962161 FESTEVAL

Feature-based Support for the Development Process Chain "Design-Planning-Manufacturing"

The objective of this project is to further develop the feature based development process chain starting from the design up to the manufacturing.

- Based on the result of the previous ESPRIT project FIRES (EP 6090) interdependencies between features will be recognised. In order to provide necessary capabilities for an optimal recognition and validation of interdependencies a non-manifold B-Rep geometric modeller will be used. This allows the representation of virtual feature-elements in the geometrical model. Further on the planning system of FIRES will be implemented to provide the manufacturing feature with the necessary manufacturing operation objects. The planning system is able to find out the optimal sequence of the manufacturing objects.

- The approach FIRES is based on the conventional manufacturing planning procedure, which means a unidirectional communication from the planning department to the shop floor. The NC-code is generated based on the analysis of the feature and the knowledge about tools and machine tools. This NC-code is transferred to the shop floor. The disadvantages of this approach are on the one hand, that the optimisation on the shop floor has to be done on the low level of NC-codes, on the other hand, that there is no possibility to provide feedback of this optimisation from the shop floor to the planning department. Through the integration by a common data model, the same high-level information can be used in the planning department as well as on the shop floor. The communication between these organisations is enhanced.

- There is no direct communication among the modelling systems of FIRES and the manufacturing system WesUF. In order to make multiple use of information such as geometric description required in all systems, it is necessary to implement a common data model. The approach taken is to base this common data model on international standard work such as ISO 10303. Like this, data structures are provided by the current versions of the Application Protocols (AP) 214 and 224 which facilitate the representation of a set of manufacturing features, but there is not enough support for the representation of interdependencies among the manufacturing features as well as technological information applied to the features. It is necessary to improve the data models provided by these STEP application protocols to overcome these limitations.

PTW and UNIMEP have developed the previous feature based systems of FIRES and WesUF and will provide the knowledge of the systems as a base for the improvement of the process chain. They are responsible for the development of the feature modeller, the planning system and the shopmill support. Kade-Tech is a development centre of applications based on CAS.CADE/SF and will support the partners with the expertise of CAS.CADE/SF. As a main developer of ISO 10303 DiK will provide special knowledge about STEP for the conception of the Common Data Model, which will serve the application along the process chain. The industrial requirements and validation will be fulfilled by Romi, one of the biggest companies of machine tools in Brazil. The ProSTEP GmbH will support the design of the Common Data Model and assure to provide the extended Data Models to other partners of the ProSTEP Association.

The results of FESTEVAL are of significance to companies involved in the computer-based integration of the CAx systems along the whole production chain. FESTEVAL will result in an integrated system which combines the feature-based design of 3D parts with capabilities for the pre-planning and interactive NC programming with full functionalities to support interactively the expert at the NC machine.

The set of manufacturing features has been selected by all partners. Romi has provided FESTEVAL with typical work pieces, which will be used for the presentation of the capabilities of the demonstrator. The demonstrator will be implemented on the CAS.CADE platform.

Contact Point

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36 months