

EngCon – Engineering & Configuration

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Abstract

In the demo presentation, a domain-independent JAVA tool for configuration (called EngCon) is demonstrated. The representation of domain objects and the agenda-based configuration cycle (interactive and control-knowledge-driven) will be presented. The enhanced features of EngCon, e.g. database integration, constraint propagation and case-based reasoning, will be illustrated based on the current project status.

EngCon Project

The starting point for the development of the configuration tool EngCon were the requirements placed on the system by the company Lenze GmbH & Co KG, i.e. the design and parametrization of electronic drive systems. The main aim was to take the combined hardware and software requirements into account.

An investigation of the market of software tools for configuration has shown that most of the available systems are only suitable for simple configuration tasks especially designed for distribution. Although configuration tasks often demand a high degree of engineering skills, most of the tools do not meet this requirement.

In order to represent complex engineering knowledge as well as the knowledge about the configuration strategy of expert engineers, systems with more complex capabilities are needed. The main focus is to represent complex technical systems as well as to support the typical strategy of engineers regarding the design of technical systems.

In many technical environments the use of software systems for development purposes is becoming increasingly popular and important. The requirements of Lenze are transferable to other application domains which are concerned with the combination of software and hardware. The basis of the application system RAPA (computer-based system for configuration of drive systems) is the configuration tool EngCon.

The Center for Computing Technologies (TZI) at the University of Bremen develops EngCon in cooperation

with Lenze GmbH & Co KG, Hameln. The goal of this project is the development of the application-independent tool EngCon and the implementation of the application system RAPA which is based on it. From the beginning EngCon is being conceived as a product.

Configuration Features

The main features of EngCon are based on the functionality of the configuration tool KONWERK (see Günter 1995, Günter and Kühn 1999 for detailed description):

- conceptual hierarchy for representing objects and their properties of application domains
- constraint system
- agenda-based control

Additional features:

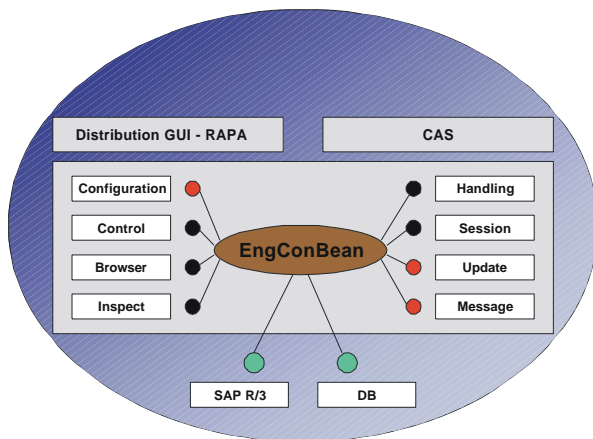
- functional and graphical specification of configuration tasks
- sketch-based task definition
- integration of calculation functions
- case-based reasoning
- knowledge-based backtracking and goal-based development of alternatives
- distributed evaluation of alternatives, comparing and criticizing solutions

Architecture and Implementation

The integration of EngCon in existing heterogeneous systems and business processes of a company is a very important requirement for the software engineering process. Therefore EngCon is designed as a software component and will be integratable with other available components.

The EngCon configurator is being implemented in pure JAVA and has a flexible component architecture, which allows an easy integration into the existing IT infrastructure of a company.

Because the configurator is implemented as a JAVA Bean, EngCon can be easily integrated into any PC environment. A JAVA Bean can be „plugged in“ via the ActiveXBridge from SUN Microsystems in any ActiveX environment. This technology allows that the application-dependent user interface can be implemented in Visual Basic, too.



EngCon architecture

Software Requirements (for integration in Visual Basic):

- JDK1.1.X
- JDK1.2 Collections API's for JDK1.1 Environments
- ActiveXBridge 1.0

For JAVA only use of EngCon, the JAVA2 technology is recommended, because of the new Collection-Framework and Swing.

Interoperability with following components are planned:

- SAP R/3 and especially the module SCE (Sales Configuration Engine)
- SalesManager (TDV GmbH, Germany) as an example for Computer-Aided Selling
- CBR Works (tecInno GmbH, Germany) for Case-Based Reasoning

Acknowledgments

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References

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