The Design Model

Design Model Elements

- Data elements
  - Data model --> data structures
  - Data model --> database architecture
- Architectural elements
  - Application domain
  - Analysis classes, their relationships, collaborations and behaviors are transformed into design realizations
  - Patterns and “styles” (Chapters 9 and 12)
- Interface elements
  - the user interface (UI)
  - external interfaces to other systems, devices, networks or other producers or consumers of information
  - internal interfaces between various design components.
- Component elements
- Deployment elements

Data Design Elements

- Creates a model of data represented at a higher level of abstraction
- Users/customers' view of data
- After that refined to more implementation-specific representation that can be processed by the system
- Data architecture has an impact on software architecture (as an effective design may lead to efficient processing)
- Data elements are important because the translation of data model to the database at the application level is an integral part of the design
- Moreover, efficient data storage may result in a data warehousing
- That may lead to data mining or knowledge discovery via insights' extraction which has an impact on business success

Architectural Design Elements

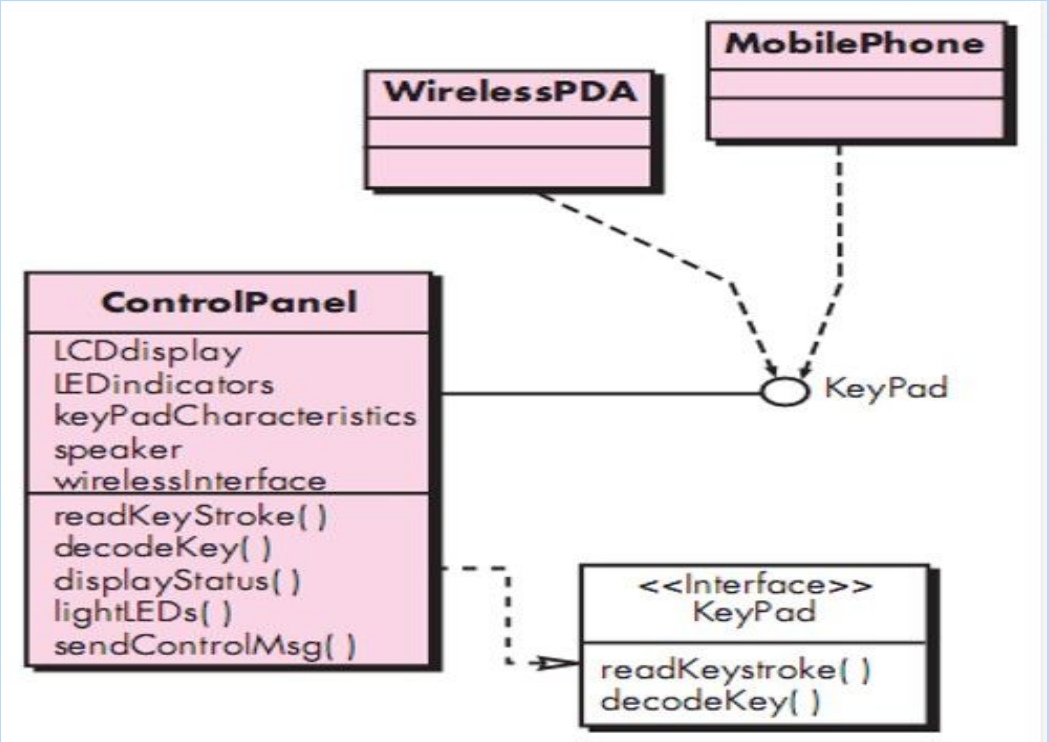
- As a house floor plan contains all the details, likewise the architectural design shows the overall view of the software system.
- Architectural model is derived from:
  - Information about the application domain for which the software is being built
  - Requirement elements like dataflow diagrams, relationship or collaboration diagrams
  - The availability of architectural styles (e.g., data-centered arch. , OO arch, layered architectures)
- Usually depicted as a set of interconnected subsystems
- Which are derived from work packages of the requirements
- Each subsystem may have its own architecture design

Interface Elements

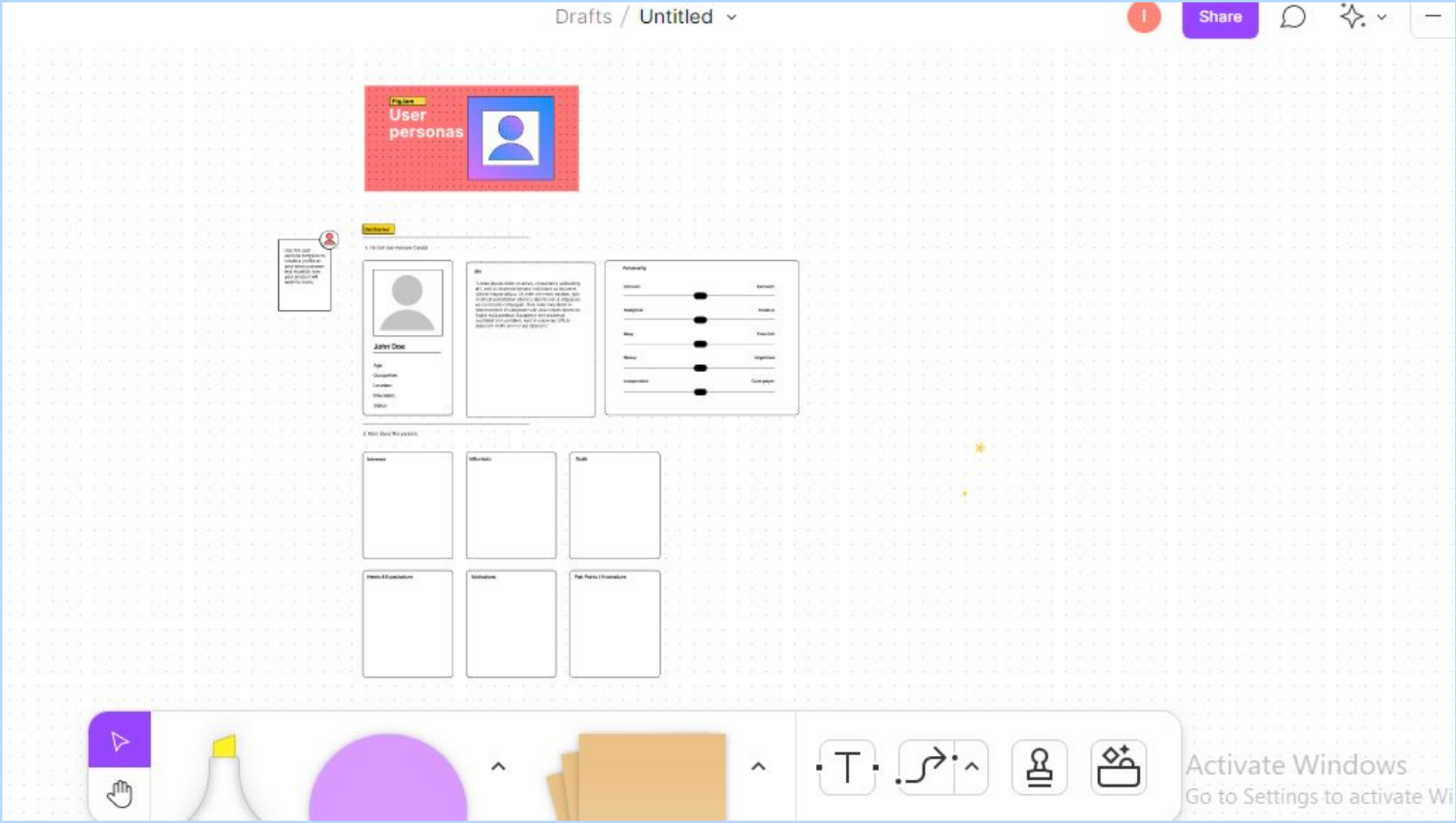
- As detailed drawings show the inner view of the plan
- likewise, the interface elements **show the information flows into and out of the system**. And **how that information is communicated among system modules.**
- **3 important elements of interface design are:**
  - **UI design (for managers)**
  - **External interface to other devices/components/consumers**
  - **Internal interfaces between various components (different screens in a module)**
- **Tools like adobe Xd, Figma, etc. could be used**
- **It encompasses:**
  - **the aesthetic elements(layout , color scheme, visuals)**
  - **Ergonomic elements (UI navigation, information placement)**

Interface Elements

- External interface design must incorporate input validation and security.
- Interfaces could be modeled as the external visualizers of public operations of class without showing the internal implementation details.

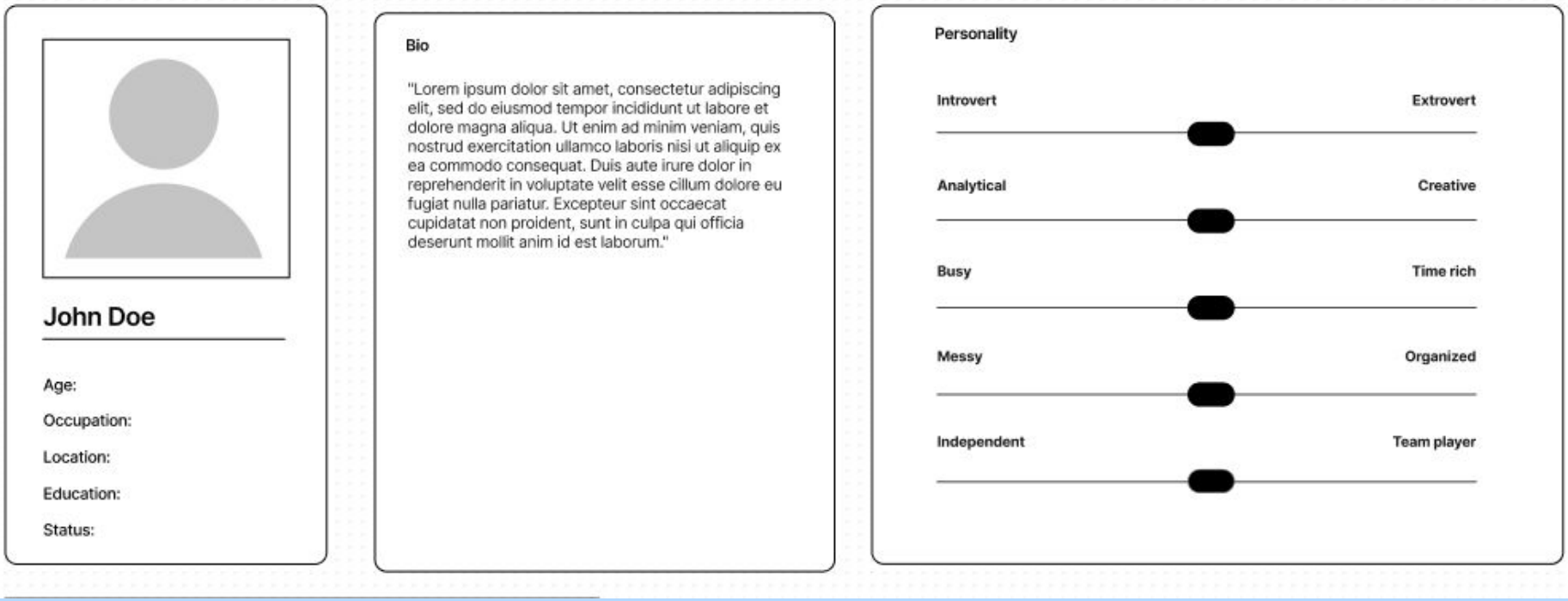


Interface Elements



Credits: Figma.com (UI design tool)

Interface Elements

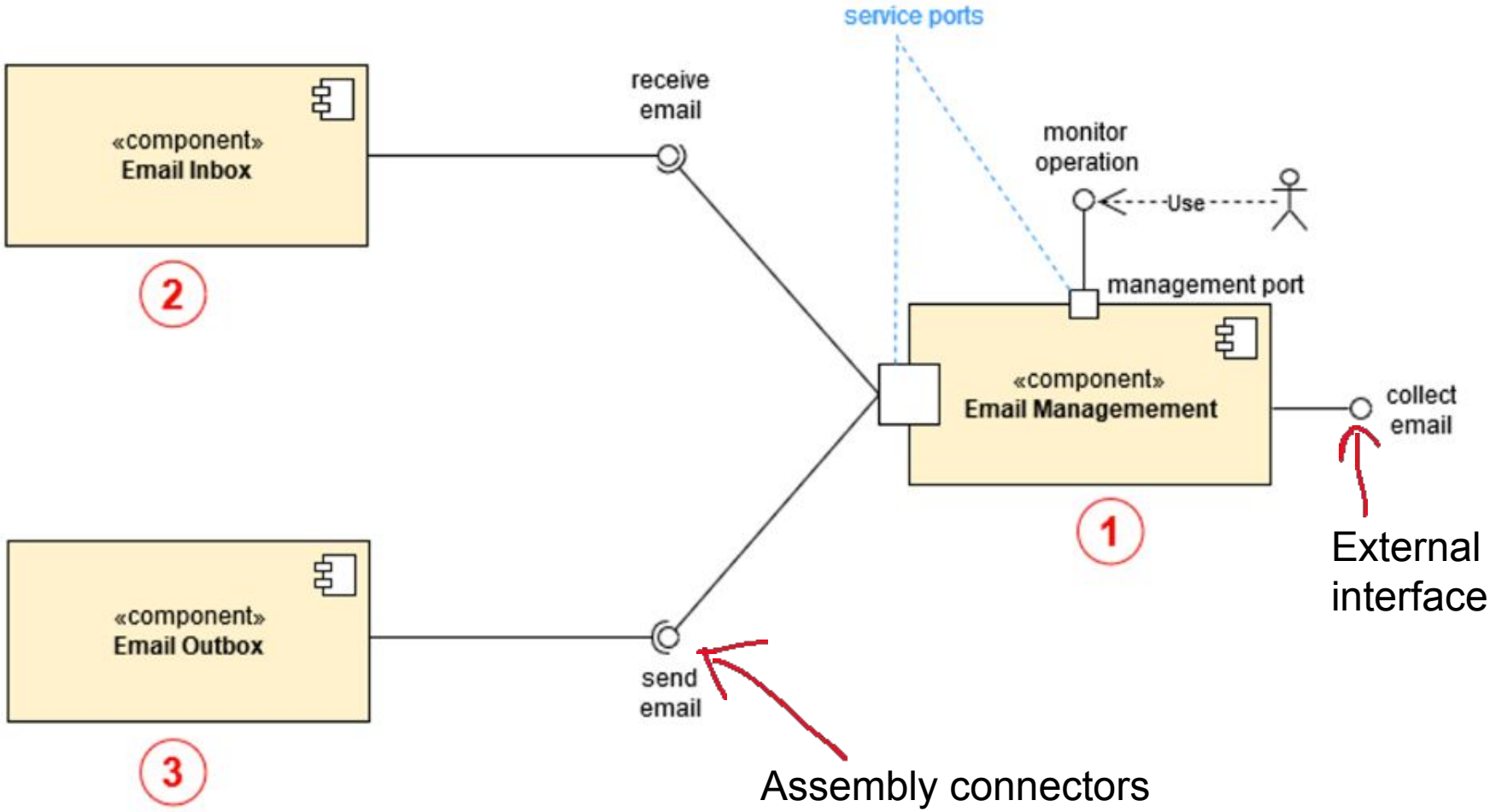


Credits: Figma.com (UI design tool)

Elements

- In software design component design is equivalent to a set of detailed drawings for a room.
- Describes internal details of a software component
- It defines :
  - Data structures for all local data objects (depends on nature of the object)
  - Algorithmic details of the process occurs in a component (shown using activity diag. / flowcharts/pseudocode)
  - Interface which allows access to all component operations

Elements



Deployment Elements

- Shows what are the physical computing environment in which the software functionality and the subsystems operate.