What is AUTOSAR?

Automotive Open System Architecture (AUTOSAR) is an open and standardized automotive software architecture, which supports standardization in interfaces between application software and basic vehicular functions and it helps in establishing common ECU software architecture for all the AUTOSAR

AUTOSAR Methodology/build process -Sequence of Steps to develop an AUTOSAR system:

It has included 4 steps according to the Therotical view, for better conceptual understanding we will discuss on tool perspective as well.
Those steps are:
1.system configuration input
2.system configuration description
3.ECU configuration description file
4.To generate an executable file

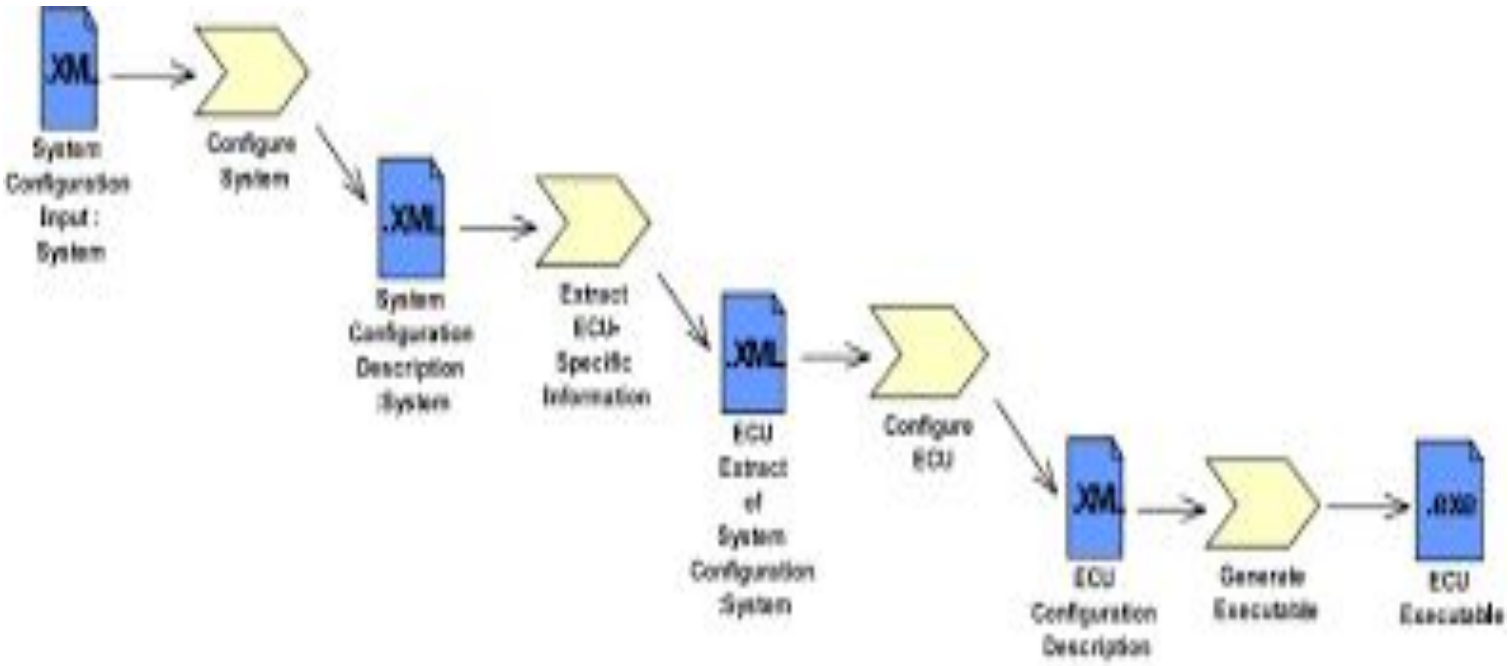
The first step: The System configuration input is the architectural design. The software components and the hardware have to be selected, and overall system constraints have to be identified. The system configuration input will contain information about the software components, ECU resources and System constraints.

The second step: The system Description file,the second step is to map the software components to the ECUs with regards to the resources and timing requirements.

The third step: The ECU Configuration description file,extract the ECU specific information and configure the ECU with all the necessary information for implementation like task scheduling, necessary BSW (basic software) modules, configuration of the BSW, assignment of runnable entities to tasks, etc.

The fourth step: The last step is to generate the executable file which can be flashed in the hardware(ECU).

Theoretical steps involved in AUTOSAR build process



Tool perspective in AUTOSAR build process:

The AUTOSAR methodology is slightly different when explained from the tools perspective. Now let us see the sequence of steps involved in the AUTOSAR methodology when viewed from a tools perspective. We use an AUTOSAR authoring tool to create a high-level design which includes- Software Component description, ECU resource Description and System Description file (including the communication matrix, topology etc).
AUTOSAR methodology can be largely broken into two pieces namely, application software development and ECU configuration process

Application software development process: In the application software component(SWC) development process, SWC description file which describes the software components that need to be developed is taken as input.

1.We build a system level file (arxml file) using Autosar Authoring tools.

2. The next step is to convert the system level file into a <*.c> and <*.h> code.

ECU configuration process: we use the Software Component description, ECU resource Description and System Description file to generate the system Description. The System description has all the mappings i.e., it has all the details of ECUs, the software components that are mapped to the ECUs and the details of the communication matrix, topology etc. A BSW configuration tool is used to configure the ECU. A BSW configuration tool will have to do RTE Generation, OS Generation, BSW Generation and MCAL configuration. The output will be a <*.c> and <*.h>. This <*.c> and <*.h> is integrated with the <*.c> and <*.h> files generated in the application software component development process and a final make file is generated.

Tool perspective on AUTOSAR build process