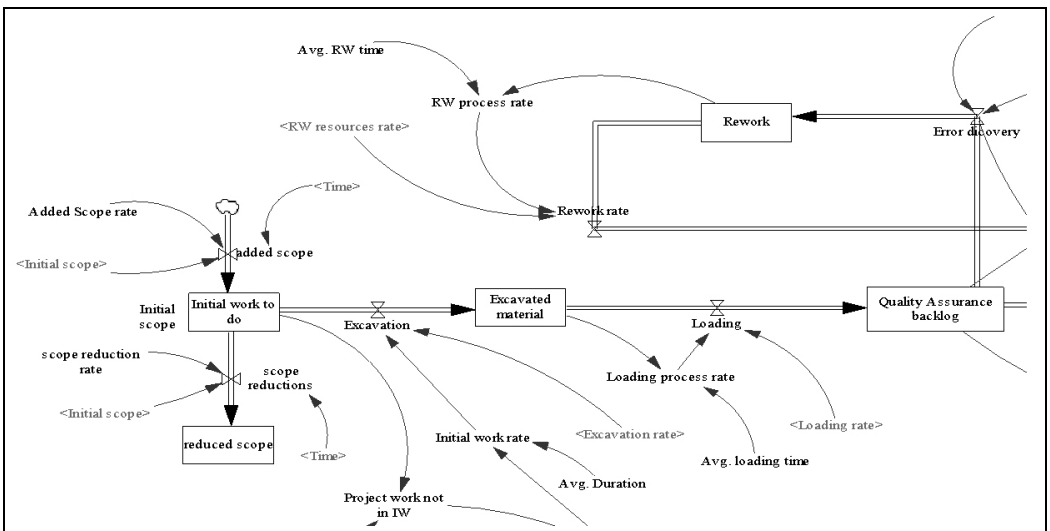
Figure 1. Part of work flow module