# ENTERPRISE ARCHITECT AND MAGIC DRAW UML – COMPARING THE ABILITIES OF CASE TOOLS

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A b s t r a c t

Creating information systems is complicated and involves finding solutions for analytic-design problems and for that reason using new programming languages and CASE tools is necessary. The author tries to evaluate two items chosen from a group of many tools available on the software market. For that reason the author pointed out few criteria connected to quality and quantity parameters. The specific character of the product influences the decision about the type of tool made by analytic-design team.

## ENTERPRISE ARCHITECT A MAGICDRAW UML – PORÓWNANIE MOŻLIWOŚCI NARZĘDZI CASE

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A b s t r a k t

Tworzenie systemów informatycznych ze względu na złożoność i konieczność rozwiązywania wielu problemów analityczno-projektowych wymaga stosowania nowoczesnych języków modelowania oraz narzędzi CASE. Autorka podejmuje próbę oceny użyteczności dwóch spośród wielu narzędzi obecnie spotykanych na rynku oprogramowania. W tym celu przyjęła kilka kryteriów uwzględniających parametry ilościowe i jakościowe. Decyzja o wyborze narzędzia zależy od specyfiki tworzonego projektu i jest podejmowana przez zespół analityczno-projektowy.

# Introduction

Using tools which allow to identify complex problems, preparing proposals of a solution and the choice of a solution which is the best in particular situation by analytic-design teams is a common phenomenon in the process of creating information systems. The usage of CASE – Computer Aide Software Engineering allows to make some changes in the project in a systematic way as well as to monitor other stages of creating software.

CASE tools perform a number of important functions such as supporting the authors and creators of software during conceptual and implementation work. Their usage increases the level of communication between specialists from different branches of science, makes the bond with the client stronger and makes the documentation and its modification more legible. As a result, the issue is formulated in a correct way (the specification of requirements) and it is better understood which helps to define the criteria of accepted assumptions verification in a more detailed way.

Present-day CASE tools market is very diverse[1] which means that one can choose such tools to perform the process of creating the software in a flexible and optimal way. Simple classification of CASE tools consists of commercial and non-commercial tools[2]. Commercial tools, absolutely professional, support all lifecycle phases of the system (the analysis of requirements, designing, programming, testing, modification). Enterprise Architect in Corporate version is a tool of this type. The second group includes commercial tools which support only selected phases of designing. MagicDraw UML in Personal version is a tool of this type.

The author tries to compare selected CASE tools – EA and MD. She pointed out a list of different features which are used to evaluate the tools (the criteria of evaluation) to illustrate in a better way the differences connected to the quality and abilities of tools. Among them there are the features connected to unified modeling language, the quality of graphic, technical quality, the ease of modification and verification of models. Obtained results are presented in a synthetic way by using the tabular form (Tables 1–5).

# Selected quantity parameters

Many producers of CASE tools don't point out any particular methods of creating information system, they only give a number of conceptual and

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[1] Authors who write about the diversity of tools: WRYCZA et al. 2005, H. TAŃSKA 2005, PIRJANOWICZ 2008.

[2] A different division was presented in this book: FUGLEWICZ et al. 1995. They point out three levels: Lower, Middle, Upper CASE.

implementation models as well as different techniques of modeling. Unified Modeling Language makes specifying analytic, design and implementation decisions easier and they must be made while creating and adjusting information system[3]. Table number 1 presents differences in the way of reproducing UML[4] while creating the system. Selected 12 features allow to state that the difference in activities connected to business analysis, database designing, import of database schemes, creating schedules, creating non-standard types of diagrams required by the user. According to this comparison Enterprise Architect offers more possibilities.

Table 1

The abilities of CASE tools and Unified Modeling Language (UML)

| Feature | Enterprise Architect | Magic Draw UML |
|---|---|---|
| UML version | UML 2.0 | UML 2.0 |
| Types of UML diagram | All included in UML 2.0 standard | It is possible to make 9 from 13 UML diagrams |
| Support for business analysis diagrams | Yes | No |
| Diagram Completeness | Diagrams contain all objects and relations defined in the standard | Diagrams contain all objects and relations defined in the standard |
| Standard UML Stereotypes | Yes | Yes |
| Stereotypes defined by the user | Yes | Yes |
| Database designing | Yes | No |
| Import of database schemes | Yes | No |
| Creating schedules | Yes | No |
| Possibility of creating non-specific type of diagram by the user | Yes | No |
| Possibility of using elements from a diagram in another diagram | Yes | Yes |
| Adding elements to diagrams from model browser | Yes | Yes |

Source: my own analysis based on: MagicDraw User Manual.pdf and Enterprise Architect User Guide.pdf and technical and usable documentation of the producer (www.sparxsystem.com.au, www.magicdraw.com 30.06.2008)

Processes which make performing a number of tasks in a project automatic play an important role in evaluating CASE tools. The designer can create

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[3] P. Graessle, H. Baumann, Ph. Baumann underline that UML "can by used to modeling different systems: information, business or other systems". Graessle et al. 2006.

[4] Unified Modeling Language is a graphic language for presenting, specifying, designing and documenting the elements of information application. It allows to unify the process of preparing the system section including conceptual objects like the functions of the system as well as specific objects like classes, database schemes and programming components which can be used again.

a framework of source code for particular elements of application in a programming language selected by the modeler, among other things to generate DDL code[5] of the database with is modeled. What is more, these tools allow to generate the documentation of the system in an automatic way according to the needs of the designer and system user. The documentation created in this way consists of system architecture and a detailed description of all components. Complete documentation becomes a source of knowledge for analysts, designers, programmers and system users.

Table number 2 presents 6 features which are connected to the processes which are performed automatically in CASE tools (Enterprise Architect and MagicDraw UML).

Table 2

Comparison of automatic generation processes

| Feature | Enterprise Architect | Magic Draw UML |
|---|---|---|
| Generating documentation in HTML format | Yes | Yes |
| Generating documentation in RTF format | Yes | No[a] |
| Generating DDL | Yes[b] | No |
| Generating the framework of source code | Yes[c] | No |
| Control of correctness | Yes | No |
| Reverse engineering | Yes[d] | No |

[a] Generating only the pattern of documentation.
[b] DB2, InterBase, MS Access, MySQL, Oracle 9i, PostgreSQL, SQL Server 2000, SQL Server 7, Sybase Adaptive Server Anywhere, Sybase Adaptive Server Enterprise
[c] ActionScript, C, C#, C++, Delphi, Java, PHP, Pyton, VBnet, Visual Basic
[d] For the same languages as in the case of generating source code

Source: my own analysis based on: MagicDraw User Manual.pdf and Enterprise Architect User Guide.pdf

Selected features point out poor support of generating documentation (only HTML format) by MagicDraw. Other processes like generating DDL, generating the framework of source code, the control of correctness, reverse engineering are not used by this tool.

## Selected quality parameters

Tools like CASE are often used in big software companies. In these companies work is divided between few or even more people. Quite often

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[5] Date Definition Language (DDL) allows to operate on structure which contain data. It involves adding, modifying and deleting tables or bases.

different elements are made in completely different rooms, buildings or even cities. For that reason the possibility of working on a project from many places and by using the net is crucial. It is connected with keeping information confidential as well as the safety of information which is sent. Table number 3 presents the possibilities of work by using MagicDraw UML and Enterprise Architect in an environment which involves one as well as many posts. The ability of these two tools to move created models, diagrams or elements made by using these tools to other tools or modeling environment while keeping the cohesion and integration of data was compared.

Table 3

Technical quality comparison

| Feature | Enterprise Architect | Magic Draw UML |
|---|---|---|
| Work from many posts | Yes | No |
| Creating XML schemes[a] | Yes | No |
| Transformation of models to XMI format | Yes | Yes |
| Transformation of models to CSV format[b] | Yes | No |
| Reading of other models made by using other tools | Yes[c] | Partly[d] |
| Creating hyperlink from UML diagrams to URL | Yes | Yes |
| Version control | Yes[e] | No |
| Exporting diagrams to other applications | Yes | Yes |
| Ability to create a diagram picture | Yes[f] | Yes[g] |

[a] Extensible Markup Language (XML)
[b] Comma Separated Values (CSV)
[c] Testing with MagicDraw UML, Rational Rose Enterprise
[d] Only saved in XML Metadata Interchange (XMI)
[e] Uses CVS
[f] In: BMP, PNG, JPG, TGA, GIF, WNF, EMF format
[g] In EMF, EPS, JPG, PNG, SVG, WNF format

Source: my own analysis based on: MagicDraw User Manual.pdf and Enterprise Architect User Guide.pdf

It is worth mentioning that CASE tools support team work much more often and moving created models from one tool to another one is an important criterion of evaluating their functionality. Table number 3 presents 9 features which are connected to technical aspects and to the export of diagrams to other applications. Only three features (transformation of models to XMI format, creating hyperlinks from UML diagrams to URL, creating diagram picture) which occur in both tools; only Enterprise Architect possess other 6 features.

Visual-usability aspects also influence the evaluation of CASE tools. Often applications with too complicated user interface or too difficult navigation are

rejected even though they have good project parameters. It is caused by the fact it is difficult to master the ability to use tools effectively by the teams which create software in a short period of time. Additionally it is worth pointing out the possibility of adjusting visual parameters of the tool to user's habits.

Graphic quality of application is another feature which has been compared. Quality aspects were evaluated such as possible adjustment of elements appearance and tools background to the individual habits of the user. Moreover, the settings of application interface appearance according to the user's expectations were taken under consideration (Tab. 4) which makes working with the tool easier and using the application more convenient. The change of interface appearance as well as the arrangement of different elements influence the way the tool is used and makes it less time-consuming.

Table 4

Graphic quality comparison

| Feature | Enterprise Architect | Magic Draw UML |
| --- | --- | --- |
| Adding symbols to diagram space | Yes | No |
| Changing the size of symbols and connections | Yes | Yes |
| Changing the colours of diagram background | Yes | Yes |
| Changing the colours of diagram elements | Yes | Yes |
| Possibility of adding icons and symbols by the user | Yes | No |
| Possibility of choosing the type of interface | Yes | Yes |
| Possibility of changing elements arrangement | Yes | Yes |

Source: my own analysis based on: MagicDraw User Manual.pdf and Enterprise Architect User Guide.pdf

MagicDraw application doesn't allow the user to add new symbols and icons which can especially discourage experienced users. Among 7 features, 5 of them connected to changing the size of symbols and icons, colours of diagram background and its elements, arranging these elements and choosing interface are not very different in two tools which have been compared.

The author who teaches information systems designing, software engineering and the basics of information system managing evaluated selected tools by using subjective opinions of students. Table 5 presents non-technical features which influence general evaluation of CASE type application.

Enterprise Architect, according to the opinions of 100 students from the 3rd year of information science who took part in this research, has intuitive user interface and good arrangement of tools which allows to make very professional diagrams, generating the code and preparing documentation fast and quite easily. According to many students EA tool allows to use UML in

Other aspects of comparison

| Feature | Enterprise Architect | Magic Draw UML |
|---|---|---|
| The ease of tool usage | intuitive | intuitive |
| The ease of diagram modification | intuitive | intuitive |
| The ease of finding necessary information in the diagram | intuitive | intuitive |
| Size and complexity of the tool | Very complex with a huge number of options | Simple tool to create diagrams |
| Time needed to get to know the abilities of the tool | Very long (to master all possible abilities) | Short |
| The quality of tool's technical documentation | Very rich | Good |

Source: my own analysis based on: MagicDraw User Manual.pdf and Enterprise Architect User Guide.pdf

more complex way. As a result it guarantees good support in a full system lifecycle from analyzing requirements, creating diagrams, generating the code till testing and preparing final technical documentation of model software. The tool makes team work easier and guarantees the safety of designing. It allows the usage of different programming languages (however Java platform is the most recommended format by company called Sparx System) and database according to the needs. Enterprise Architect is mainly dedicated to Windows platform although distribution for Linux platform have appeared recently. To sum up, it is a tool which requires time to master all its abilities.

MagicDraw UML (MDU) is a simple tool and less complex than Enterprise Architekt so it is easier to master. Many users will appreciate its simplicity and intuitiveness. MagicDraw UML is a tool which can by use by anyone who is interested in UML and has experience in programming and designing objects. MDU has an intuitive user interface. The arrangement of tools is clear and as a result it is easier to find a necessary tool, it takes less time and makes the process of creating diagrams easier. The price often influences the choice of a tool. It is important for the decision-maker when he or she makes decision about the purchase. One can check the current prices of EA and MDU tools on their producers' web pages[6].

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[6] Data can be obtained from these web pages: www.sparxsystem.com.au and www.magic-draw.com

## Conclusion

CASE tools are poorly described in the literature despite their growing popularity (there is a small number of items). Items available on the market are not directly devoted to CASE tools, they are only elements which the descriptions of other issues consist of. The necessity of mastering the tool which the design team hasn't used before must be taken under consideration before starting the production. Mastering these tools takes much time during the process of creating the system because there are many modules, elements and options. Deepened knowledge of UML is necessary.

Establishing the list of features (the criteria of evaluation) was required to compare these tools. The features, which allow to make the quality of software and documentation better, amass the knowledge of design team in repository (system encyclopedia), make information more available (among other things different models, documentation, data) and a faster flow of information between project groups or tools as well as the automation of many other activities, were chosen.

Enterprise Architect in Corporate version is a perfect tool for big companies producing software because they need a tool to support analysts, programmers, managers and application kontrolers. On the other hand MagicDraw UML in Personal version is a great tool supporting a single designer at the initial phases of system lifecycle.

To sum up, Enterprise Architect in Corporate version is a tool which offers better functionality (better and more abounding functionality than Magic-Draw UML). If the fact that the systems are seldom created by a single designer and more often by a specialized design teams is taken under consideration, it is reasonable to use tools which support production. Then good tools are needed to support analysts and designers so the process of creating application would be more efficient and complex, the verification of the work progress done by project managers would be easier and kontrolers would obtain mechanisms necessary to perform the tests. No doubt, Enterprise Architect and MagicDraw UML are CASE tools of this type. These tools satisfy most needs of many companies which design and produce information systems. However it is the team leader who makes the final decision which tool to choose.

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