

# Review on StarUML an Open-Source Unified Modeling Language Tool

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## ABSTRACT

Poor planning is one of the top reasons why software projects are delivered late, over budget, or not at all, so it's important to get organized before start coding. Wide range of modeling tools that make it relatively easy to lay out the functionality and use cases for a new project. One of the most popular languages that are used to represent software design is the UML. The Unified Modeling Language (UML) is the most widely used design notation for software at this time, unifying a number of popular approaches to specifying structure and behavior. In the last decade, the Unified Modeling Language (UML) has become a de-facto standard as modeling language in software engineering. Nearer to 200 Commercial and open source tools which provide UML modeling capabilities available in market. In this paper we concentrate on StarUML. StarUML is an open source tool to develop fast, flexible, extensible, feature-full, and freely-available UML/MDA platform running on Win32 platform. StarUML is excellent in customizability to the user's environment and has a high extensibility in its functionality. In this we present paper summarized study on open source technology, UML, StarUML. We hope it will be help to Academic person, Student, Research, and those who are interested in software engineering field.

**Keywords:** Open source technology, UML, StarUML

## 1. INTRODUCTION

One of the most popular languages that is used to represent software design is the UML. The Unified Modeling Language (UML) is used to spell out, visualize, modify, construct and document the artifacts of an object-oriented software system that is under development. Those who want work on software design they have to know the importance of UML. It is by far the standardized general-purpose modeling language in the field of software engineering. UML combines the best practice from data modeling concepts such as entity relationship diagrams, business modeling (work flow), object modeling and component modeling. It can be used with all processes, throughout the

software development life cycle, and across different implementation technologies.

## 2. OPEN-SOURCE SOFTWARE

Open-Source Software as software that comes under an open source license. This implies that every recipient of the software can freely study its source code, modify it, and distribute it [15]. This software typically does not require a license fee. There are open source software applications for a variety of different uses such as office automation, web design, content management, operating systems, and communications. Future uses of open source where could open source be used and how could its development processes help technology projects be more productive [14].

OSS is unique in that it is always released under a license that has been certified to meet the criteria of the Open Source Definition. [17] [16] Advantages of Open Source Software Costs (little or no-charges), Flexibility, Reliability and Quality, Reduces “Vendor Lock-in”, Availability of External Support, Every one find bugs, cons of open source technology is Lack of Personalized Support (Documentation).

### 3. StarUML

**StarUML** is an open source project to develop fast, flexible, extensible, featureful, and freely-available UML/MDA platform running on Win32 platform. StarUML modeling application licensed under a modified version of GNU GPL. StarUML is based on UML version 1.4 and provides UML version 2.0 notations and eleven different types of diagram. It actively supports the MDA (Model Driven Architecture) approach by supporting the UML profile concept. It provides maximize the productivity and quality because of generating numerous results automatically from it. Use of StarUML help to easily and quickly design exact software models which is based on UML standard. The goal of the StarUML project is to build software modeling tool and also platform that is a compelling replacement of commercial UML tools such as Rational Rose, Together and so on. starUML boasts a complete set of UML modeling features.

**UML Profile & Notation Extension:** UML Profile allows extension of expression for the software model through the extension mechanism of UML.

**Model Framework:** Model Framework makes software models reusable and allows them to be used when defining other software models.

**Add-In COM Object:** Add-In COM allows addition of new functionality to StarUML.

**Menu Extension:** The StarUML application menu (main menu and pop-up menu) can be added by the user.

**Option Extension:** The StarUML option items can be added by the user.

**Event Subscription:** Various events occurring in StarUML can be subscribed to.

**External API:** The external API from StarUML allows access to various functionalities and information. Details on API are discussed throughout this developer guide, and the example included in StarUML installation 'StarUML Application Model. UML provides a good illustration. [8][13]

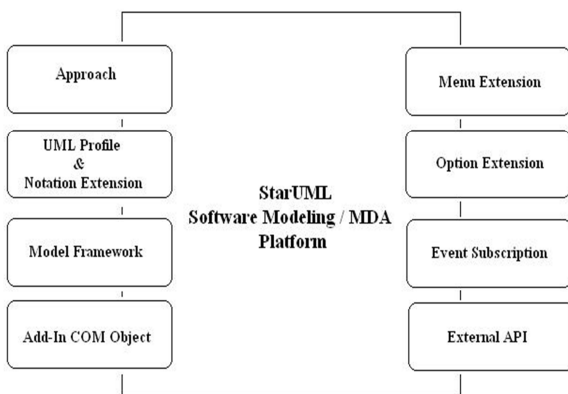


Fig-1: Architecture of StarUML [8][13]

**Approach:** Approach defines the model of the project and basic organization of the diagrams.

### 4. KEY FEATURES OF StarUML

**UML Tool that Adapts to the User:** StarUML provides maximum customization to the user's environment by offering customizing variables that can be applied in the user's software development methodology, project platform, and language.

**True MDA Support:** Software architecture is a critical process that can reach 10 years or more into the future. The intention of the OMG (Object Management Group) is to use MDA (Model Driven Architecture) technology to create platform independent models and allow automatic acquisition of platform dependent models or codes from platform independent models. This maximizes extensibility

of UML, making modeling of applications possible even in areas like finance, defense, e-business, insurance, and aeronautics. Truly Platform Independent Models (PIM) can be created, and Platform Specific Model (PSM) and executable codes can be automatically generated in any way.

**Excellent Extensibility and Flexibility:** StarUML provides excellent extensibility and flexibility. It provides Add-In frameworks for extending the functionality of the tool. It is designed to allow access to all functions of the model/meta-model and tool through COM (Visual Basic Script, Java Script, VB, Delphi, C++, C#, VB.NET, Python, etc.) Automation and it provides extension of menu and option items. Also, users can create their own approaches and frameworks according to their methodologies. The tool can also be integrated with any external tools.

**Accurate UML standard model:** StarUML™ strictly adheres to the UML standard specification specified by the OMG for software modeling. Considering the fact that the results of design information can reach 10 years or more into the future, dependence on vendor-specific irregular UML syntax and semantics can be quite risky. StarUML™ maximizes itself to order UML 1.4 standard and meaning, and it accepts UML 2.0 notation on the basis of robust Meta model.

**Open software model format:** Unlike many existing products that manage their own legacy format models inefficiently, StarUML™ manages all files in the standard XML format. Codes written in easy-to-read structures and their formats can be changed conveniently by using the XML parser. Given the fact that XML is a world standard, this is certainly a great advantage, ensuring that the software models remain useful for more than a decade.

**Applicability of methodologies and platforms:** StarUML manipulates the approach concept, creating environments that adapt to any methodologies/processes. Not only the application framework models for platforms like .NET and J2EE, but also basic structures of software models (e.g. 4+1 view-model, etc.) can be defined easily.

**Software model verification function:** Users can make many mistakes during software modeling. Such mistakes can be very costly if left uncorrected until the final coding stage. In order to prevent this problem, StarUML automatically verifies the software model developed by the user, facilitating early discovery of errors, and allowing more faultless and complete software development.

**Useful Add-Ins:** StarUML includes many useful Add-INS with various functionalities: it generates source codes in programming languages and converts source codes into models, imports Rational Rose files, exchanges modeling information with other tools using XML, and supports design patterns. These Add-Ins offer additional reusability, productivity, flexibility and interoperability for the modeling information.

**System Requirement:** The following are the minimum system requirements for running StarUML. Intel(R) Pentium(R) 233MHz or higher, Windows(R) 2000, Windows XP, or higher Microsoft(R) Internet Explorer 5.0 or higher, 128 MB RAM (256MB recommended), 110 MB hard disc space (150MB space recommended), CD-ROM drive, SVGA or higher resolution monitors (1024x768 recommended), Mouse or other pointing device [8].

#### Some Other features [2][8][13]

- StarUML is mostly written in Delphi. However, StarUML is multi-lingual project and not tied to specific programming language, so any programming languages can be used to develop StarUML.
- StarUML supports the following UML diagrams
  - Use Case Diagram
  - Class Diagram
  - Sequence Diagram
  - Collaboration Diagram
  - State chart Diagram
  - Activity Diagram
  - Component Diagram
  - Deployment Diagram
  - Composite Structure Diagram (UML 2.0)

- Code generation can be done for Java, C++ and C# as well as Reverse Engineering Documentation can be generated for all of the Microsoft Office suite programs such as Word, Excel and PowerPoint.

### 5. PROS OF StarUML

- Supports most of the diagrams specified in UML 2.0.
- Very rich feature set and formatting options.
- Ability to generate source code from the UML diagram.
- Reverse engineer the existing code into UML diagrams.
- Supported languages: C, C# and Java.
- Fast load time/execution time compared with other UML tools.
- Familiar Visual Studio like user interface.
- Supports exporting diagrams into JPG / XMI formats.
- Supports plug-ins for both importing and exporting.
- Code and documentation plug-ins provided with package.
- Useable.
- Free.

As basic comparison to other open source UML tool like argoUML with StarUML have some limitation are as follows

- Not fully supports UML 2.0.
- Can't Undo! Developers of argoUML must be so optimistic that people (especially Software Developers) never do mistakes.
- Written in Java, so run comparatively slower than starUML.
- Lack of formatting options [3][4][6][12][13].

### 6. CONS OF StarUML

- Complex for the beginner.
- No longer on a release cycle.
- Not cross platform. (only Windows)

- Does not support exporting diagrams into SVG format [3] [4] [6] [12] [13].

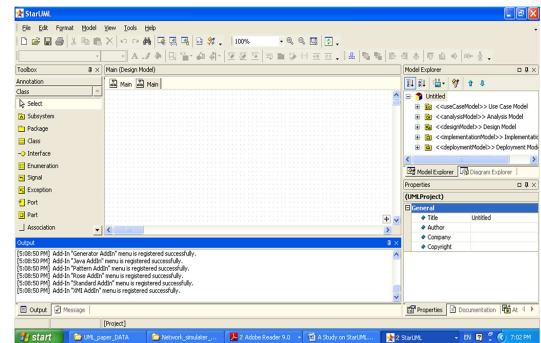


Fig-2: StarUML Effective GUI.

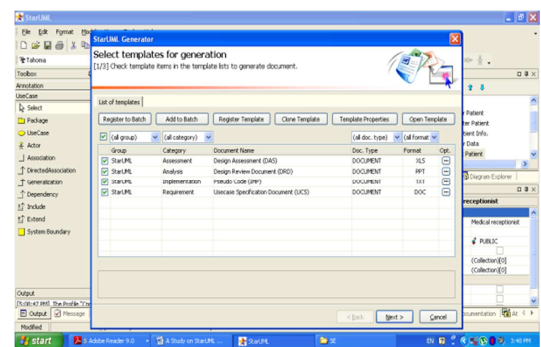


Fig-3: Different types Document generation by StarUML.

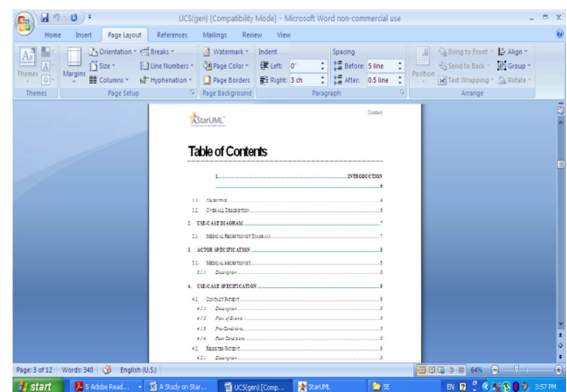


Fig-4: Table content of generated document of Medical Receptionist.

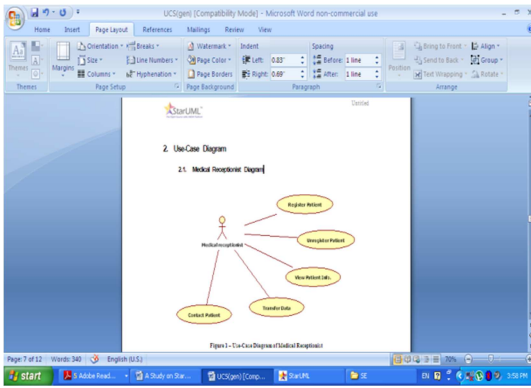


Fig-5: Use case model for Medical Receptionist in generated document.

## 7. CONCLUSION

In this paper we have described some of the cognitive features of StarUML and key parts of the system's design. These features are inspired by published theories of human cognition during design tasks. We have discussed the Key features, pros and cons of StarUML. After this study on StarUML modeling tool and basic comparison to some other open source tools like AgroUML it looks much better than others. So we recommend starUML for any developer for modeling of software models and prepare the document.

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