

ABSTRACT

AN OBJECT ORIENTED SMART COSTING SYSTEM

by

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CAD/CAM integration problem has emerged as a result of the development of CAD and CAM separately. There has been many successful approaches to partially integrate both systems. Some approaches used the Computer Aided Process Plan (CAPP) as a base for integration, others used Form Feature Approach (FFA). But none of the so far existing systems manage to deal with all the life cycle aspects of a product. In this research Object Oriented Structure is utilized to represent the different product aspects through its life cycle. Cost of the product is selected as the main focus of this research, because it is believed that cost is eventually touching all the product life cycle aspects from concept to disposal. Four major levels of cost are explored: 1) plant level. 2) part level. 3) feature level. 4) feature entities (edges, vertices). Selected issues related to those four levels are modeled in an OOS, and a costing system is developed using ELEMENTS ENVIRONMENT software development tool. The developed system "A Smart Object Oriented Costing System" includes C programs to handle all the above cost levels with relation to the feature at the design stage. The system not only calculates the cost of the designed part online as you are adding features to the part, but also takes care of the connectivity of features issues such as tool change and setups costs related. An algorithm is developed to calculate the machining time and cost for rotational parts, which are the selected type of parts for implementation. The developed software has the capability of checking on line for the manufacturability of the part within the predefined manufacturing constraints, and prompt the user with any violations. A case study of a rotational part is presented.