Types of design elements:

1. Data design elements The data design element produced a model of data that represent a high level of abstraction.

- This model is then more refined into more implementation specific representation which is processed by the computer based system.

- The structure of data is the most important part of the software design.

2. Architectural design elements The architecture design elements provides us overall view of the system.

- The architectural design element is generally represented as a set of interconnected subsystem that are derived from analysis packages in the requirement model.

- **The architecture model is derived from following sources:** The information about the application domain to built the software.

- Requirement model elements like data flow diagram or analysis classes, relationship and collaboration between them.

- The architectural style and pattern as per availability.

3. Interface design elements The interface design elements for software represents the information flow within it and out of the system.

- They communicate between the components defined as part of architecture.

- **Following are the important elements of the interface design:**
  1. The user interface
  2. The external interface to the other systems, networks etc.
  3. The internal interface between various components.

4. Component level diagram elements The component level design for software is similar to the set of detailed specification of each room in a house.

- The component level design for the software completely describes the internal details of the each software component.

- The processing of data structure occurs in a component and an interface which allows all the component operations.

- In a context of object-oriented software engineering, a component shown in a UML diagram.

- The UML diagram is used to represent the processing logic.
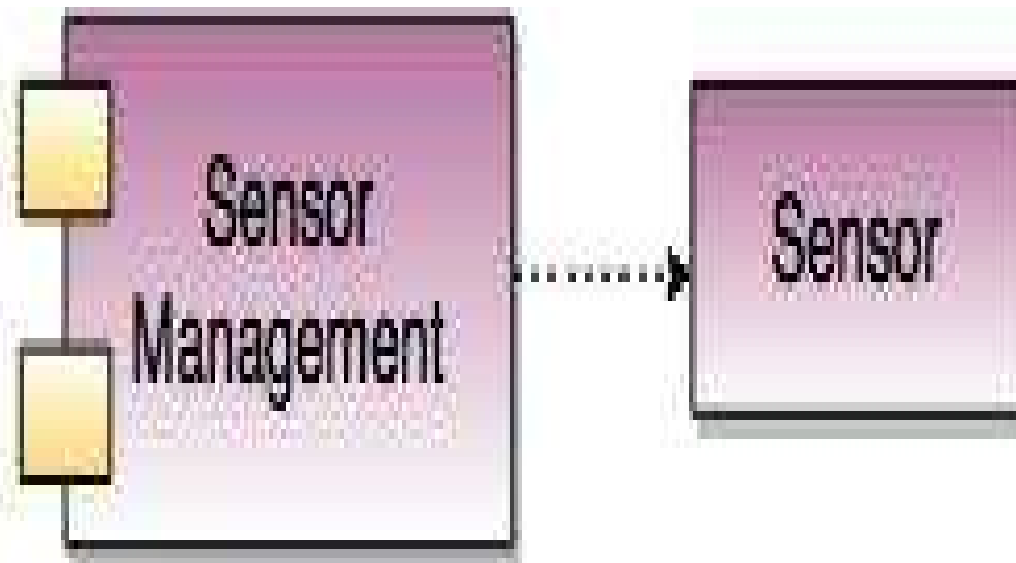
Fig. - UML component diagram for sensor managemnet

5. Deployment level design elements. The deployment level design element shows the software functionality and subsystem that allocated in the physical computing environment which support the software.

Following figure shows three computing environment as shown.

These are the personal computer, the CPI server and the Control panel.
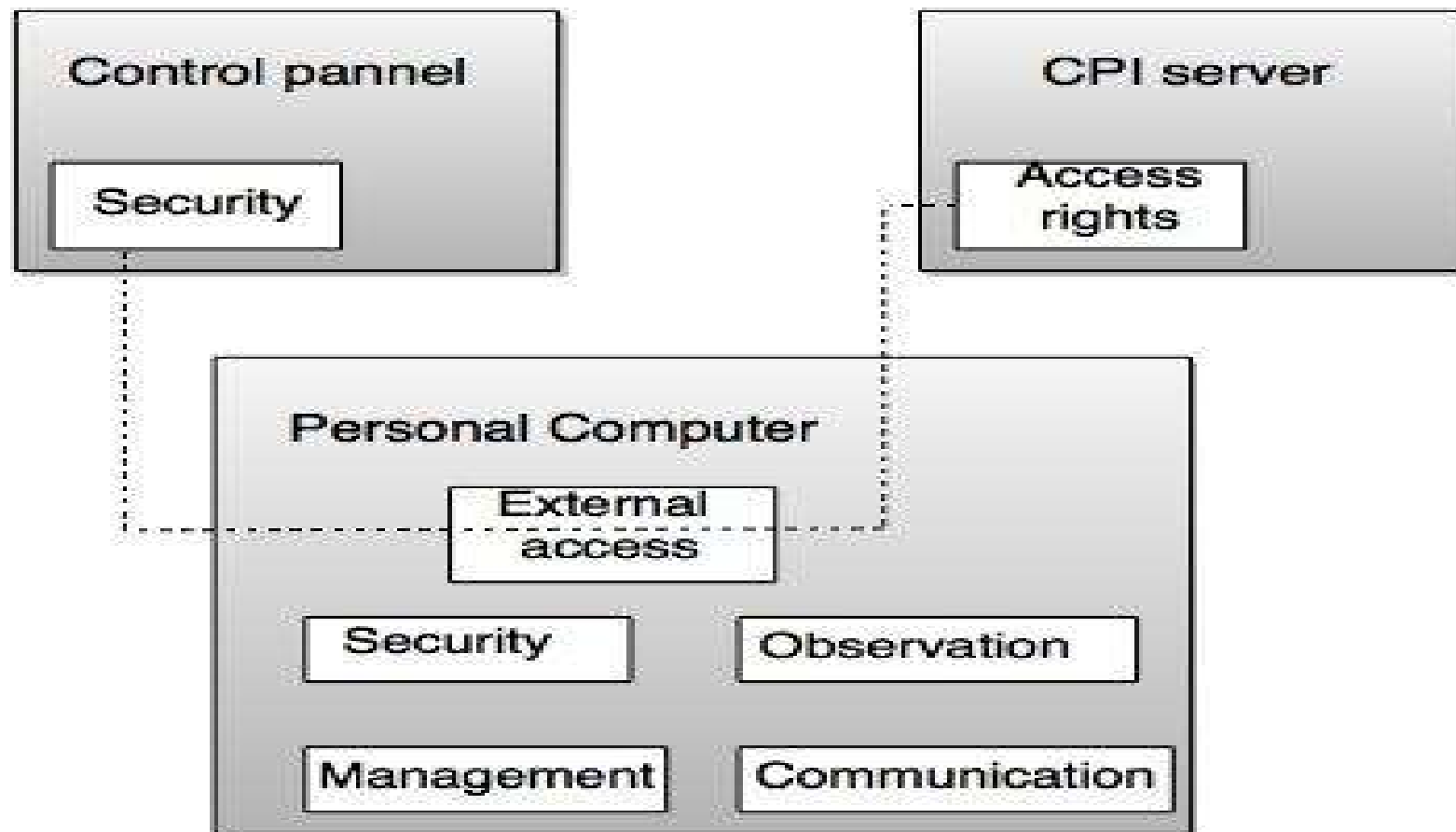
Fig. – Deployment level diagram

Software Engineering | Architectural Design

- **Introduction:** The software needs the architectural design to represents the design of software. IEEE defines architectural design as "the process of defining a collection of hardware and software components and their interfaces to establish the framework for the development of a computer system."

- The software that is built for computer-based systems can exhibit one of these many architectural styles.

- Each style will describe a system category that consists of :

- A set of components(eg: a database, computational modules) that will perform a function required by the system.

- The set of connectors will help in coordination, communication, and cooperation between the components.

- Conditions that how components can be integrated to form the system.

- Semantic models that help the designer to understand the overall properties of the system.

- The use of architectural styles is to establish a structure for all the components of the system.