Service Oriented Software Engineering

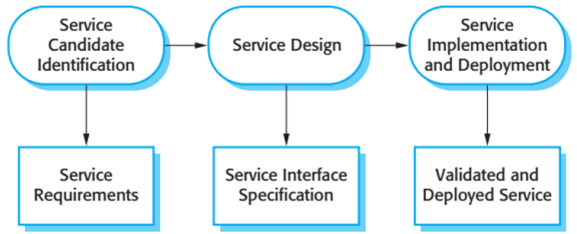
Services as Reusable Components

- Software systems are constructed by composing software components that are based on some standard component model.
- Services are a natural development of software components where the component model is the set of standards associated with web services.

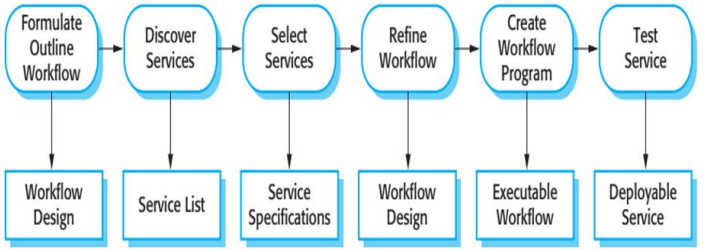
A service can therefore be defined as:

- A loosely coupled, reusable software component that encapsulates discrete functionality, which may be distributed and programmatically accessed.
- A web service is a service that is accessed using standard Internet and XML-based protocols.

The service engineering process



Software development with service



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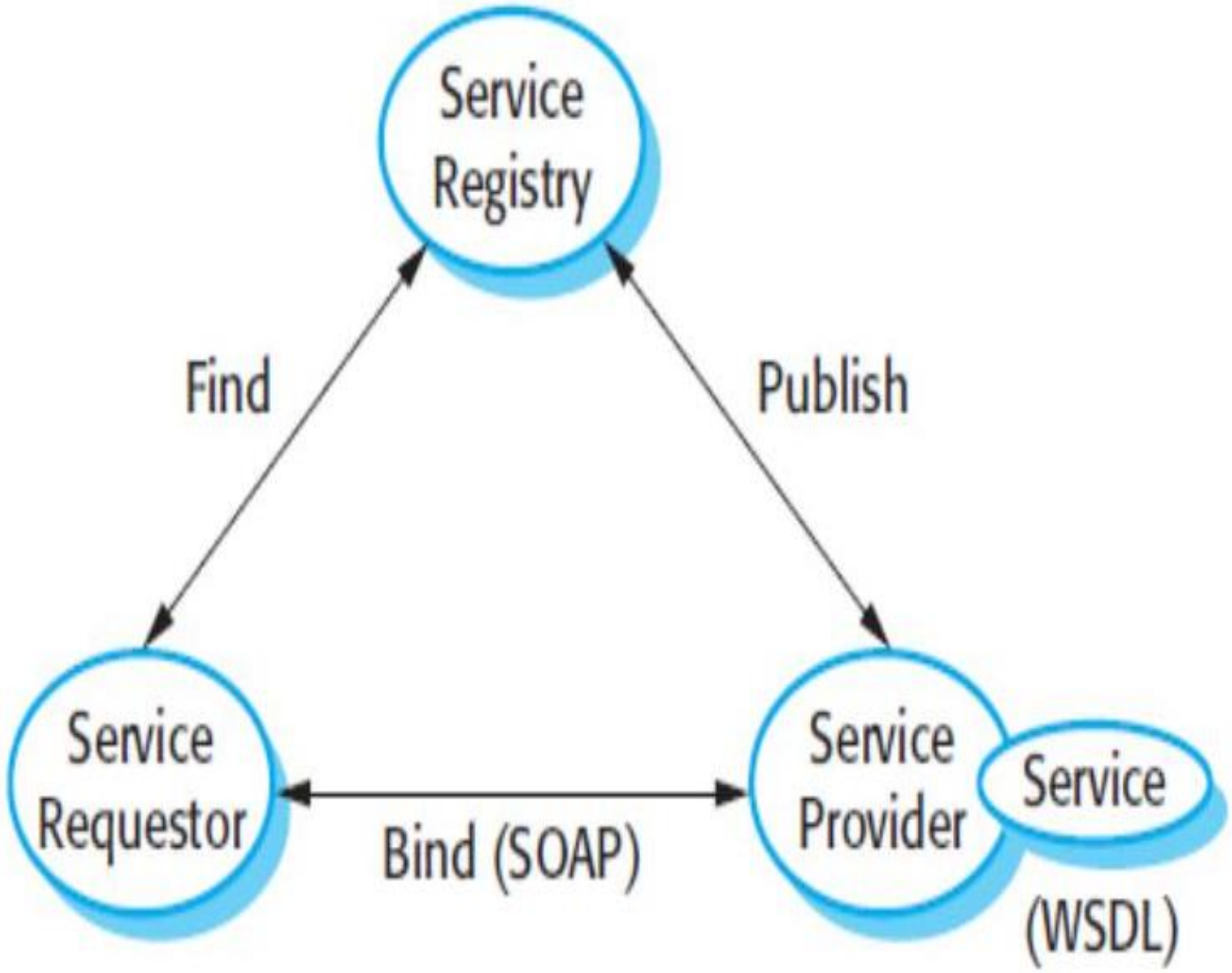
Service-oriented architectures (SOA) are a way of developing distributed systems where the components of these systems are stand-alone services.

Standard protocols have been designed to support service communication and information exchange. Consequently, services are platform and implementation-language independent.

Service oriented architecture



Benefits of SOA

- Services can be offered by any service provider inside or outside of an organization so that it can create applications by integrating services from a range of providers.
- The service provider make information about the service so that any authorised user can use the service.
- Applications can delay the binding of services until they are deployed. The new services can be linked with the existing in innovative ways.
- Service users can pay for services according to their use rather than provision.

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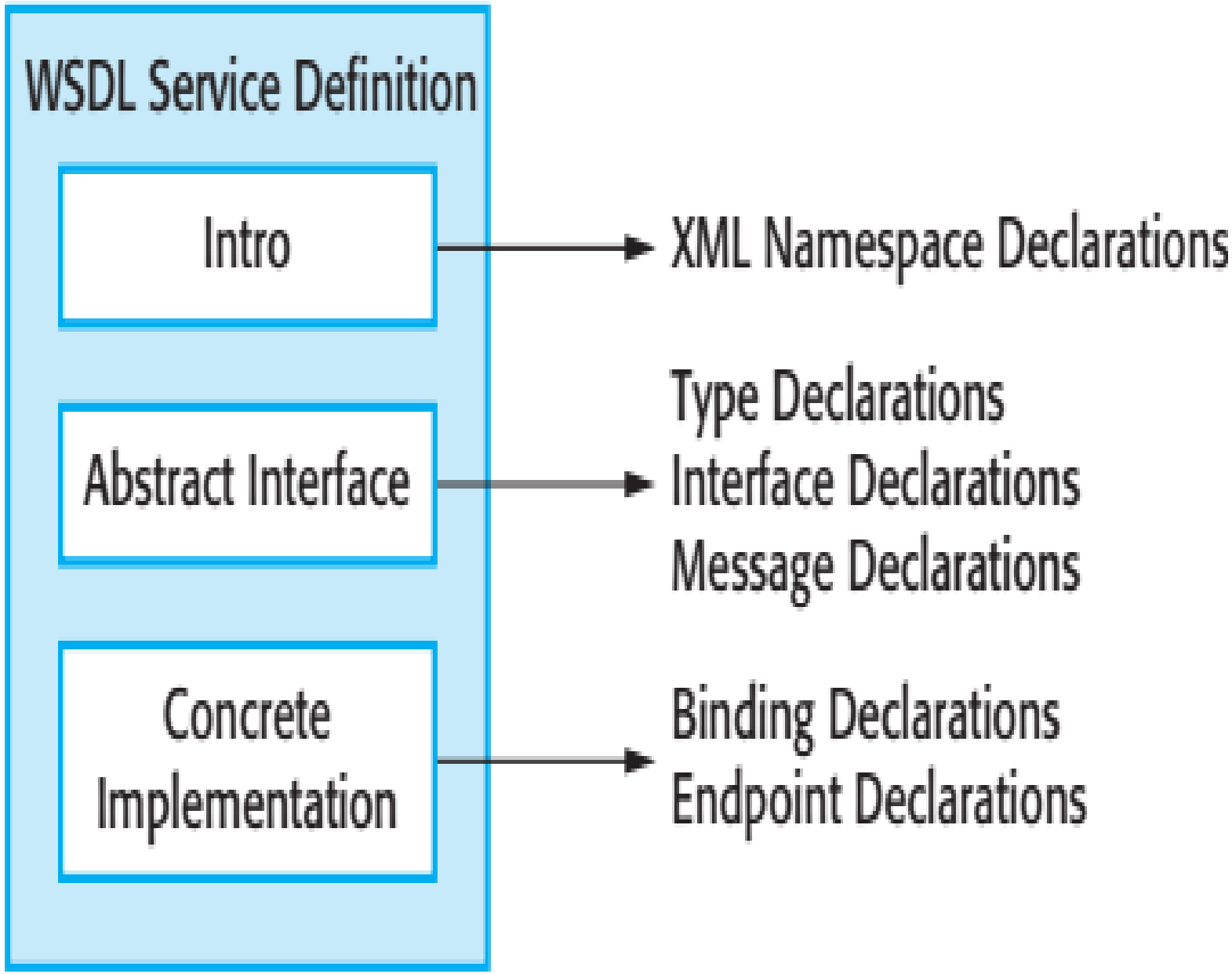
Organization of WSDL(Web Service Description Language)



WSDL Service Definition

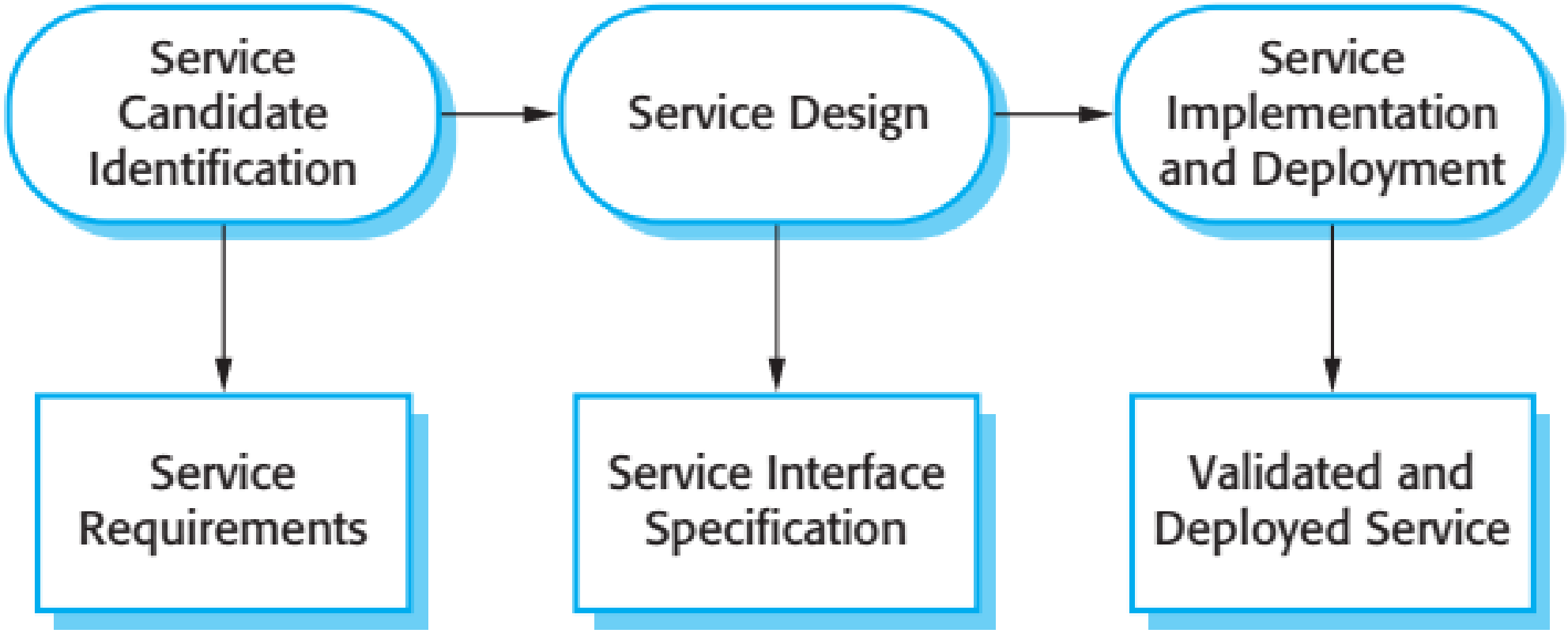
1. An introductory part that usually defines the XML namespaces used and which may include a documentation section providing additional information about the service.

2. An optional description of the types used in the messages exchanged by the service.

3. A description of the service interface; that is, the operations that the service provides for other services or users.

4. A description of the input and output messages processed by the service.

The service engineering process



Service Engineering

- Service engineering is the process of developing services for reuse in service-oriented applications.
- Service engineers must ensure that the service represents a reusable abstraction that could be useful in different systems. They must design and develop generally useful functionality associated with that abstraction and ensure that the service is robust and reliable.

There are three logical stages in the service engineering process

- Service candidate identification, where you identify possible services that might be implemented and define the service requirements.
- Service design, where you design the logical and WSDL service interfaces.
- Service implementation and deployment, where you implement and test the service and make it available for use.

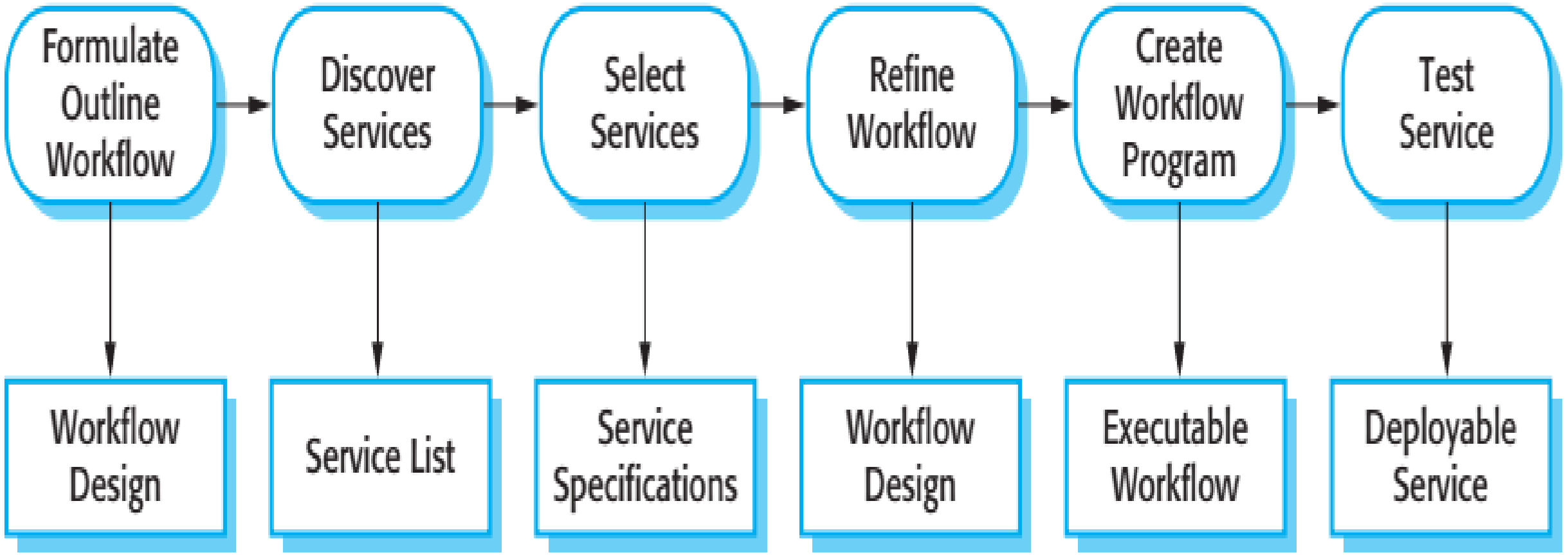
Fundamental types of service

1.Utility services These are services that implement some general functionality that may be used by different business processes. An example of a utility service is a currency conversion service that be accessed to compute the conversion of one currency (e.g., dollars) to another (e.g., euros).

2. Business services These are services that are associated with a specific business function. An example of a business function in a university would be the registration of students for a course.

3. Coordination or process services These are services that support a more general business process which usually involves different actors and activities. An example of a coordination service in a company is an ordering service that allows orders to be placed with suppliers, goods accepted, and payments made.

Software development with service



Software development with service

- The development of software using services is based around the idea that you compose and configure services to create new, composite services.
- The services involved in the composition may be specially developed for the application, may be business services developed within a company, or may be services from an external provider.