

INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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THE IMPACT OF CASE TOOLS ON SOFTWARE DEVELOPMENT**BALAMURUGAN SUBRAYEN****ASST. PROFESSOR****DEPARTMENT OF MCA****SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE****PUDUCHERRY****AURCHANA PRABU****ASST. PROFESSOR****DEPARTMENT OF MCA****SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE****PUDUCHERRY****ANGAYARKANNI ANANTHARAJAN****ASST. PROFESSOR****DEPARTMENT OF MCA****SRI MANAKULA VINAYAGAR ENGINEERING COLLEGE****PUDUCHERRY****ABSTRACT**

Now-a-days everything has to go faster because of the increasing speed of changing market-demands new products replace old ones much earlier than before, so the development of new products has to go faster. Thus the production lines have to be developed faster, too. A very important role in this development is software engineering because many production processes are 'computer aided', so software has to be designed for this production system. It seems very important to do the software engineering right and fast. Software engineers had to design software without help of computers, by programming each step at one time. This way is much too costly and time-consuming. In order to speed up the process the bottlenecks in building software systems are to be found. This is hard to do because of the increasing role of computers in our society. Technology is developed further every day, so faster and bigger computers enter the scene. The software running on these computers can be more extensive because they can handle more information in the same time, so there is an increasing amount of data to go with it. Finding the right data out of this increasing amount of information is getting harder and harder, so finding the bottleneck is harder to do.

KEYWORDS

CASE Tools, Software Development, Impact, Productivity, Quality.

1. INTRODUCTION

For the most part, the available CASE technology is intended to automate certain phases of the software development life cycle which focus on how the current technology alters the nature of software engineering efforts. Papers which investigate into the knowledge a software engineer needs to possess and how the software engineer's work content has or may change are included. The current CASE technology exists to automate phases of the software development life cycle, thus affecting software development in the short term, but we cannot ignore the CASE research efforts toward a higher generation language. Such a language should affect software development in the long term. It suggesting how these languages may alter the nature of software engineering in the future is presented. CASE stands for Computer Aided Software Engineering which is software that supports one or more software engineering activities within a software development process, and is gradually becoming popular for the development of software as they are improving in the capabilities and functionality and are proving to be beneficial for the development of quality software.

2. DEVELOPMENT OF CASE TOOLS**2.1 INTRODUCTION**

CASE tools are designed to enhance and upgrade the computing system adopted and used. This is very important with regards to the dependence on a computer-based environment for business and/or personal pursuits. It is an important part of various business growth strategies. The CASE tools are developed for the following reasons:

1. Firstly Quick Installation.
2. Time Saving by reducing coding and testing time.
3. Enrich graphical techniques and data flow.
4. Optimum use of available information.
5. Enhanced analysis and design development.
6. Create and manipulate documentation.
7. Transfer the information between tools efficiently.
8. The speed during the system development increased.

2.2 STANDARDIZE THE DEVELOPMENT PROCESS

CASE tools are the software engineering tools that permit collaborative software development and maintenance. Almost all the phases of the software development life cycle are supported by them such as analysis; design, etc., including umbrella activities such as project management, configuration management etc.

TO FACILITATE SINGLE DESIGN METHODOLOGY

CASE tools help the organization to standardize the development process. It also facilitates coordinated development. Integration becomes easy as common methodology is adopted.

RAPID APPLICATION DEVELOPMENT

To improve the speed and quality of system development organizations use CASE tools.

TESTING

CASE tools help in improving the testing process through automated checking and simplified program maintenance.

DOCUMENTATION

In a traditional software development process, the quality of documentation at various stages depends on the individual. At various stages of SDLC CASE tools improve the quality and uniformity of documentation. It also ensures the completeness of the documentation.

MANAGEMENT

It improves project management activity and to some extent automates various activities involved in project management.

REDUCE THE MAINTENANCE COST

Use of CASE tools makes the software easy to maintain and hence reduce the maintenance costs.

INCREASE PRODUCTIVITY

Automation of various activities of system development and management processes increases productivity of the development team.

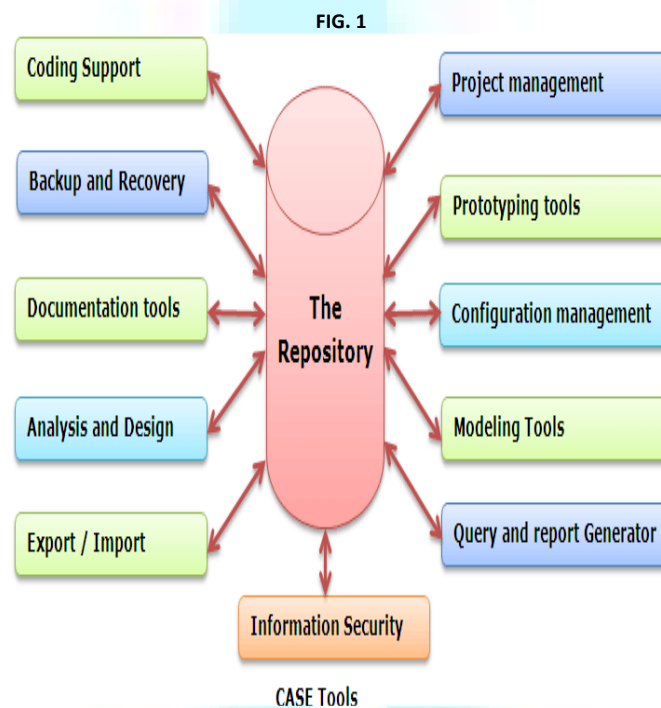
2.3 ENVIRONMENT OF CASE

The heart of a well-designed I-CASE system is a repository, which is used as a knowledge base to store information about the organization, its structure, enterprise model, functions, procedures, data models etc. The meaning represented by diagrams and their detail windows is stored in the repository. The repository steadily accumulates information relating to the planning, analysis, design, construction and maintenance of systems. In other words: The repository is the heart of a CASE system.

Two types of mechanisms have been used in CASE software to store design information:

A *dictionary*, which contains names and descriptions of data items, processes, etc.

A *repository*, which contains this dictionary information and a complete coded representation of plans, models and designs, with tools for cross-checking, correlation analysis and validation.



When an enterprise takes these actions ahead of its competition, it gain a major competitive advantage. An enterprise should also be up-to-date because the rapid advances in computer technology allow the competition to get ahead of you. Some significant trends in the development of new system environments include:

Low-cost MIPS, the price of fast processors is decreasing and even faster everyday

Distributed computing environment, end-users are moving towards multilayered distributed computer architecture

CASE and I-CASE tools, highly integrated, repository-driven, computer-aided systems engineering tools are making it possible to generate application code directly from graphical specifications

Forward/reverse engineering tools, re-engineering tools enable analysts to convert low-level data definition and unstructured process code into standardized data elements and structured code.

New development methodologies, more efficient development life-cycle processes are making it possible to develop applications more rapidly and in closer coordination with end users.

Growth of standards, standards are emerging that will govern the future evolution of hardware and software.

3. POSITIONING OF CASE TOOLS IN A SOFTWARE APPLICATION DEVELOPMENT

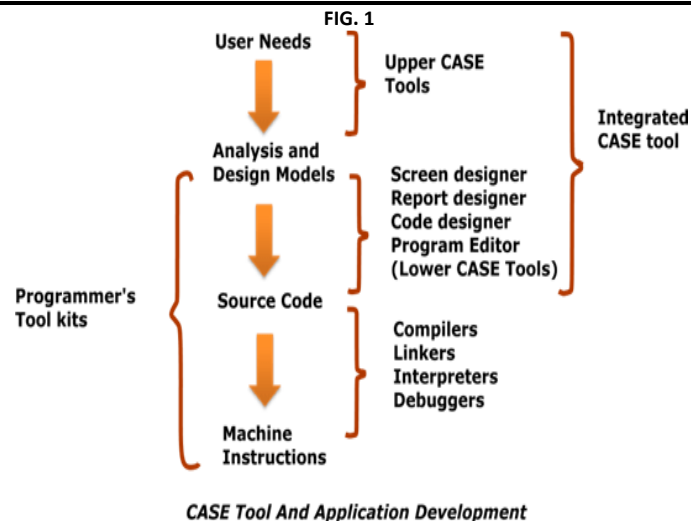
On the basis of their activities, sometimes CASE tools are classified into the following categories:

1. Upper CASE tools
2. Lower CASE tools
3. Integrated CASE tools.

UPPER CASE: Upper CASE tools mainly focus on the analysis and design phases of software development. They include tools for analysis modeling, reports and forms generation.

LOWER CASE: Lower CASE tools support implementation of system development. They include tools for coding, configuration management, etc.

INTEGRATED CASE TOOLS: Integrated CASE tools help in providing linkages between the lower and upper CASE tools. Thus creating a cohesive environment for software development where programming by lower CASE tools may automatically be generated for the design that has been developed in an upper CASE tool.



4. IMPLEMENTATION OF CASE TOOLS

Before implanting CASE and designing tools, a series of steps should be followed:

Conduct a technology-impact study to determine how the basic business of the organization should change to maximize the opportunities presented by rapid technological change

Evaluate how the organization should be re-engineered to take advantage of new technology

Establish a program for replacing the old systems with the most effective new technology

Commit to an overall integrated architecture

Select a development methodology

Select a CASE-tool

Establish a culture of reusability

Strive for an environment of open interconnectivity and software portability across the entire enterprise

Establish interoperate network links to most trading partners

Determine how to provide all knowledge to workers with a high level of computerized knowledge and processing power

Determine the changes in management-structure required to take full advantage of innovative systems, architectures, methodologies and tools.

5. CASE SOFTWARE DEVELOPMENT ENVIRONMENT

CASE tools support extensive activities during the software development process. Some of the functional features that are provided by CASE tools for the software development process are:

Creating software requirements specifications

Creation of design specifications

Creation of cross references

Verifying/Analyzing the relationship between requirement and design

Performing project and configuration management

Building system prototypes

Containing code and accompanying documents.

Validation and verification, interfacing with external environment.

Some of the major features that should be supported by CASE development environment are:

- A strong visual support
- Prediction and reporting of errors
- Generation of content repository
- Support for structured methodology
- Integration of various life cycle stages
- Consistent information transfer across SDLC stages
- automating coding / prototype generation.
- Link checkers
- Program checkers
- Web security test tools.

6. SOFTWARE QUALITY AND CASE TOOLS

Software quality is sacrificed by many developers for more functionality, faster development and lower cost. However, one must realize that a good quality product actually enhances the speed of software development. It reduces the cost and allows enhancement and functionality with ease as it is a better structured product. The high quality software development process is most important for the development of quality software product. Software quality involves functionality for software usability, reliability, performance, scalability, support and security. Quality in such tools is represented in all life cycle phase's viz., Analysis/ Design development, test and deployment. Quality is essential in all the life cycle phases.

ANALYSIS: A poor understanding of analysis requirements may lead to a poor product. CASE tools help in reflecting the system requirements clearly, accurately and in a simple way. CASE tools support the requirements analysis and coverage also as we have modeling. CASE also helps in ambiguity resolution of the requirements, thus making high quality requirements.

DESIGN: In design the prime focus of the quality starts with the testing of the architecture of the software. CASE tools help in detecting, isolating and resolving Structure deficiency during the design process. On an average, a developer makes 200 to 250 errors for every thousand lines of code. Assuming only 8% of these errors are serious, if software has ten thousand lines of code you may still have around 50 serious coding errors in your system. One of the newer software developments processes called the Agile process helps in reducing such problems by asking the developer to design their test items first before the coding. A very good approach that is supported by CASE tools specially running time development of C, C++, JAVA or .NET code is to provide a set of automatic run time Language tools for development of reliable and high performance applications.

TESTING: Functionality and performance testing is an integrated part of ensuring high quality product. CASE support automated testing tools that help in testing the Software, thus, helps in improving the quality of testing. CASE tools enhance the speed breadth and reliability of these design procedures. The design tools are very important specifically in case of a web based system where scalability and reliability are two major issues of design.

DEPLOYMENT: After proper testing software goes through the phase of deployment where a system is made operational. A system failure should not result in a complete failure of the software on restart. CASE tools also help in this particular place. In addition, they support configuration management to help any kind of change thus to be made in the software.

QUALITY IS TEAMWORK: It involves integration of workflow of various individuals. It establishes a traceability and communication of information, all that can be achieved by sharing workload documents keeping their configuration items.

6.1. IMPLEMENTATION

Whenever a new system is installed, the implementation integrates a number of related and different tasks. The process has to be efficiently organized and it is for this very reason that CASE tools are developed. With the help of CASE, the installation process can be automated and coordinated within the developed and adopted system life cycle.

CASE tools are the software engineering tools that permit collaborative software development and maintenance. Almost all the phases of the software development life cycle are supported by them such as analysis; design, etc., including umbrella activities such as project management, configuration management etc. In general, standard software development methods such as Jackson Structure programming or structured system analysis and design method are also supported by CASE tools. CASE tools may support the following development steps for developing data base application:

- Creation of data flow and entity models
- Establishing a relationship between requirements and models
- Development of top-level design
- Development of functional and process description
- Development of test cases.

6.2. ADVANCEMENT OF SOFTWARE DEVELOPMENT

A CASE tool must have the following characteristics in order to be used efficiently:

- **A standard methodology:** A CASE tool must support a standard software development methodology and standard modeling techniques. In the present scenario most of the CASE tools are moving towards UML.
- **Flexibility:** Flexibility in use of editors and other tools. The CASE tool must offer flexibility and the choice for the user of editors' development environments.
- **Strong Integration:** The CASE tools should be integrated to support all the stages. This implies that if a change is made at any stage, for example, in the model, it should get reflected in the code documentation and all related design and other documents, thus providing a cohesive environment for software development.
- **Integration with testing software:** The CASE tools must provide interfaces for automatic testing tools that take care of regression and other kinds of testing software under the changing requirements.
- **Support for reverse engineering:** A CASE tools must be able to generate complex models from already generated code.
- **On-line help:** The CASE tools provide an online tutorial.

7. CONCLUSION

In this paper we have suggested that the issue of CASE tool utilization, by shifting the focus more towards the development- and maintenance *process* and increasingly adopting to CASE tools – especially when it comes to development and maintenance of software application. The positioning paper looks at CASE-tools and how they influence in the SDLC for gaining project success. They have explored CASE-tools adoption by focusing on the individual user in an organization that has implemented such tools for system development and maintenance. We argue that this is a somewhat backwards approach to the issue, which does not catch the big challenge with development and maintenance of software application. The detailed model of the positioning paper is clear and well arguable; however, we propose different concepts that follow our new focus, which leads to an interesting field for investigation.

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