# Chapter 5. UML & SysML

The **Unified Modeling Language** (**UML**) is a general-purpose, developmental, modeling language in the field of software engineering, that is intended to provide a standard way to visualize the design of a system. It represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems. The UML uses mostly graphical notations to express the design of software projects. Using the UML helps project teams communicate, explore potential designs, and validate the architectural design of the software. As mentioned before, UML is a very important part of developing object oriented software and the software development process, but it is not a development method by itself; however, it was designed to be compatible with the leading object-oriented software development methods of its time.

SysML is defined as a lightweight dialect (Profile) of UML 2.x, the industry standard modeling language for software-intensive applications. (The SysML Profile is *lightweight* in the sense that the changes that it makes to the underlying language are relatively modest in scope and extent, using a small number of simple stereotypes, tagged values and constraints. Compare and contrast with a *heavyweight* Profile, which could significantly impact how the underlying language is used.) The advantage of defining SysML as a UML Profile is that it can reuse the relatively mature notation and semantics of UML 2.x, which many modeling tool vendors have already implemented. The disadvantage of specifying SysML as a UML Profile is that SysML inherits many of the problems associated with UML 2.x, such as gratuitously complex notation, imprecise semantics, and a dysfunctional diagram interoperability standard (XMI).

UML vs SysML

The Systems Modelling Language (SysML) is a general purpose modelling language for engineering systems. SysML supports the analysis, design and verification of complex systems including hardware, software, information, personnel, procedures, and facilities in a graphical notation. SysML is defined as an extension of a subset of the ***Unified Modelling Language (UML)*** using UML's profile mechanism and was submitted to the Object Management Group (OMG) in November 2005. SysML provides graphical representations based on a semantic foundation for modelling system behavior, requirements, structure, and parametrical elements which are used to integrate with other engineering analysis models. SysML is defined as an extension of a subset of the ***Unified Modelling Language (UML)*** using UML's profile mechanism and was submitted to the Object Management Group (OMG) in November 2005. A number of competing specification proposals were merged and adopted by the OMG as OMG SysML in July 2006 and the availability of OMG SysML™ v1.0 in September 2007.
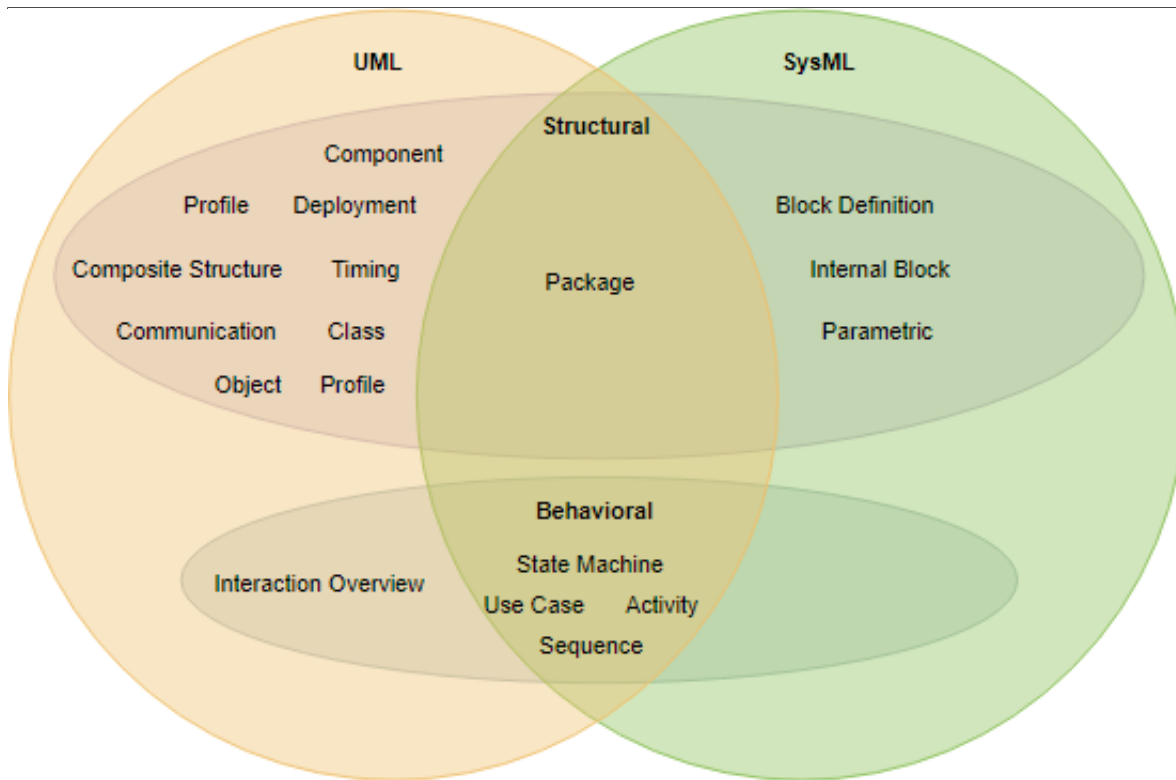
The SysML diagram types are identified in the Figure and summarized below.
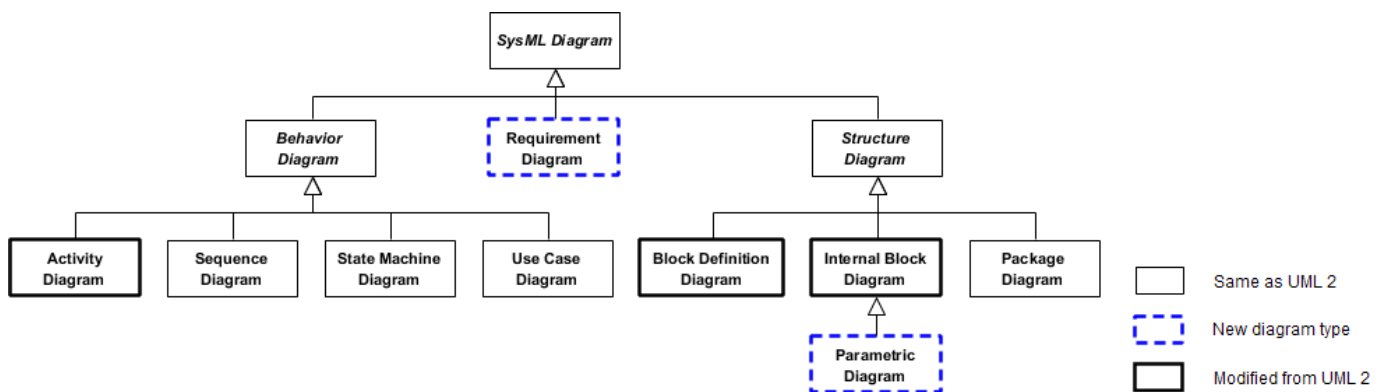
Related UML and SysML Articles

- [What is SysML?](#)
- [What is UML?](#)
- [Why UML Modeling?](#)
- [Overview of the 14 UML Diagram Types](#)