WHITESTEIN
Technologies

Unified Modeling Language

Components

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Component Model

→ **Decomposition of the system into reusable, modular, executable logical or physical units—components.**

Consists of:

- Component diagrams.
- Element descriptions.

Used (mainly) in:

- Design ⇒ logical and physical component structuring of the system.

Component

→ A self contained part of a system that encapsulates its contents (state and behavior of a number of classifiers) and whose manifestation is replaceable within its environment.

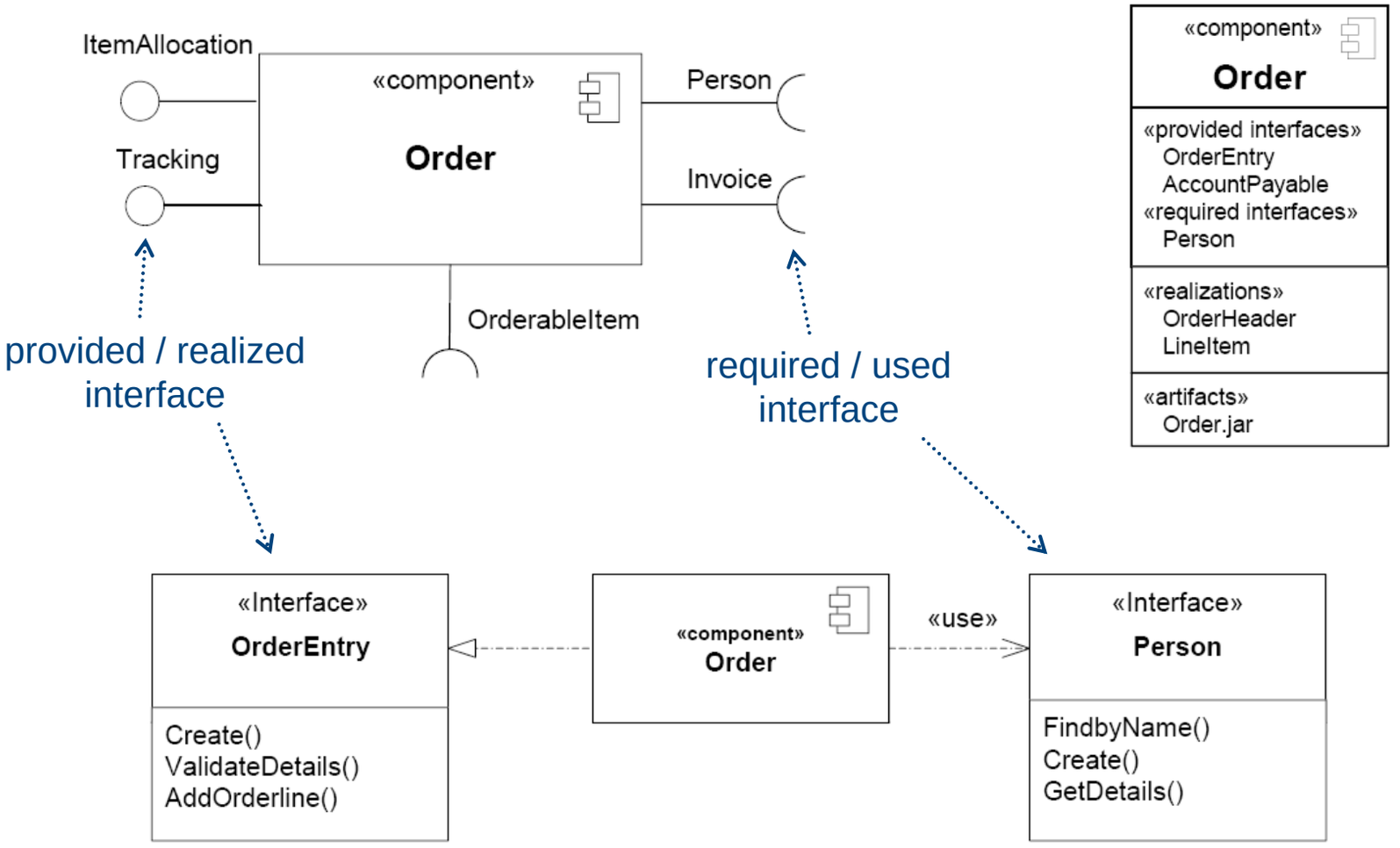
- Specifies a formal contract of the services that it provides to its clients and those that it requires from other components or services in the system in terms of its provided and required interfaces. ("external view")
  - A component serves as a type whose conformance is defined by these provided and required interfaces.
  - One component may therefore be substituted (at design time or run-time) by another only if the two are type conformant.
- A specialized Class. ("internal view")

  ⇒ Attributes, operations, owned behavior, internal structure, ports, participation in associations and generalizations.

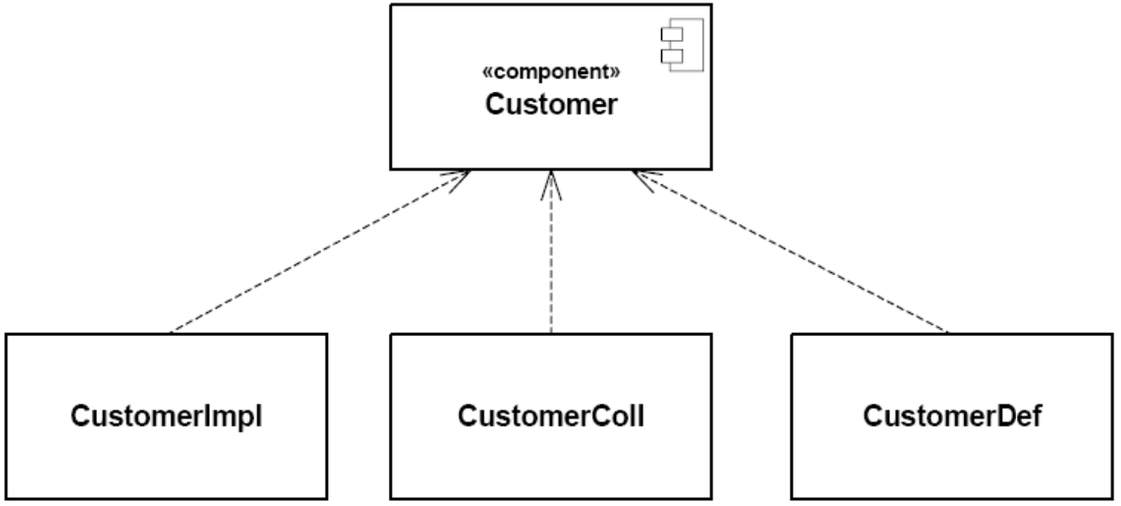
- Can own and import members; as a package. ("internal view")

- Represents either a logical structure of the model or physical structuring of code (modules, libraries, executables, etc.).

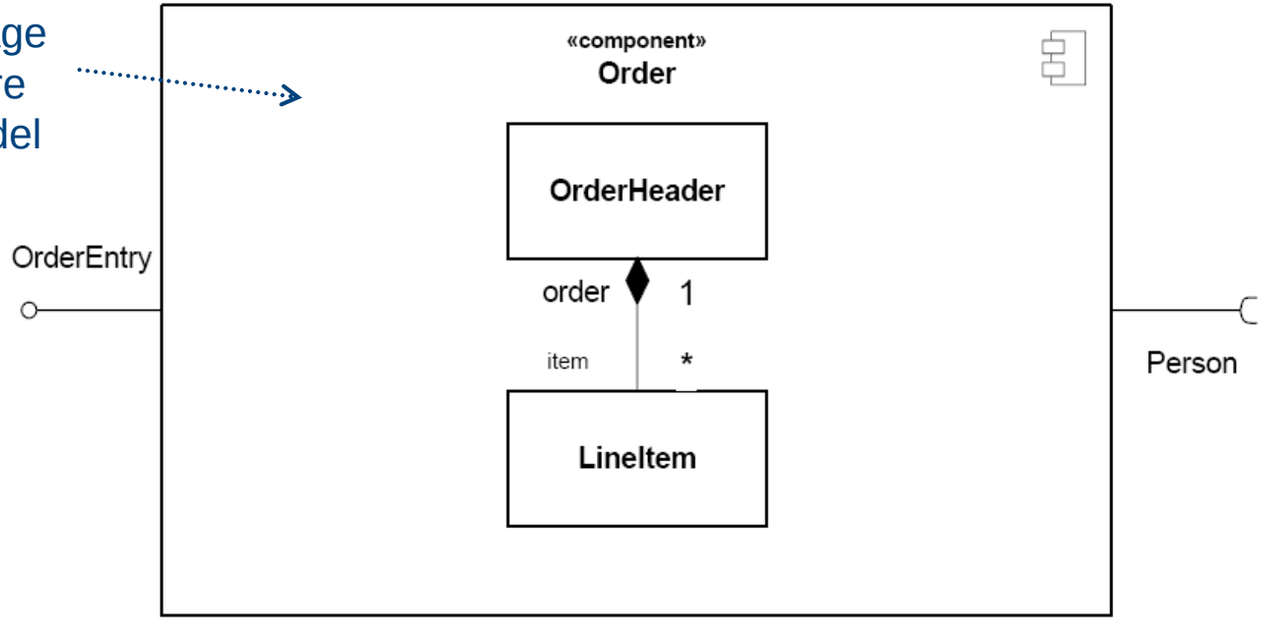
Examples of Components (1)



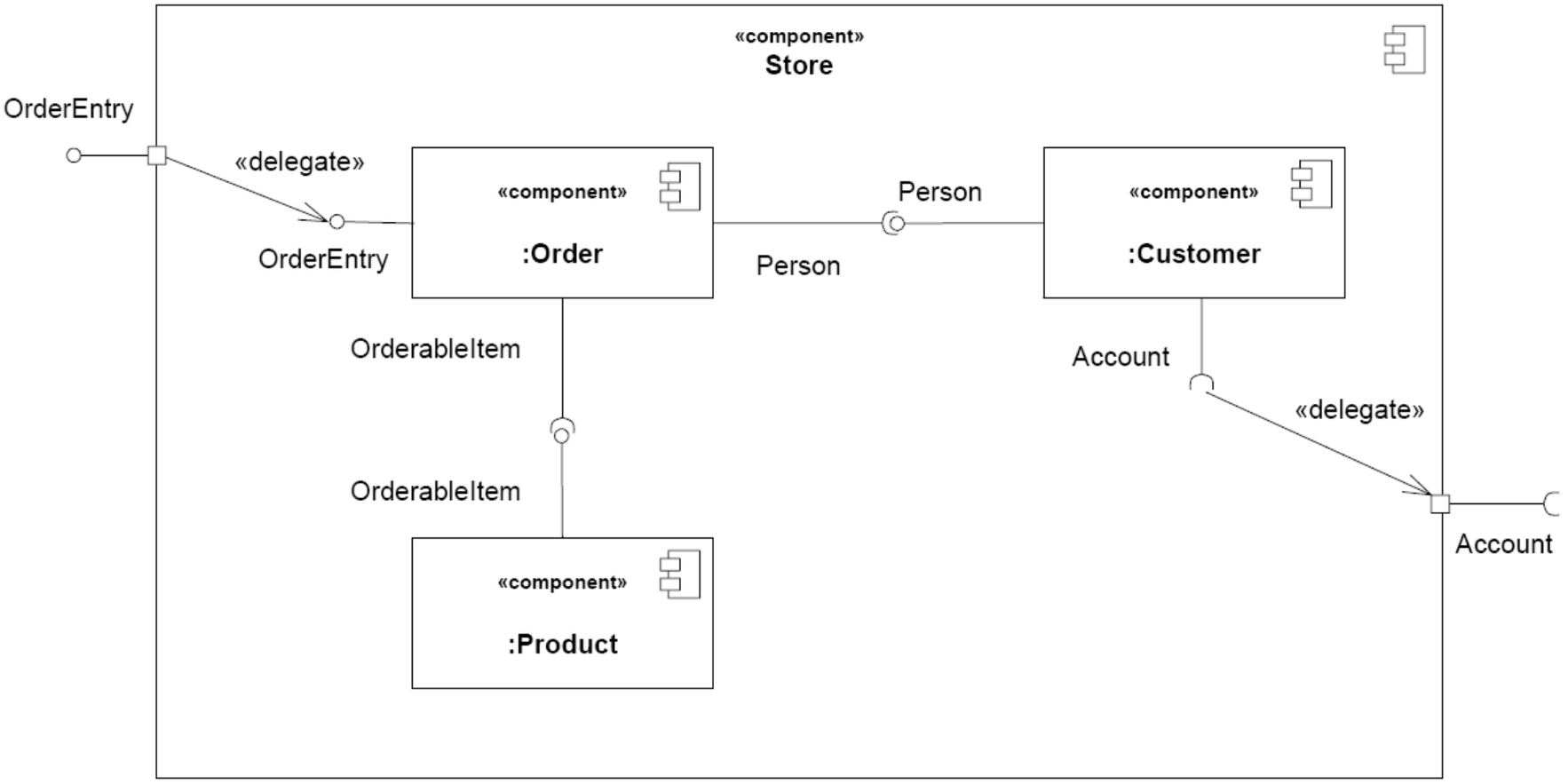
Examples of Components (2)



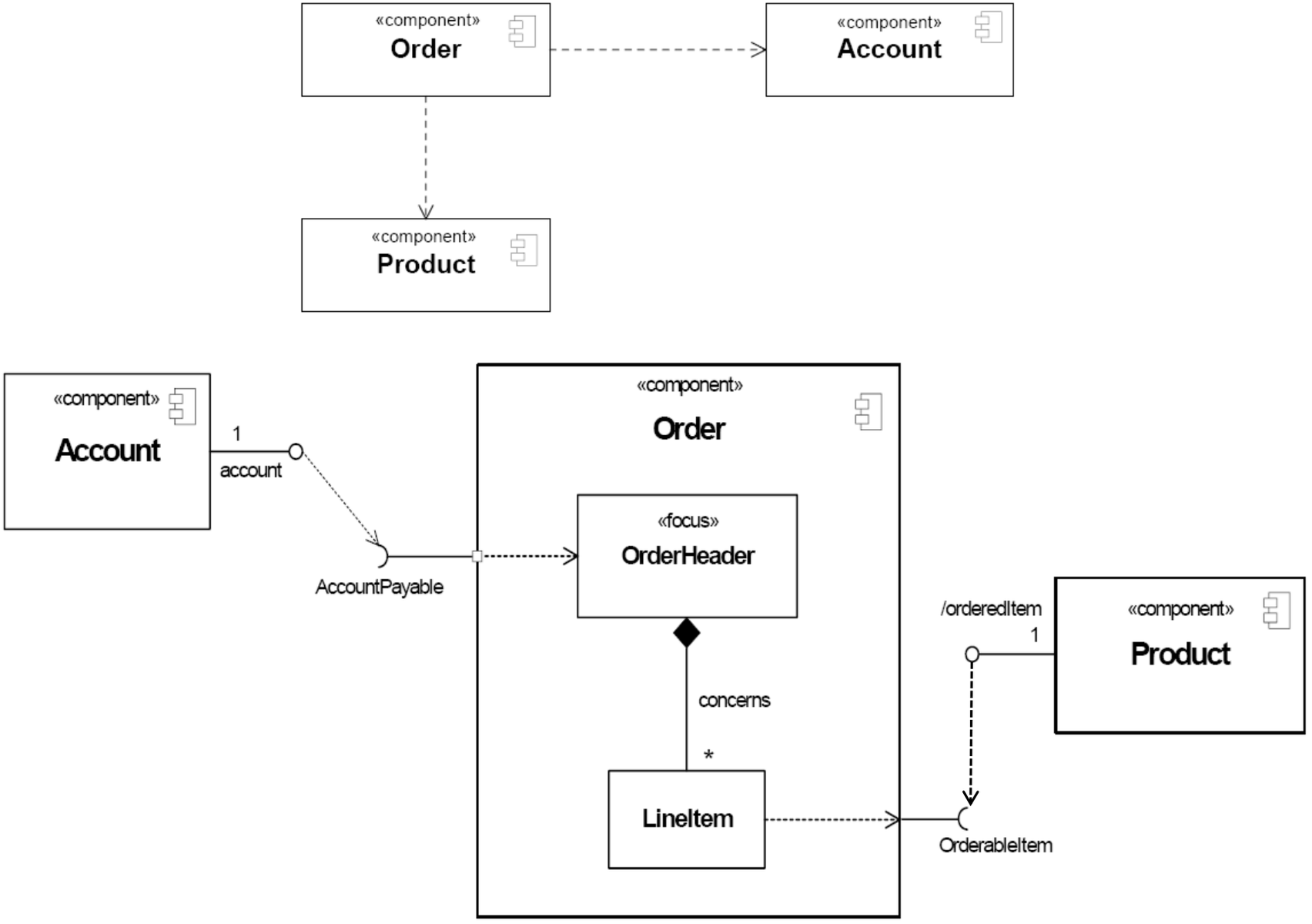
component as a package for its internal structure modelled as class model



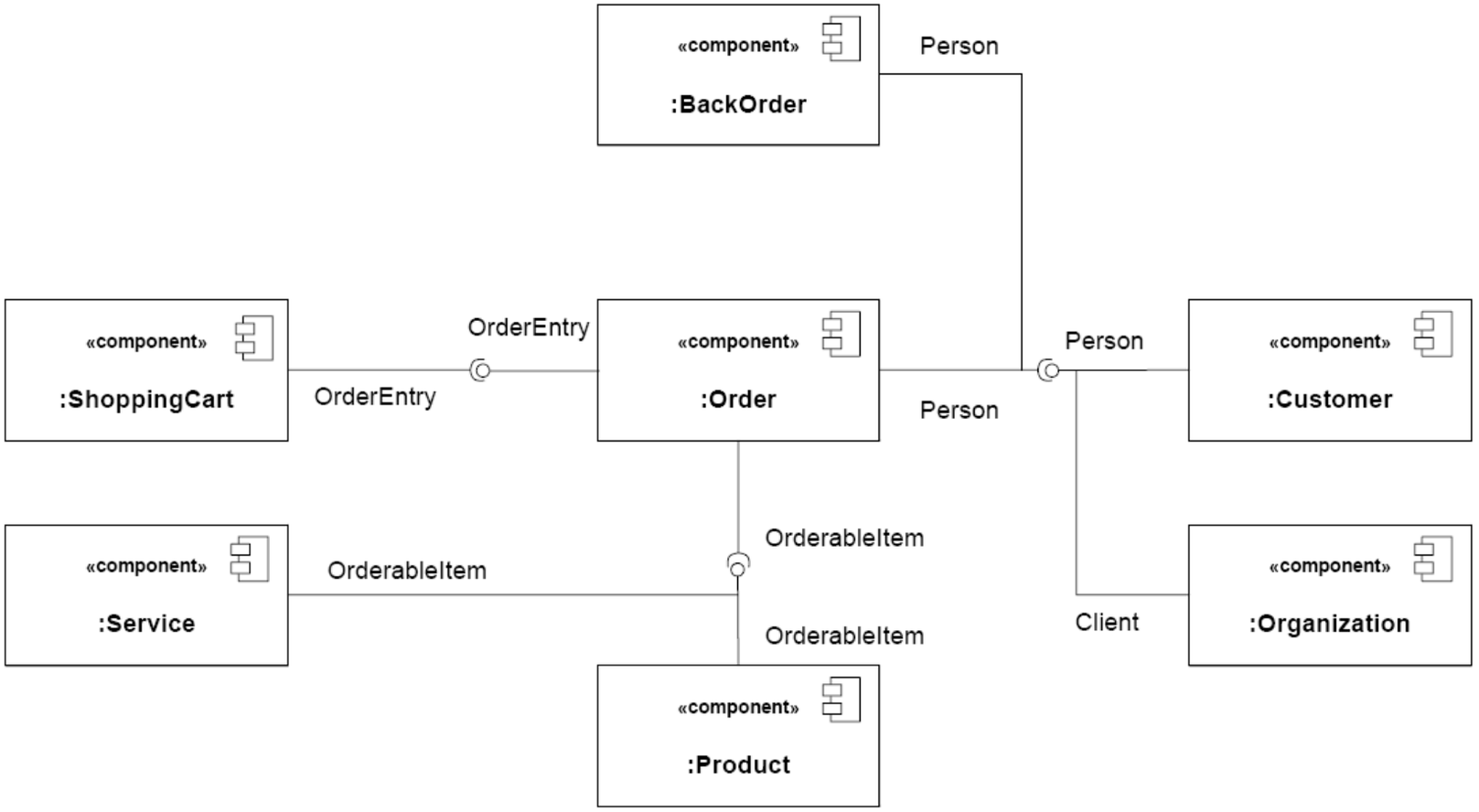
Examples of Components (3)



Examples of Components (4)



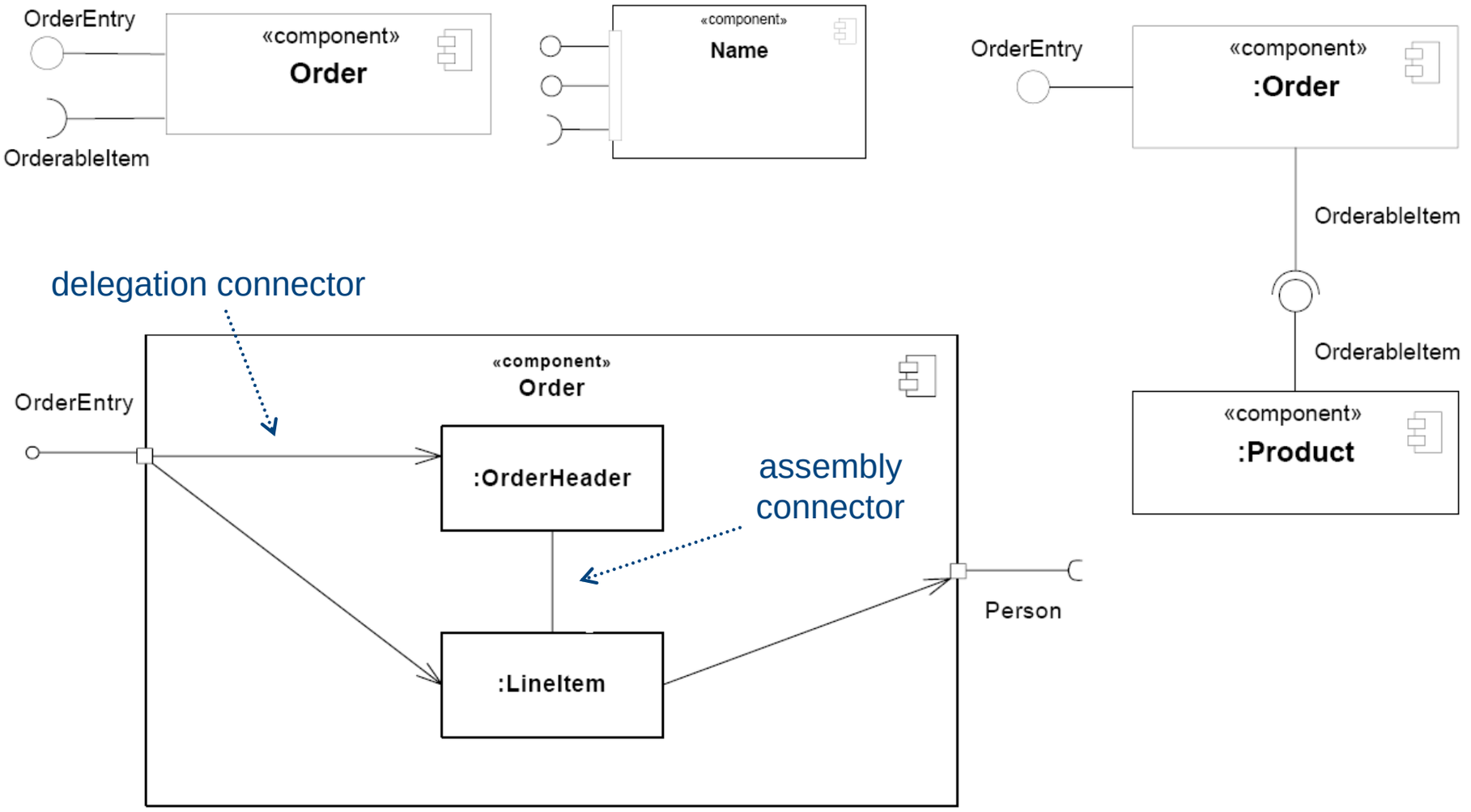
Examples of Components (5)

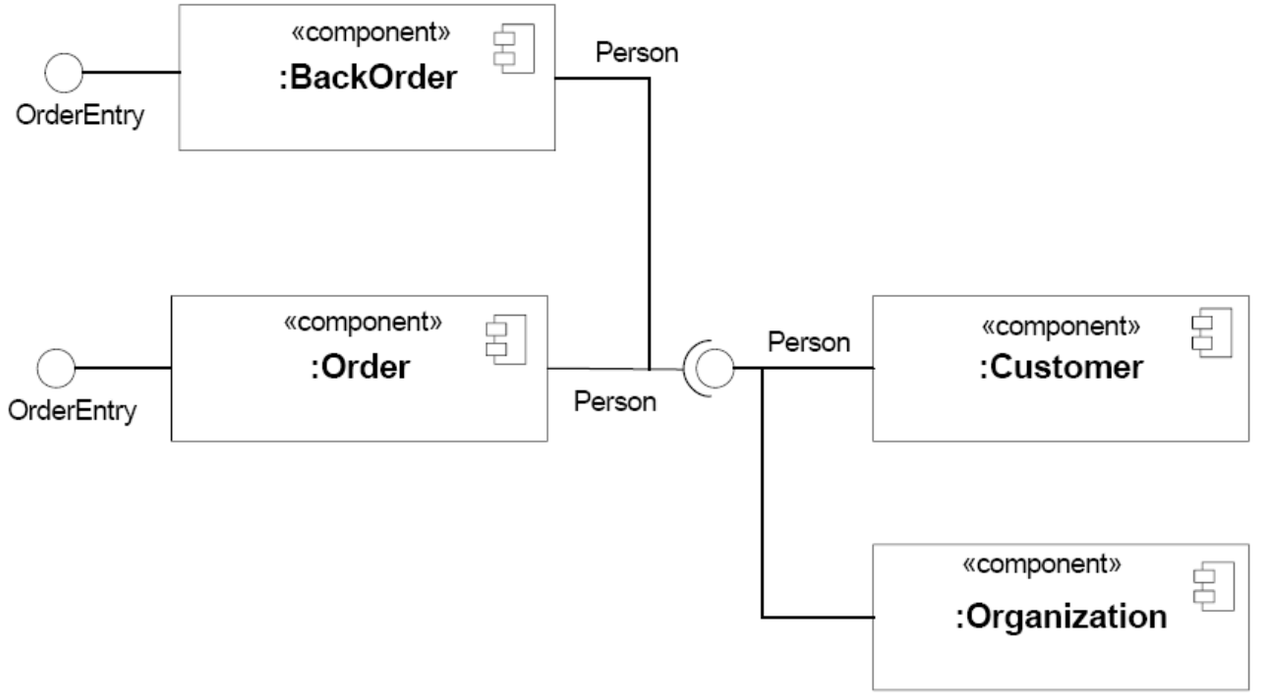


Connector

- The connector concept is extended to include interface based constraints and notation.
- A ***delegation connector*** is a connector that links the external contract of a component (as specified by its ports) to the internal realization of that behavior by the component's parts. It represents the forwarding of signals (operation requests and events): a signal that arrives at a port that has a delegation connector to a part or to another port will be passed on to that target for handling.
- An ***assembly connector*** is a connector between two components that defines that one component provides the services that another component requires. An assembly connector is a connector that is defined from a required interface or port to a provided interface or port.

Examples of Connectors (1)



Examples of Connectors (2)

Internal structure of a component modelled as connected parts of type component. (The parent component is not drawn.)