CASE TECHNOLOGIES

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The functionality of CASE-tools makes it easier to work at many stages of designing information systems. They can be both analysis and documentation and full-scale automation, which is important at all stages of software development. The technology guarantees the quality and efficiency of work at the stages of analysis and design of information systems, which are consided to be the most difficult.

CASE-technologies (Computer-Aided Software / System Engineering) are technological systems implemented in the form of software products, focused on creating complex software systems and supporting their full life cycle or its main stages. Currently, CASE technologies are used not only for the production of software products, but also as a powerful tool for solving research and designing problems, such as structural analysis of the subject area, modeling business proposals in order to solve the problems of operational planning and resource management [1].

The integrated CASE tool is a combination of many components, which ensures its versatility.The repository is the core of the CASE tools. It ensures the safety of the project versions and its individual components for editing and saving progress, synchronization of information for the development of group

projects, verification of data requirements such as completeness and consistency. The task of tools designed for graphical analysis and design is to create and edit diagrams of information systems, the connection of which is formed according to the principle of hierarchy (DFD, ERD, etc.). Application development tools, including 4GL languages and code generators, help programmers generate basic parts of code: reading, writing, sorting and comparing information for different parameters. It makes work faster and easier. Configuration management, testing and project management tools substitute a person in testing, and management processes. Documentation tools increase efficiency and accuracy and reduce the risk of errors and inaccuracies [2].

Every invention is valued for its effectiveness. CASE tools can offer improved software quality through automatic control; speeding up the design and development process; the ability to quickly create a prototype of the future system; the use of generating program codes to free the developer from routine work; support software component reuse technology; development support and maintenance. These advantages make the system quite useful for many purposes.

Alongside with positive features, there exist some negative ones, concerning the CASE approach. Expenses present the first problem in using the CASE tool. Many small software development companies believe that the benefits of CASE are obvious when developing large projects. This is the reason why there is no investment in technology from small entrepreneurs. The second issue is Learning Curve. Basically, programmer's productivity level may decrease, because a user needs time to study the technological methods. At the moment there are many courses that help speed up learning process and spend less time developing CASE tools. And last difficulty is connected with Tool Mix. To make a profit, it is important to develop an optimal set of mix tools. Synchronization among different platforms is an important step in the CASE technology.

The model of the software life cycle in the form of a spiral was chosen as the basis for the operation of CASE technology. In the early stages of the spiral, which consists of requirements analysis, specification design, preliminary and detailed design, the feasibility of technical solutions is checked and justified by creating prototypes. This work must be repeated and each next step is characterized by a higher degree of detailing in the software. The end of the coil is the clarification of goals and characteristics of the project and the work planning of the next spiral coil. These implements are based on the top-down design principle.

Goals and content of software life cycle stages (CASE technology) include:

Importance of analysis and design

Rapid iterative prototyping

Automatic code and documentation generation

Automatic project control

Design specifications maintenance

CASE technologies can be classified according to their functional focus to domain modeling tools, analysis and design tools, database scheme design technologies, application development tools and technologies for reengineering program code and database schemes.

CASE tools can be divided into 3 groups according to their functions: tools, toolkit, workbench. Auxiliary programs (tools) solve minor autonomous problems. Development packages (toolkit) are a set of integrated tools that provide assistance for one of the software tasks. In comparison with toolkit, the tools (workbench) have a higher degree of integrated functions, greater independence and autonomy degree. Due to this hierarchy, there exists a process distribution and control at every step [3].

CASE tools include 3 allocate levels. Upper CASE means computer planning. With its help, the process of analyzing various scenarios and accumulating information for making optimal decisions is made. Middle CASE supports the stages of requirements analysis and design of specifications and structure of automated systems. The main benefit of using middle CASE is great simplification of system design. Medium CASEs also provide fast documentation options. Lower CASE is a support tools of software development system containing system dictionaries and graphic tools that eliminate the need to develop physical specifications. System specifications are directly translated into the program codes being developed. About 80% of codes are automatically generated. The main advantages of lower CASEs are a significant reduction of development time, simpler modifications, support for prototyping capabilities [4].

At present there are more than 300 different CASE tools on the software market. The most famous are CA ERwin Process Modeler, CA ERwin Data Modeler, Rational Rose, ARIS.

CASE-technologies have obvious advantages, since they significantly simplify the process of software development and design of information systems and improve its quality. However, despite this, CASE-technologies are away from direct business management. They help deal with the existing and desired situation, but are not a means of automating processes.

References:

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