

Intellectual Model Control Data of the Module Integration SAP-ERP and Teamcenter-PLM

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Abstract: Constructed model intellectual control of data module integration of information systems based on multi-agent system and knowledge base. Developed structure and functional model of the integration module SAP-ERP and TeamCenter-PLM, which allows import and convert data from files, spreadsheets, TeamCenter-PLM in the required format with the further transfer in SAP-ERP.

Key words: Information system (IS) structure • Functional model • The integration module • Knowledge base (KB) • multi-agent system • Intelligent agents

INTRODUCTION

There are simultaneously several local information systems in machine building at present, which designed to perform various functions associated with certain stages of the product life cycle and levels between. It has the following disadvantages: there is no control of data interoperability in the interaction between IS, inefficient processing system for making decisions when used data from several IS, not in sufficient quantity and quality performed relationship management of IS and documenting processes relationships at various life stages of the flow information. The above mentioned disadvantages affect the final result of production, do not give transparency traceability throughout the lifecycle of the product, namely, reduce the quality of production due to the ambiguity of these regulatory information used the local IS.

To provide a single information space in all structural units of the distributed production associated with the preparation and production of products, it is necessary to integrate existing solutions with each other into a single information system that provides a unified format interconnection between them, certain rules of the passage of product life cycle and keeps a history of these relationships.

For transmitting and information between the IS and the processing, required to fulfill certain transformation

algorithms and data comparison. However, each information system uses its own algorithms which are similar to each other, but are performed separately.

Consider operation of the module on the example of systems interaction of preparation, planning and production management TeamCenter-PLM and SAP-ERP. Work on formation a database for SAP-ERP performed manually force of engineers, which is a deterrent to full-scale implementation of SAP-ERP in production. At the same time this information to form a database (DB) could be transferred from Team Center-PLM. However, the lack of integration of the two systems does not allow to automate the transfer of data from one of IS to another. Manual maintenance of the database is a very costly and leads to significant losses for the business entities. Populating the database of possible schemes of integration of information systems will easily (by tuning and training) to apply the accumulated communication options and control with other enterprise information resources.

When developing the structural scheme of the structural scheme integration of SAP and Team Center, the enterprise environment which uses package technology of data transmission for local computer networks and compatibility of information systems SAP and TeamCenter with the integration module was considered (Figure 1).

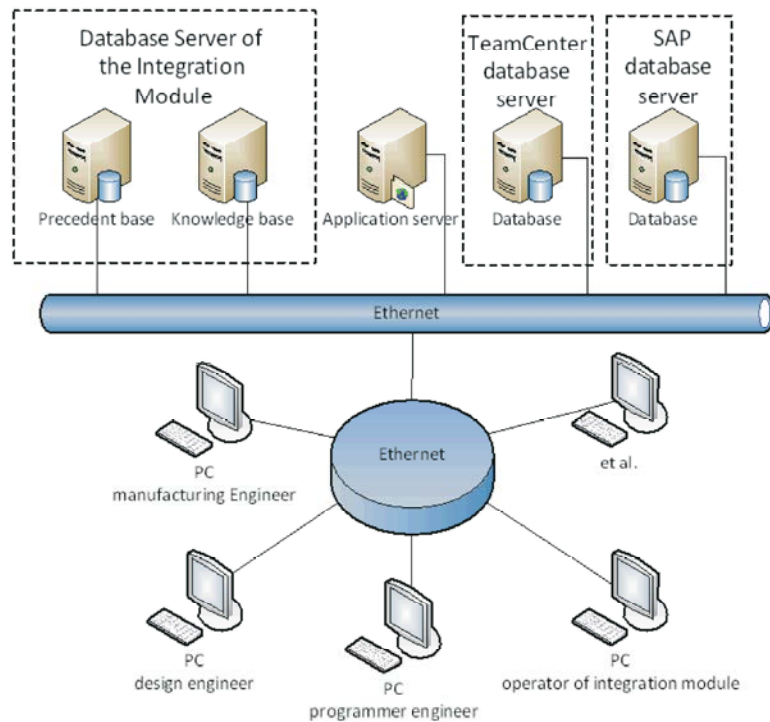


Fig. 1: Structural module integration schema of SAP and TeamCenter systems

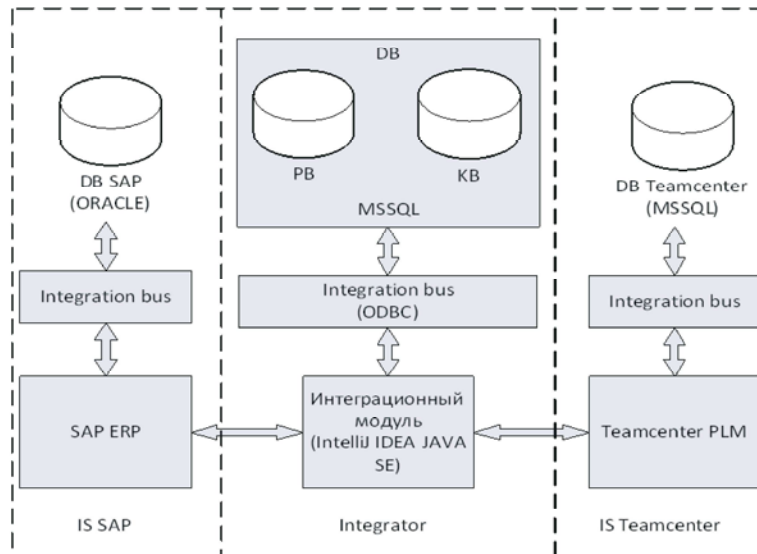


Fig. 2:

Compatibility of integration module with database is carried by open database connectivity (ODBC) driver that allows you to connect the database with java virtual machine (JVM). The Java virtual machine interprets the byte code java, which is pre-created from the source code of the program by java compiler.

Structural scheme of Software Complex Integration SAP and TeamCenter. Java Virtual Machine (JVM) is a

key component of the java platform (Figure 2). Because the java virtual machines are available for many hardware and software platforms. Java can be considered as middleware products and as an independent platform, hence the principle of "write once, run everywhere." [3]

When systematic data from SAP to TeamCenter, instrument of in the information system SAP is LSMV- project (Legacy System Migration Workbench -

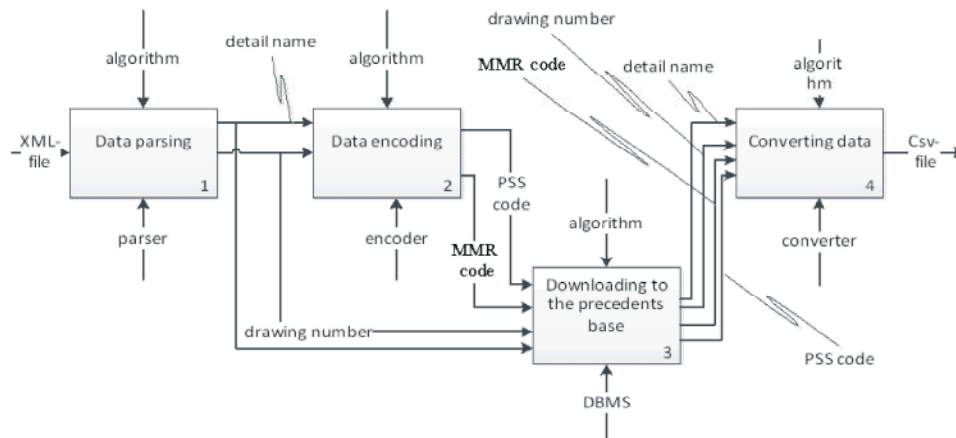


Fig. 3: The functional model of the process of the module integration

instrument for transfer data from external systems into SAP system and component XI). CSV file is loaded into the SAP system with the help of technology XI or LSMW, which allows you to get the necessary attributes in different modules of the information system SAP.

At the input the block systematization the transfer of data from TeamCenter are transferred to the SAP value attributes: name and number of drawing. We get XML file on output through workflow technology. This file is served to the Integration software module and the output is CSV file (Figure 3). Then this file is loaded to SAP through XI or LSMW technology.

The input is an XML file and loaded from it the necessary attribute values, which are supplied for the subsequent encoding into the precedents base (PB). Based on these two blocks we get the CSV file.

To improve the efficiency of data processing and decision-making in the automatic mode is proposed to develop the structure of the integration module based on intelligent agents, which are software modules. These are controlled communication protocol and synchronization of the business objects [1]. This scheme is applicable for the integration of three or more IS. Each intelligent agent (IA) has at least two inherited from him intelligent agents, each of which serves to search and apply logic to the data interface between two information systems. Thus, during the data transfer will form of at least two intelligent agent, one-for receiving the second for transmission of data between the SAP and TeamCenter. Also need to provide the precedents base, which will increase the quality of decisions made by the choice of the optimal evaluation criteria and methods of elimination differences. For transformation and transfer of information between systems is

required a certain set of rules and techniques. Figure 4 shows the sequence interactions of agents in the system, where each unit is a separate and autonomous intelligent agent.

The intelligent agent receiver and transmitter (IA- receiver/transmitter). Alternately takes (according to the algorithm) data packets 1 and 4 of IS interface and transmits them to IA parser. After received data is transmitted in packet 8 for the corresponding data transfer of IS. The agent has a complete understanding of the physical environment and communicative environment. When a file arrives agent takes the name (number) of the file and transmits the value of IA-coordinator to find precedents in the database. When finding precedents IA-coordinator copies the files to the PB and transmits the data to the IA-converter packet 7, after conversion transmits the data to IA receiver \ transmitter packet 8, for downloading to TeamCenter. Search in PB is to prevent duplication of data. If the IA-coordinator did not find duplicate files, it sends a request to the agent to allow file transfer in IA parser [2].

The intelligent agent coordinator (IA- coordinator). This is the connecting agent to the general KB for various agents.

The intelligent agent encoder (IA-encoder) is used to convert the code into required form (transcoding) with different rules. After coding, the resulting value brings to PB through the IA-coordinator, it also applies to search for coding rules through the IA-coordinator for the general knowledge base.

The intelligent agent converter (IA-converter) is used to convert the data into a single file in a specific format, just turns to find the transformation rules through IA-Coordinator to the overall knowledge base.

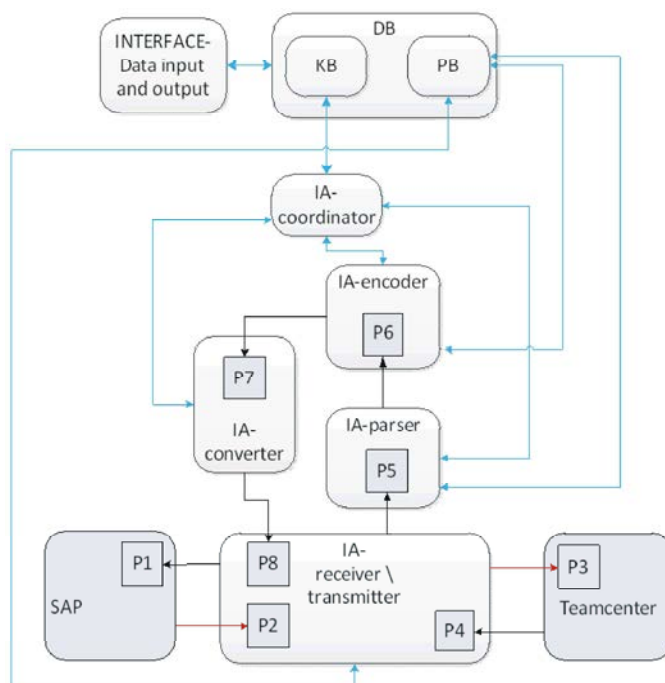


Fig. 4: The interaction of agents of the integration module

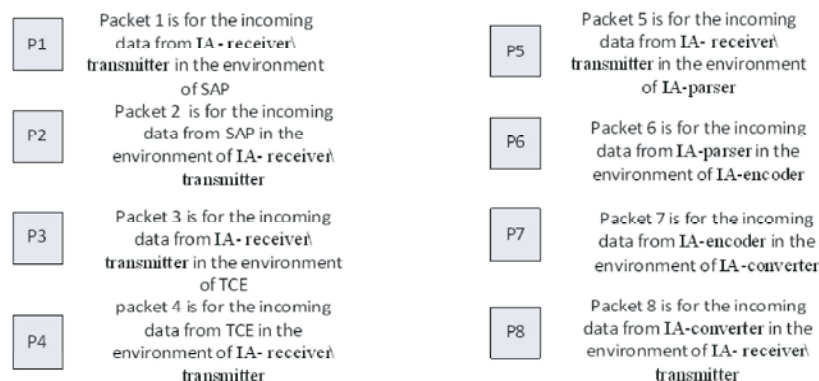


Fig. 5: A list of packages to search for files

The intelligent agent parser (IA-parser) is seeking a certain type of an attribute in the file. At the end of research puts the data in PB through IA-coordinator. Agent determines the type of input data depending on the type searches relevant attributes on a particular algorithm such as the type of search may differ depending on the format.

Packets is the internal working environment of each agent, a certain type of agent has a right of access to a package of a particular agent. Each agent is an incoming packet by which to search for files (Figure 5).

Input and output interface is used for manually forming DB and also for the analysis of the diagnosis system.

The informational system TeamCenter is used workflow technology in drawing up the route the data stream. This technology allows you to visually construct a scheme and if necessary, make the necessary settings. This technology allows you to organize unloading the drawing number and title by time, or after approval.

At the output of the system is given XML file containing the data attributes and their values, namely ProductId and Name. ProductId attribute value have to encode the two rules: the first rule resulting value is transferred to the Product table in the column SAP code; the second rule, the resulting value is transferred to the Product table in the column manufacturing specification

summary code (MSS code). Thus the Product table should be columns: ProductId, Name, Date (downloading date file in the database), SAP code, MSS code.

Product table is copied and recoded in CSV format in a certain folder. The resulting table is absorbed manually by LSMW project in SAP or by XI component automatically. The developed module will provide a dynamic implementation of the integration of the enterprise through the use of intelligent agents and knowledge based on experience and rules. Necessary based on a detailed analysis of the requirements and create a set of rules, form and fill the precedent base and implement a process for planning in SAP (IPPE) for download from the TCE data. The result will be to minimize errors by eliminating the of human factors, the exclusion of manual labor and increase efficiency of decision making.

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