SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

Accredited by NBA – AICTE and Accredited by NAAC – UGC with 'A++' Grade
Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

19ECT312 – EMBEDDED SYSTEM DESIGN

III YEAR/ VI SEMESTER

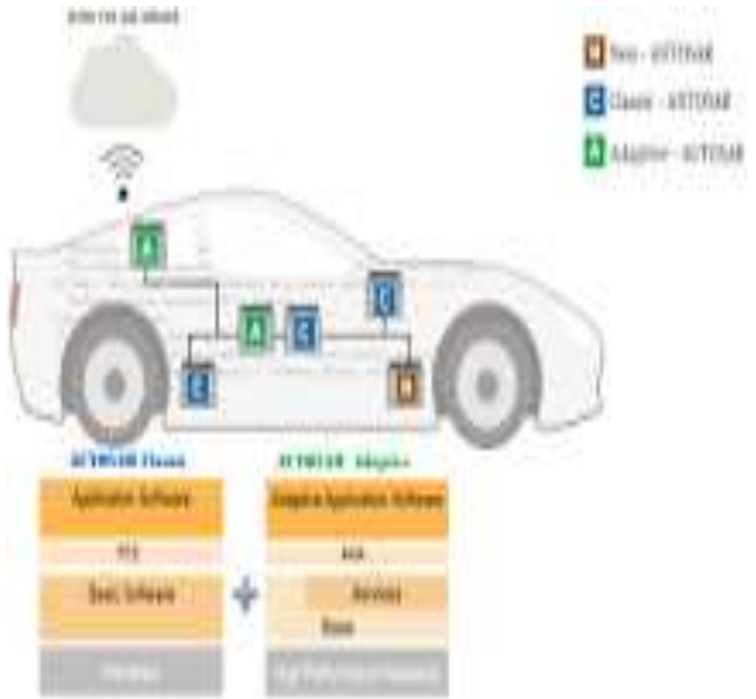
1

UNIT 4 :**Embedded Operating System and Modelling**

TOPIC 4. 10 : AUTOSAR

AUTOSAR

- AUTOSAR (AUTomotive Open System Architecture) is a worldwide development partnership of vehicle manufacturers, suppliers, and other companies from the electronics, semiconductor, and software industries.



Importance of AUTOSAR

- Standardization
- Modularity and Reusability
- Scalability
- Flexibility and Customization
- Interoperability and Supplier Collaboration
- Adaptability to Future Technologies

Need of AUTOSAR

- Embedded systems is a vast field having n number of semiconductor manufacturers, hardware and software platforms which can be selected based on application requirements
- Due to such varieties, the development effort is tough and the portability of code is hard which further increases the development cost
- A automotive is a complex machine which consists of n number of small embedded systems called Electronic control Unit(ECUs) so maintenance and development of code for such controllers is not easy
- Further complexity is increased if different ECUs use different MCUs for meeting cost requirements, then each ECU will have different software as hardware platforms will be different
- To partially standardize things, sometimes there is also a need to develop and follow custom created standard (Custom standard means to develop a **protocol** for communication which is agreed by all ECUs in network) to communicate with other ECUs
- This is the conventional way of writing software which is very hard to maintain and has very less chance of code portability or reuse ability.

Need of AUTOSAR

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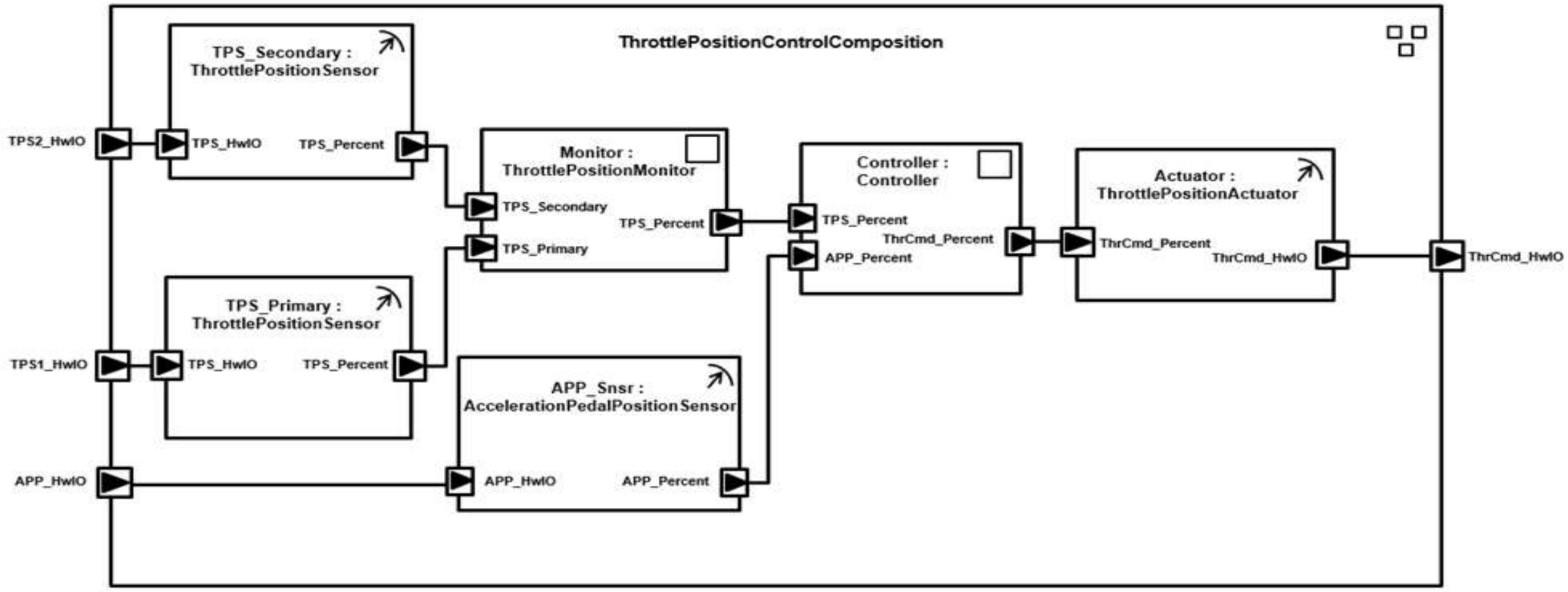
- A automobile has n number of parts which are manufactured by different companies called **Tier 1** companies which supplies the parts to OEMs like BMW, Volkswagen, etc

- Today almost all mechanical parts are becoming intelligent by adding ECU in them to increase control and efficiency

- So those ECUs also need to have a **common way** of communication to communicate with the ECUs of OEM for this again a custom standard needs to be implemented and maintained

AUTOSAR Components

- AUTOSAR software components are reusable building blocks of AUTOSAR software
- An AUTOSAR software component encapsulates one or more algorithms and communicates with its environment through well-defined ports



AUTOSAR Software Components and Compositions

- An AUTOSAR software component connects to an AUTOSAR runtime environment for communicating with other software components and software in the Basic Software layer of the AUTOSAR software architecture.
- You can reuse and relocate software components between ECUs
- In Simulink®, you represent AUTOSAR software components with Simulink model components, such as Model, subsystem, and Simulink Function blocks
- *AUTOSAR compositions* are AUTOSAR software components that aggregate groups of software components that have related functionality
- A composition is a system abstraction that facilitates scalability and helps to manage complexity when designing the logical representation of a software application.

AUTOSAR Software Components and Compositions

The composition consists of software components that represent

- Two throttle position sensors
- Throttle position monitor
- Acceleration pedal position sensor
- Controller
- Throttle position actuator

Thank you