Competence Center for Process and Systems Integration

For efficient cooperation between academics and practitioneers the Institute for Information Management at the University of St. Gallen operates the Information Management Research Program (IM HSG). Within this research program various projects, called competence centers, are pursued. On January, 1, 1994 a project for process and system integration was established.This project will be described in the following article.

The process of systems development has become significantly easier to understand through the use of both integrated development methods and tools. The

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predecessor of the CC PSI (CC RIM) developed a reference model which included a consolidation of state-of-the-art available methods for the design of business information systems. Based on this design, a comprehensive management model was developed which provided for the creation of information systems using CASE tools and methods.

Focus

While the CC RIM was concerned with the process of information systems development, the CC PSI is concentrating its research on improving existing information systems. The necessity of research in this area arises from several problems:

- The implementation of firm-wide data and function integrated information system architectures has proven to be too costly. Futhermore, the ability of firms to respond to changing market conditions is not adequate.
- Easily comprehensible information system architectures become difficult to understand with further development and integration of package software. Consequently firm's data becomes difficult to manage and the effects of information systems on business become intransparent.

These problems grow due to both a decentralization of information system development and an increase in the heterogeneous characteristics of a firm's technical platforms. The continuous increase in the use of package software in business is asking for a systematic approach to control the conceptual and technical integration of new applications in an existing heterogeneous application environment.

Goals

The CC PSI is striving to produce an extensive methodology to be used for the further development of information systems. Instead of planning and developing one consolidated information system, the CC PSI concentrates on the integration of heterogeneous component information systems and on their interfaces with the main goals being:

- In a company with a heterogeneous application structure, a business process engages various applications which are usually based on different technical platforms. Furthermore, an automatic control mechanism seldom exists for the regulation of these process activities. Therefore, an important goal of the CC PSI is to use workflow systems for the control of business processes and the integration of different applications. The developed *model* should provide *for the implementation of business processes and for the use of workflow system* in a heterogeneous application environment.
- A *data integration methodology* is required for the control of data exchange and data management. In order to be able to integrate data of new applicatios in an existing application framework, appropriate software has to be made available. With respect to this issue, the question arises, whether a standard for internal data interchange (IDI) would be useful. An analysis of existing approaches in conjunction with the evaluation of the needs and benefits to our corporate participants will allow the CC PSI to produce answers regarding this area.
- If we assume that in the future, package software rather than custom-made applications will predominately be used, a *standardized integration method* will then be required. This method should concentrate on describing the integration of new applications in an existing heterogeneous application environment. In order to reach this important goal the method will include a description of the activities and the milestones of the integration process.
- The *existing information systems have to be described* in order to implement a workflow system, to integrate data or to integrate new applications. This description includes the analysis of the existing applications and the corresponding interfaces. Additionally, techniques are required to describe the effective planning and the realization of integration projects.

Status

Up to now, the following results have been achieved:

- The *Metamodel for Conceptual Integration* consists of various components which must be documented in systems integration. The model is divided into two problem-oriented views and it shows possible uses.
- The *Criteria Catalogue for Workflow Systems* supports the evaluation of workflow systems. It is useful as an aid for orientation as well as a foundation to understand workflow systems. Furthermore, it will be used as a framework to compare such systems.
- The *Metamodel for Workflow* defines the foundations in the area of workflows. It captures the main components of workflow systems and the relationships among them. It is used as a reference model to compare different systems in the context of a tool evaluation. Moreover, it structures the results of workflow methods which are used in the implementation. All these results are conceptual and independent of specific workflow systems.
- The *Reference Example for Workflow*, which describes the process 'settlement of a deposit account' in the retail business of a bank. The description of this process creates a reference example, which will be used by the competence center to debate aspects of workflow modelling and integration.
- The *Market Analysis of Integration Techniques of Workflow Systems* handles integration in the sense of how to actually implement processes using workflow systems. It analyses the requirements of all the integration aspects of workflow projects. A structured representation identifies the integration techniques used in workflow systems.

In 1995, there are plans for the development of techniques for the conceptual description of existing information systems and the design of a methodology for the realisation of optimized business processes in a heterogenous application environment. ■

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