

A Taxonomy of Service Engineering Stakeholder Types

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- **Research questions**
- **Background and context**
- **Research method**
- **Results**
- **Conclusions**

Research questions

- Stakeholders in **requirements engineering** and **architectural design**
- Stakeholder in SOSE : “any group or individual who can affect or is affected by engineering of Service-based applications. ”
- **Research Question:** What are the **stakeholder types and roles** and their relationship to the service engineering lifecycle?

Motivation



Owner of system
controls and owns the
elements



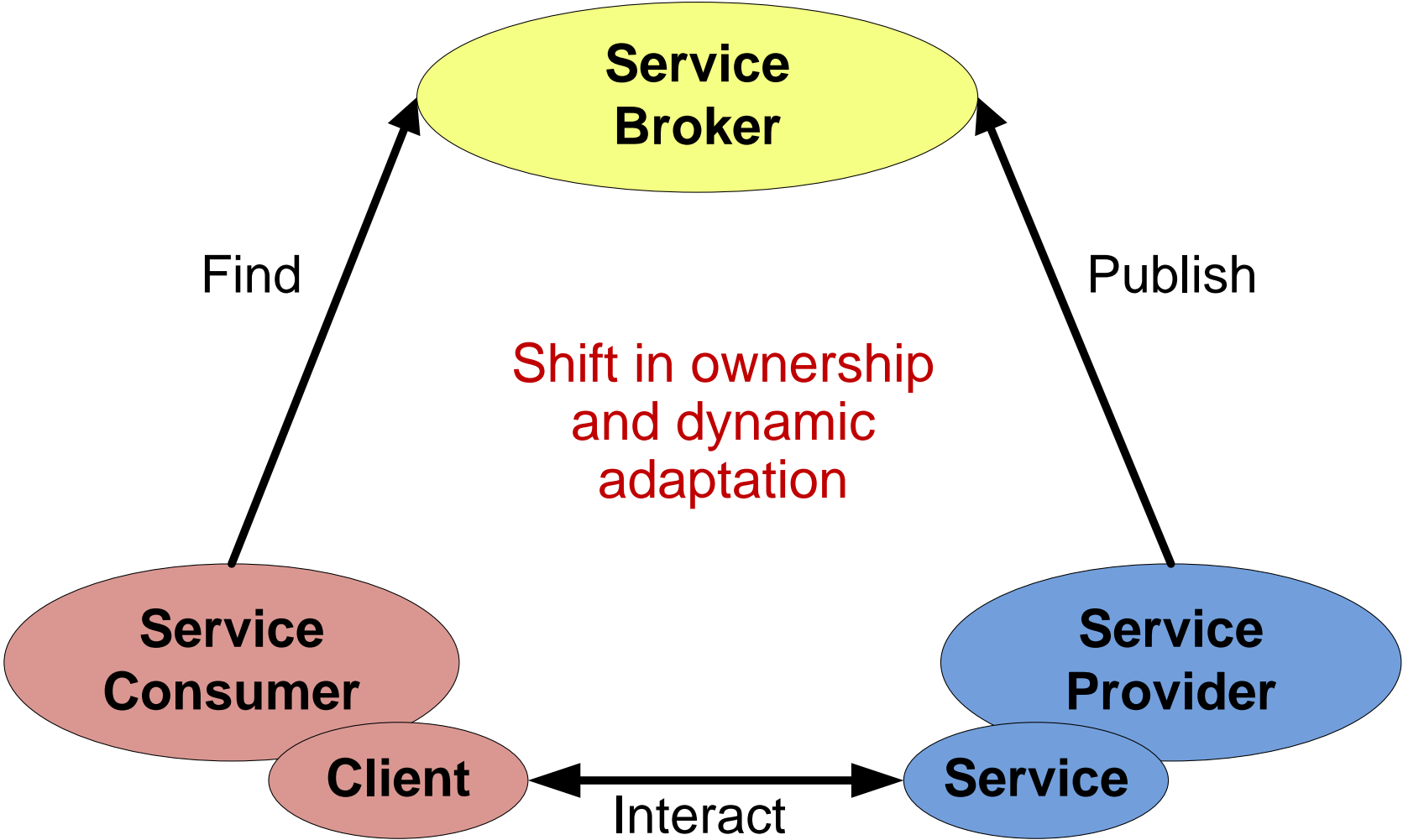
Requirements
Gathering

Application
Architecture

Development

Testing &
Validation

Deployment



- New stakeholder types
 - For example: *service modelers, service monitors or adaptation designers*

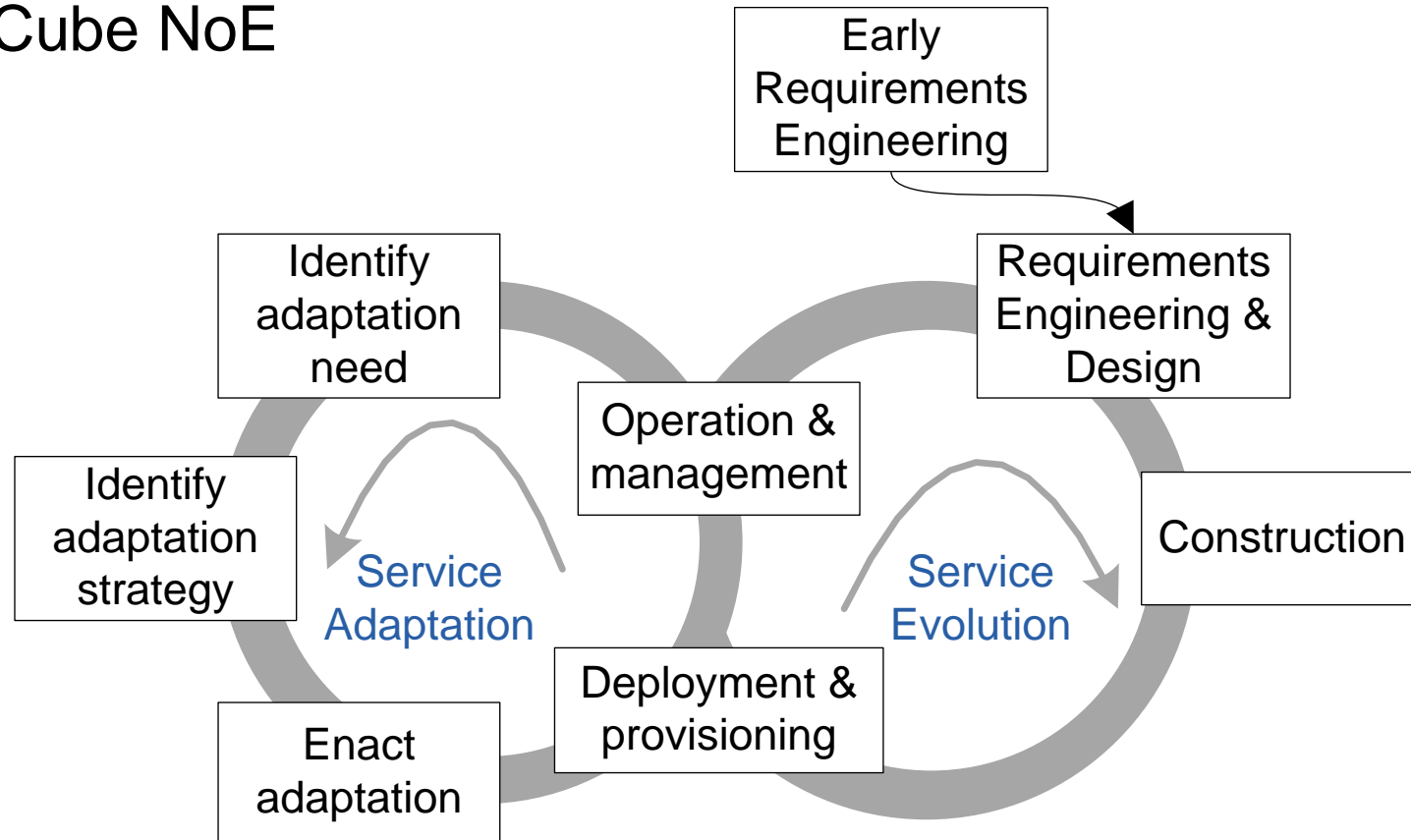


- Multiple stakeholder roles and concerns
 - A stakeholder may play different roles simultaneously
 - For example: A designer with a **service provider's** perspective should focus on requirements **external to the organization**, whereas a designer with the **service consumer's perspective** should pay particular attention to the **constraints internal to the organization**

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- **Background and context**
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- Results
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Background and context

- To find stakeholders types and roles and to find how they are involved in SBA → collective knowledge of S-Cube NoE



The S-Cube service engineering lifecycle

Research method

- **Step 1:** Soliciting stakeholder types: a questionnaire survey
- **Step 2:** Classification of stakeholder types based on their role:
Content Analysis
- **Step 3:** Consolidation of stakeholder types: Content Analysis
- **Step 4:** Map stakeholder types to S-Cube lifecycle phases: a case-specific mapping study

- Research questions
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Step 1: Soliciting stakeholder types

Q) What are the service engineering stakeholders in your work?

Q) How do you justify it?

- Researchers in different areas of service composition, service design etc. answered
- In total 50 completed questionnaires were returned back to us.

http://www.s-cube-network.eu/results/deliverables/wp-ia-3.1/cd-ia-3.1.4/survey_results.xls

Step 2: Classification of stakeholder types



1. **Service Providers:** design, implement, own, publish and maintain services that can be invoked/executed.
2. **Application Builders:** integrate services into an application that meets the requirements of its end users.
3. **Service Composers:** provide composite services for internal or external usage and compose existing services or SBAs to achieve business goals.
4. **Application Clients:** use the application to achieve their goals.
5. **Supporting Roles:** are indirectly involved with the service lifecycle and provide auxiliary functions such as project management, technical advice and consultancy.

Application builder



Q) How to collect requirements from
end users

Service composer

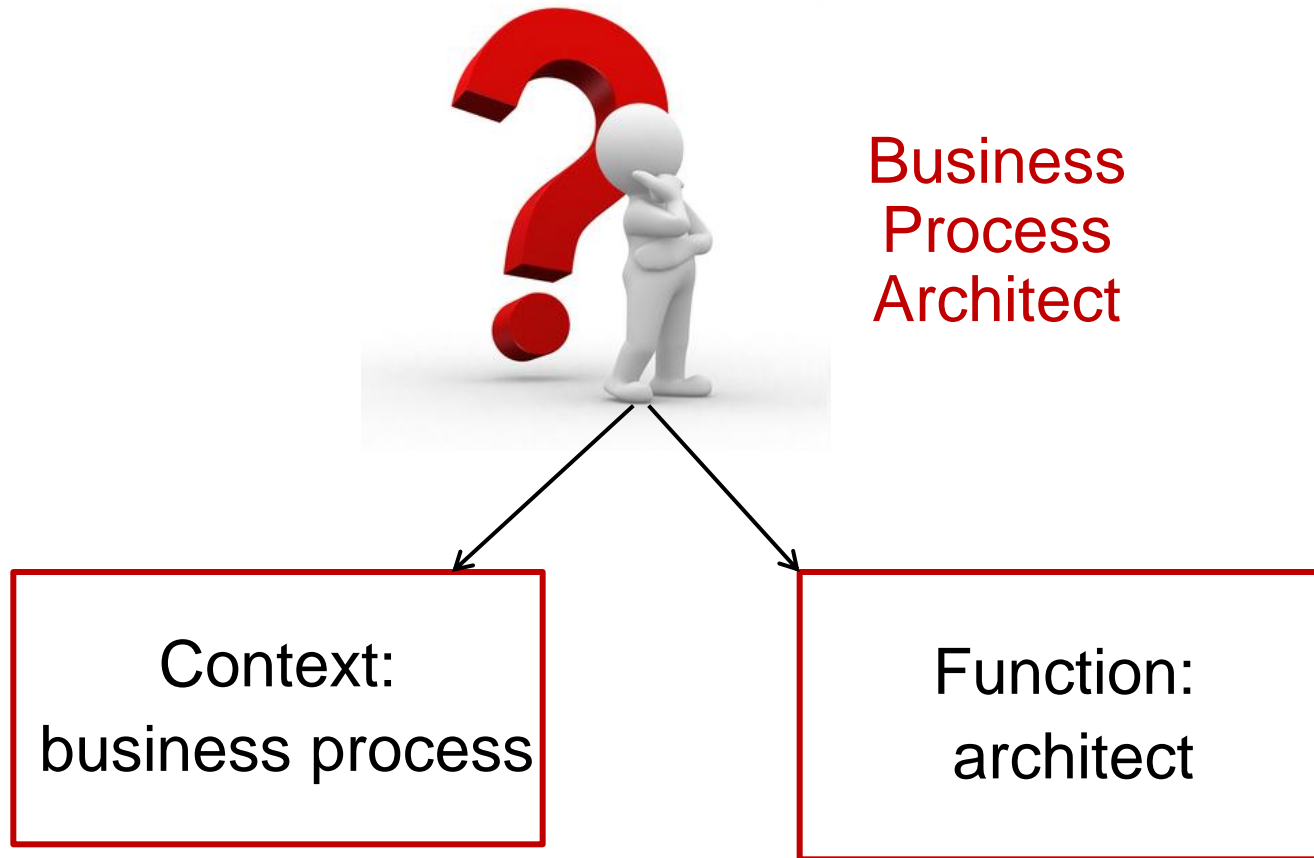


Q) How to collect requirements from
consumers

Different expertise
and concerns

Step 3: Consolidation of stakeholder types

- Different names for similar concepts



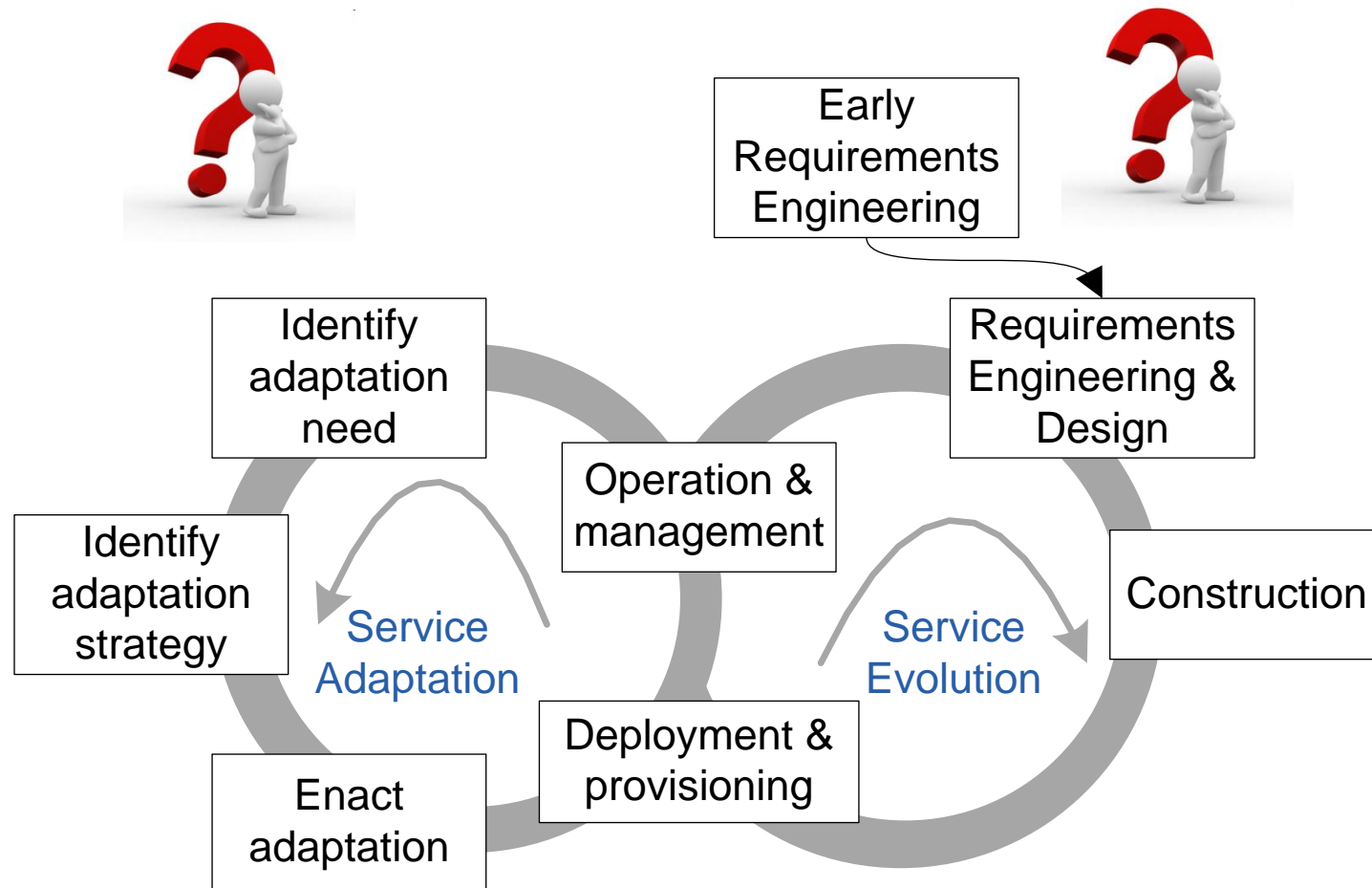
Step 3: Consolidation of stakeholder types



Role	Consolidated Stakeholder Type
Application Builders	SBA Architect SBA Modeler Application Developer Business Analyst Business Process Analyst Business Process Administrator Domain Expert SBA Engineer
Application Clients	End User Service Consumer
Service Composers	Composition Designer Negotiation Agent
Service Providers	Service Architect Service Deployer Service Designer Service Developer Service Provider
Supporting Roles	Manager Supporting Expert

19 stakeholder types

Step 4: Map stakeholder types to S-Cube lifecycle phases



Coverage of Lifecycle Phases by Stakeholder Types



Role	Consolidated Stakeholder Type	Early Re- quirements Engineering	Evolution Lifecycle			Adaptation Lifecycle			
			Requirements Engineering & Design	Construction	Deployment & Provision	Operation & Manage- ment	Identify Adaptation Needs	Identify Adaptation Strategies	Enact Adaptation
Application Builders	SBA Architect	✓	✓	✓	✓	✓	✓	✓	✓
	SBA Modeler	✓	✓		✓	✓	✓	✓	
	Application Developer	✓	✓	✓	✓				
	Business Analyst	✓	✓				✓	✓	
	Business Process Analyst	✓	✓	✓			✓	✓	
	Business Process Administrator	✓	✓		✓		✓	✓	
	Domain Expert	✓	✓						
	SBA Engineer	✓	✓			✓			
Application Clients	End User	✓				✓	✓	✓	✓
	Service Consumer	✓	✓		✓	✓	✓		✓
Service Composers	Composition Designer	✓		✓			✓	✓	✓
	Negotiation Agent				✓	✓			✓
Service Providers	Service Architect	✓	✓	✓	✓	✓	✓	✓	✓
	Service Deployer				✓				
	Service Designer	✓		✓					
	Service Developer	✓	✓	✓	✓	✓			
	Service Provider				✓	✓	✓		✓
Supporting Roles	Manager	✓	✓	✓	✓	✓	✓	✓	✓
	Supporting Expert	✓	✓			✓	✓		
Coverage		84%	68%	42%	58%	53%	63%	48%	42%

All but two that are responsible for provision

Coverage of Lifecycle Phases by Stakeholder Types



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	SBA Modeler	✓	✓			✓	✓	✓	
	Application Developer	✓	✓	✓		✓			
	Business Analyst	✓	✓				✓	✓	
	Business Process Analyst	✓	✓	✓			✓	✓	
	Business Process Administrator	✓	✓		✓		✓	✓	
	Domain Expert	✓	✓						
	SBA Engineer	✓	✓			✓			
Application Clients	End User	✓				✓	✓	✓	✓
	Service Consumer	✓	✓		✓	✓	✓		✓
Service Composers	Composition Designer	✓		✓			✓	✓	✓
	Negotiation Agent				✓	✓			✓
Service Providers	Service Architect	✓	✓	✓	✓	✓	✓	✓	✓
	Service Deployer				✓				
	Service Designer	✓		✓					
	Service Developer	✓	✓	✓	✓	✓			
	Service Provider				✓	✓	✓		✓
Supporting Roles	Manager	✓	✓	✓	✓	✓	✓	✓	✓
	Supporting Expert	✓	✓			✓	✓		
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Adaptation well-covered

Coverage of Lifecycle Phases by Stakeholder Types



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	Domain Expert	✓	✓						
	SBA Engineer	✓	✓			✓			
Application Clients	End User	✓				✓	✓	✓	✓
	Service Consumer	✓	✓		✓	✓	✓		✓
Service Composers	Composition Designer	✓		✓			✓	✓	✓
	Negotiation Agent				✓	✓			✓
Service Providers	Service Architect	✓	✓	✓	✓	✓	✓	✓	✓
	Service Deployer				✓				
	Service Designer	✓		✓					
	Service Developer	✓	✓	✓	✓	✓			
	Service Provider				✓	✓	✓		✓
Supporting Roles	Manager	✓	✓	✓	✓	✓	✓	✓	✓
	Supporting Expert	✓	✓			✓	✓		
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We expected more stakeholders types

The Participation of each Stakeholder Types



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Service Composers	Composition Designer	✓		✓			✓	✓	✓
	Negotiation Agent				✓	✓			✓
Service Providers	Service Architect	✓	✓	✓	✓	✓	✓	✓	✓
	Service Deployer				✓				
	Service Designer	✓		✓					
	Service Developer	✓	✓	✓	✓	✓			
	Service Provider				✓	✓	✓		✓
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Evolution vs. Adaptation



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	Business Process Analyst	✓	✓	✓			✓	✓	
	Business Process Administrator	✓	✓		✓		✓	✓	
	Domain Expert	✓	✓						
	SBA Engineer	✓	✓			✓			
Application Clients	End User	✓				✓	✓	✓	✓
	Service Consumer	✓	✓		✓	✓	✓		✓
Service Composers	Composition Designer	✓		✓			✓	✓	✓
	Negotiation Agent				✓	✓			✓
Service Providers	Service Architect	✓	✓	✓	✓	✓	✓	✓	✓
	Service Deployer				✓				
	Service Designer	✓		✓					
	Service Developer	✓	✓	✓	✓	✓			
	Service Provider				✓	✓	✓		✓
Supporting Roles	Manager	✓	✓	✓	✓	✓	✓	✓	✓
	Supporting Expert	✓	✓			✓	✓		
Coverage		84%	68%	42%	58%	53%	63%	48%	42%

Conclusions

1. We presented an initial taxonomy of **19 stakeholder types** performing **5 roles** and a mapping between these stakeholders and the S-Cube service engineering lifecycle.
2. More types of stakeholders participate in the lifecycle of SBAs than in that of traditional applications and that stakeholders may play different roles depending on their focus
3. Some stakeholders types are required in all phases: Service Architect
4. Absence of a stakeholder for broker
5. Comparison between the evolution and adaptation cycles
The adaptation side of the S-Cube lifecycle a much broader range of roles are involved than in the evolution phases.



Thank you!

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