SOFTWARE ENGINEERING-I

BY
SAID UL ABRAR

LECTURER IN ICS/IT
THE UNIVERSITY OF AGRICULTURE PESHAWAR.

Week 10 Architectural Styles

-Data centered architectures

-Data flow architectures

-Call and return architectures

-Object Oriented architectures

-Layered architectures

Architectural Styles

- 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.

Data centered architectures:

- The data store in the file or database is occupying at the center of the architecture.

- Store data is access continuously by the other components like an update, delete, add, modify from the data store.

- Data-centered architecture helps integrity.

- Pass data between clients using the blackboard mechanism.

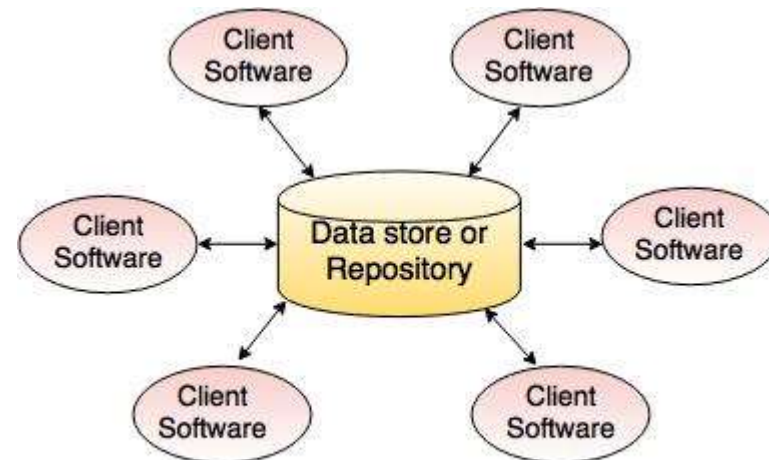- The processes are independently executed by the client components.

Fig.- Data centered architecture

Data flow architectures

- This architecture is applied when the input data is converted into a series of manipulative components into output data.

- A pipe and filter pattern is a set of components called as filters.

- Filters are connected through pipes and transfer data from one component to the next component.

- The flow of data degenerates into a single line of transform then it is known as batch sequential.
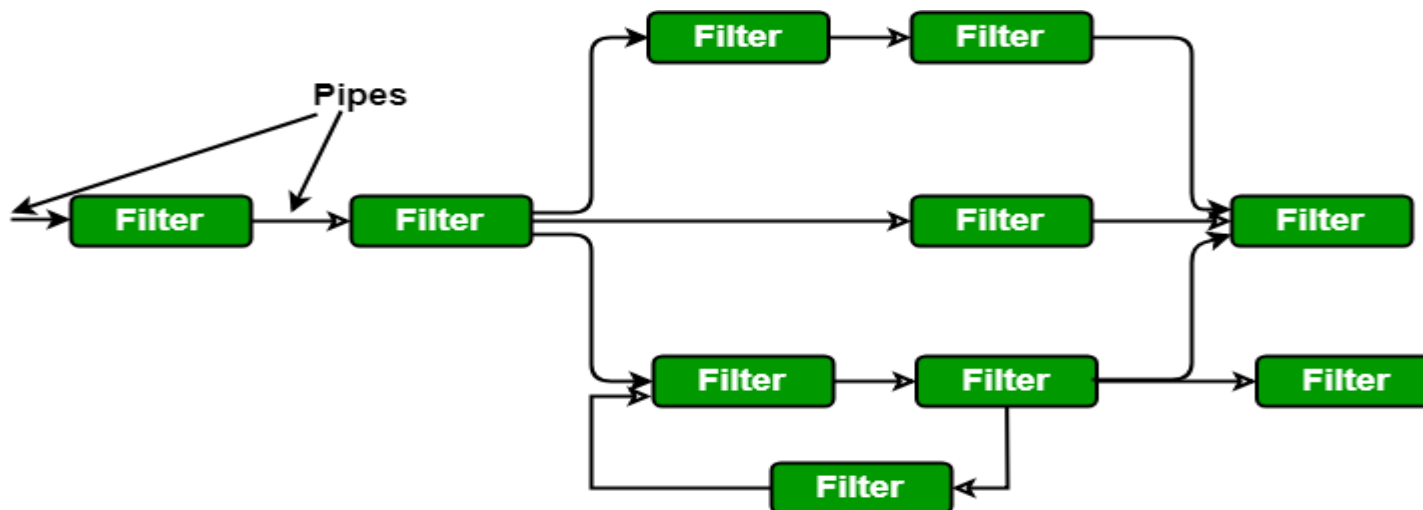
Call and Return architectures:

- This architecture style allows to achieve a program structure which is easy to modify.

 **Following are the sub styles exist in this category:**

  1. Main program or subprogram architecture
- The program is divided into smaller pieces hierarchically.
- The main program invokes many of program components in the hierarchy that program components are divided into subprogram.

2. Remote procedure call architecture
- The main program or subprogram components are distributed in network of multiple computers.
- The main aim is to increase the performance.

Continue….
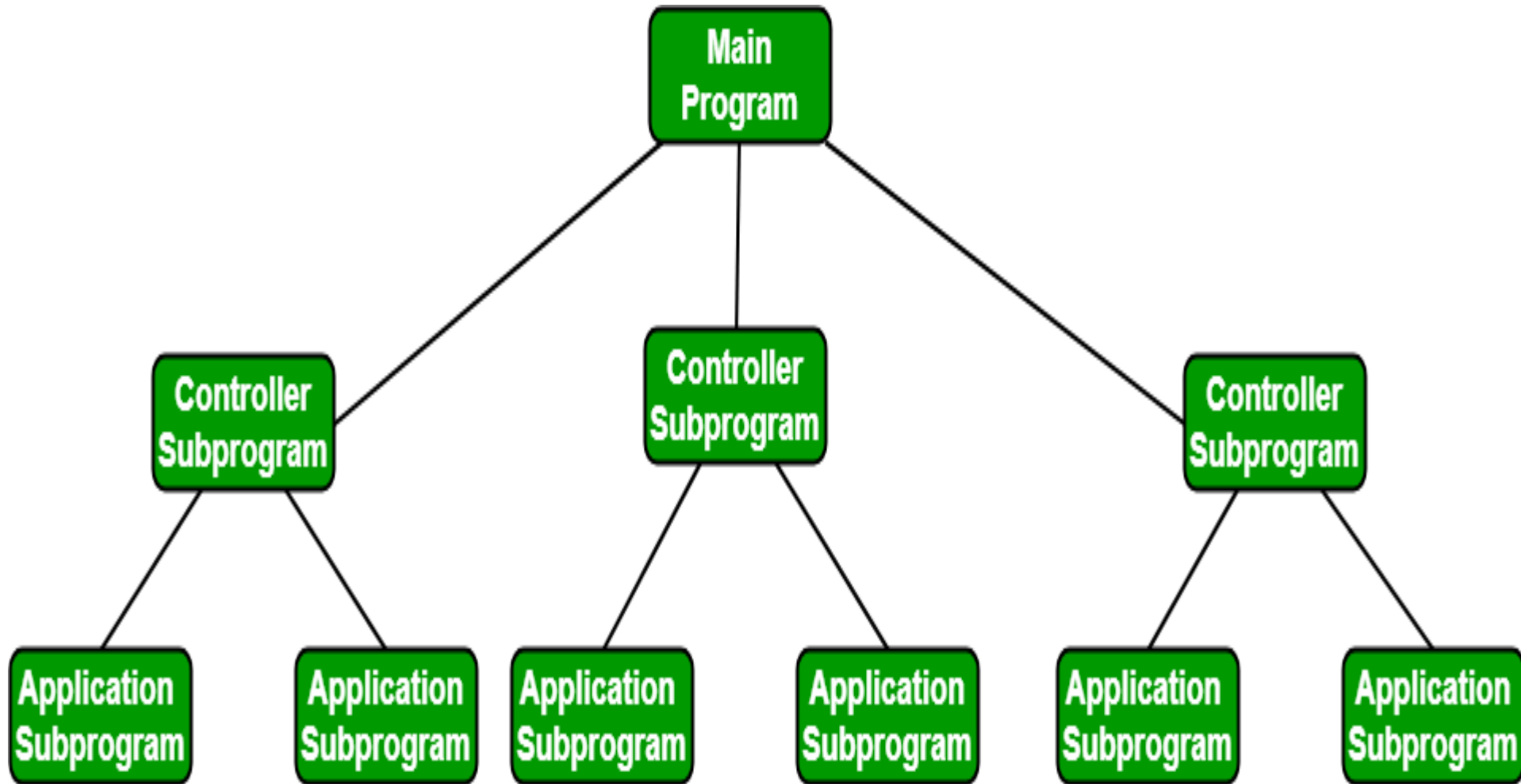
Object Oriented architecture:

- This architecture is the latest version of call-and-return architecture.
- It consist of the bundling of data and methods.

Layered architecture:

- The different layers are defined in the architecture. It consists of outer and inner layer.

- The components of outer layer manage the user interface operations.

- Components execute the operating system interfacing at the inner layer.

- The inner layers are application layer, utility layer and the core layer.

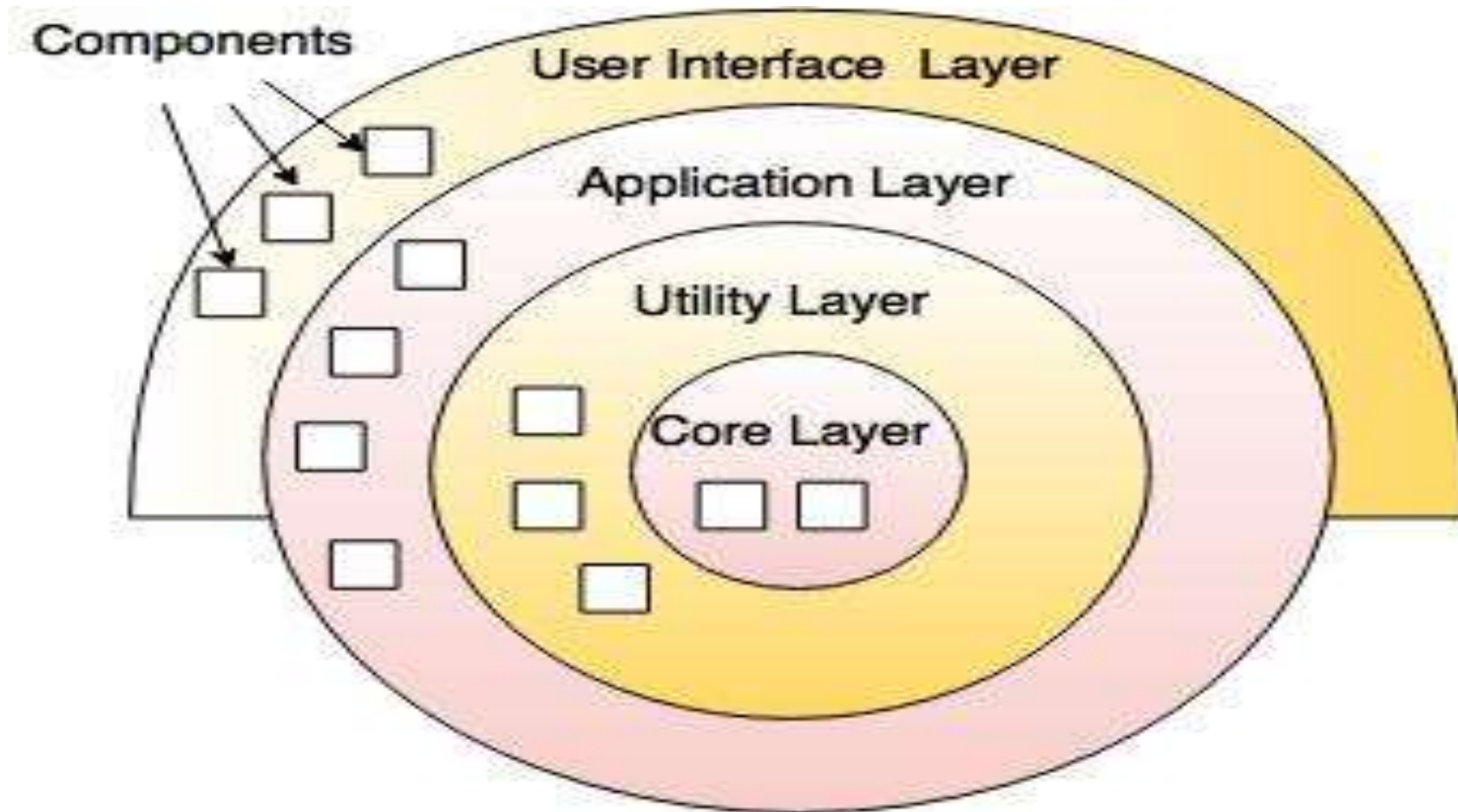- In many cases, It is possible that more than one pattern is suitable and the alternate architectural style can be designed and evaluated.

Continue…

Fig.- Layered Architecture