



2010 ERC WORKSHOP

Research Topics in Service-Oriented Modeling

Yukyong Kim, Ph.D.
PLASSE Lab.

Agenda

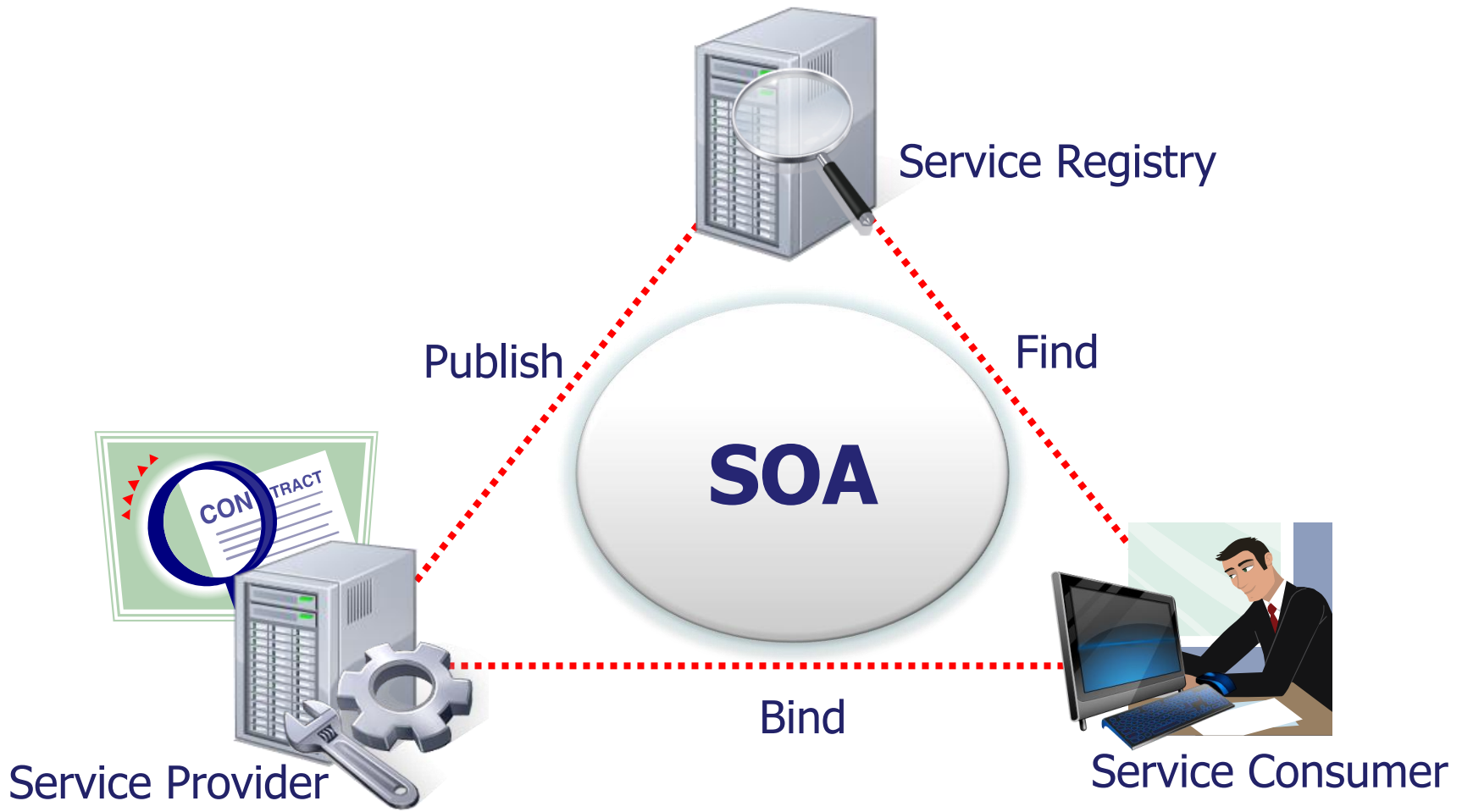
- Introduction to SOA
 - SOA concept
 - Business process and services
- Service-Oriented Modeling Overview
- Major Research Contents

What is SOA ?

- SOA[so-ah] = Service-Oriented Architecture



SOA Components



The Concept of SOA

- Service-Oriented \Rightarrow the core unit of design is a **service** implementing a capability so that it can be easily consumed
 - An approach to designing systems
 - A set of design principles
 - A way of thinking about a problem
 - A mindset

SOA In Context...

Modeling
focus

Business

a set of services that a business wants to expose to their customers and partners, or other portions of the organization

Architecture

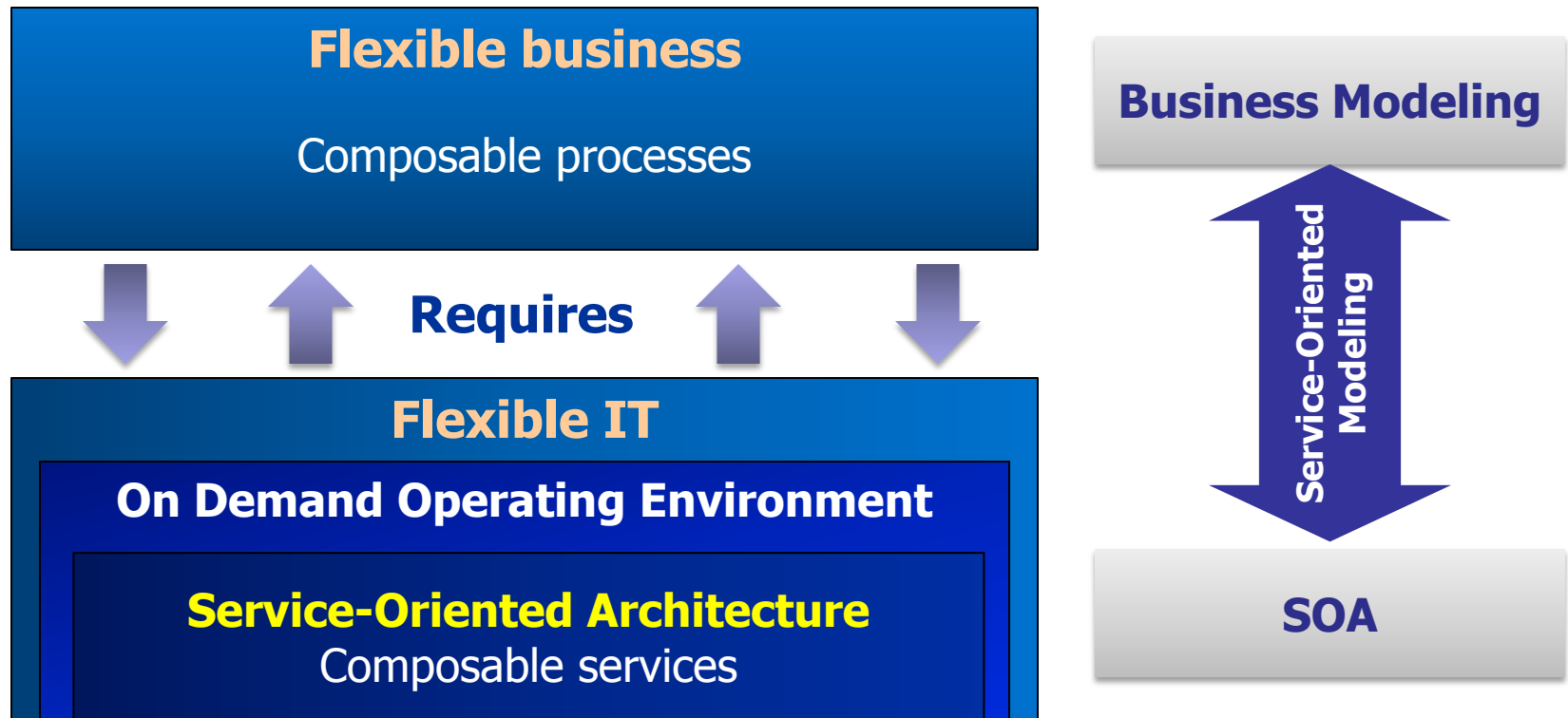
a set of architectural principles, patterns and criteria which address characteristics such as modularity, encapsulation, loose coupling, separation of concerns, reuse, composability and single implementation

a programming model complete with standards, tools and technologies such as Web Services

Implementation

From Business Models to SOAs via Service Modeling

- Service Oriented Modeling aligns business value and SOA



Agenda

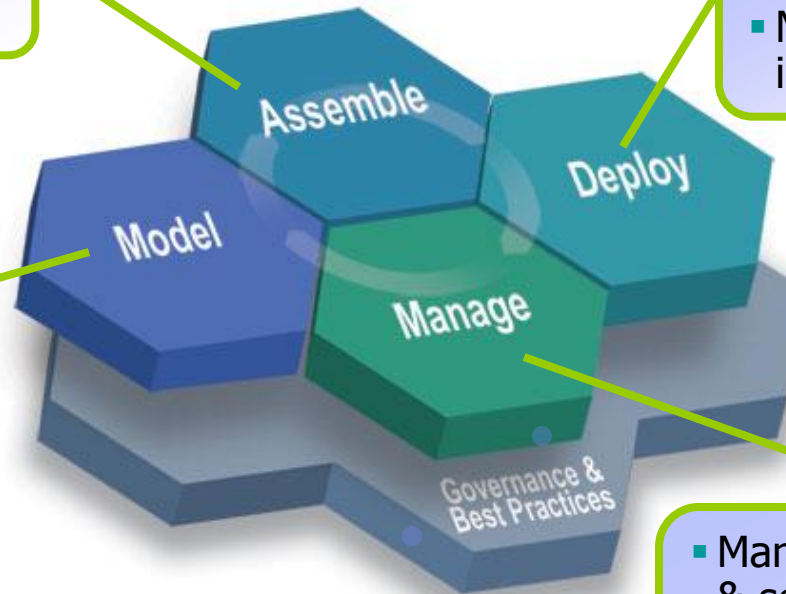
- Introduction to SOA
- **Service-Oriented(SO) Modeling Overview**
 - SOA lifecycle
 - SO Modeling steps
 - Existing approaches
- Main Research Contents

SOA Lifecycle

- Discover
- Construct & Test
- Compose

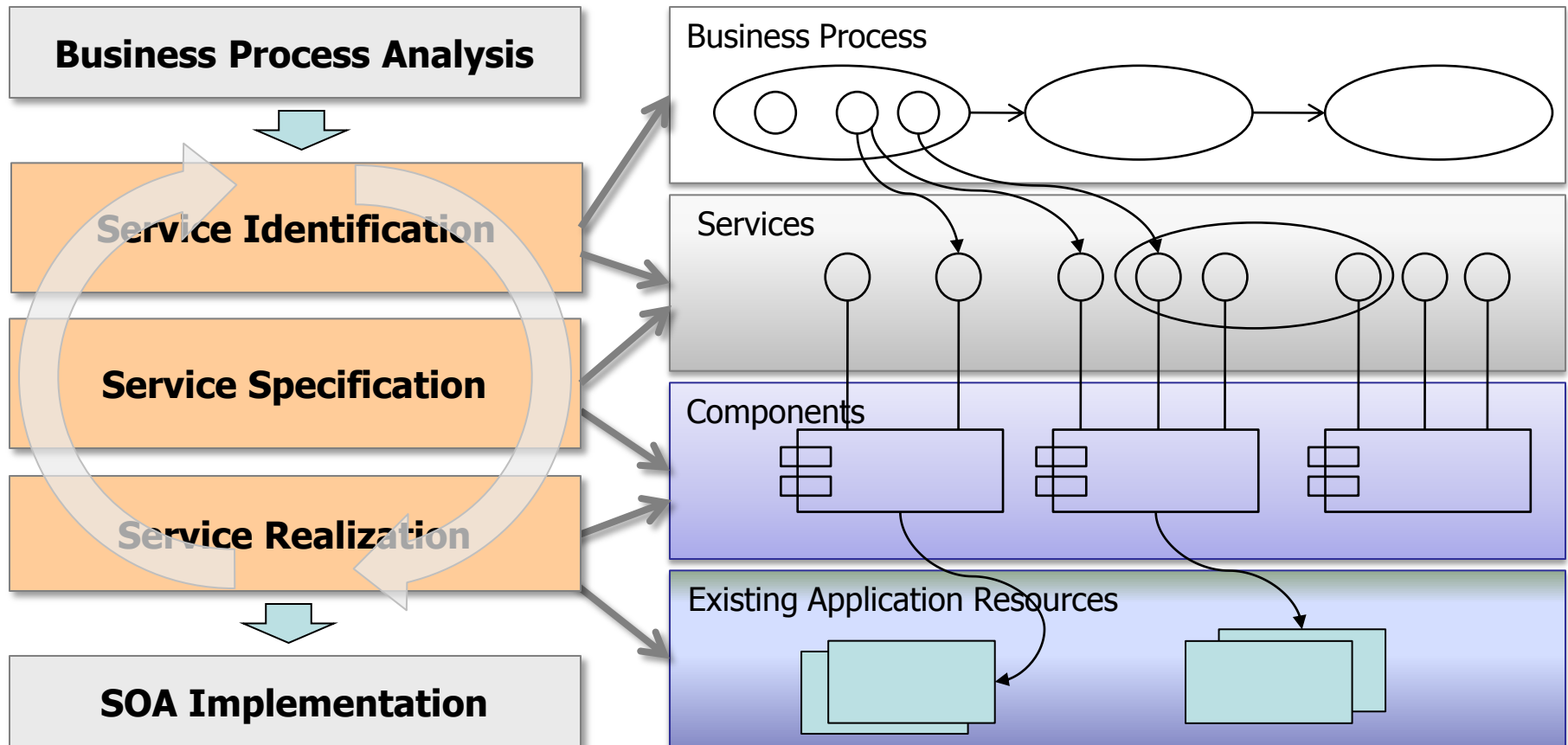
- Integrate people
- Integrate processes
- Manage and integrate information

- Gather requirements
- Model & Simulate
- Design



- Manage applications & services
- Manage identity & compliance
- Monitor business metrics

SO Modeling & SOA Layers



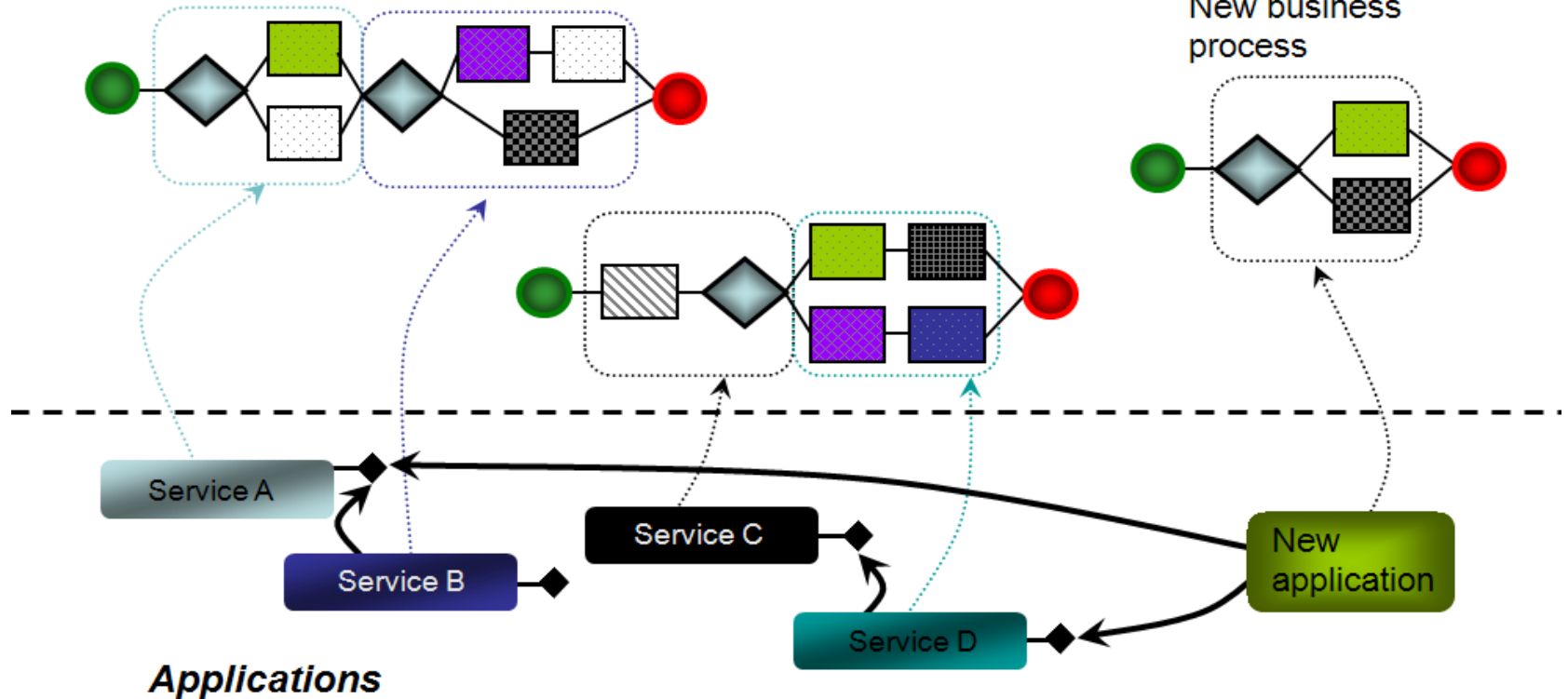
SO Modeling Steps

- SO modeling activities are grouped into three major steps
 - **Identification** discovers candidate services, enterprise components and flows
 - **Specification** makes service exposure decisions, and specifies the services and enterprise components to realize them
 - **Realization** captures realization decisions

Business Model & Services

Business Processes

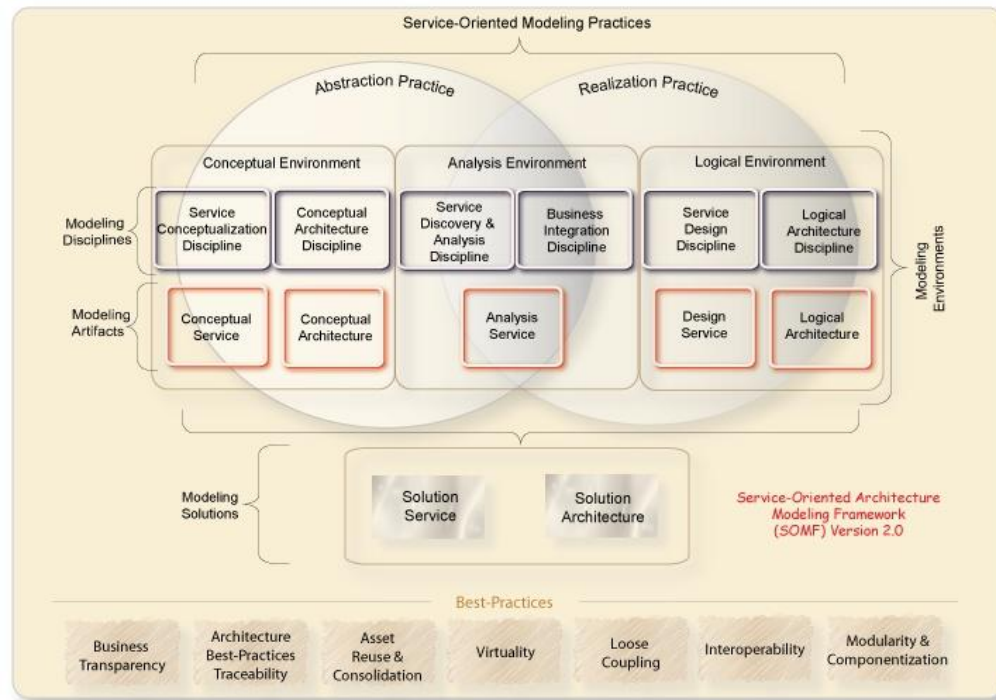
New business process



How do we derive “good” service abstractions from high-level business requirements and business process models?

Current Approaches to SO Modeling

- There are many different approaches that have been proposed for service modeling: SOMA, SOMF, Service Oriented Analysis and Design Methodology, WSMF



Agenda

- Introduction to SOA
- Service-Oriented Modeling Overview
- **Main Research Contents**
 - Research Directions

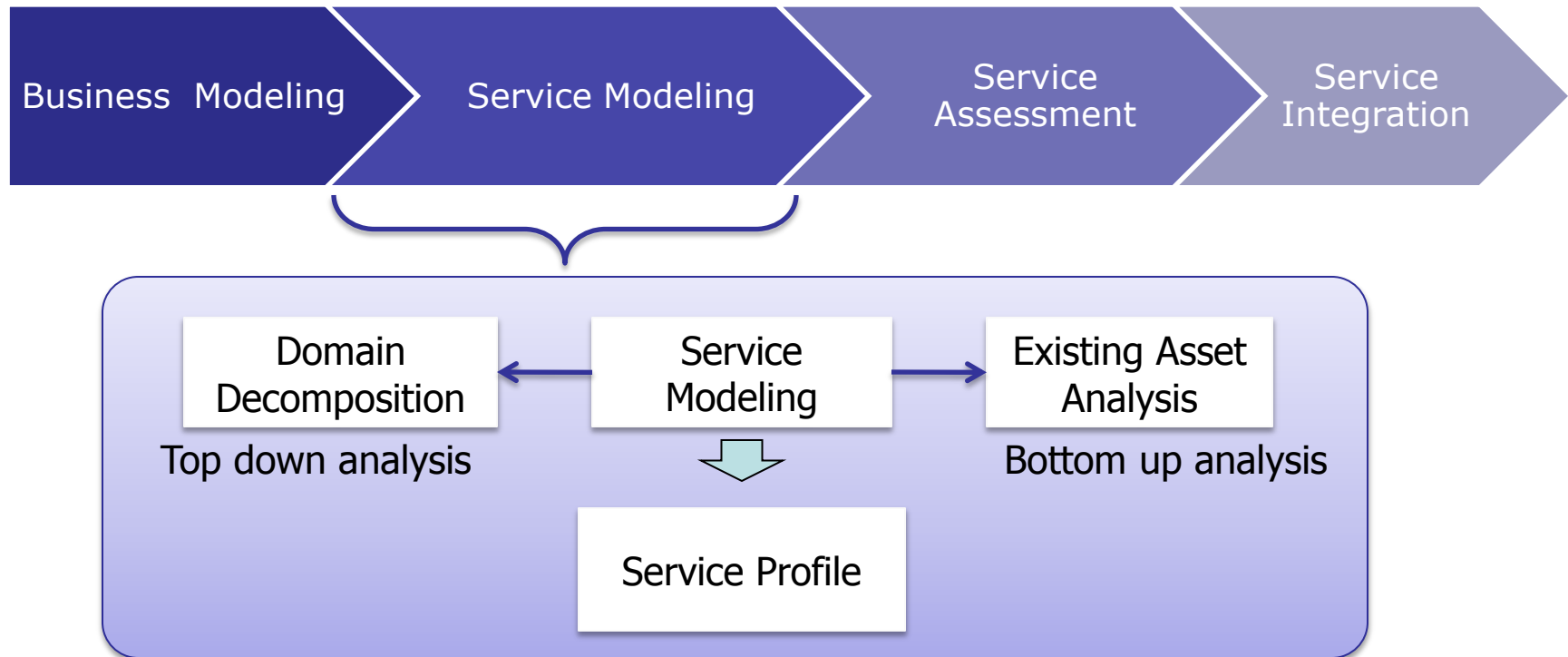
Service Modeling Issues

- The challenge is how well-designed, meaningful service abstractions can be characterized and constructed systematically:
 - How are services in a SOA identified and described?
 - What is the process for developing a SOA and services?
 - How are business processes realized in terms of a SOA and services?
 - Which development approaches are relevant to a SOA and service assets?

Research Directions

■ Research goal

Defining a practical Service-Oriented Modeling framework



Research Theme

■ Service identification

- Top-down approach: identifying services formally at the right level of abstraction from business models
- Bottom-up approach: identifying service components from legacy applications using program analysis techniques

■ Service assessment

- Formal decision criteria for service realization
- Metrics for measuring service QoS

■ Extraction of domain properties from source code for categorizing service assets

Current State

- Outline of the SOA development process
 - M4SOD [정보과학회논문지 2005, SCC 2006]
- Service identification (top down approach)
 - Usecase Refactoring based [CIT 2006, BIS 2007]
 - Graph Partitioning and Metrics based [WISE 2009]
- Service assessment
 - QoS related [ICCIT 2008]
 - Trust evaluation [정보과학회논문지 2009]
- Now we are searching the solution for measuring the functional similarities of code clones to extract service component from source code (bottom up approach)