Abstract

The purpose of this project is to analyse tool management issues within Flexible Manufacturing Systems (FMS) and its implementation on a database system, as part of the work at Warwick University involving the implementation of Computer Integrated Manufacturing (CIM) principles using its manufacturing related facilities.

After analyzing the manufacturing aspects of tool management, including the characteristics of general CIM and FMS manufacturing environments, tool management systems within these environments, and the particular CIM/FMS system at Warwick University, the study focuses on database design and the methodology chosen to approach this problem.

The methodology consists of two distinct phases: one concerned with building a conceptual data model based on a previous analysis of the tooling system and which is independent of the database and computers used to implement it, and another basically consisting in restructuring that conceptual model according to the characteristics of the particular database and its physical implementation. The data analysis techniques used to derive the conceptual model are entity modelling, relational model and normalization.

As part of this methodology it is then presented a more detailed analysis of a general tool management system which defines what are its main components, its functions and users requirements, and the interaction with other systems.

From that analysis it was concluded that the design of a general tool management system and its tool database is limited by the large diversity of components of the tooling system and the complexity of its functions, being the methodology exemplified by applying data analysis techniques to a limited set of tools (turning tools). Basically it is defined the entities, attributes and relationships for that particular case. The approach can be used for other sets of tools to increase the capabilities of the tool management system.