A4M36AOS – Architektury orientované na služby

3. Service-Oriented Modeling

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SOA Principles

- Service-oriented architecture
- Service-oriented analysis and design
- Service-oriented modeling
- Service-oriented computing
- Service-oriented programming
- ... separation of concerns to services

Service-oriented Modeling

- Designing and specifying service-oriented business systems within a service-oriented architecture
- Includes a modeling language understandable by both business and technical people
- Comprehensive view of analysis, design, and architecture of 'Software Entities' in an organization
- Encourages viewing software entities as 'assets' referred as 'services'

Service-oriented Modeling

- Service-Oriented Modeling and Architecture (SOMA) by IBM in 2004
  - Targets service-oriented analyses and design (SOAD) – focus to service components and flows
  - Extends traditional object-oriented and component-oriented analyses and design
  - Three phases: identification, specification, and realization (+ implement, deploy, manage)
  - Domain decomposition, goal-service modeling

Service-oriented Modeling

- Service-Oriented Modeling Framework (SOMF)
- Michael Bell[1]
- Sparx Enterprise Architect modeling platform[2]
- Modeling language for software development
- Can be employed to design any application (application-level or enterprise-level, local or distributed, business or technological)

[1] http://www.modelingconcepts.com

[2] http://www.sparxsystems.com.au/

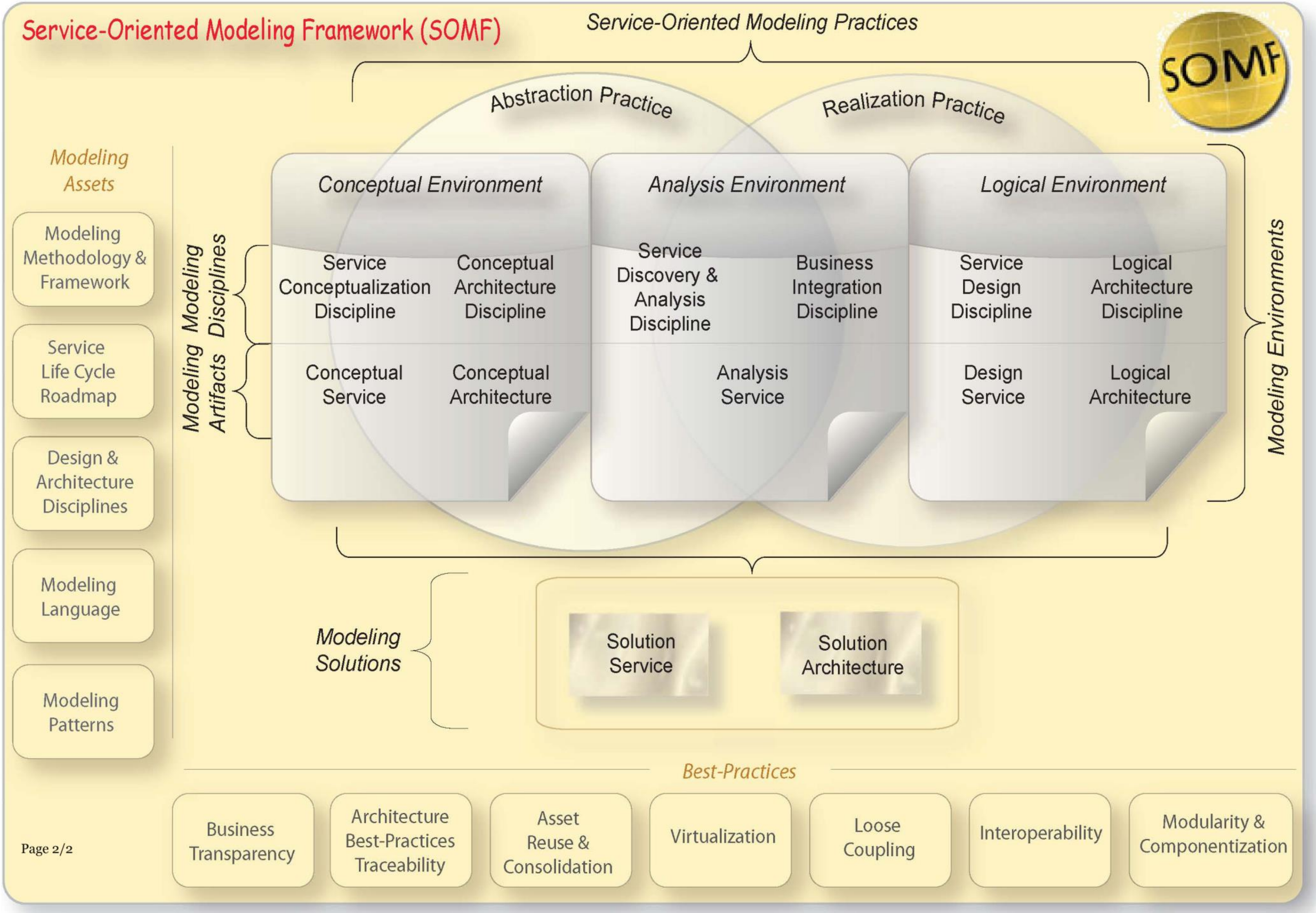
SOMF

- Methodology for service-oriented development (lifecycle management and modeling)
- Intuitiveness of implementation and simplicity of usage
- Number of modeling practices, environments, disciplines, and artifacts
- http://www.modelingconcepts.com/pages/download.htm

SOMF

- Not based on any particular programming language, nor constrained to any implementation technology (e.g. Web Services)
- Model-driven analysis, design and architectural disciplines
- Software lifecycle and service portfolio management practices
- An easy to use notation for modeling the “used-to-be”, “as-is”, and “to-be” states of the enterprise service catalog

Service-Oriented Modeling Framework (SOMF)



Service-Oriented Modeling Practices

SOMF

Abstraction Practice

Realization Practice

Modeling Assets

Modeling Methodology & Framework

Service Life Cycle Roadmap

Design & Architecture Disciplines

Modeling Language

Modeling Patterns

Modeling Disciplines

Modeling Artifacts

Conceptual Environment

Service Conceptualization Discipline

Conceptual Architecture Discipline

Conceptual Service

Conceptual Architecture

Analysis Environment

Service Discovery & Analysis Discipline

Business Integration Discipline

Analysis Service

Logical Environment

Service Design Discipline

Logical Architecture Discipline

Design Service

Logical Architecture

Modeling Environments

Modeling Solutions

Solution Service

Solution Architecture

Best-Practices

Business Transparency

Architecture Best-Practices Traceability

Asset Reuse & Consolidation

Virtualization

Loose Coupling

Interoperability

Modularity & Componentization

SOMF for Software Development

- Service-Oriented Conceptualization
- Conceptual Architecture
- Service-Oriented Discovery and Analysis
- Service-Oriented Business Integration
- Service-Oriented Design
- Logical Architecture

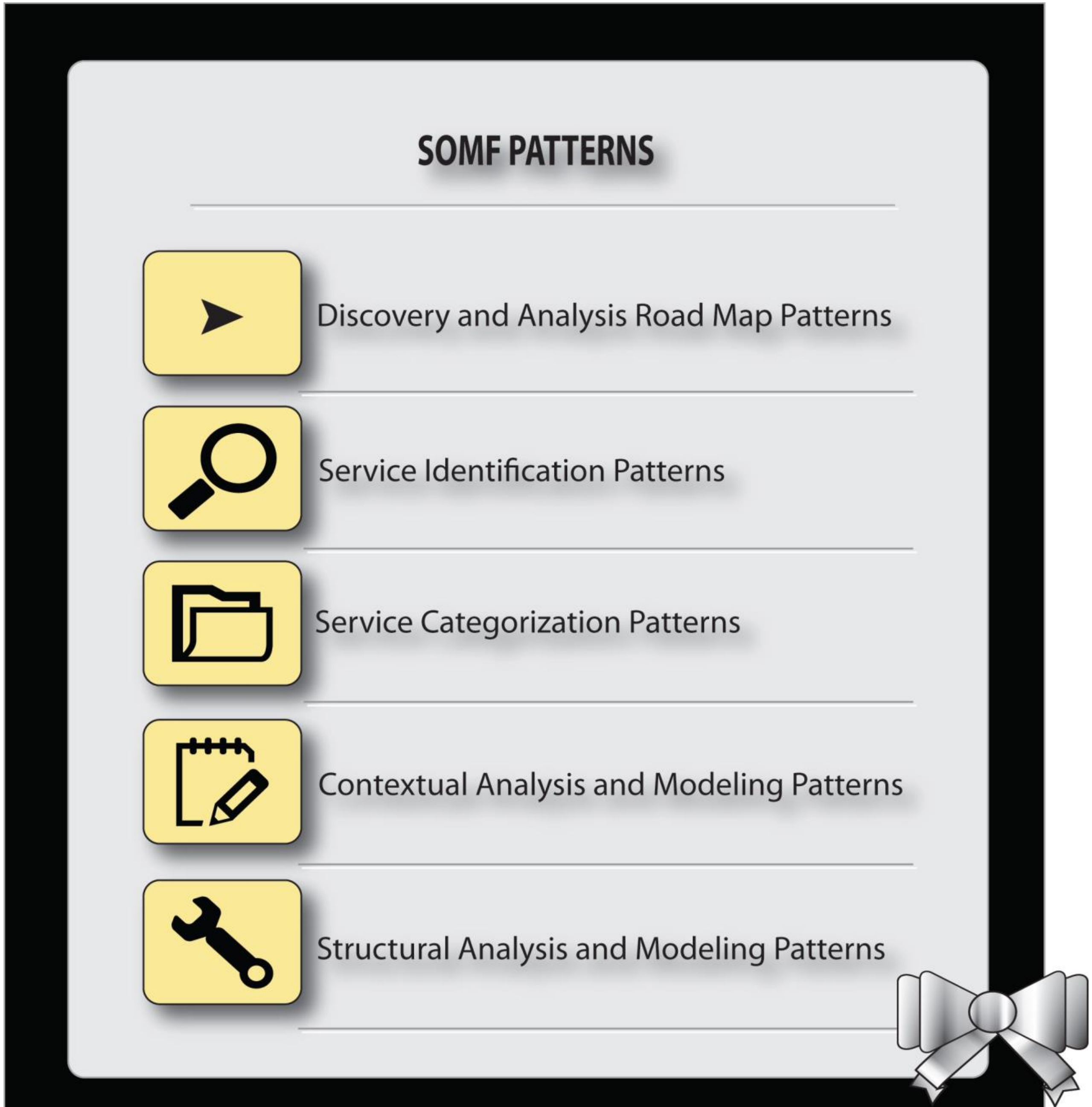
SOMF Modeling Language

- Analysis Model
  - Service-Oriented Analysis Proposition Diagram
  - Service-Oriented Logical Relationship Diagram
- Design Model
  - Service-Oriented Business Integration Diagram
  - Service-Oriented Logical Composition Diagram
  - Service-Oriented Transaction Diagram

SOMF Modeling Language

- Architecture Model
  - Service-Oriented Conceptual Architecture Diagram
  - Service-Oriented Utilization Diagram - Logical Architecture
  - Service-Oriented Transaction Directory Diagram - Logical Architecture

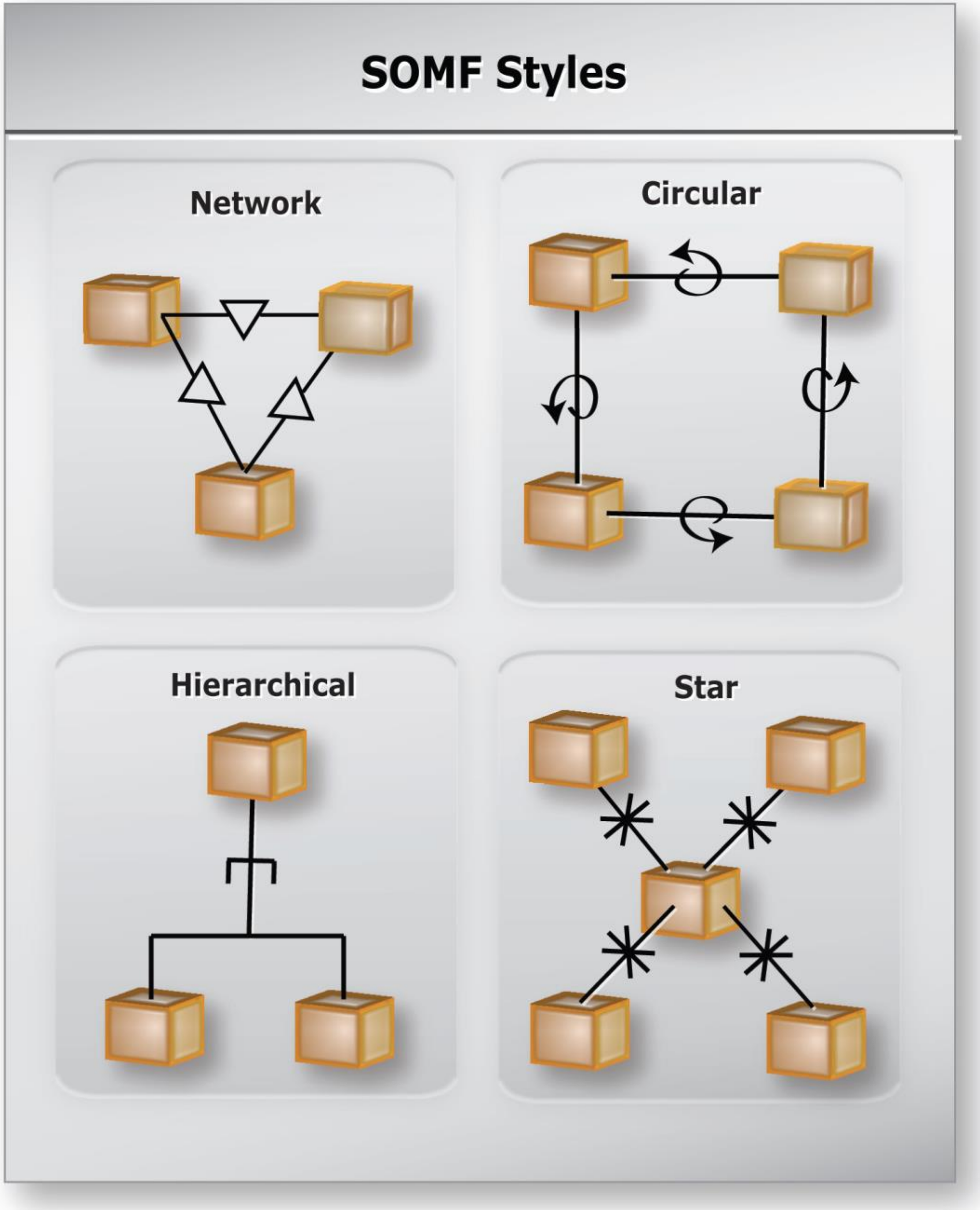
SOMF Modeling Patterns



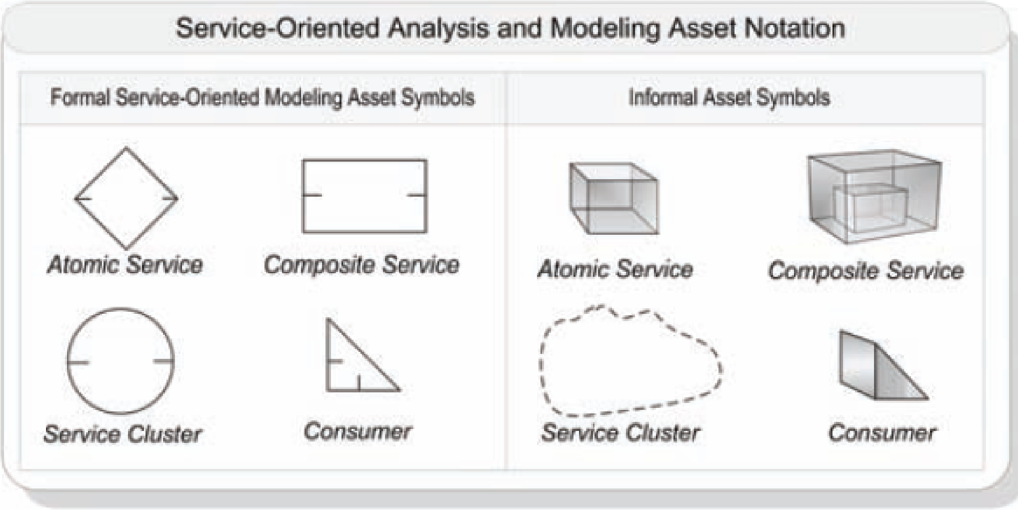
SOMF PATTERNS

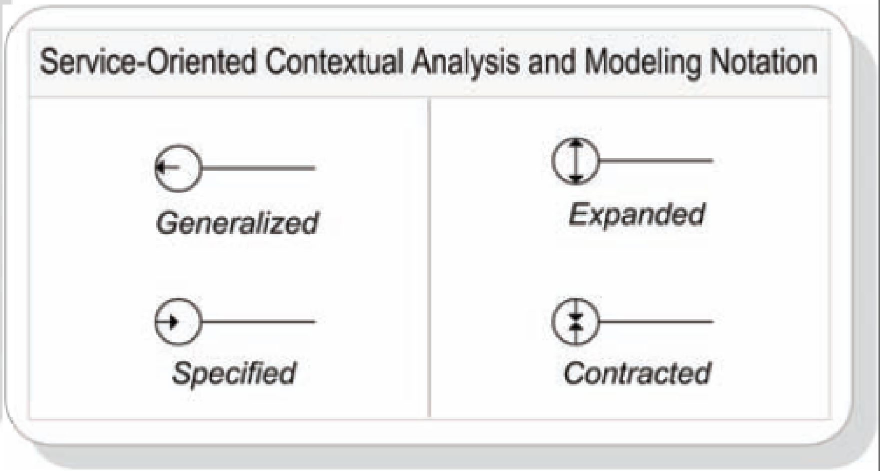
- Discovery and Analysis Road Map Patterns
- Service Identification Patterns
- Service Categorization Patterns
- Contextual Analysis and Modeling Patterns
- Structural Analysis and Modeling Patterns

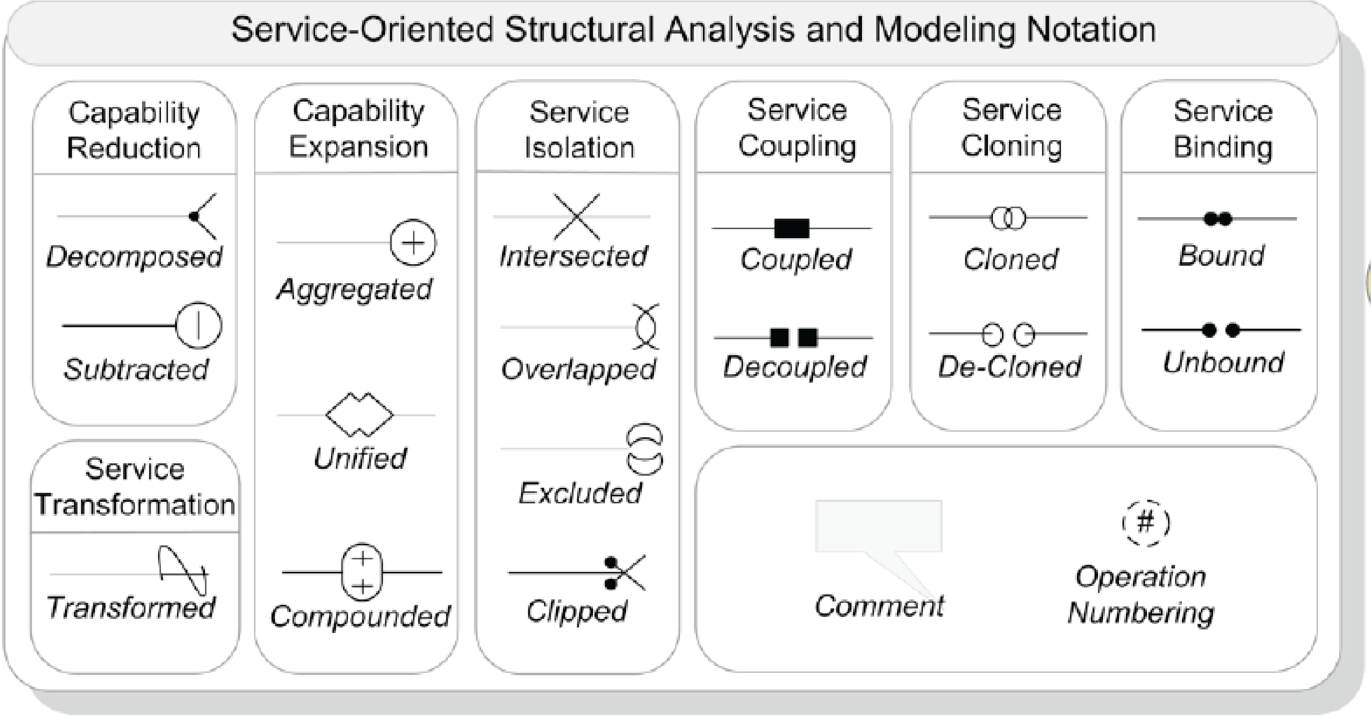
SOMF Modeling Styles



SOMF Notation







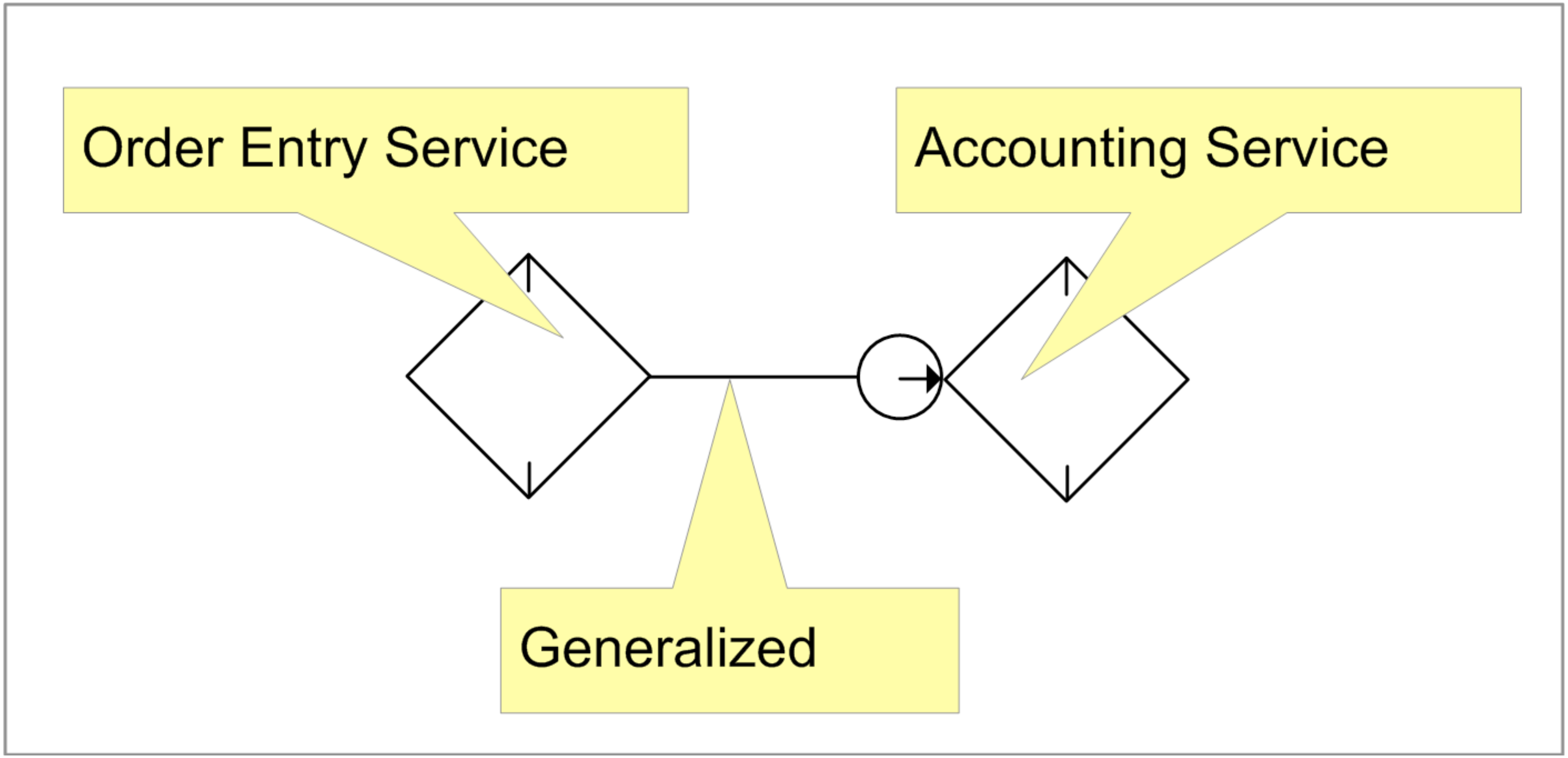
Motivation: How to Discover and Analyze services for Granularity, Reusability, Interoperability Success, etc…

Contextual Modeling

- Simple way to describe the capabilities of a software component
- Describes service functionality, name, specialty, and role
- “Art” of manipulating the context of a service to perfect its offerings and performance
- Generalization, Specification, Expansion, and Contraction

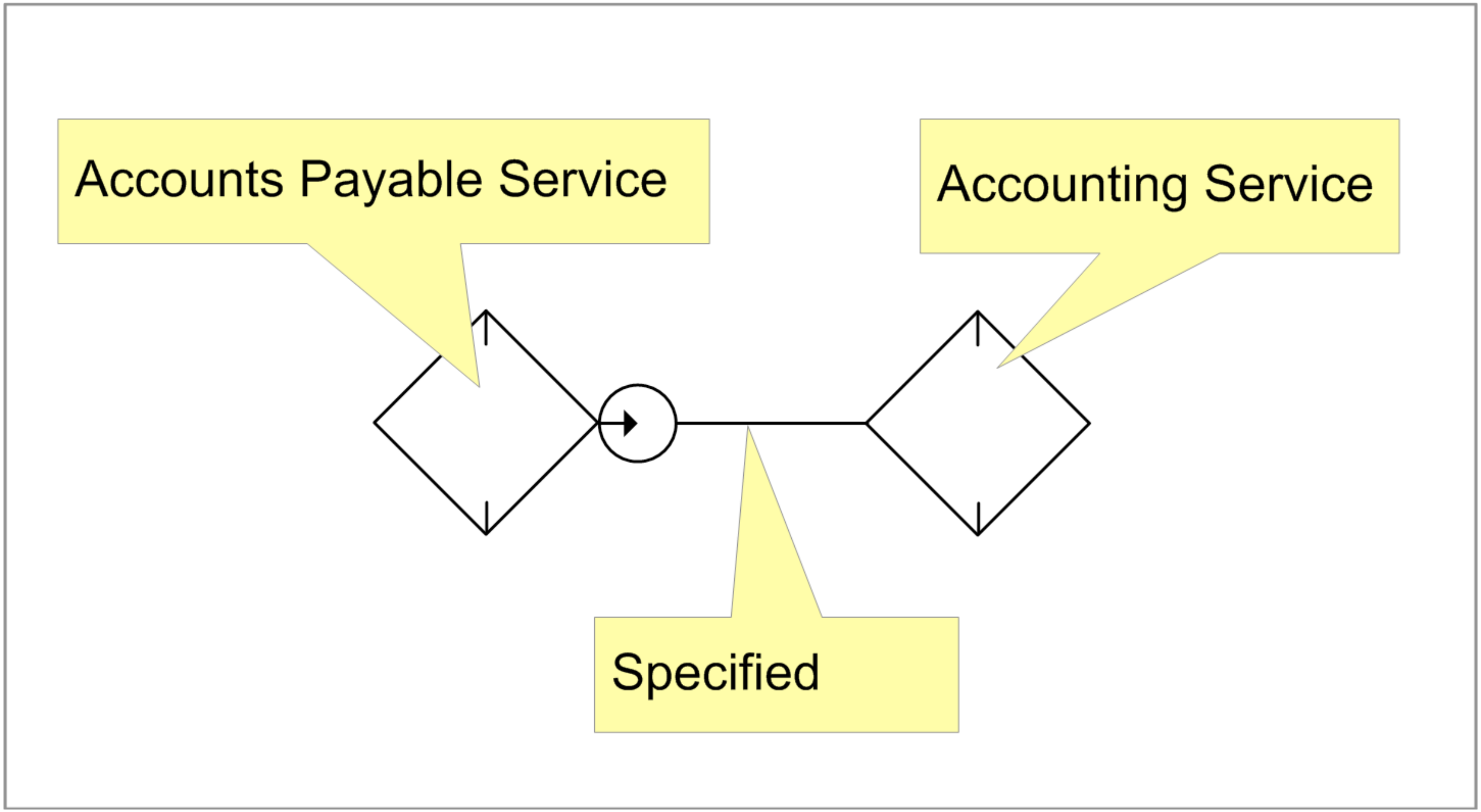
Contextual Generalization

- Raising the level of abstraction



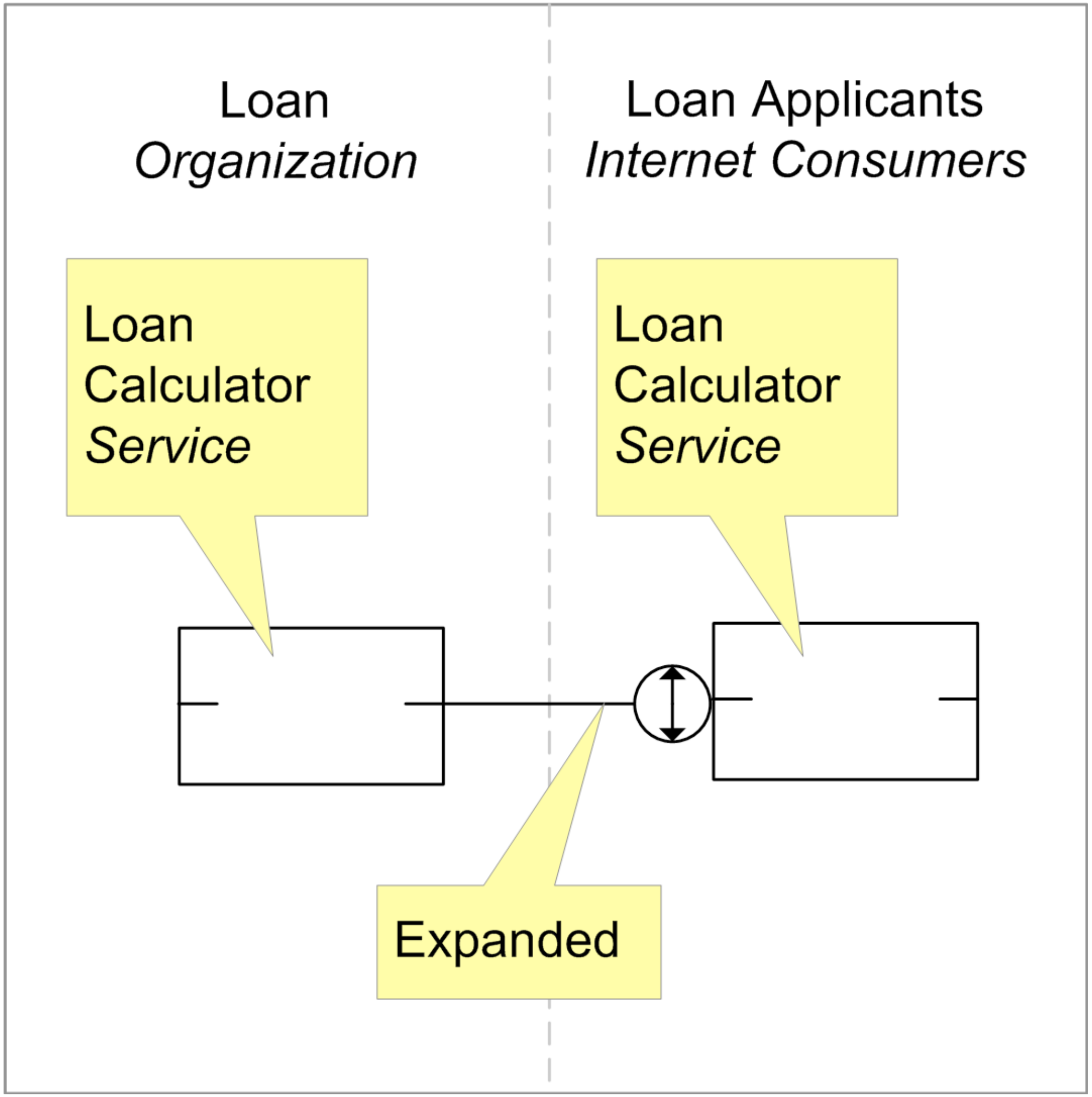
Contextual Specification

- Reducing service abstraction level (trim down the functionality)



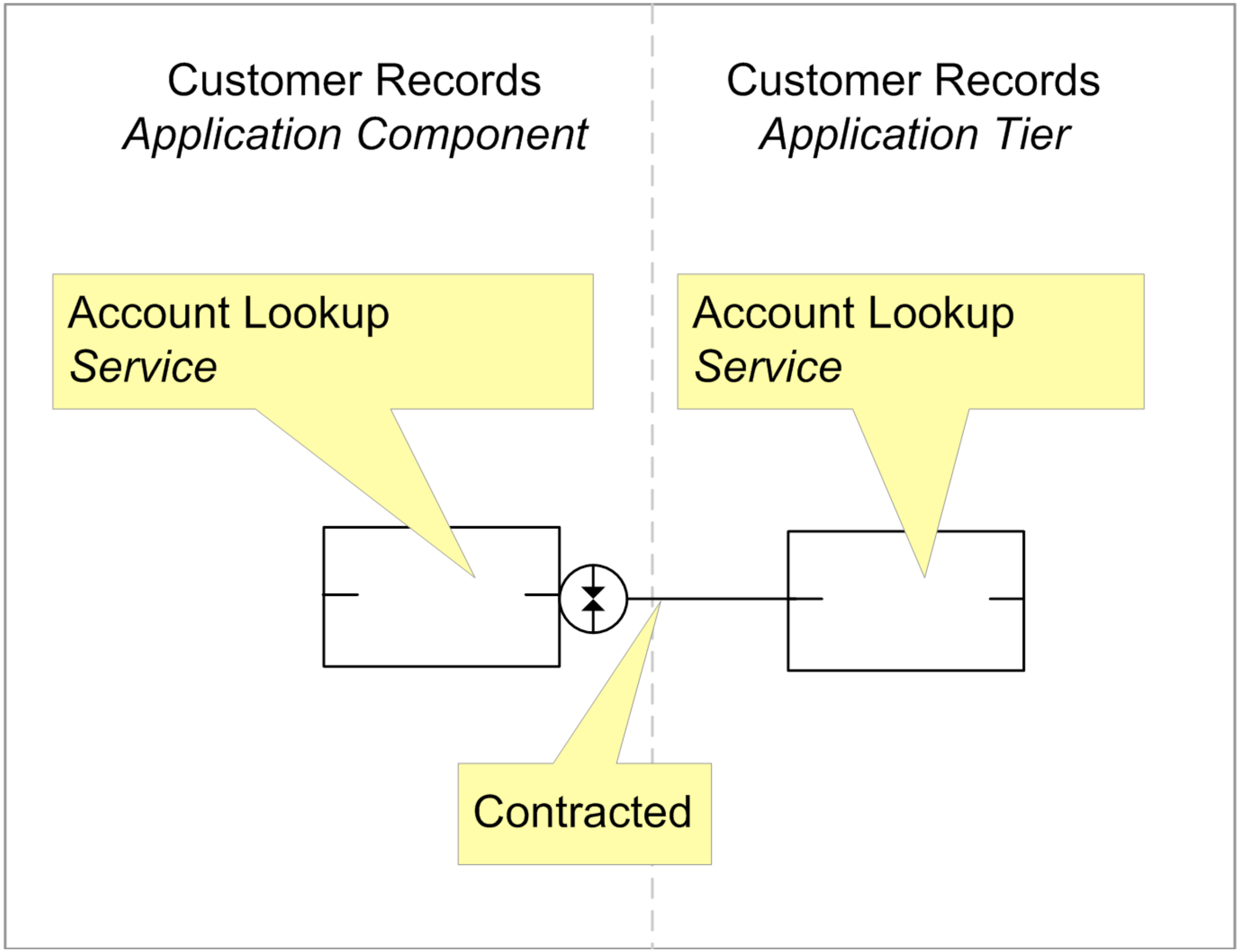
Contextual Expansion

- Increasing service influence and offerings across boundaries
- increasing service's consumer base



Contextual Contraction

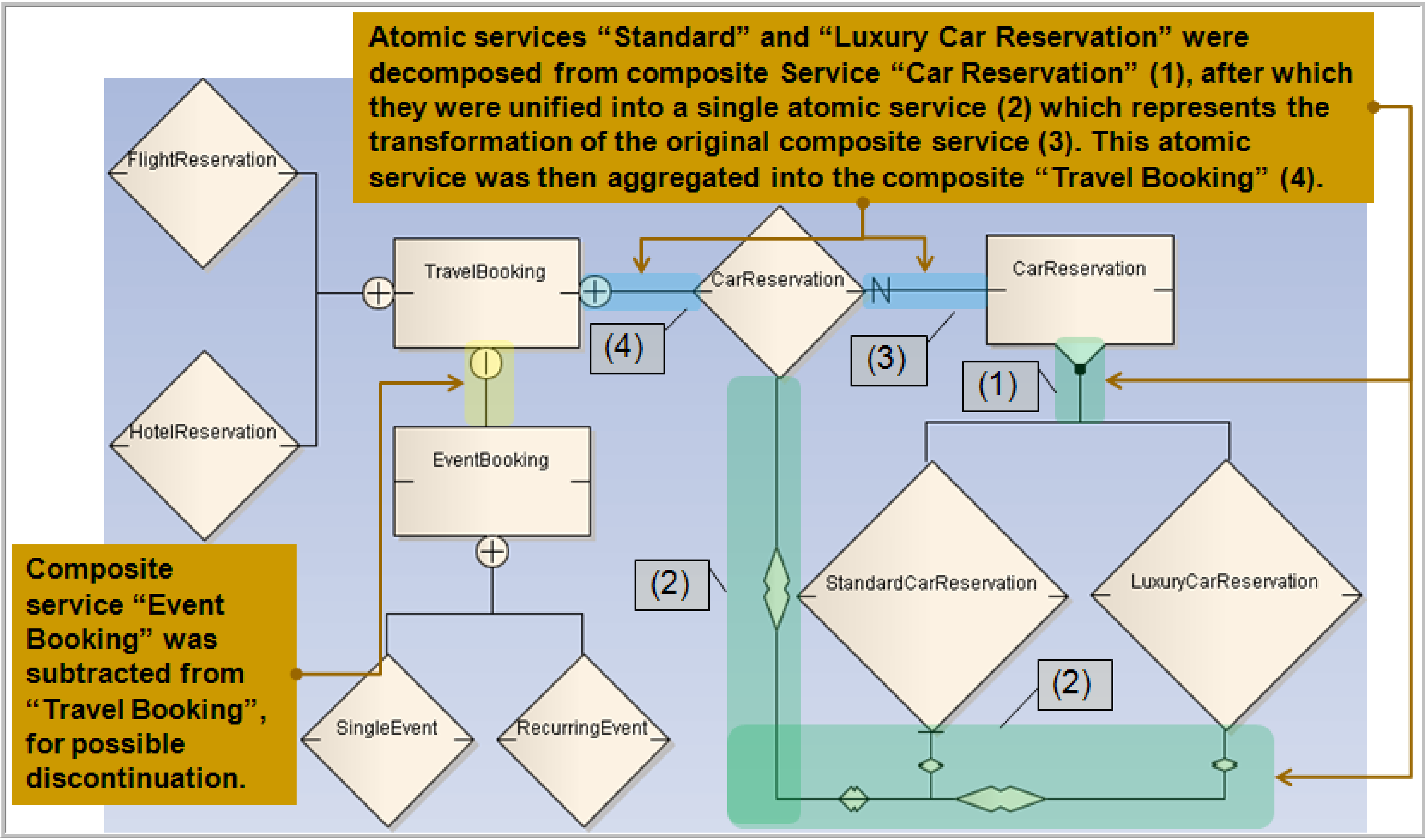
- Reducing a service's consumer base and decreasing its influence
- limits accessibility to the service



Examples of Diagrams

- Analysis Proposition Diagram
- Business Integration Diagram
- Logical Relationship Diagram
- Logical Composition Diagram
- Transaction Diagram

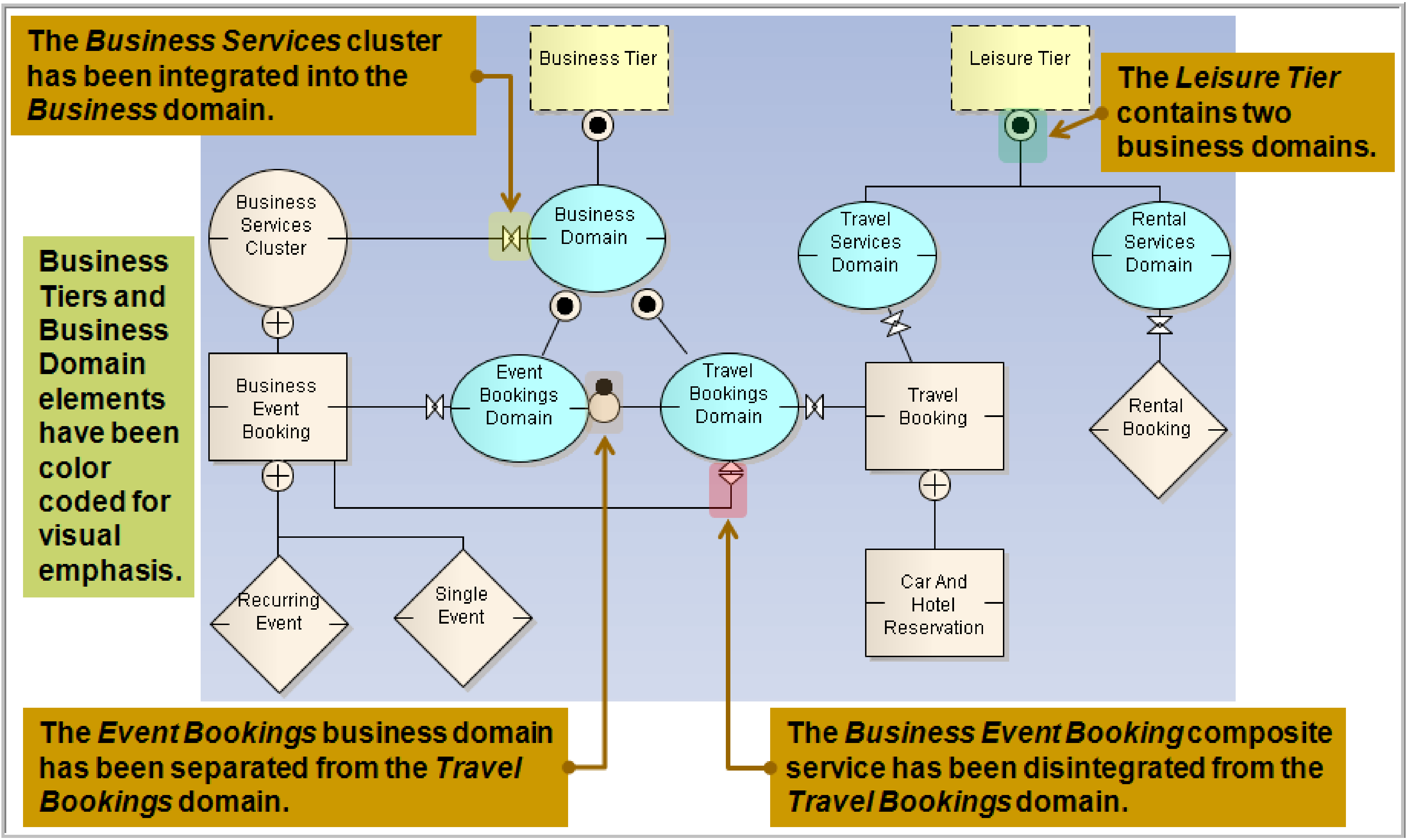
Analysis Proposition Diagram



Atomic services "Standard" and "Luxury Car Reservation" were decomposed from composite Service "Car Reservation" (1), after which they were unified into a single atomic service (2) which represents the transformation of the original composite service (3). This atomic service was then aggregated into the composite "Travel Booking" (4).

Composite service "Event Booking" was subtracted from "Travel Booking", for possible discontinuation.

Business Integration Diagram



The *Business Services* cluster has been integrated into the *Business* domain.

The *Leisure Tier* contains two business domains.

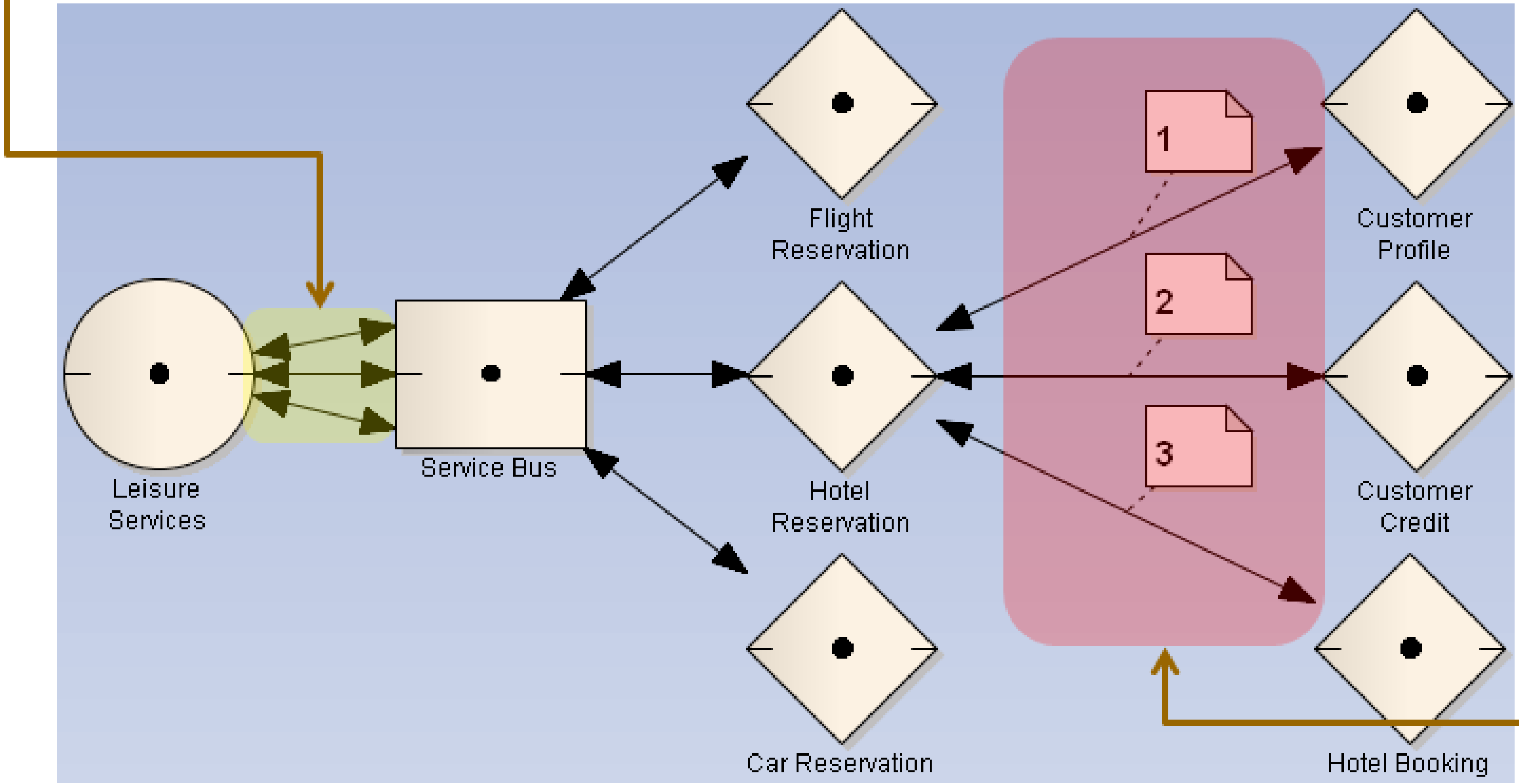
Business Tiers and Business Domain elements have been color coded for visual emphasis.

The *Event Bookings* business domain has been separated from the *Travel Bookings* domain.

The *Business Event Booking* composite service has been disintegrated from the *Travel Bookings* domain.

Service-Oriented Logical Design Relationship Diagram

The example on the left illustrates a "same-time", asynchronous (non-blocking) design whereby messages can be sent & received in no particular order. To coordinate the messages an intermediary such as an ESB can be used.

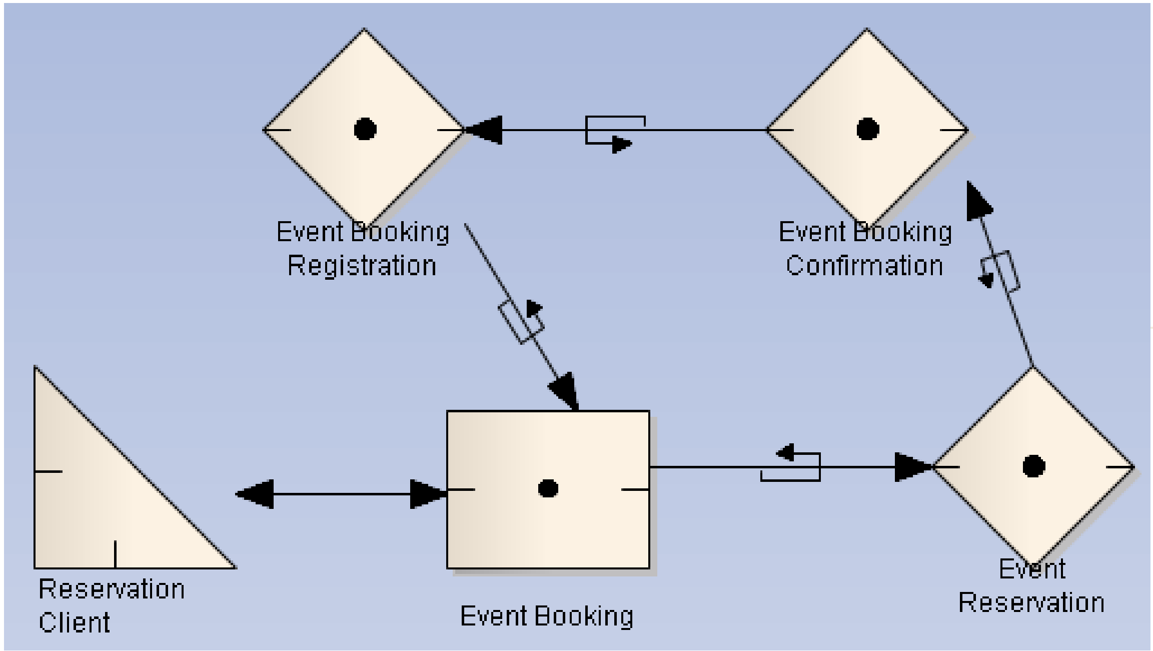


In EA, message sequencing can be documented using connector notes, as shown in this example.

The example on the right depicts an "in-order" sequential design whereby messages must be sent (and their reply received) in a particular order. This implies the calling service is blocked waiting for each response.

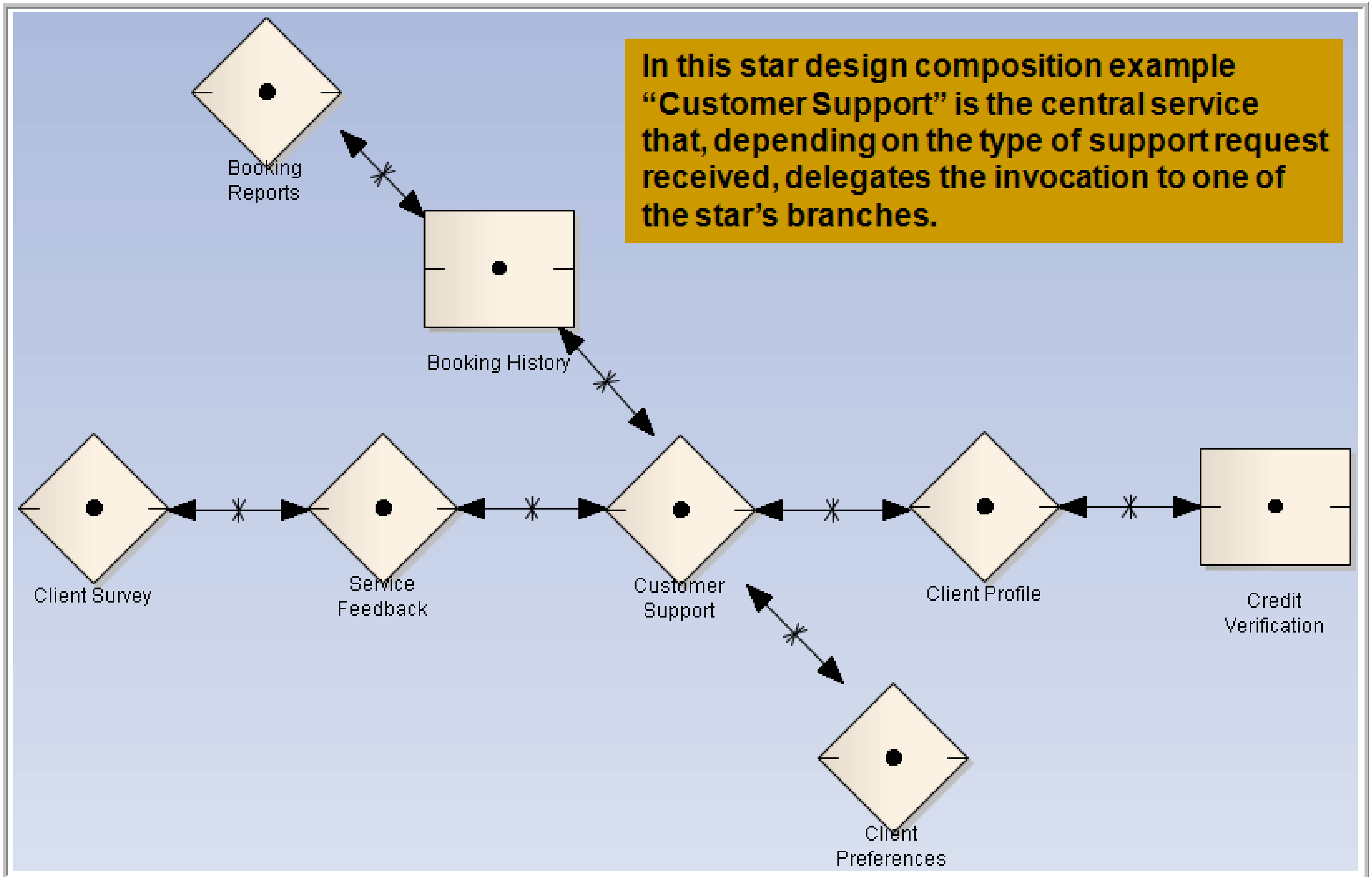
Logical Design Composition Diagram Employing the Circular Style

In this example the "Event Booking" composite service delegates the request from the consumer to the first service in the chain, "Event Reservation". The latter, in turn, passes the request (which may be altered along the way) to the "Event Booking Confirmation" service, and so forth, until the originator receives the final message in the sequence.



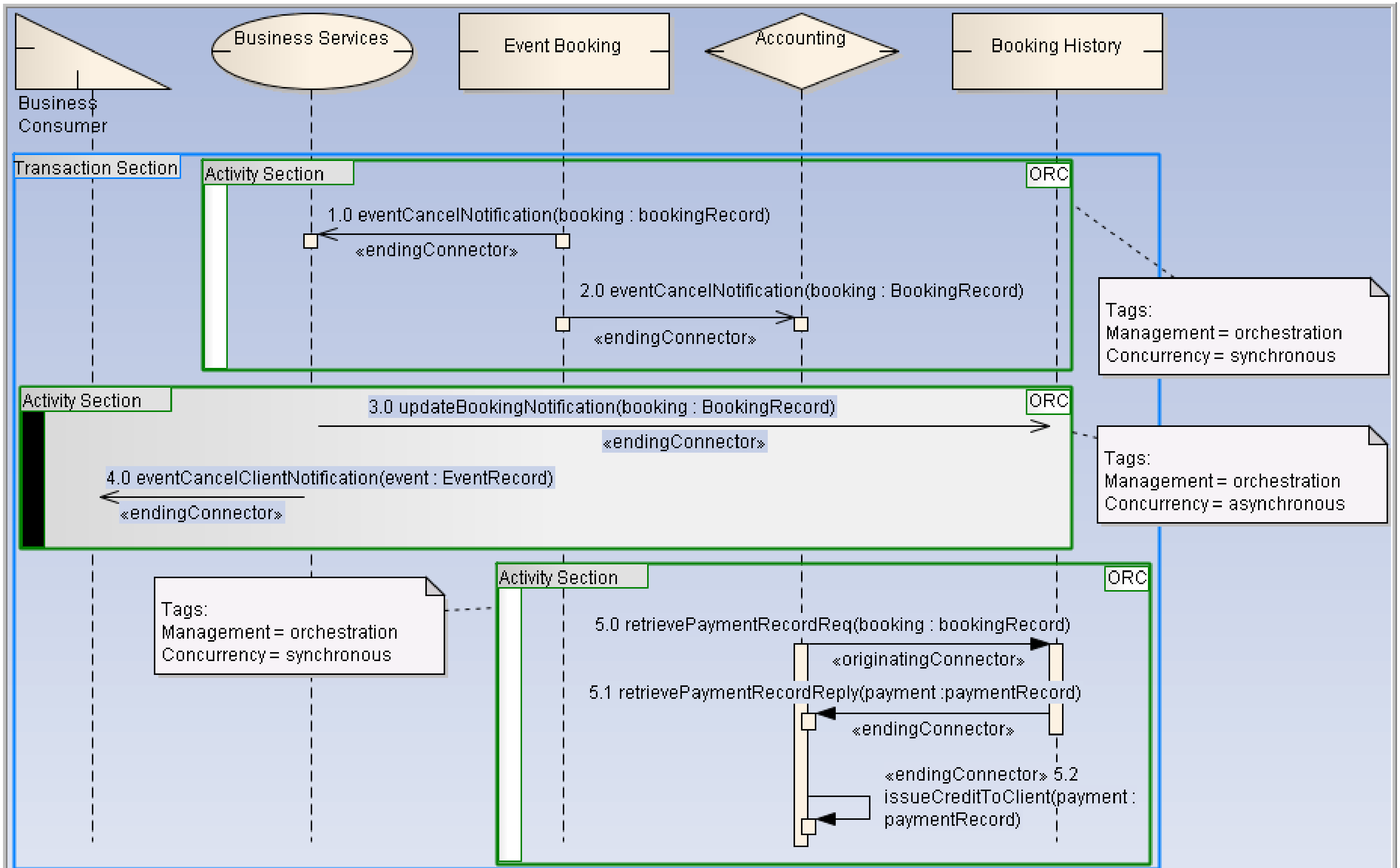
Note that in addition to the circular beam marker this style is also apparent via the unidirectional connectors of the message flow.

Logical Design Composition Diagram Employing the Star Style



In this star design composition example "Customer Support" is the central service that, depending on the type of support request received, delegates the invocation to one of the star's branches.

Service-Oriented Transaction Diagram


Business Consumer
Business Services
Event Booking
Accounting
Booking History
Transaction Section
Activity Section
ORC
1.0 eventCancelNotification(booking : bookingRecord)
«endingConnector»
2.0 eventCancelNotification(booking : BookingRecord)
«endingConnector»
Activity Section
ORC
3.0 updateBookingNotification(booking : BookingRecord)
«endingConnector»
4.0 eventCancelClientNotification(event : EventRecord)
«endingConnector»
Activity Section
ORC
5.0 retrievePaymentRecordReq(booking : bookingRecord)
«originatingConnector»
5.1 retrievePaymentRecordReply(payment :paymentRecord)
«endingConnector»
«endingConnector» 5.2 issueCreditToClient(payment : paymentRecord)

Tags:
Management = orchestration
Concurrency = synchronous

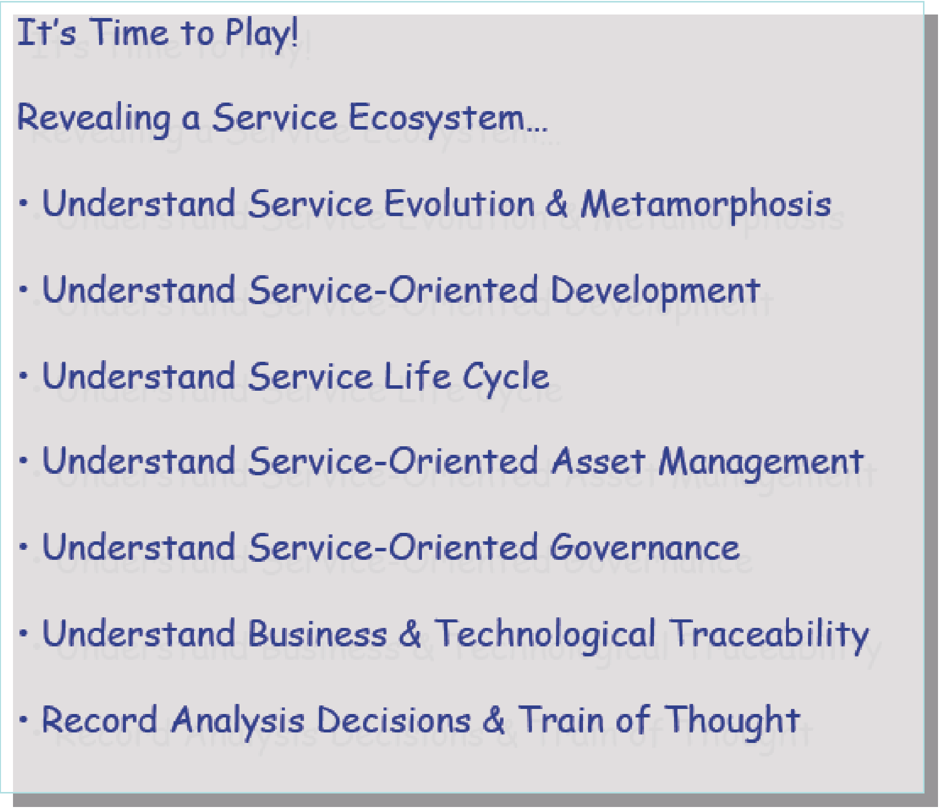
Tags:
Management = orchestration
Concurrency = asynchronous

Tags:
Management = orchestration
Concurrency = synchronous

SOAM in SOMF

- Service-oriented analysis modeling example

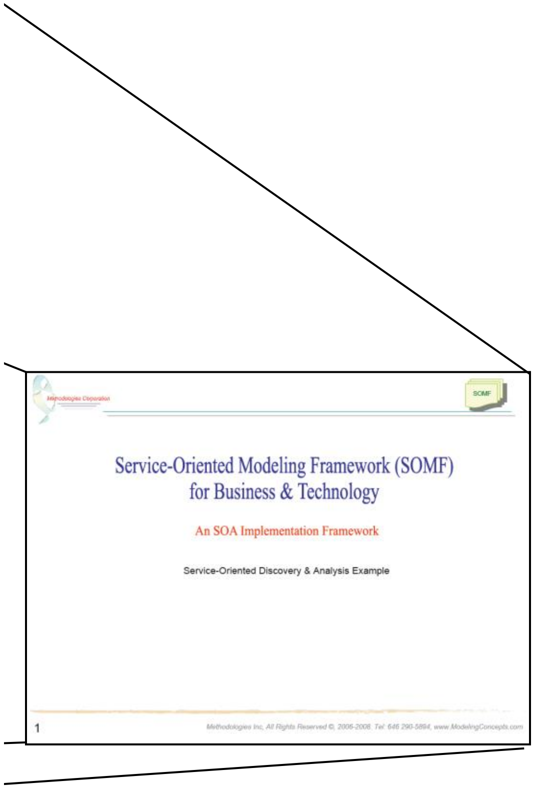
http://www.modelingconcepts.com/pdf/SOMF_ANALYSIS_MODELING.pdf



It's Time to Play!

Revealing a Service Ecosystem…

- Understand Service Evolution & Metamorphosis
- Understand Service-Oriented Development
- Understand Service Life Cycle
- Understand Service-Oriented Asset Management
- Understand Service-Oriented Governance
- Understand Business & Technological Traceability
- Record Analysis Decisions & Train of Thought



Methodologies Corporation

SOMF

Service-Oriented Modeling Framework (SOMF)
for Business & Technology

An SOA Implementation Framework

Service-Oriented Discovery & Analysis Example

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