


# Announcements

- 
- Quiz #2 scheduled for 10:30am on Wednesday, October 30<sup>th</sup>
  - Submit Study Guide with your answers by class time 10:30am on Wednesday for 5 bonus points
  - Muhammad has Quiz #1

# AWARENESS 3D ARCHITECTURES™: SOLUTION BLUEPRINT SPECIFICATIONS

Suzanne Barber

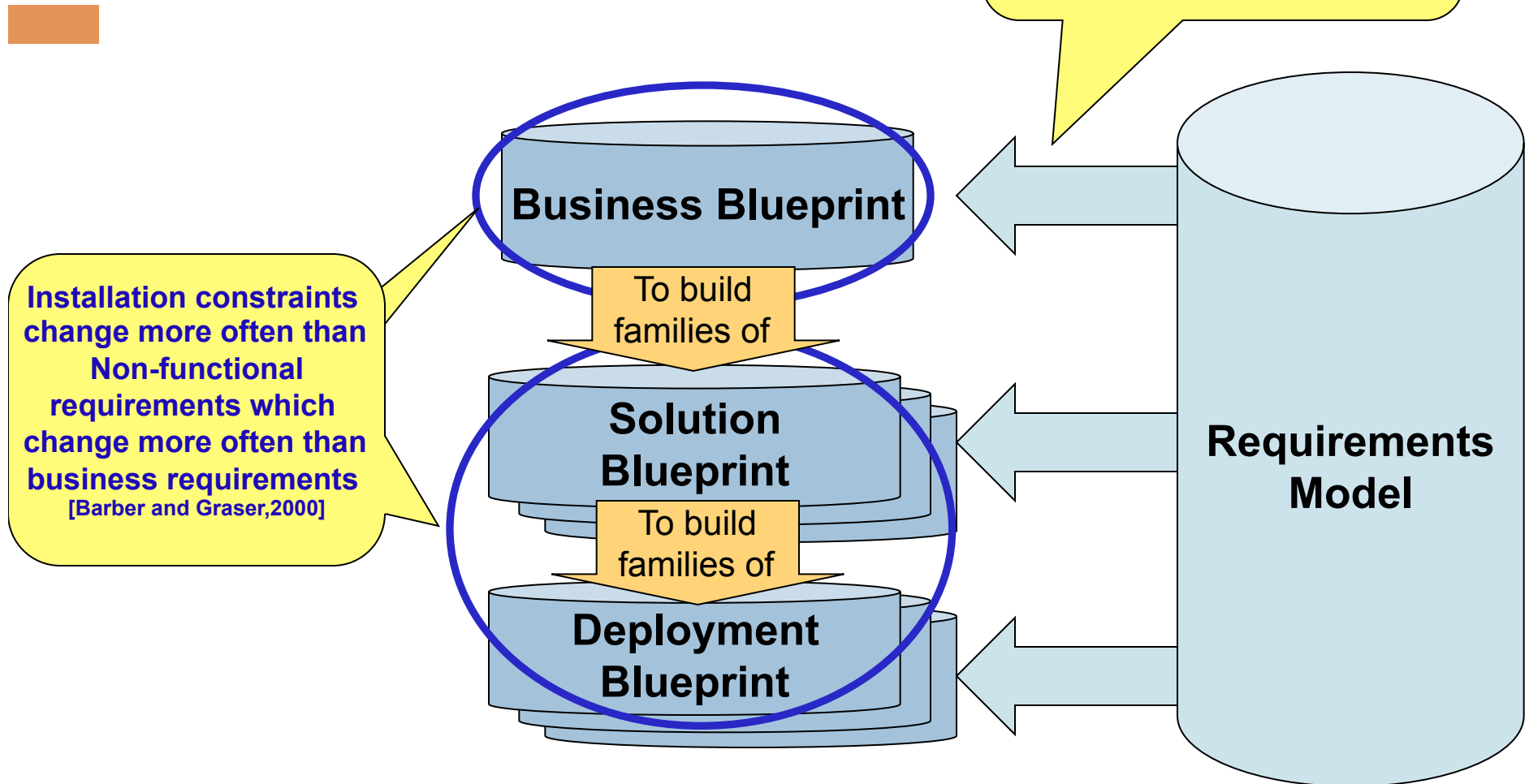
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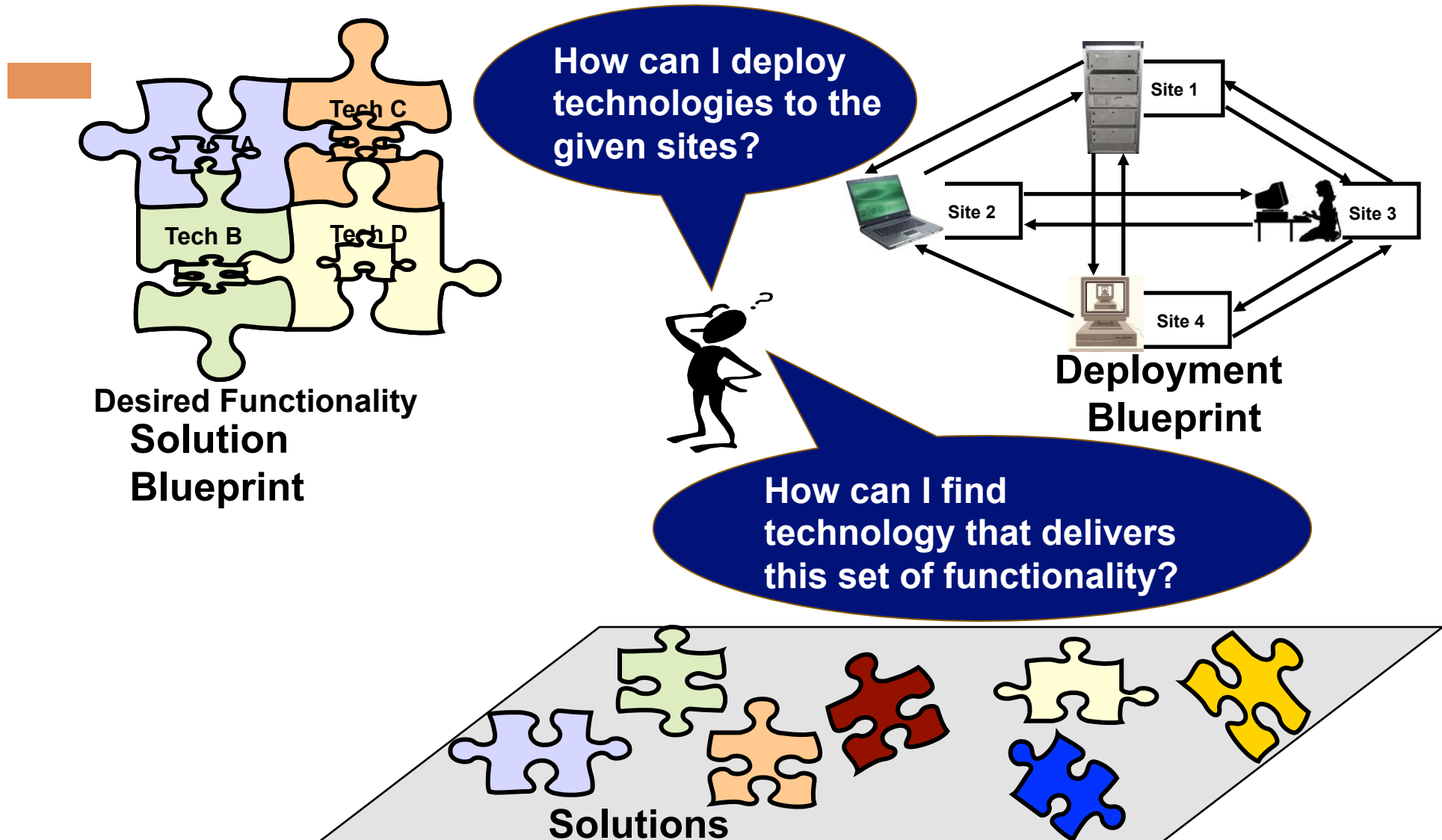
# Lecture Outline

- What does an Solution Blueprint look like?
- How is an SB derived?
  - ▣ Planning required?
  - ▣ What is the input?
  - ▣ How is the SB artifact represented/documented?
  - ▣ Why document this level of detail?
- How is an SB evaluated?
- Management of change to the SB?

# Architecture Evolution



# Difference between Solution & Deployment Blueprints



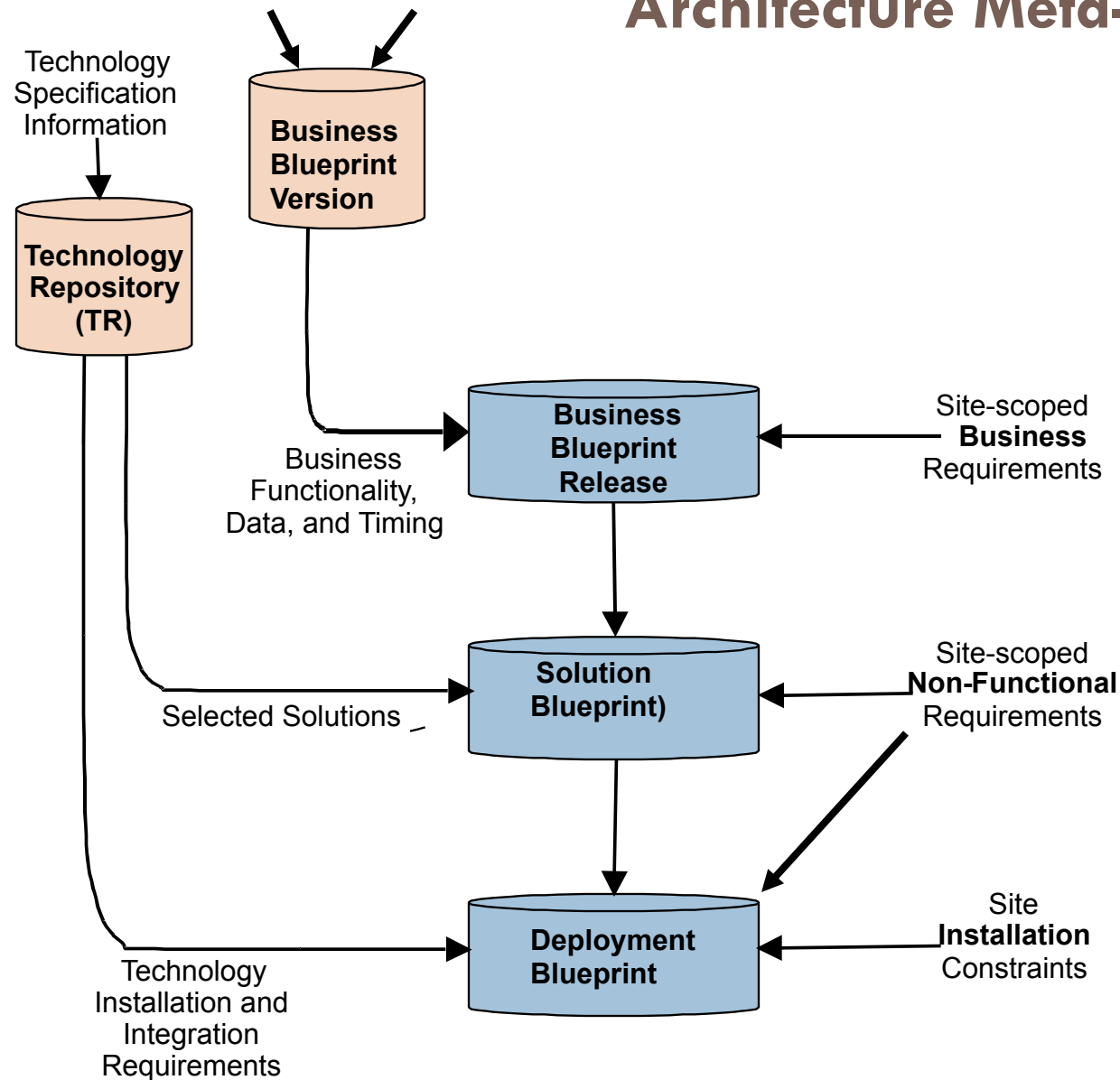
If the Business Blueprint sets the vision  
for the system ...

What are the Solutions that will fulfill  
that vision set by the architect?

# The Essential Questions the architect asks to build a Solution Blueprint ...

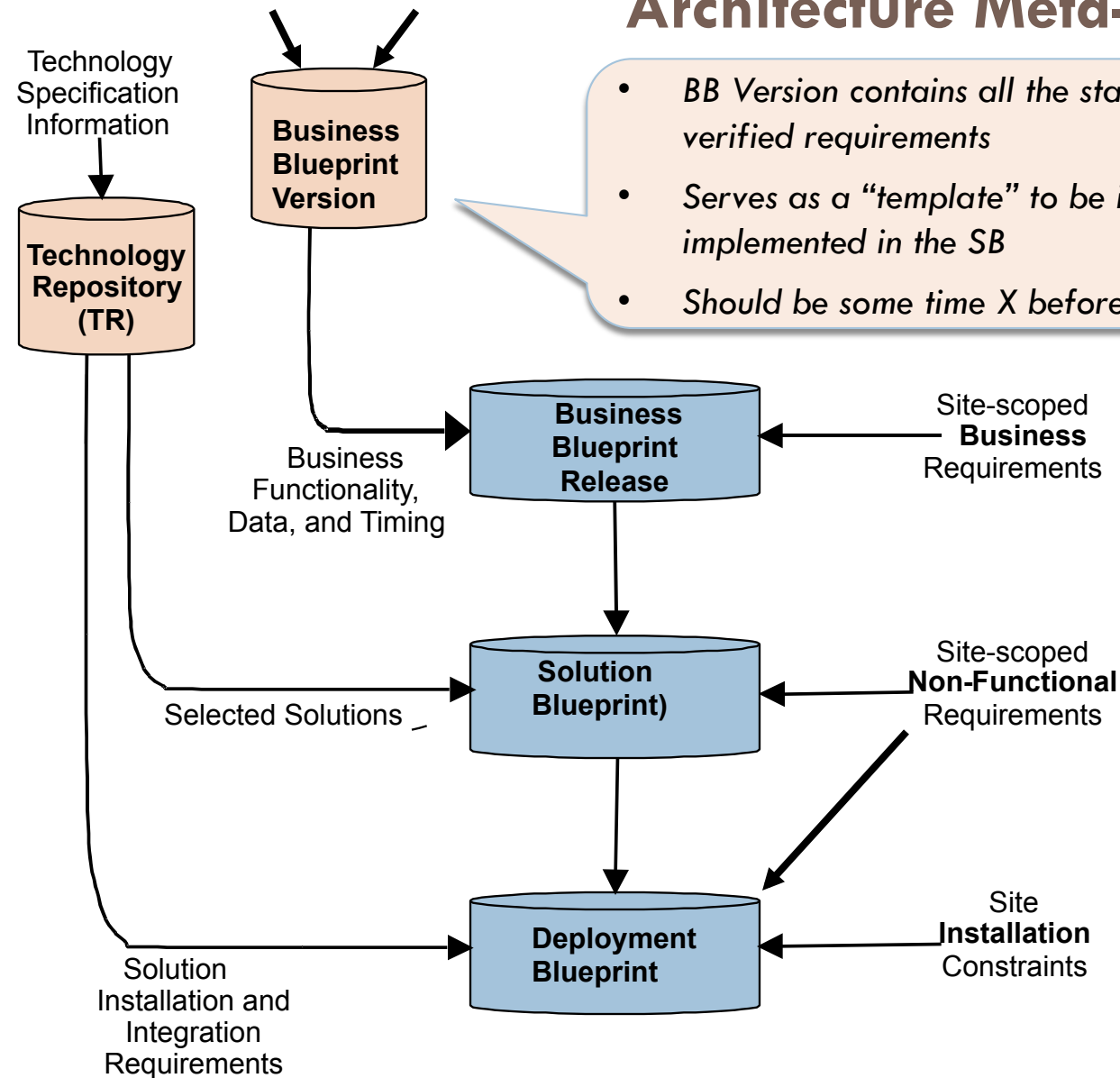
- Which Solutions will deliver satisfy the requirements contained in the BB?
  - ▣ Functionality (services)
  - ▣ Data/events (attributes)
  - ▣ NFR qualities
- Structure (Topology)
  - ▣ Component boundaries (Solution implements not more or less that the services & attributes)
  - ▣ Component interfaces (i/o)

# AWAREness 3D Architecture Meta-Model



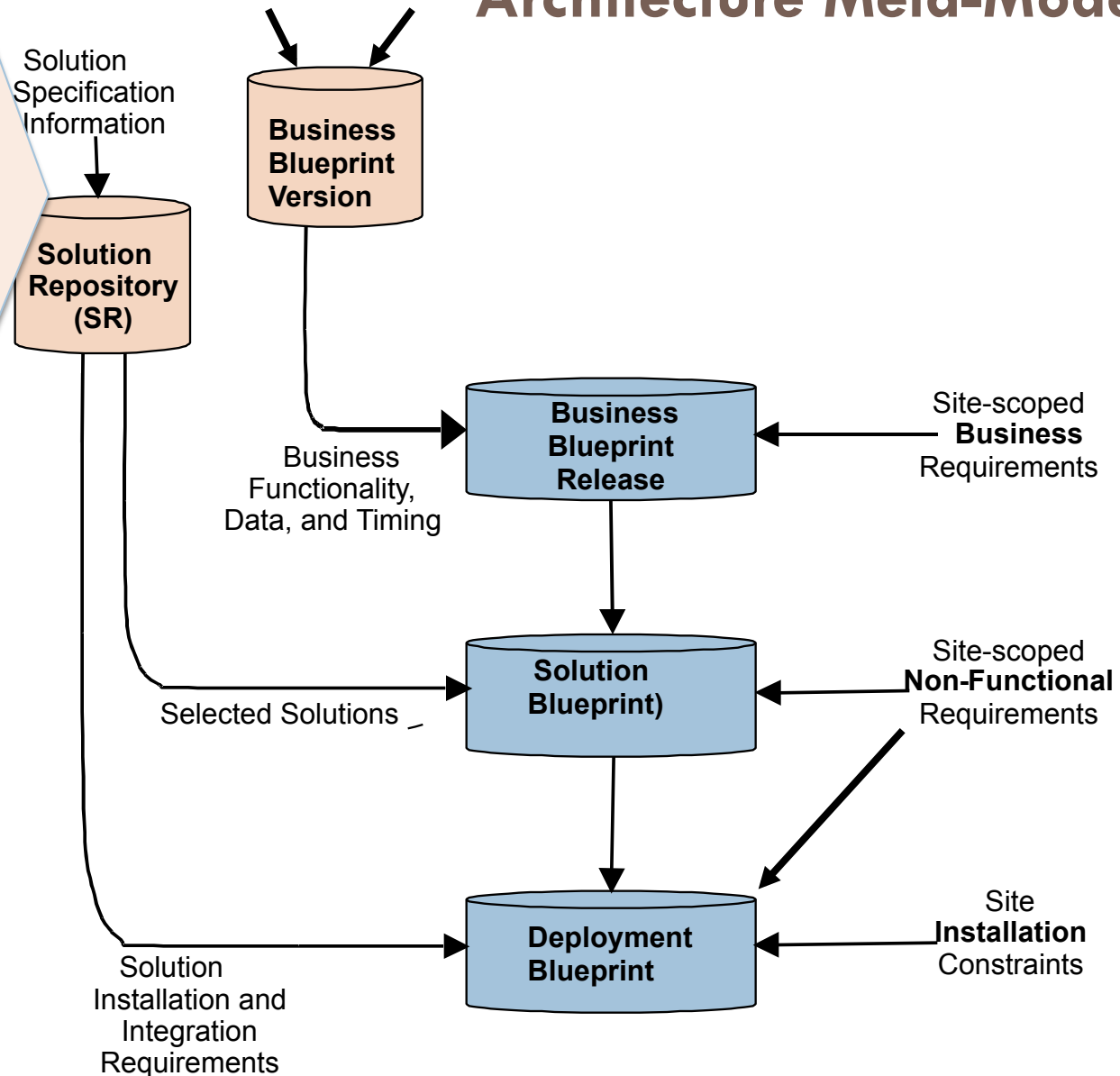


# AWAREness 3D Architecture Meta-Model

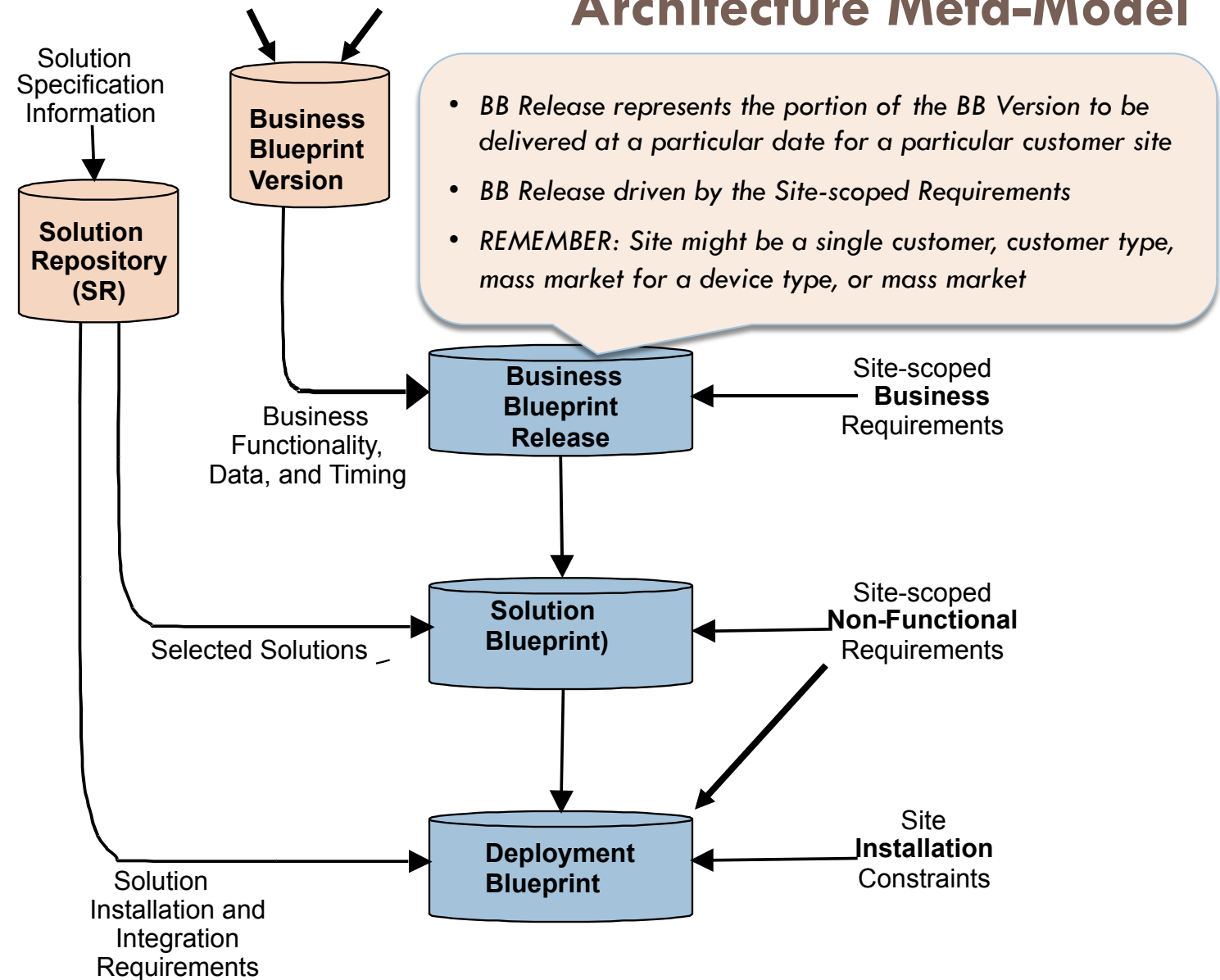


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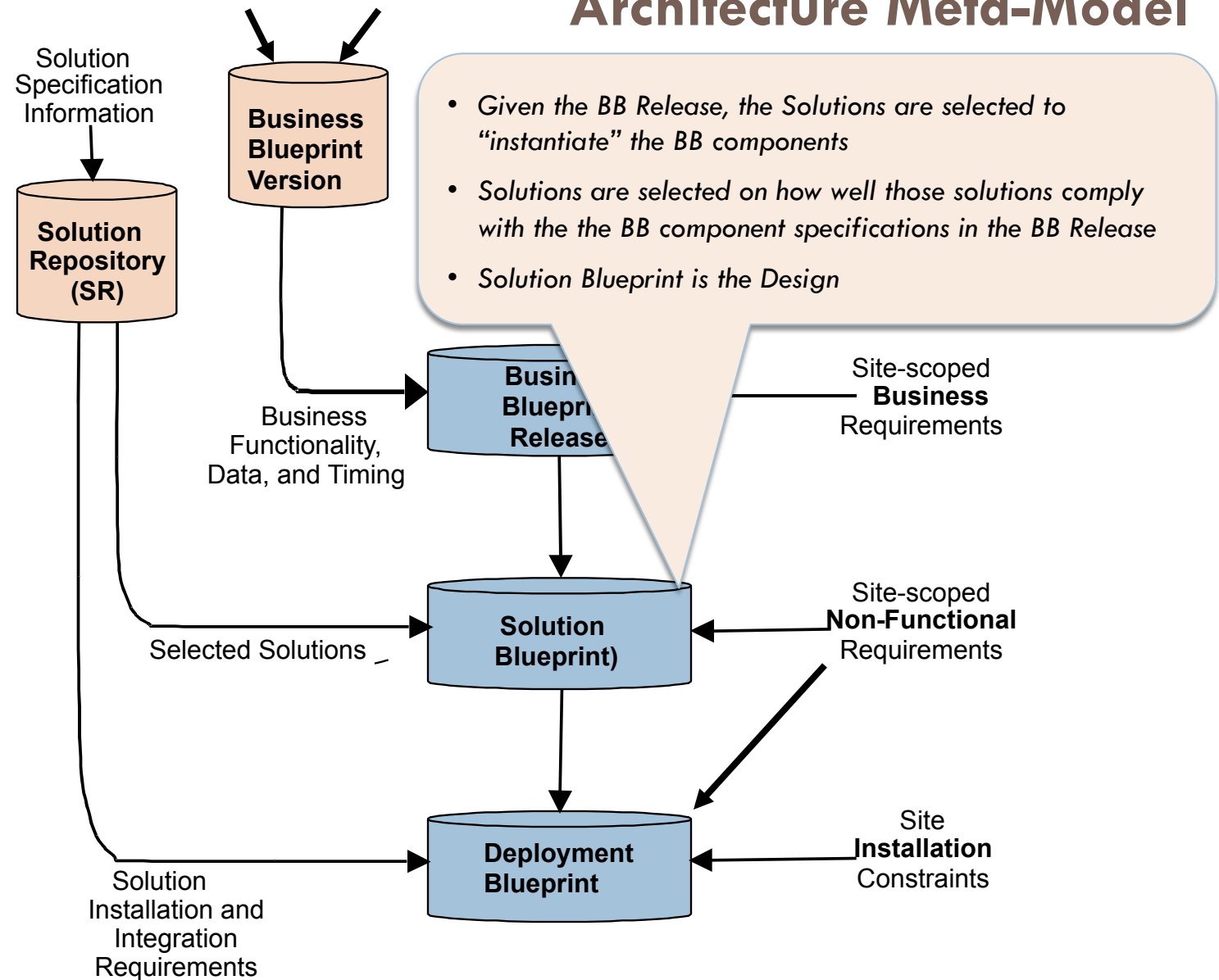
- Possible Solutions to be selected for the SB
- “Solutions” might be SW, HW or People
- “Solutions” might as different states – envisioned, under-development, implemented, deployed, etc.
- Solution source might be in-house, another project, third party contractor, open source, COTS, GOTS, etc.
- Solution Repository represents the landscape of the “what’s possible”
- Solution Repository always exists – Question is ... in someone’s head? Distributed thru-out the organization? Central DB accessible by all (i.e. does everyone know the entire “landscape of the possible?”)



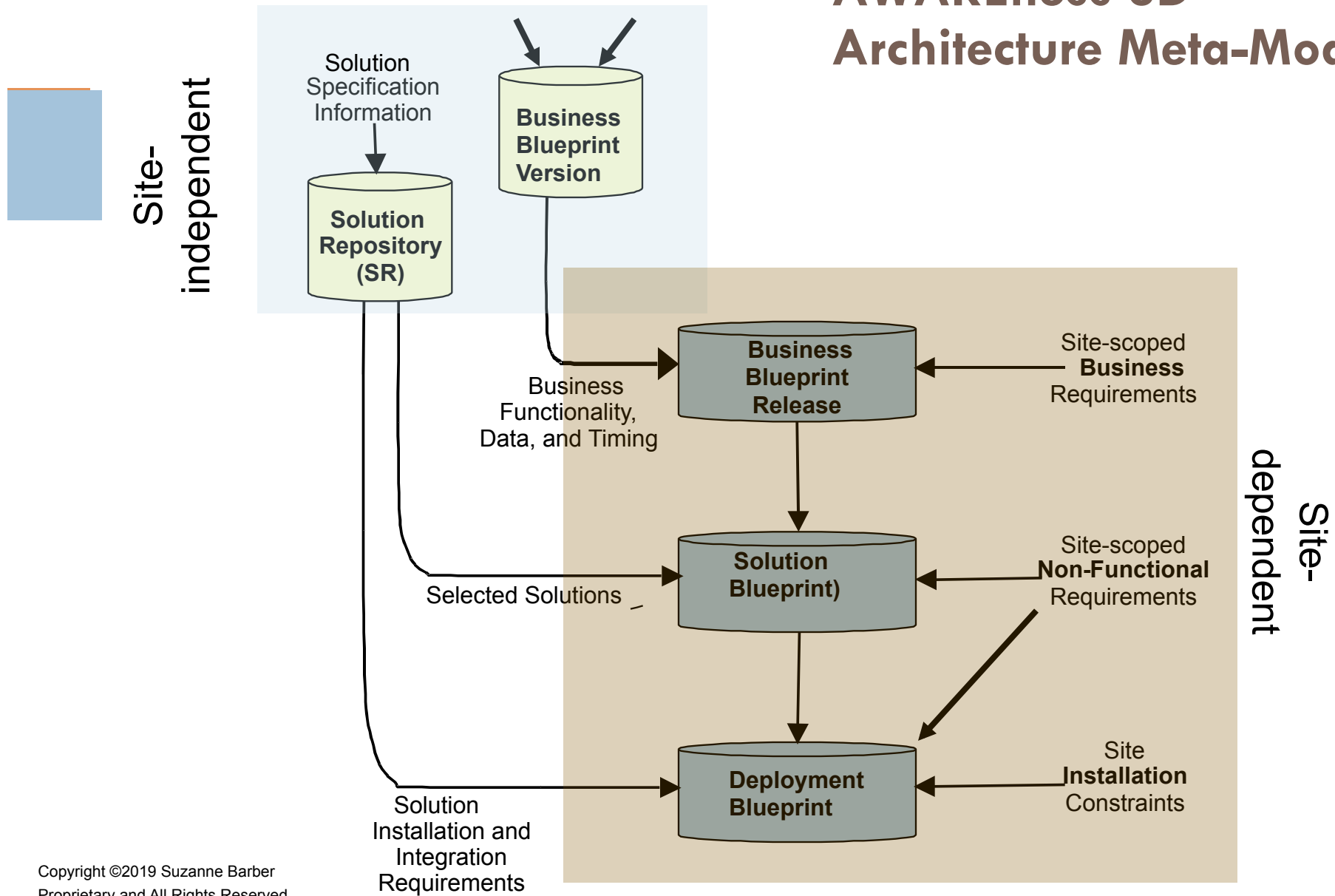
# AWAREness 3D Architecture Meta-Model



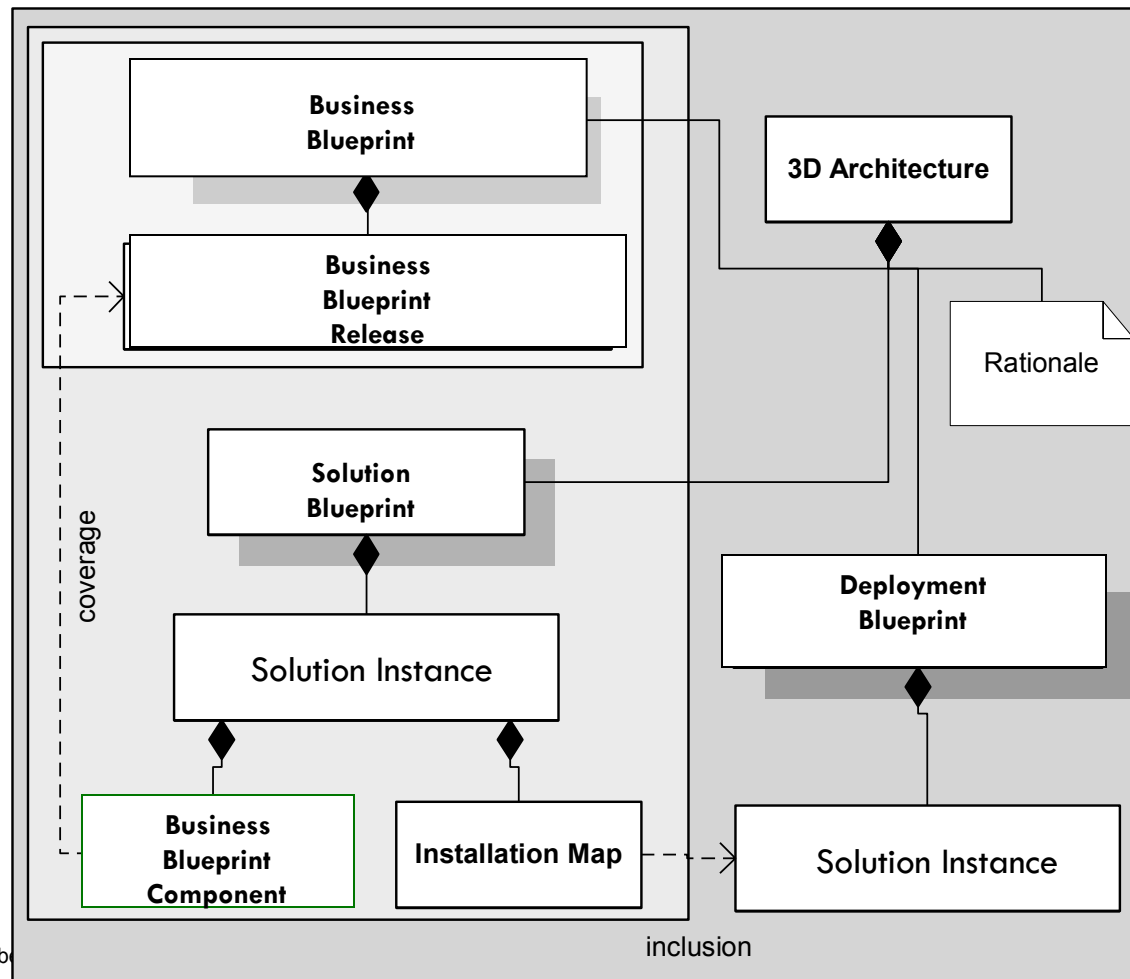
# AWAREness 3D Architecture Meta-Model



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# AWAREness 3D Architecture Meta-Model



# Cohesion calculations



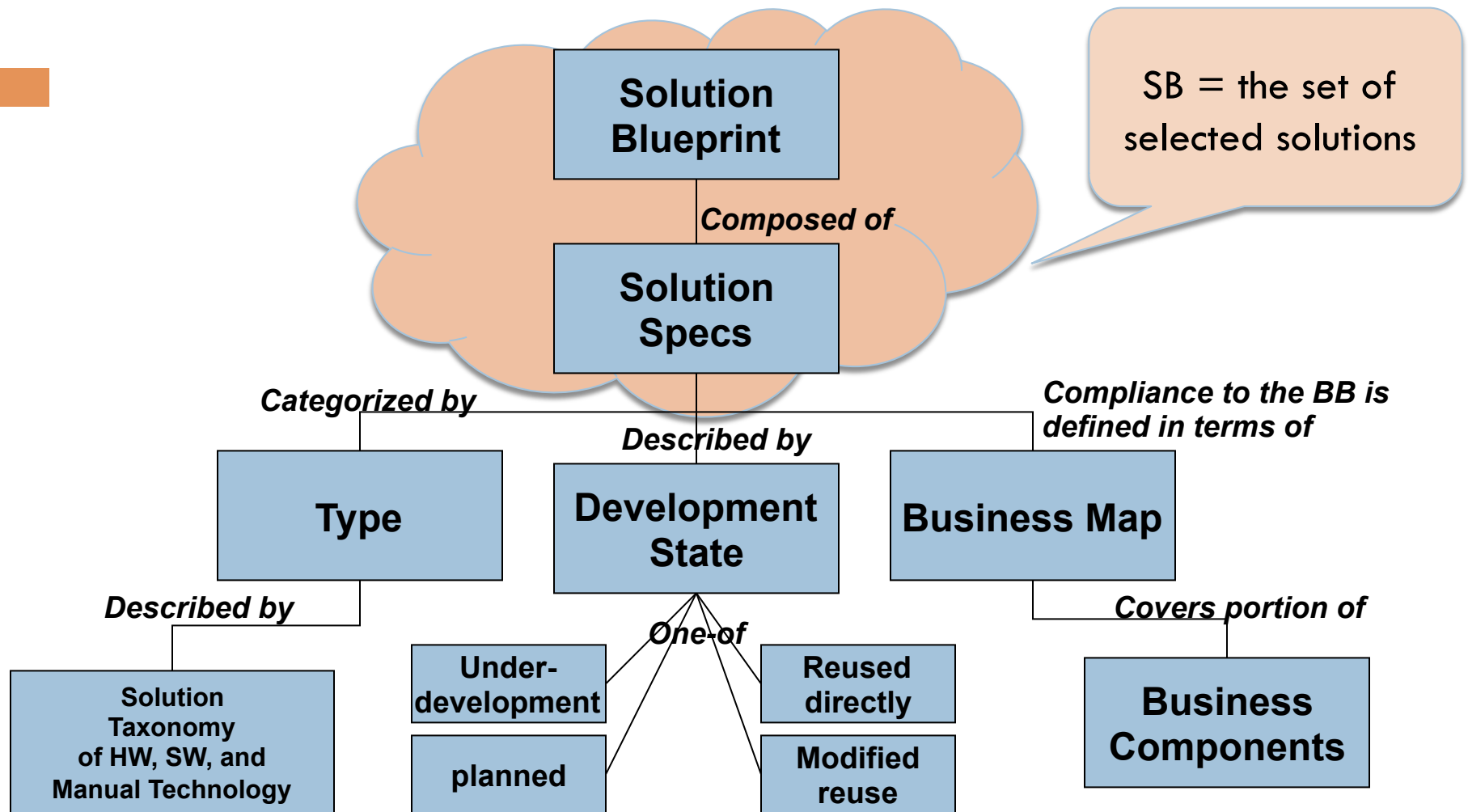
For each Component –

Sum of (ALL data inputs for ALL Functions in the component received from ANOTHER component+ ALL data outputs for ALL Functions in the component sent to ANOTHER component)

---

Sum of (ALL data inputs for ALL Functions in the component + ALL data outputs for ALL Functions in the component)

# What does the Solution Blueprint look like?



*Note: you might decide on a different classification of Development State or Type*



# Questions to ask



## □ Planning

- Customer scope -- What is the range of functionality and data (business requirements) required by the customer?

- Customer “Site” and product delivery “milestones” determine target scope

## □ Evaluation based on Compliance to Business Blueprint

- Delivery of Services: To what extent does available Solutions comply with the scoped business requirements?

- System Integration: Can selected Solutions be integrated to insure business I/O requirements are satisfied?

- Do configurations of Solutions in the SB satisfy Site BB topology (structure given by Business Components and Business Component dependencies)?

- Does SB topology satisfy non-functional requirements originally imposed on the BB?

- Have styles/patterns emerged in the SB?

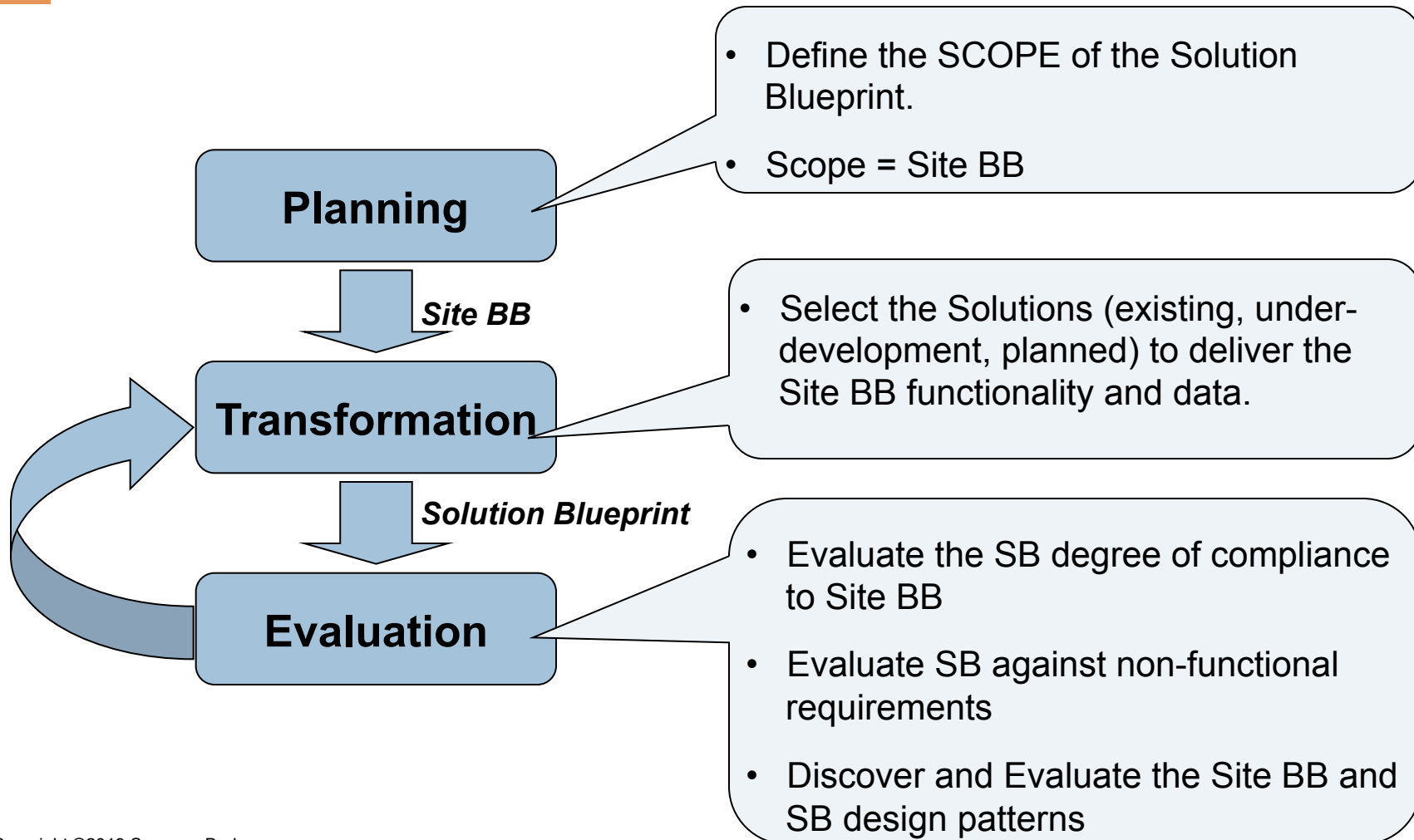
- Data flow

- Control flow

- Do configurations of Solutions satisfy intended style/pattern requirements?

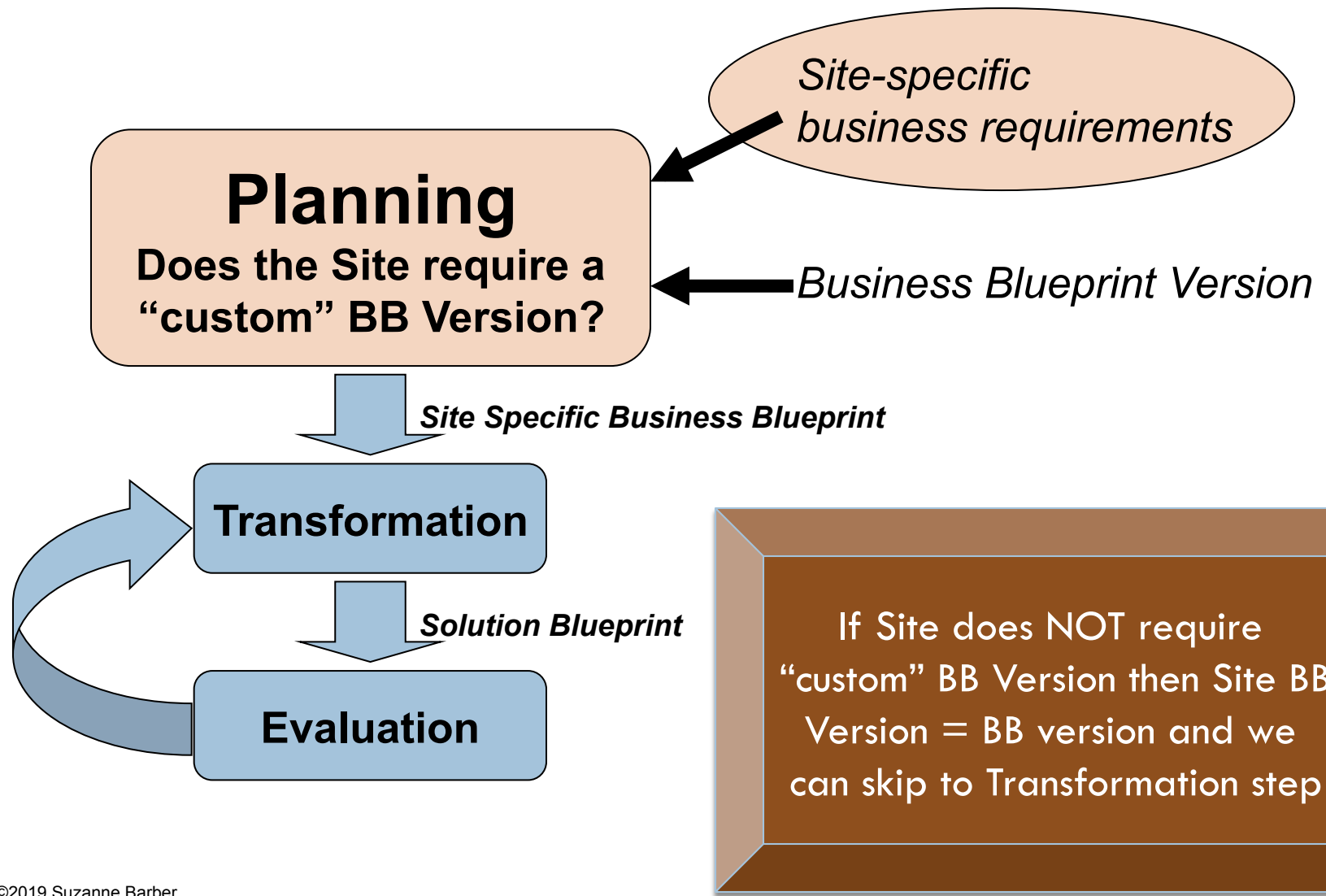
- Style/pattern requirements originally imposed on the BB

# Solution Blueprint Derivation Process



# PLANNING THE SOLUTION BLUEPRINT SCOPE

# PLANNING specifies the SB target scope

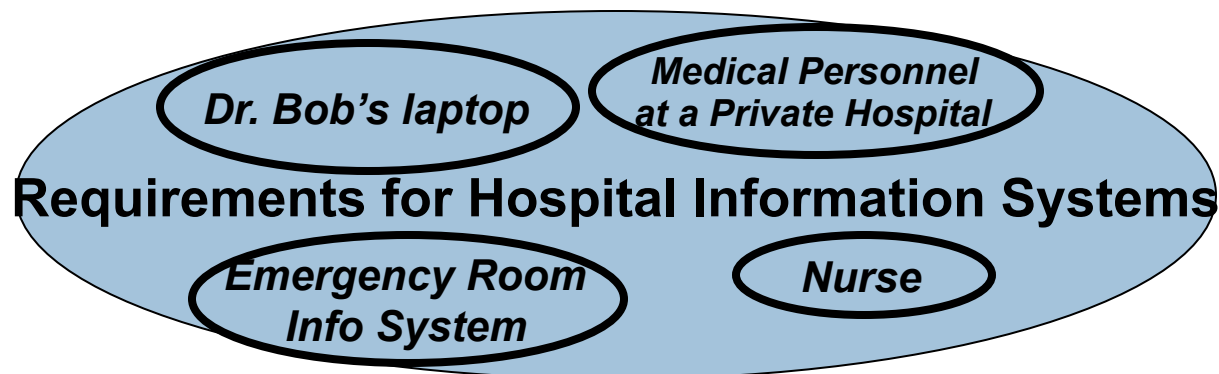


# Site sets Solution Blueprint SCOPE

## Remember: What is a site?

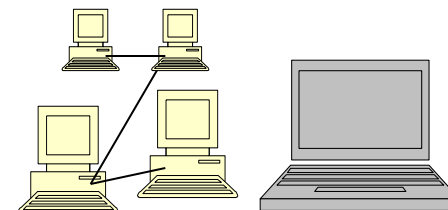
- Site is...

- Where and with Whom the Software will reside.
- The more specific the site, the more customized the software



# Example Deployment Sites

- A specific user, collection or type of user (Who not Where)
- A specific, collection, or type of Organization/ Business (Who not Where)
- A specific, collection, or type of computer(s) (Where not Who)
- Not specified
  - ▣ Not possible



# Scope is based on the Site

- Single customer
  - ▣ Dr. Barber laptop
- Single customer organization
  - ▣ The University of Texas System registration system
- Single customer organization type
  - ▣ Public Universities registration systems
- Geographical Site
  - ▣ The University of Texas at Austin registration system
    - Electrical and Computer Engineering Admission Office
  - ▣ The University of Texas at Arlington registration system
  - ▣ The University of Texas at El Paso registration system

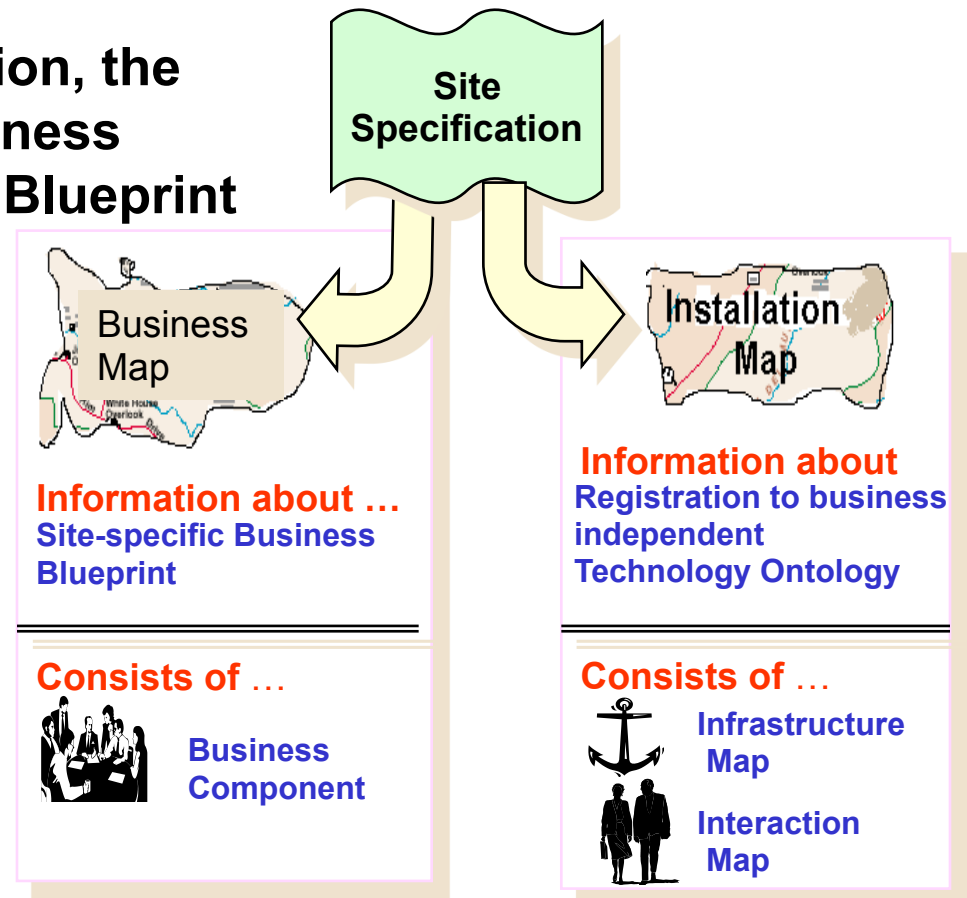
# Specification of a Site

**Site Business Map = Site BB version, the site specific scope of the business requirements in the Business Blueprint**

**Business Requirements = functional, data and timing requirements**

**Site Installation Map = Details of installation constraints at the site (technology capacity or infrastructure at the site)**

**Installation Constraints = available infrastructure (HW, SW and people) to support delivered technology.**





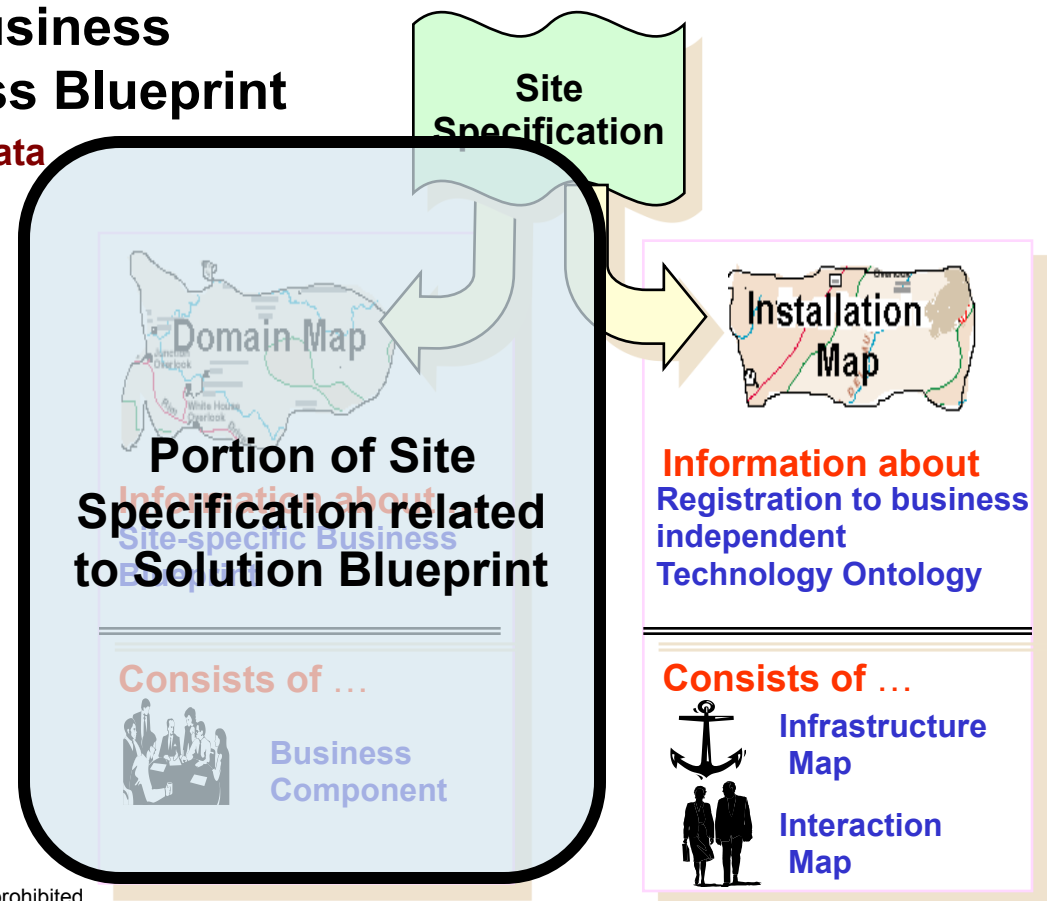
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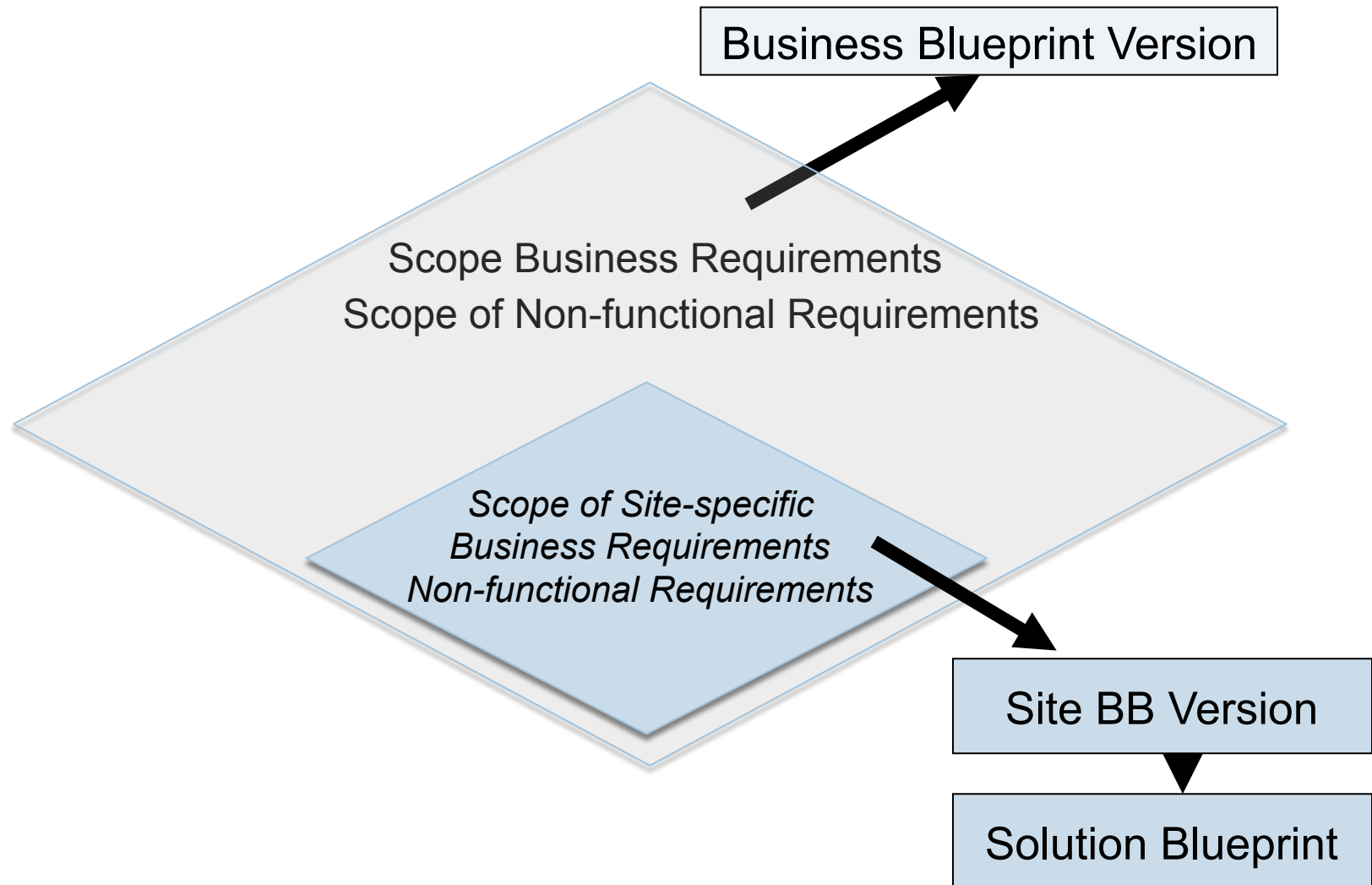
# What is a Site-scoped BB (Site Business Blueprint)?



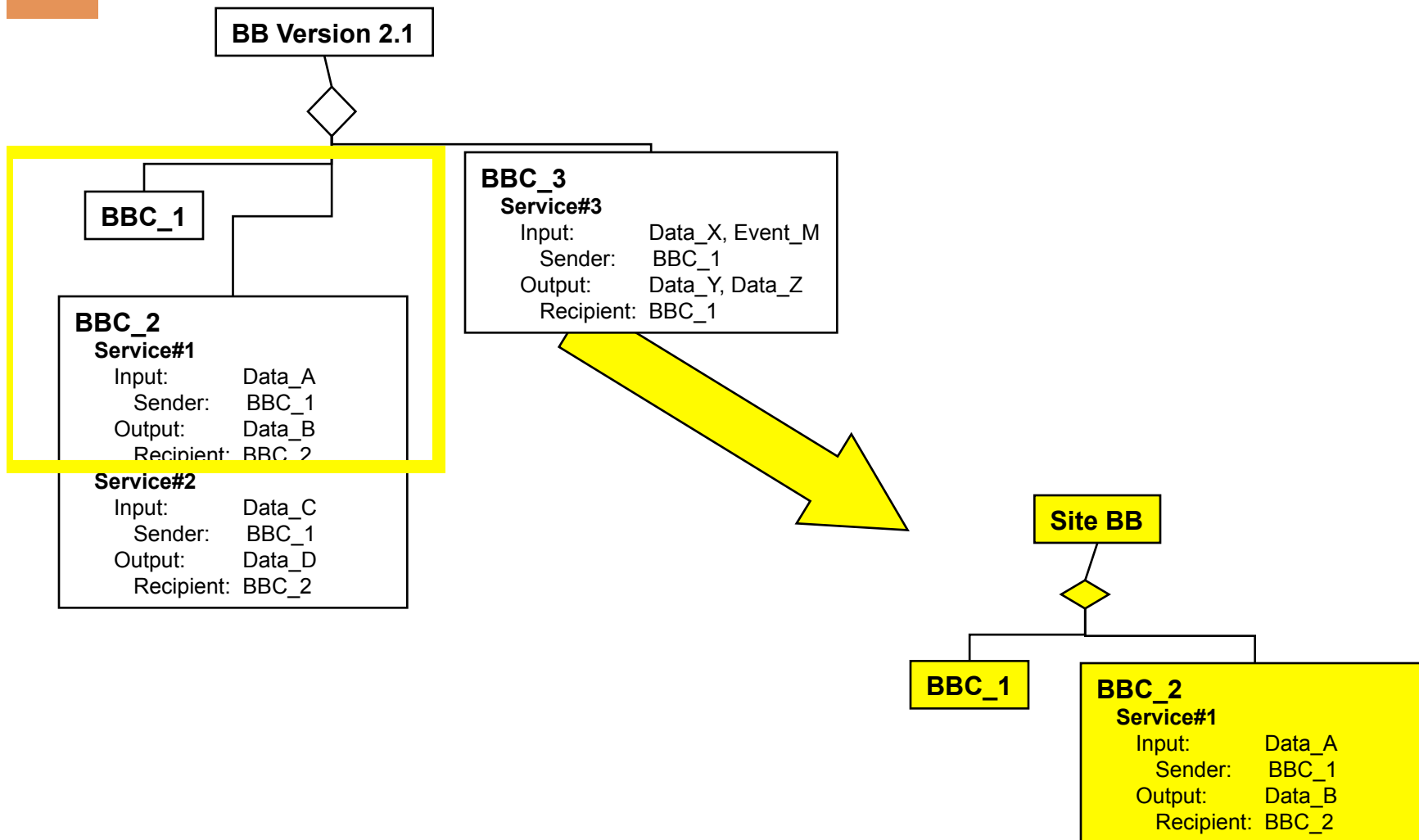
- Every new Site BB is:
  - ▣ Defined in the context of a BB version
  - ▣ Associated with the site-scope business requirements

# For a custom system for a respective Site ....

## Remembering the importance of Requirements...



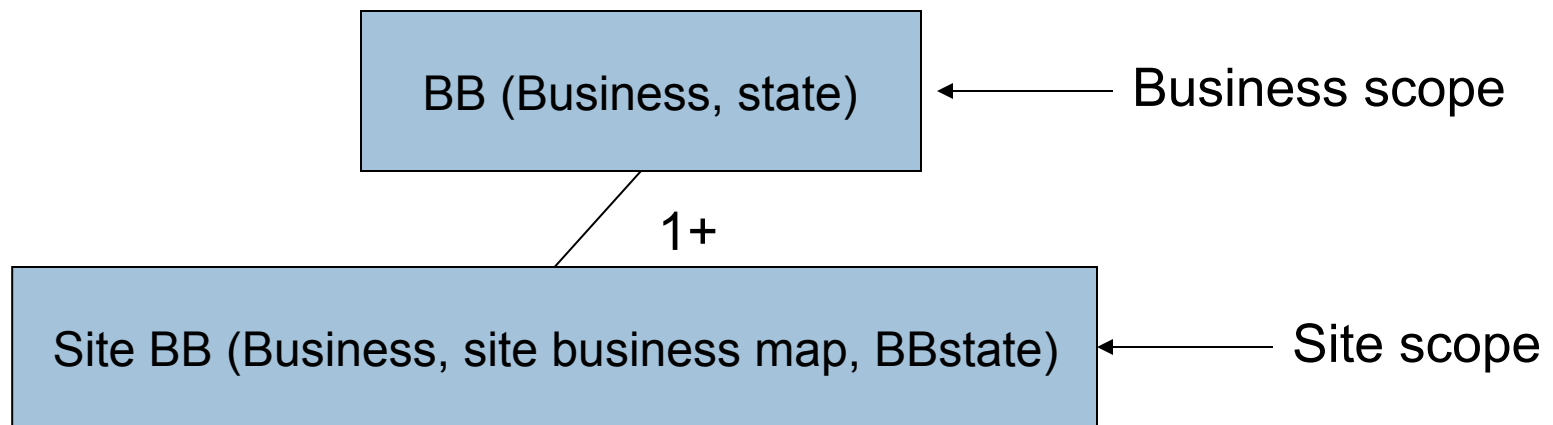
# Site-scoped Business Blueprint



# Selecting a Site-Scoped BB (Site BB)

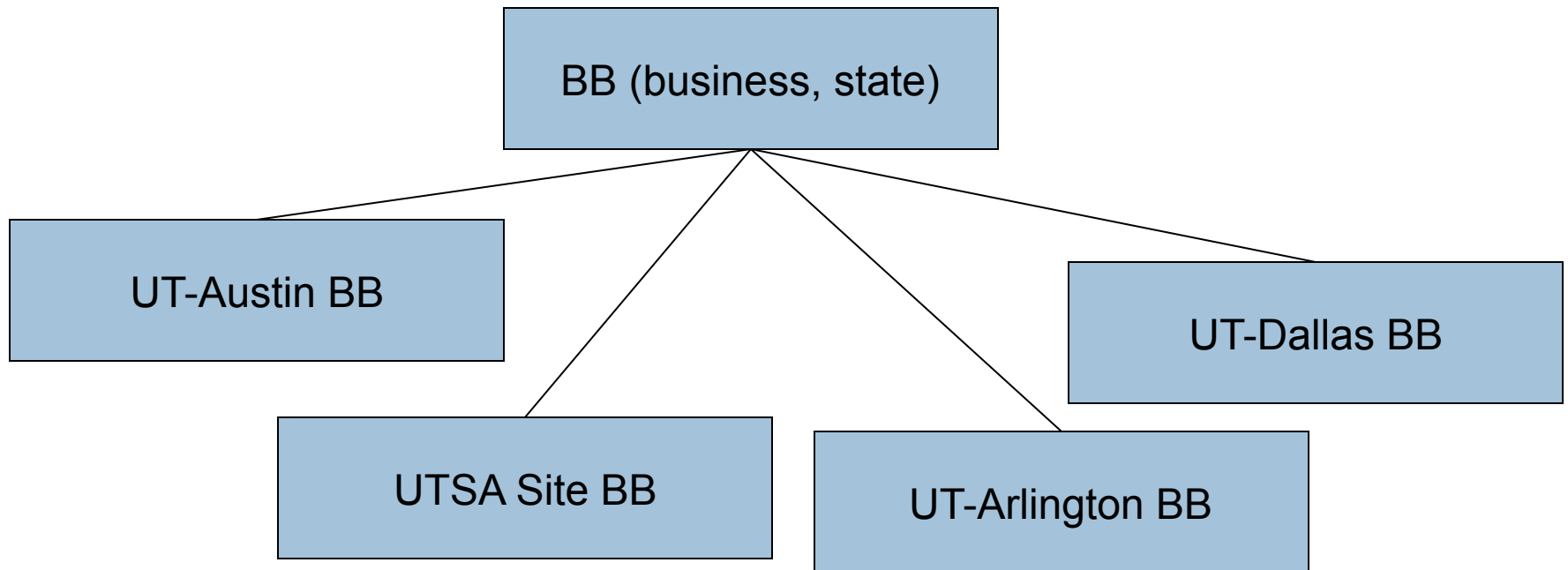
- Step 1: Know your site (the site business requirements)
- Step 2: Specify a BB version ... most often the most recent one
- Step 3: Derive a Site BB from selected BB version only if your system is customized for this Site
  - ▣ Site BB is custom for the site's business requirement needs
    - Are you re-doing the requirements engineering effort? No, You should be able to easily extract this site-specific set (in theory).

# One BB can lead to a family of Site BBs

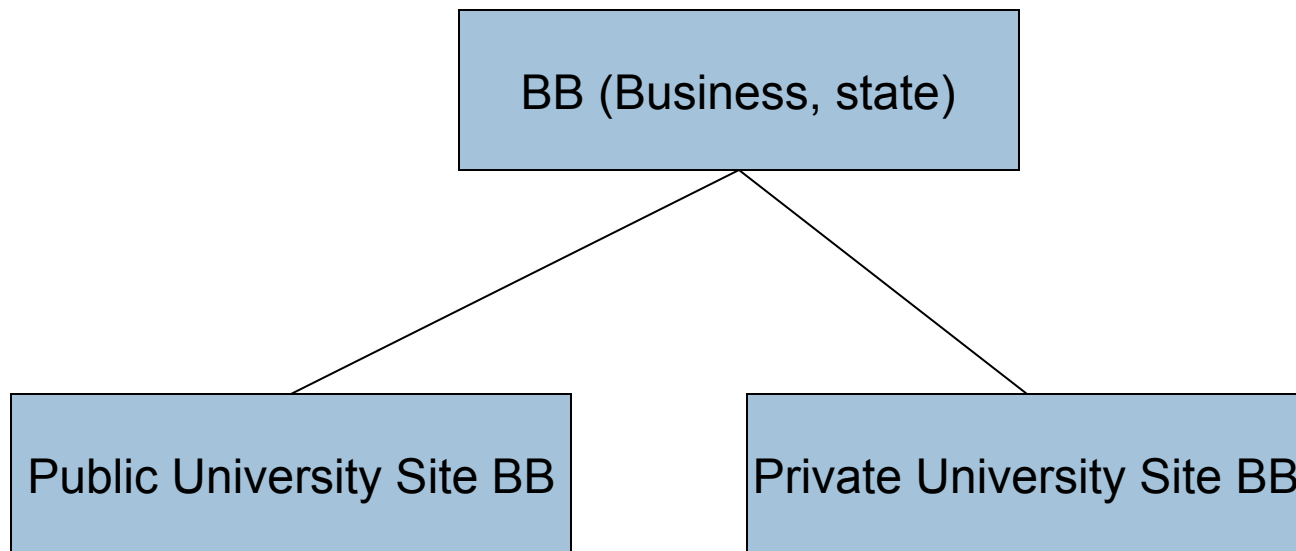


- Creation of Site BB does not change business or BB state
- Site BB is simply a subgraph of the BB

# Family of Site BBs

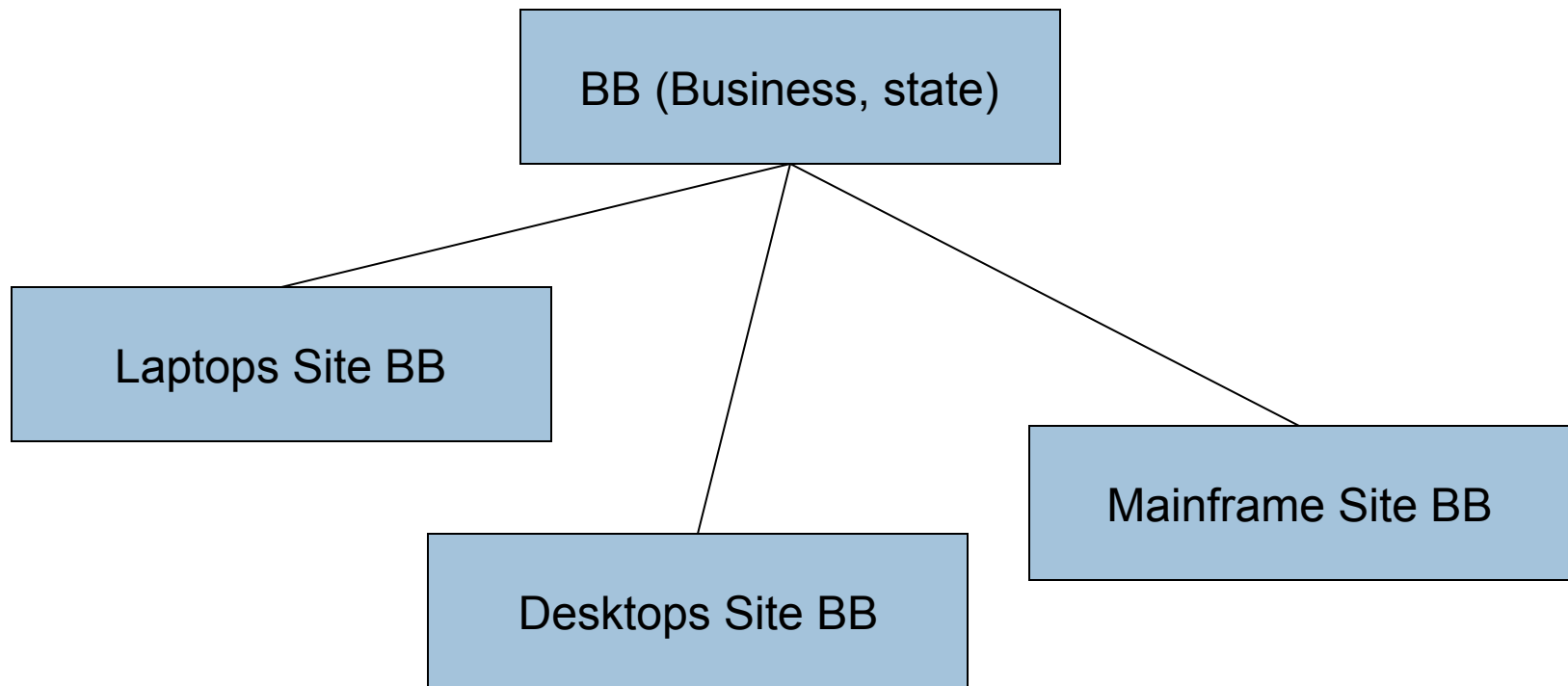


# Family of Site BBs

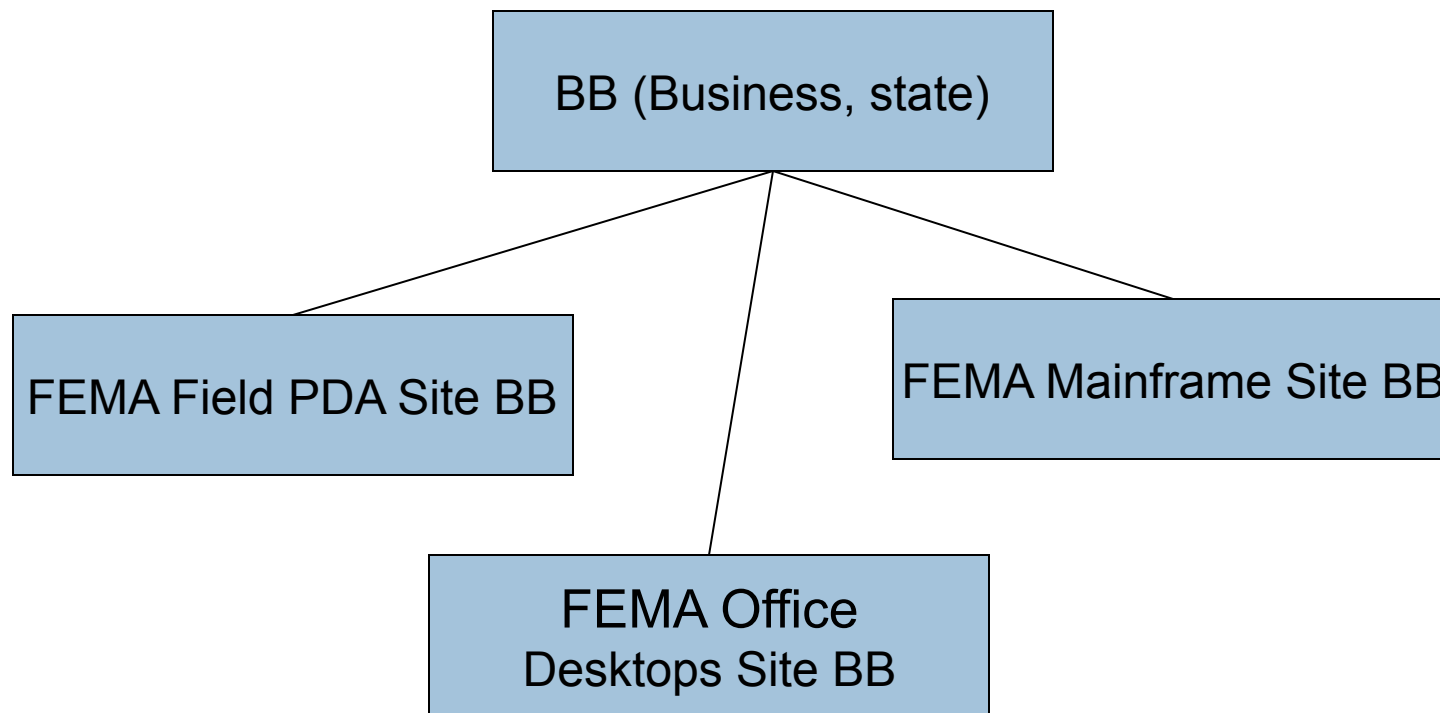




# Family of Site BBs



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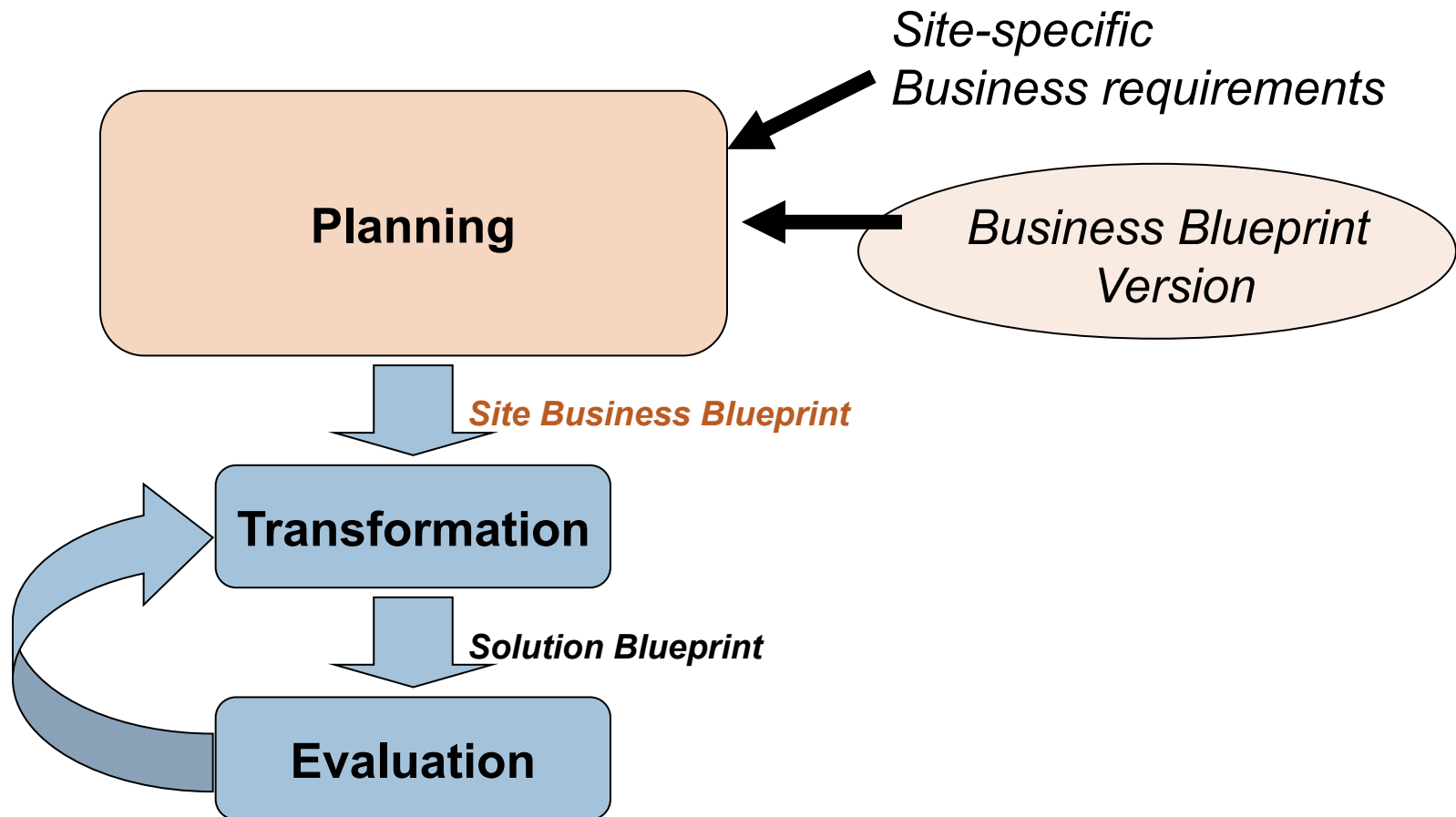


# Definitions

- What is a **Solution**?
  - ▣ Business Solution – implements/delivers business functionality specified in the Business Blueprint
  - ▣ Infrastructure Solution – required to deploy a Solution (e.g. OS, DB) but does not deliver business functionality in the Business Blueprint
- **Business Blueprint** – modular blueprint composed of business components responsible for respective business functionality and data requirements where the allocation of business functionality and data is influenced by the quality goals for the architecture.
- **Site Business Blueprint** – subset of Business Blueprint specific to a given Site. If there are no differences between Site requirements, there is no Site Business Blueprint and no customization to the Business Blueprint or Solution Blueprint.
- **Business Blueprint Release** specified WHO the Solution Blueprint is to be delivered to, WHEN the SB must be delivered and WHAT must be delivered (subset of Site BB if Sites are custom or subset of BB if all sites considered the same)
- **Business Blueprint Release** built from a ...
  - ▣ Site BB if Sites are custom (i.e. their requirements differ)
  - ▣ BB if all sites considered the same

# DEFINING BB CHANGE

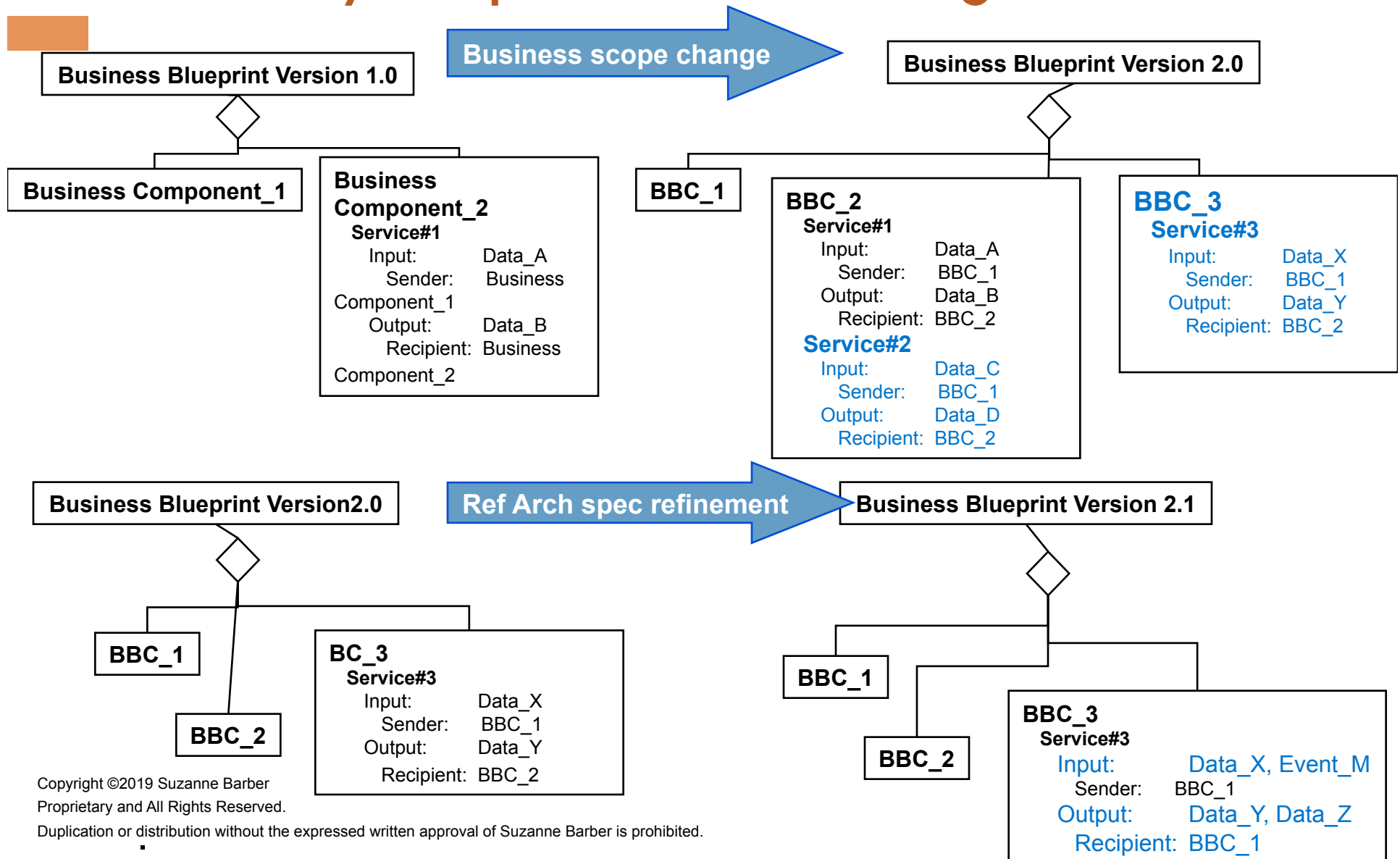
# Planning is the selection of a Site BB



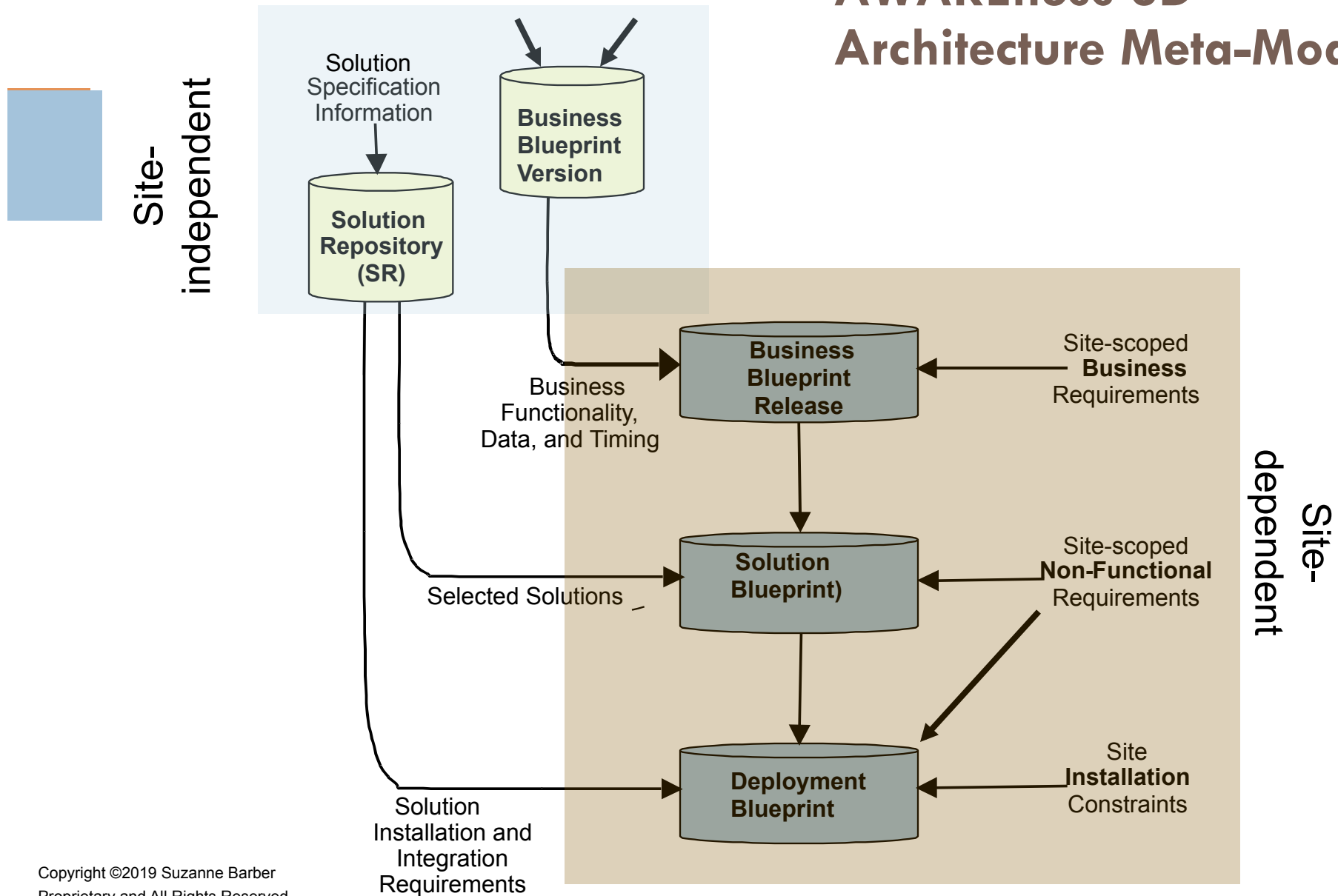
# What is a Business Blueprint version?

- Business Blueprint version represents
  - ▣ The state of Business Blueprint for a given business at a given time.
  - ▣ All the known (stable, verified, accepted) business requirements at a given time, t
- Evolution of a Business Blueprint (or changes to the Business Blueprint state) is based on changes to the Business Blueprint functional, data and dependency specifications
  - ▣ Changes to functionality (Business scope)
    - Suggestion: Business scope changes require a level 1 version number change
  - ▣ Refinements include changes to requirements or architectural decisions:
    - Changes functional and data allocations (topology/structure)
    - Changes to functional I/O
    - Changes to dependencies (topology/structure) among functionality and Business Components
    - Suggestion: All refinements require a level 2 version number change

# Business Blueprint Version marks change driven by requirements changes

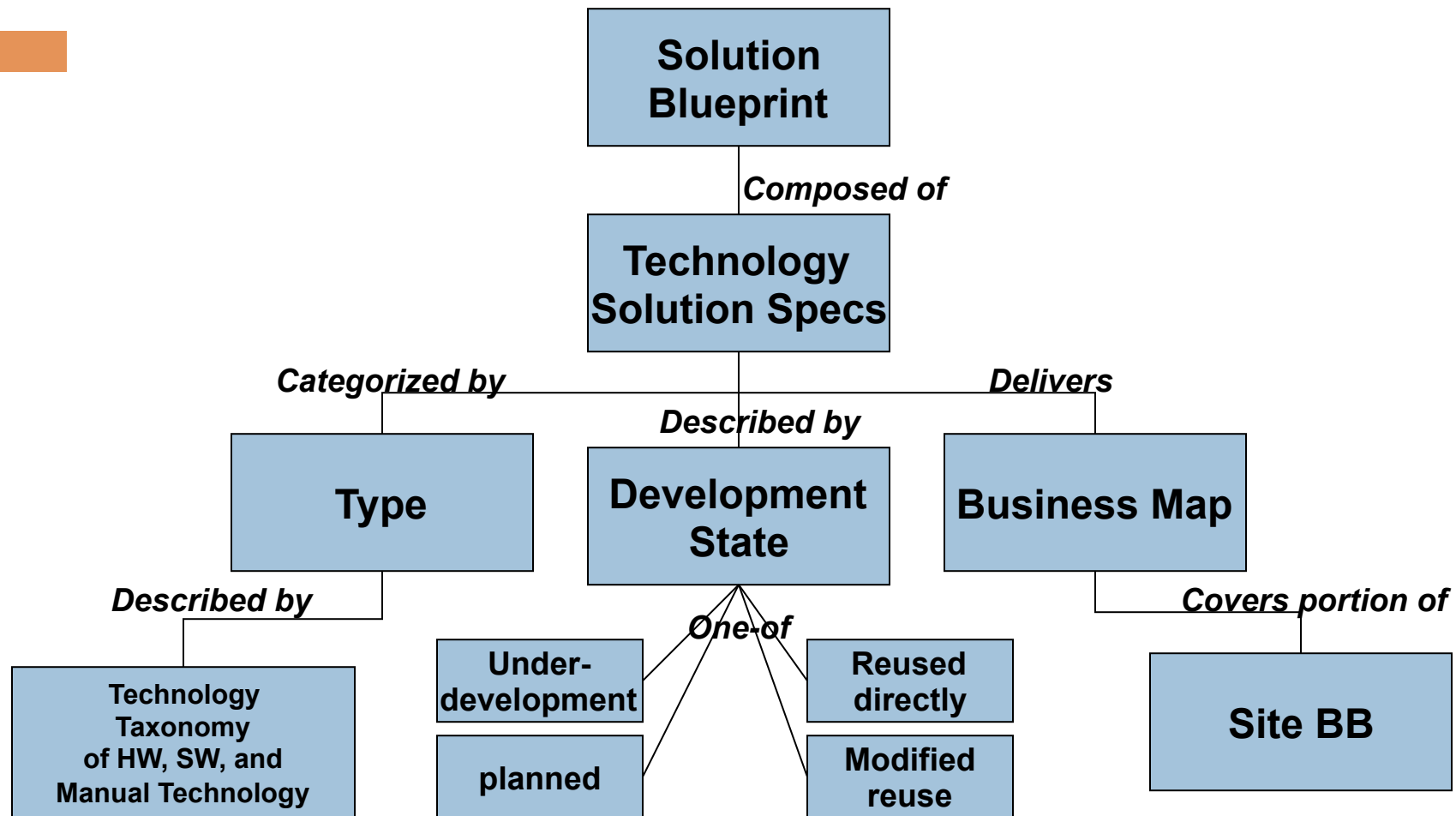


# AWAREness 3D Architecture Meta-Model





# What does the Solution Blueprint look like?

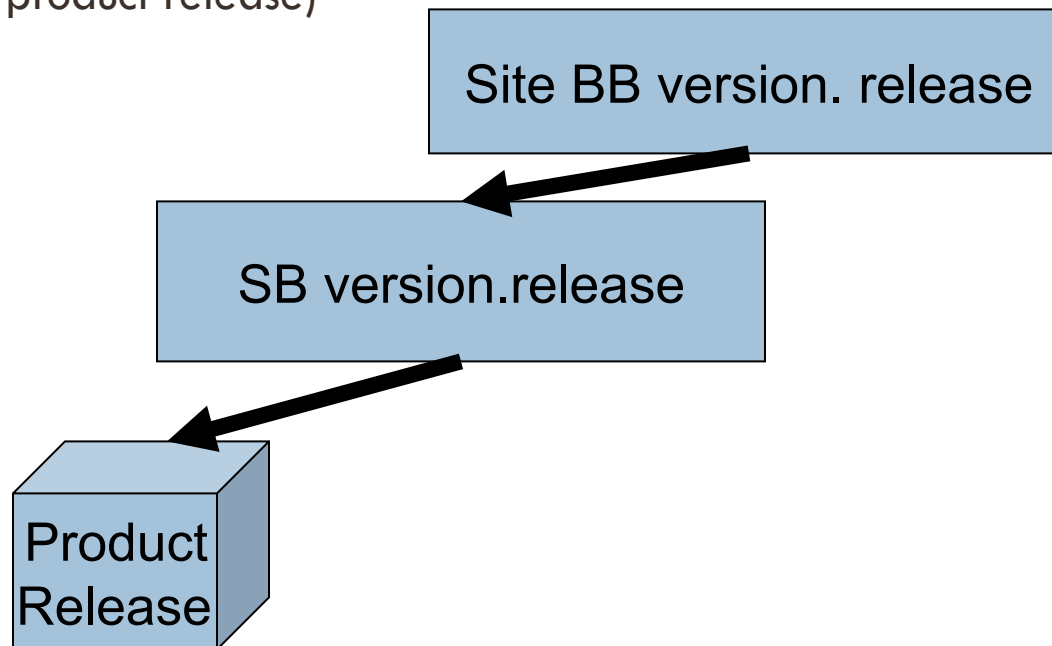


# Architecture versions are defined by “State”

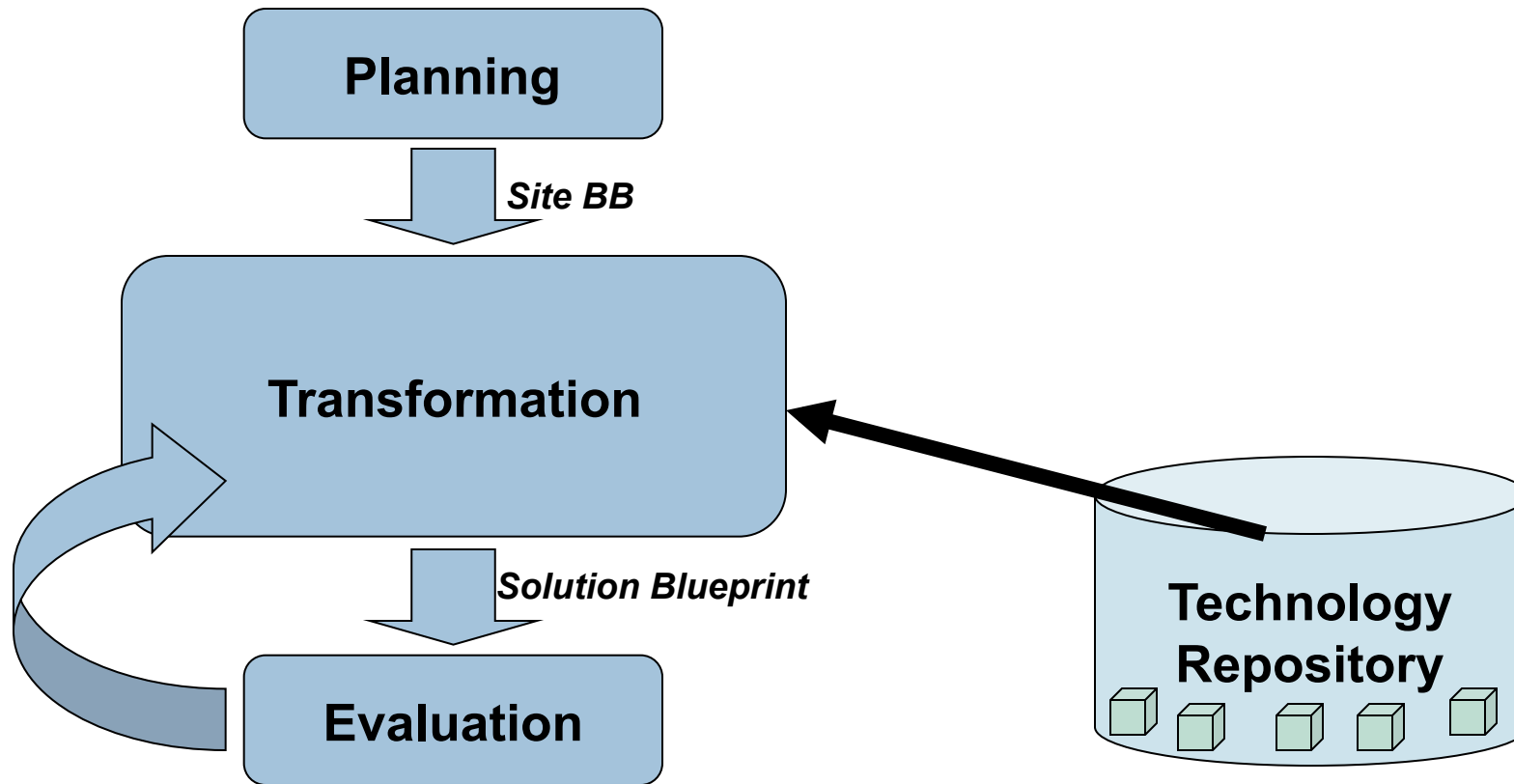
- $\Delta$ BB state =  $\Delta$ content or  $\Delta$ topology
- $\Delta$ Site BB state =  $\Delta$ site business map
- $\Delta$ SB state =  $\Delta$  selected technologies to deliver Site BB business requirements or  $\Delta$  business map of selected technologies
- $\Delta$ DB state =  $\Delta$ installation map of the SB selected technologies

# Site BB and SB associated with a Product Release

- A product release is delivered at a specific milestone to a specific site
- For every product release, there is an associated with a...
  - ▣ Site BB version (the Site BB state) and milestone release (Site BB subset relevant to the product release)
  - ▣ SB version (the SB state) and milestone release (SB subset relevant to the product release)

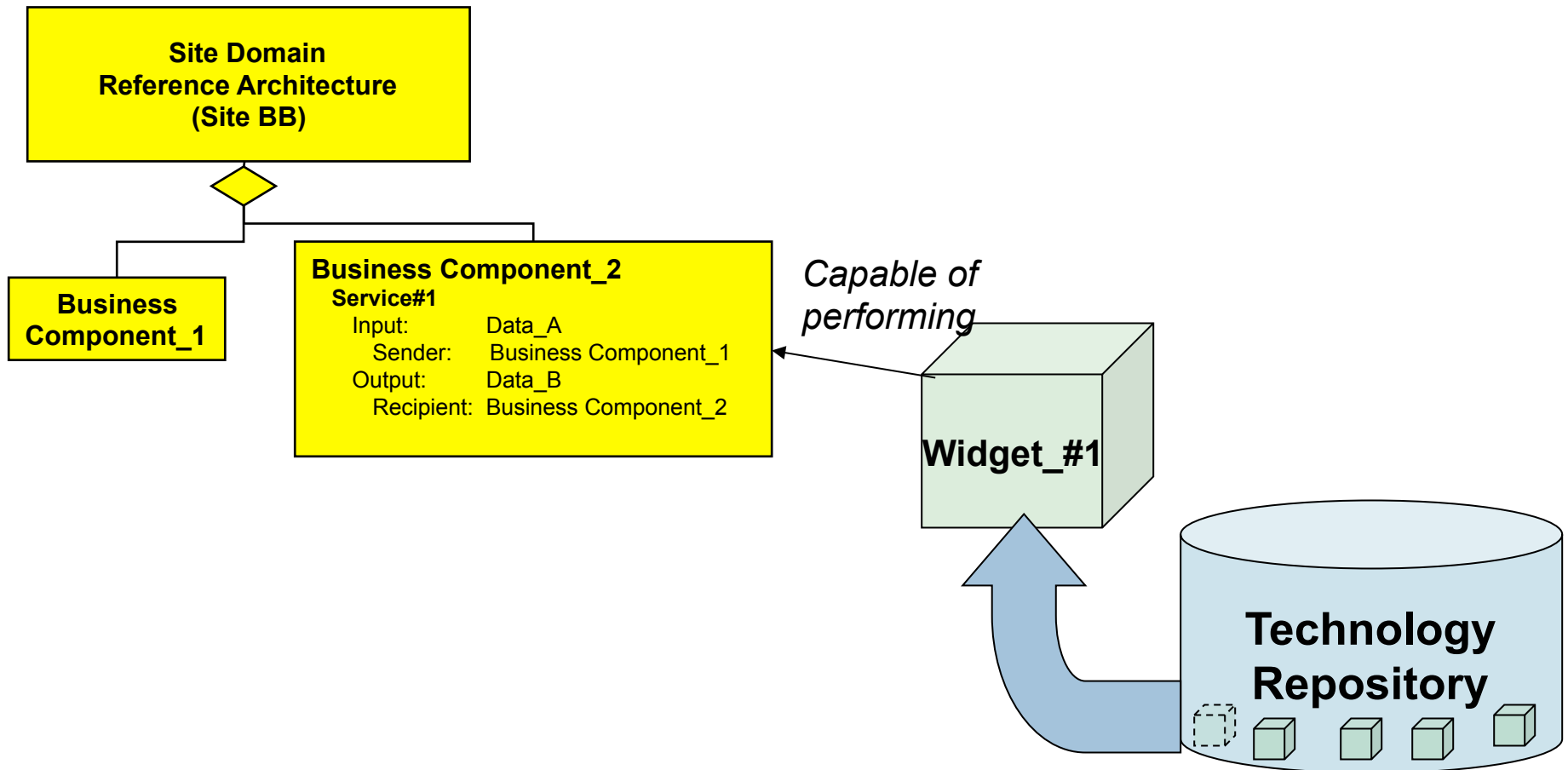


SB Transformation process selects the technologies (existing, under-development, planned) to deliver the Site BB functionality and data

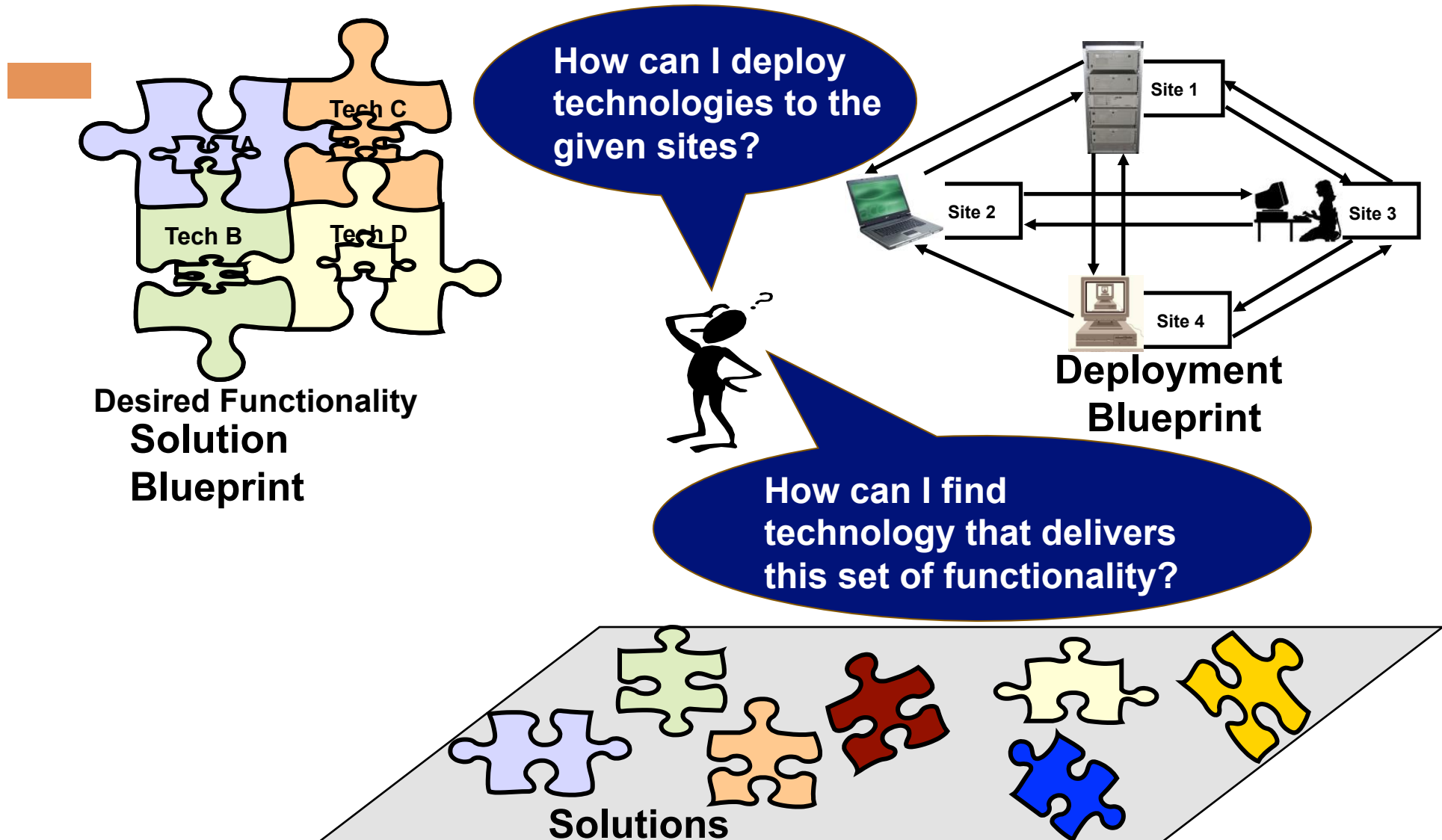


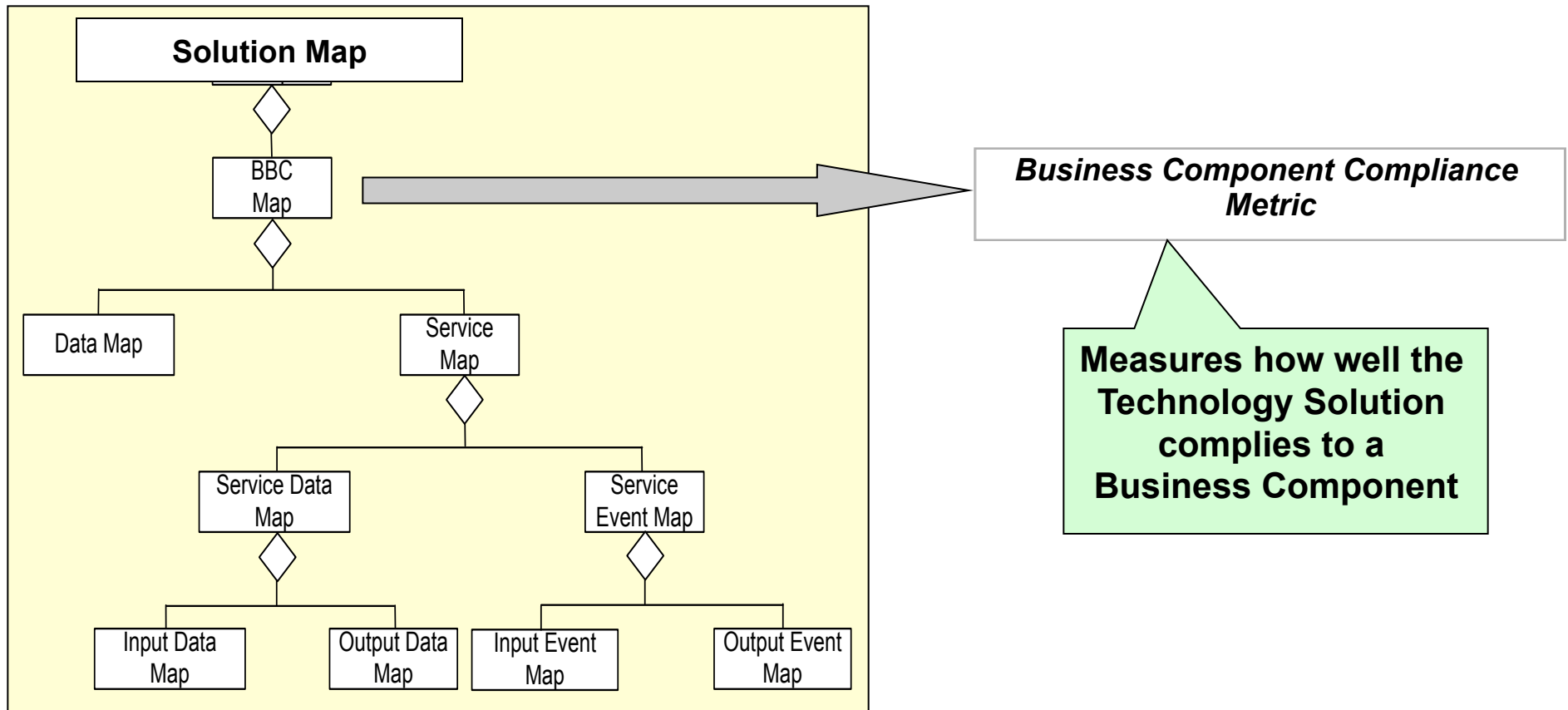
## SB Transformation Question:

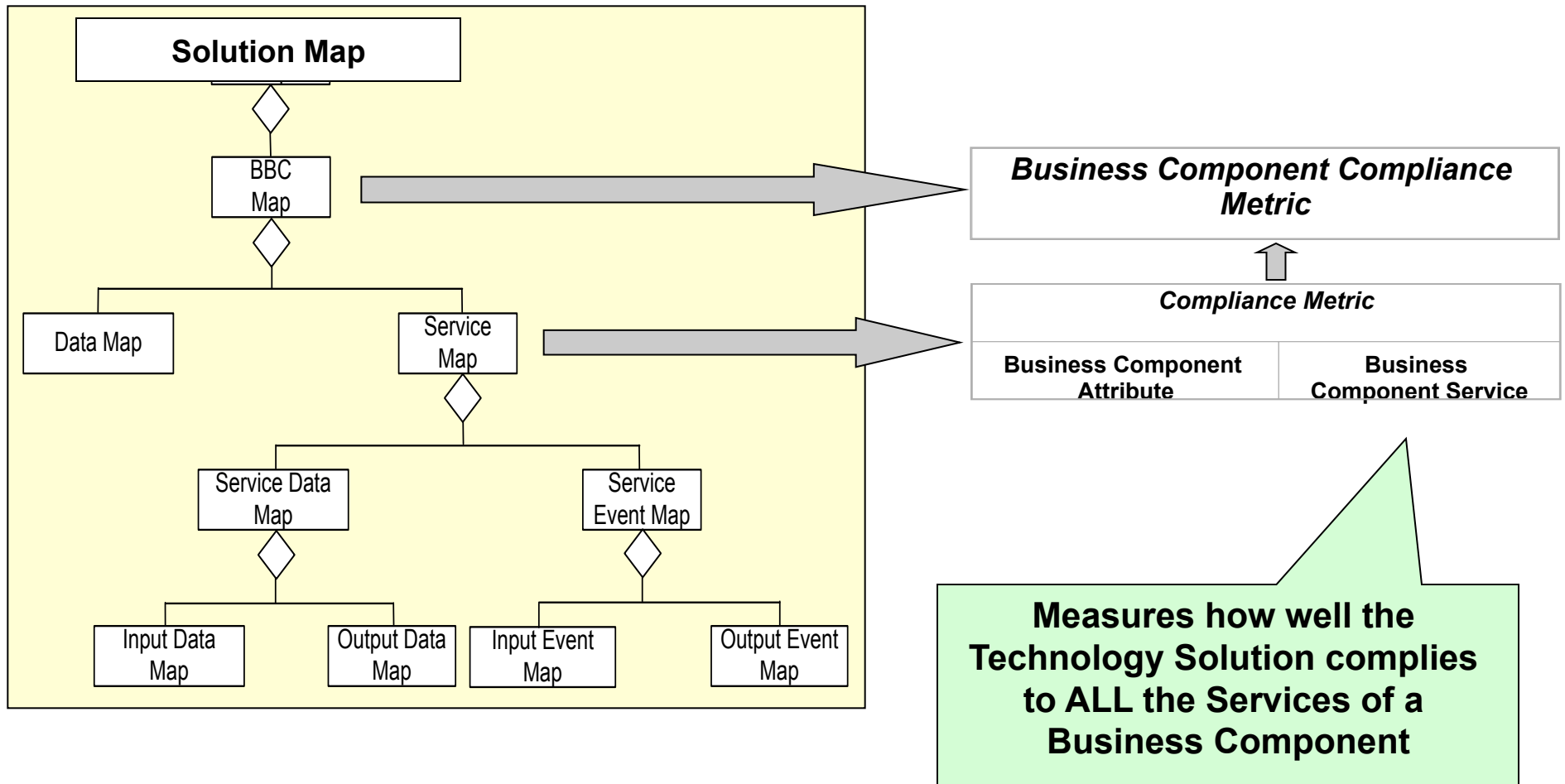
Which technologies can perform which Site BB services? Or collection of services (e.g. all the services in a given Site BB Business Component)



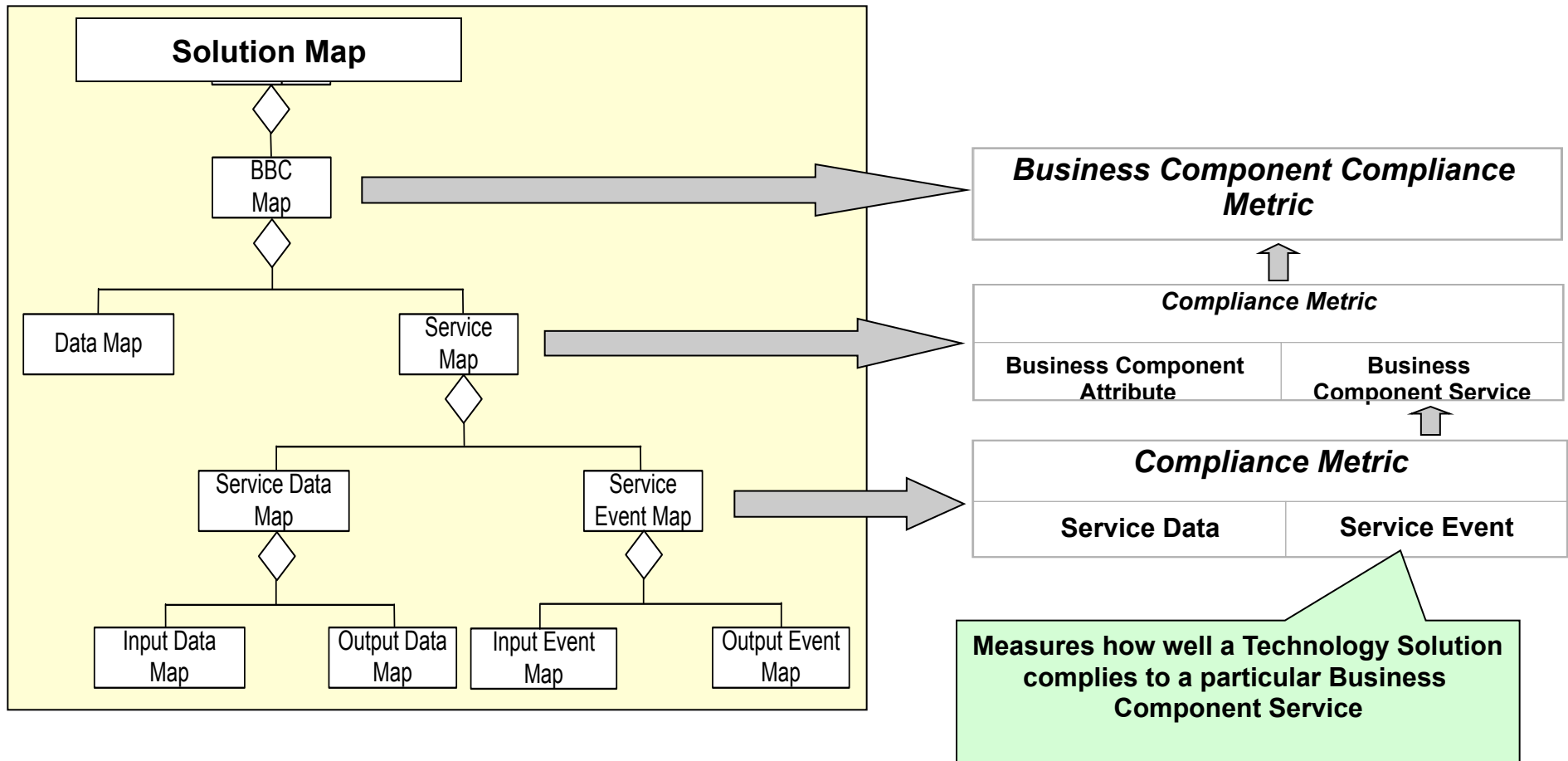
# Difference between Solution & Deployment Blueprints

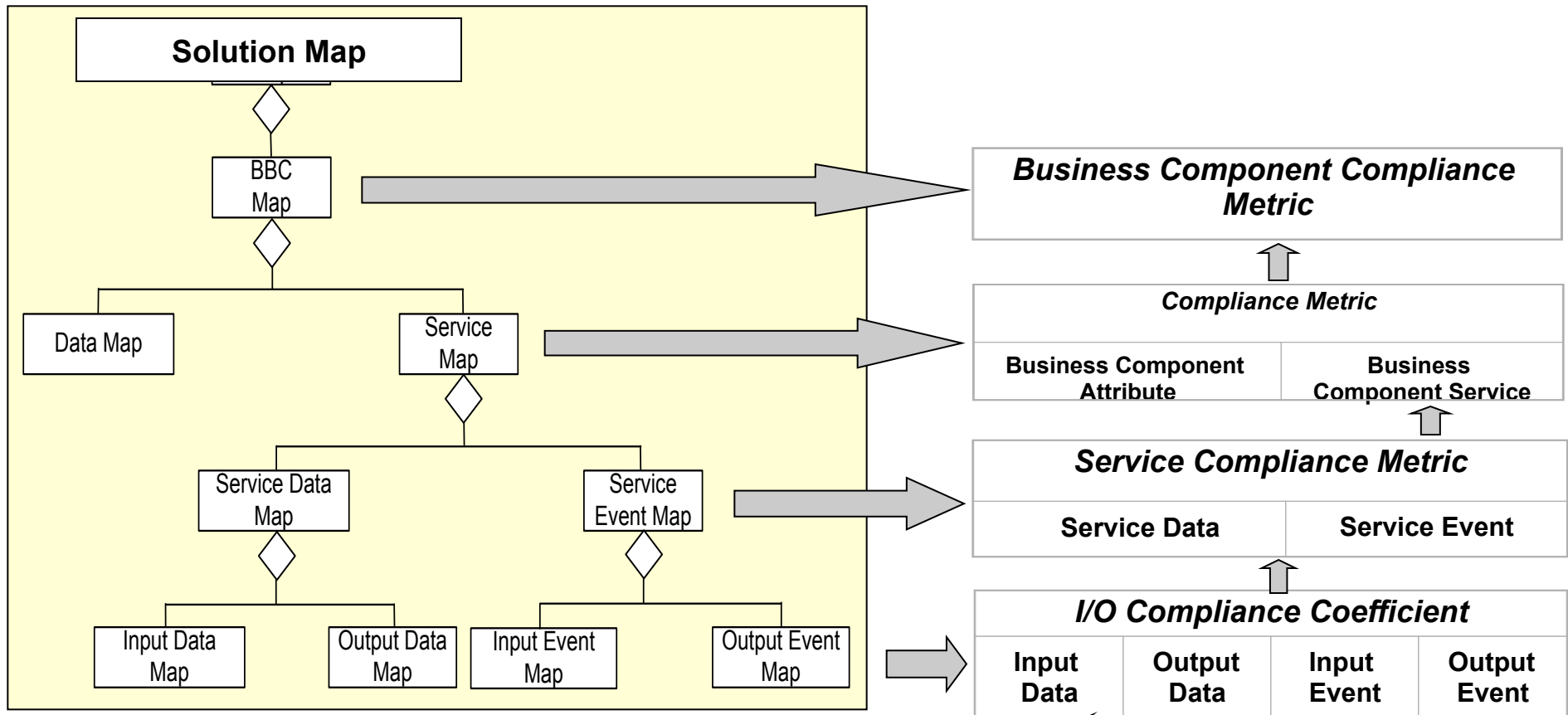






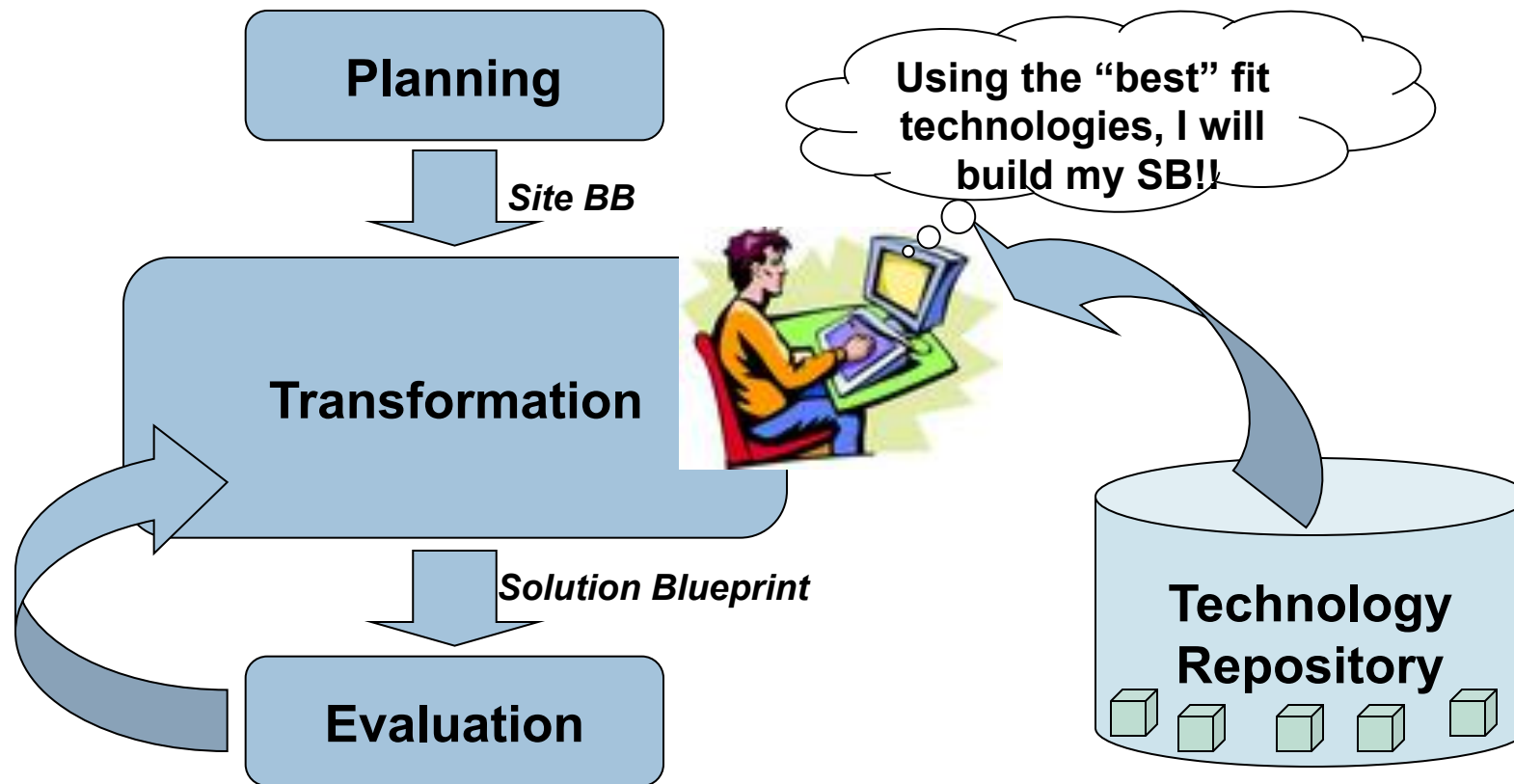




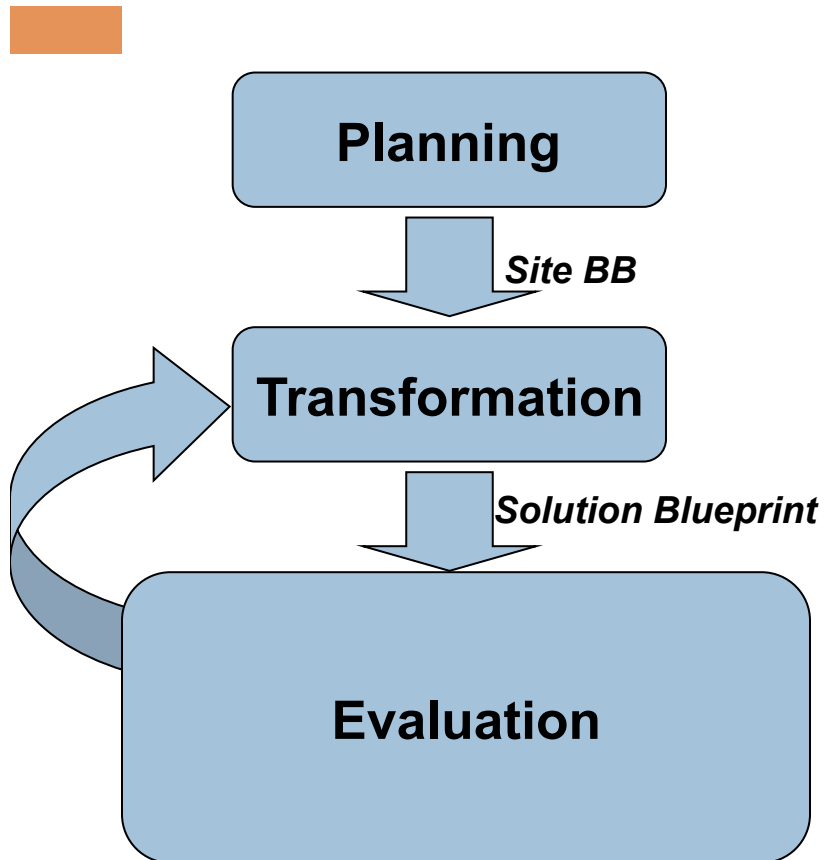


**Measures how well a Technology Solution complies to the input and output of a particular Business Component Service**

SB Transformation process selects the technologies  
(existing, under-development, planned) to deliver the Site  
BB functionality and data



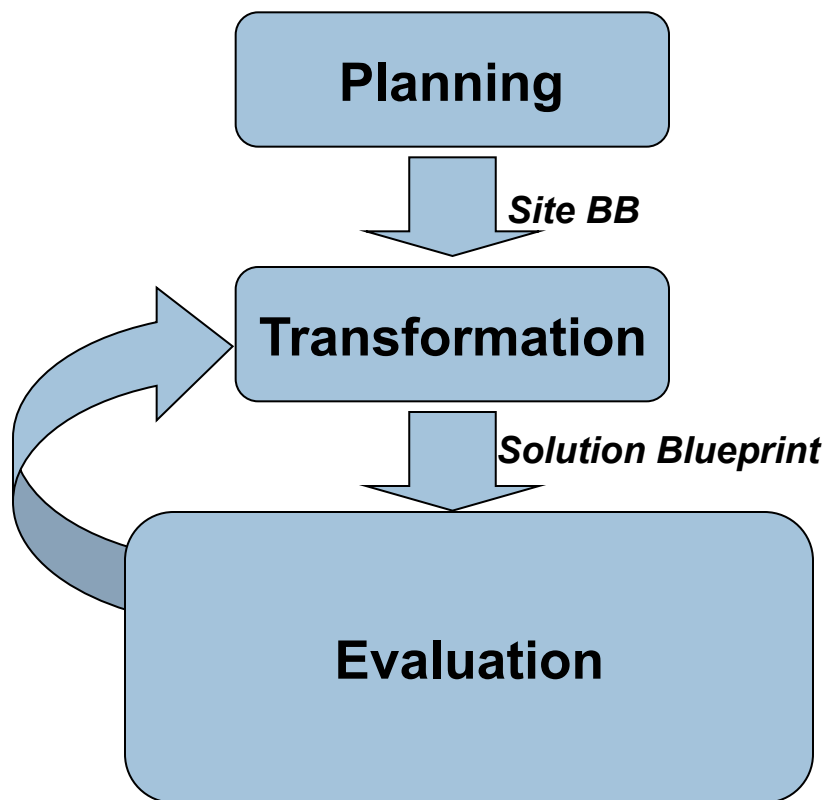
# SB Evaluation Process



## Evaluate:

- **SB degree of compliance to Site BB**
  - Functional compliance (technology service delivery)
  - I/O compliance (system integration)
- **SB satisfaction of non-functional requirements**
  - Compliance with prescribed BB design patterns
- **Discovery of emerging SB design patterns**

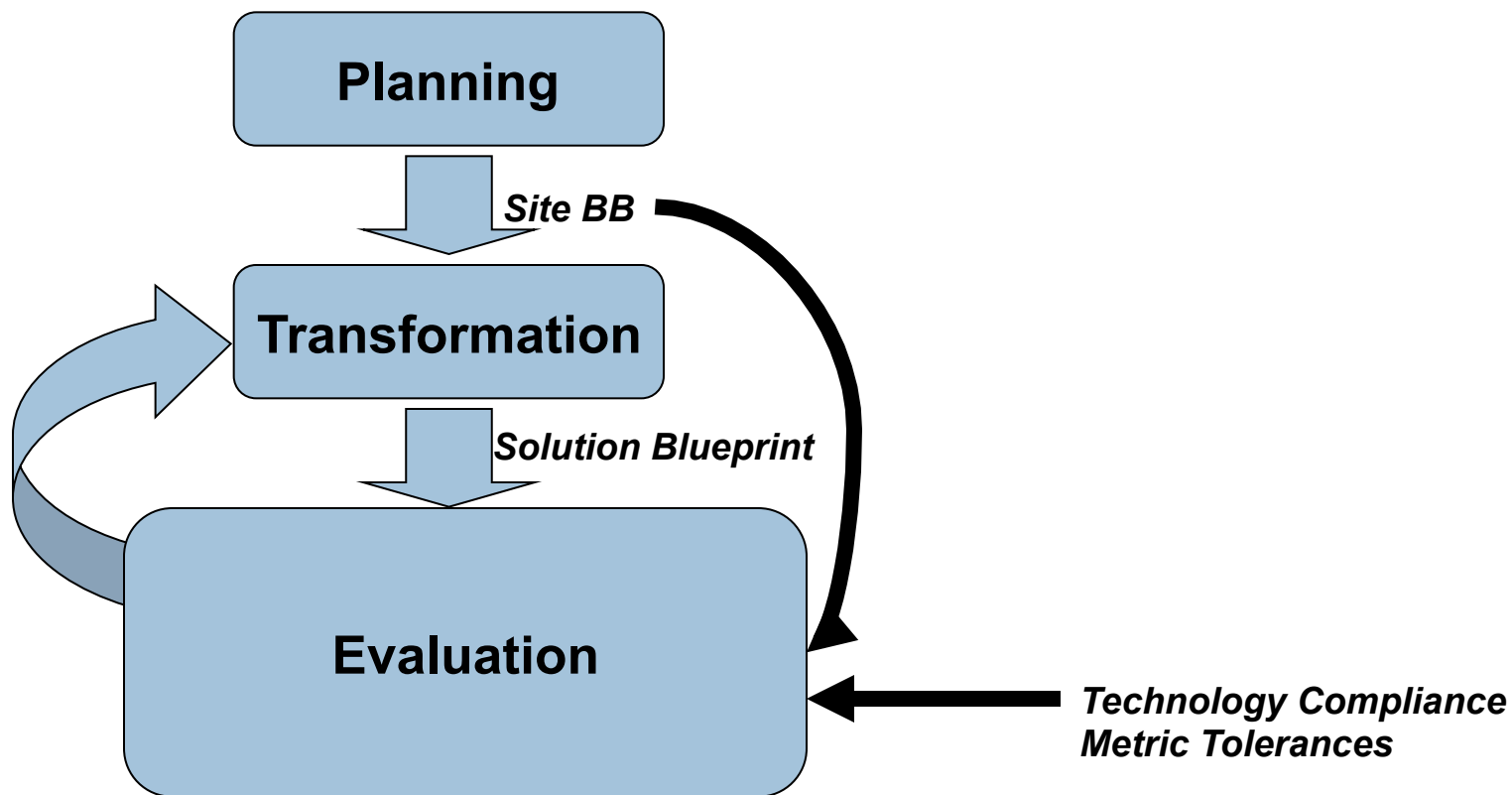
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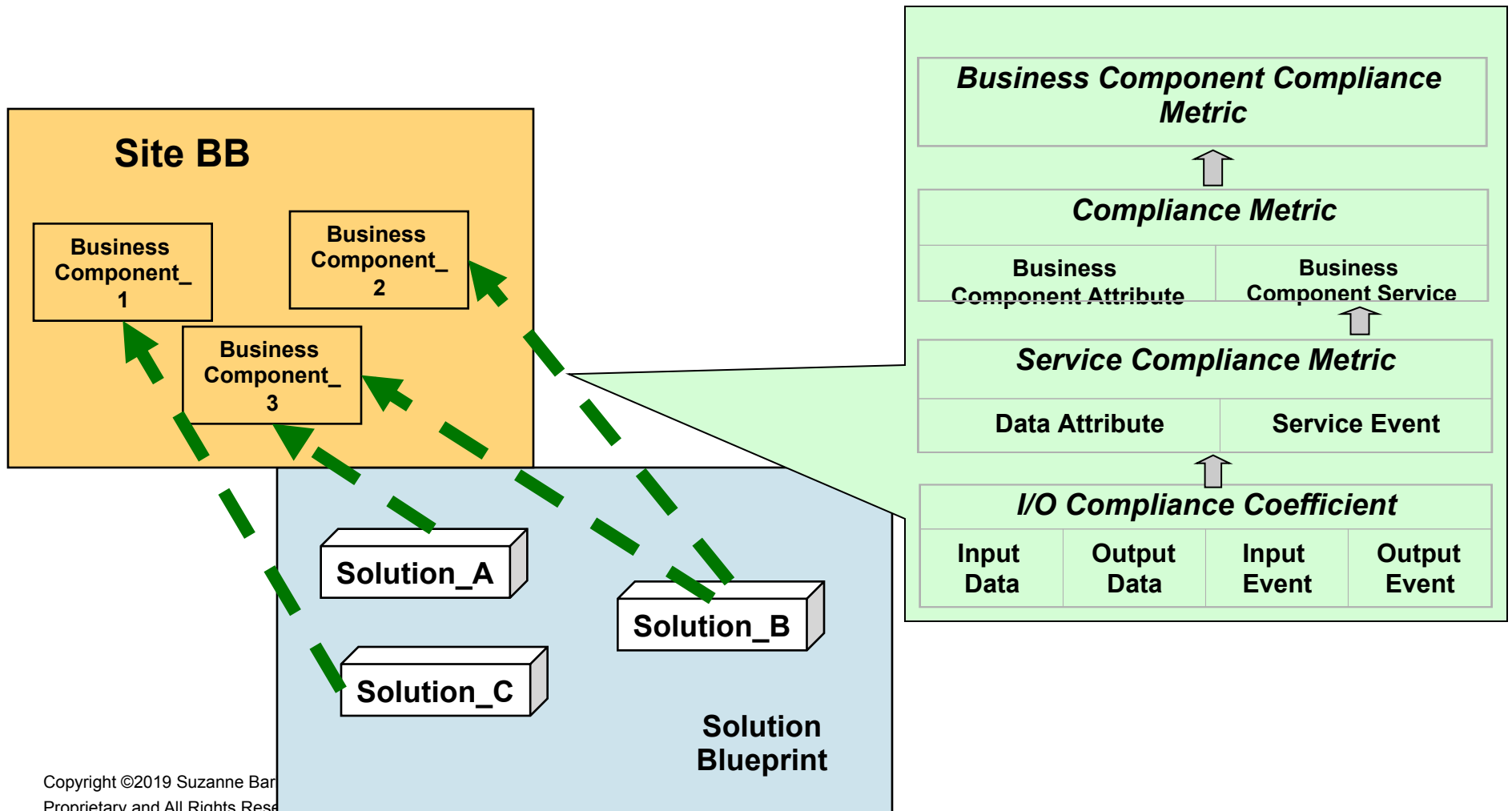
# Evaluating SB degree of compliance to Site BB



# SB Solution Compliance Evaluation



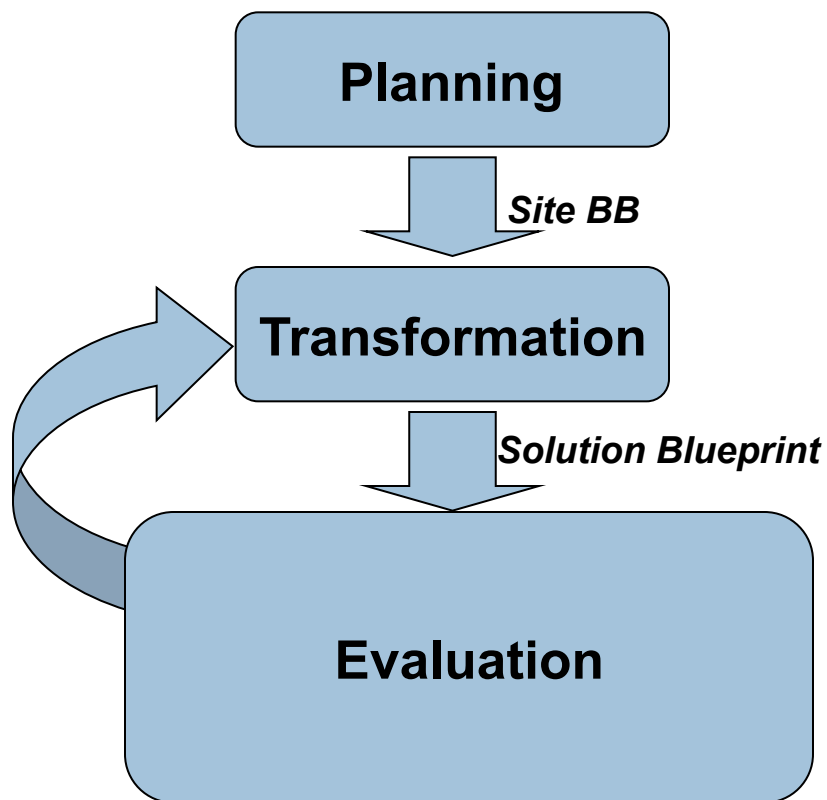
- ▣ Evaluation only in the context of the Customer specific Site BB
- ▣ Evaluation Results: Degree of compliance to the Site BB
- ▣ The Evaluations
  - Function Mapping – is there a component capable of performing function X?
  - Data Mapping— is there a component capable of managing (storing, producing, transforming) Data1?





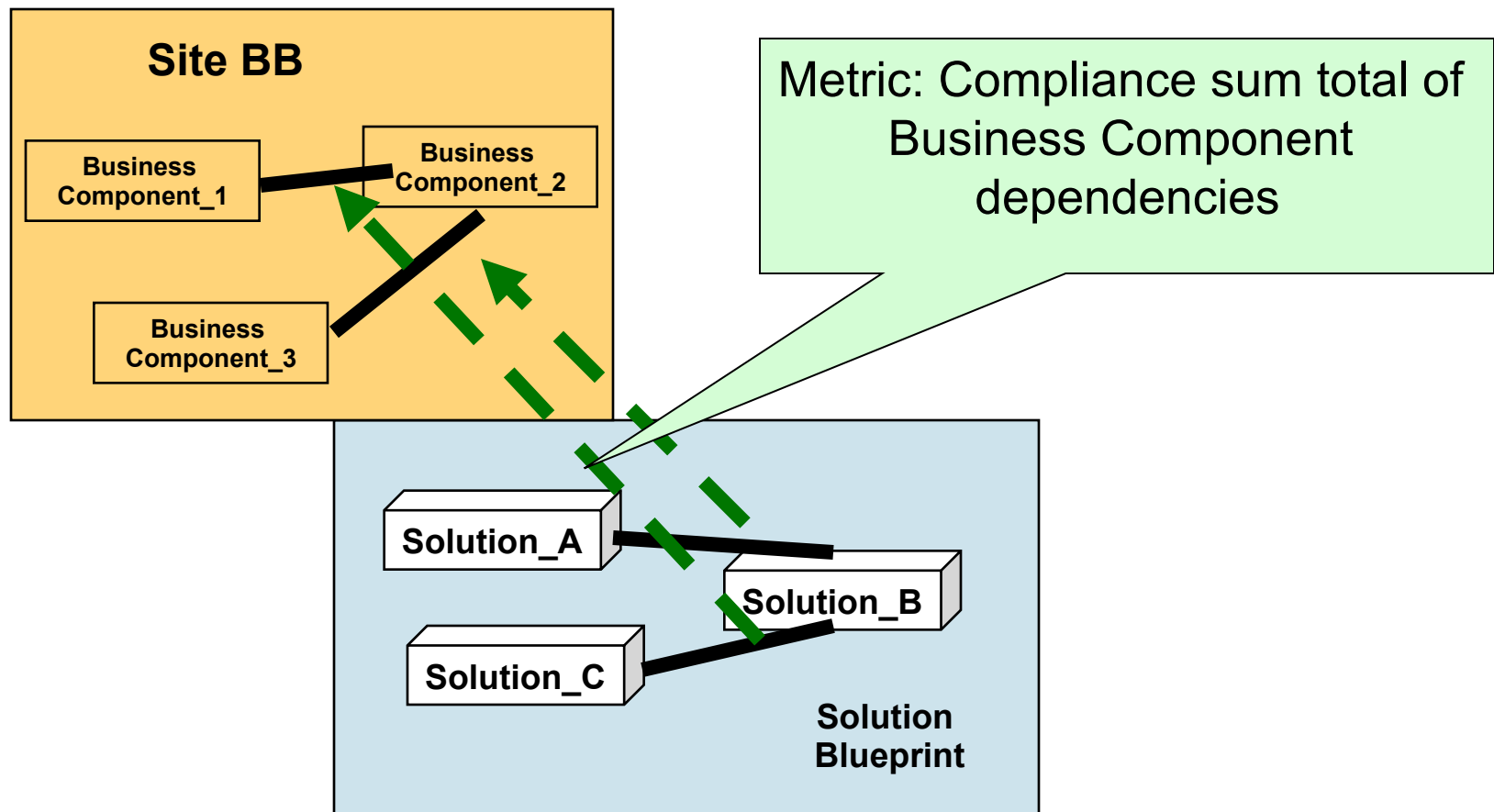
# SB Evaluation Process: SB Evaluation: System Integration

evaluation determines the SB degree of compliance with the Site BB service input and output specifications

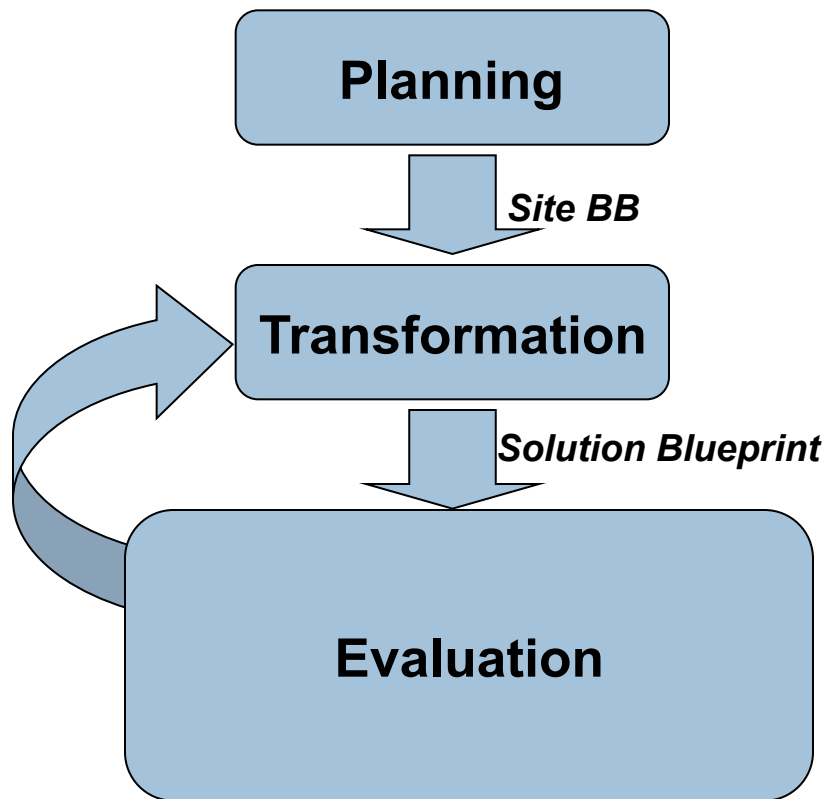


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# SB Evaluation: Satisfaction of Non-functional requirements

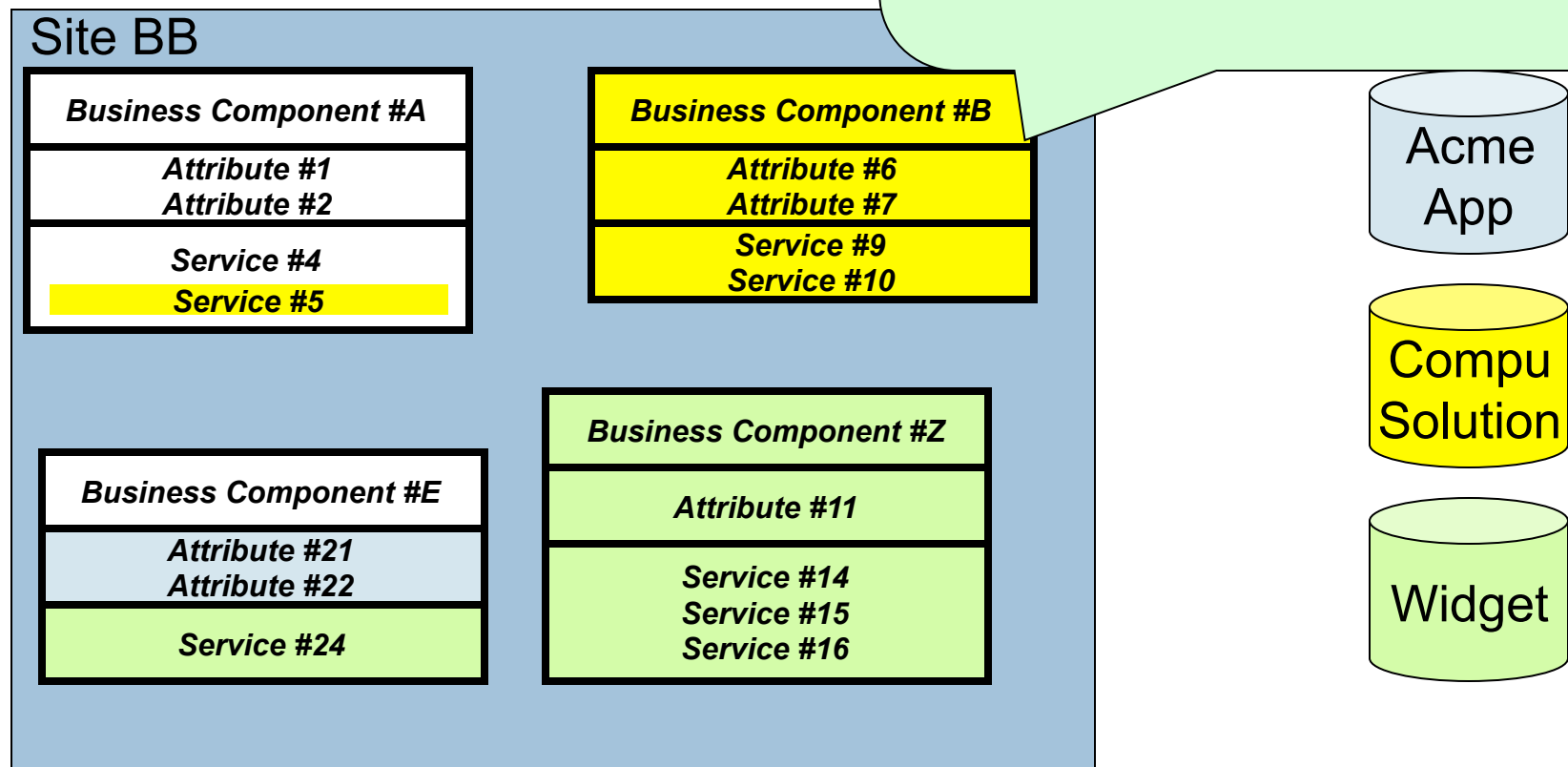


## Evaluate:


- SB degree of compliance to Site BB
- **SB satisfaction of non-functional requirements**
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- Discovery of emerging SB design patterns

# SB Non-functional Requirements Evaluation

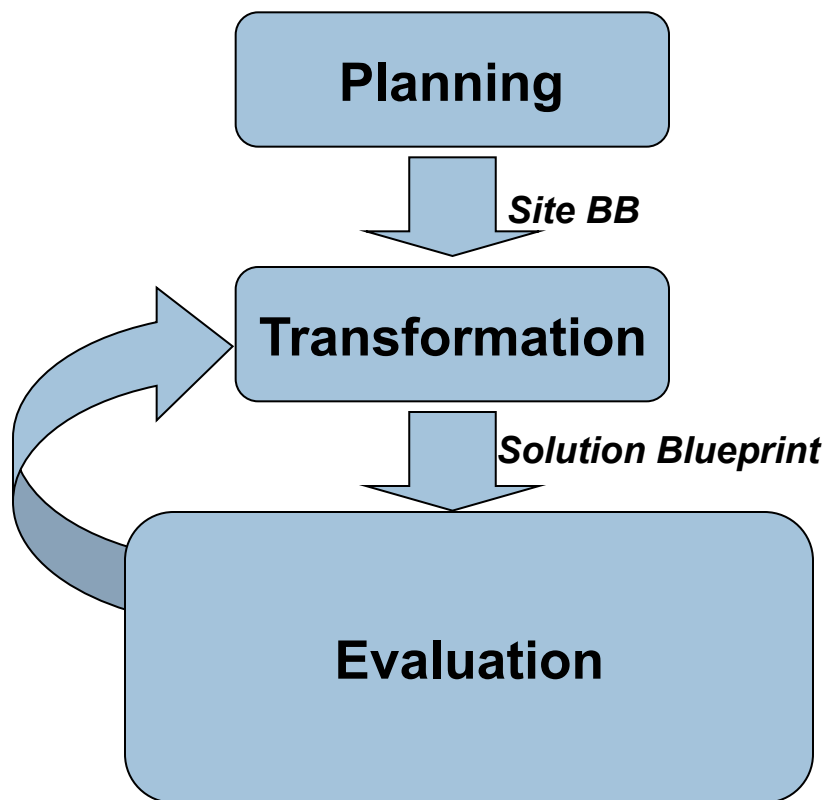
- SB content and topology is given by the colored attributes and service
- We can use the same non-functional quality metrics used to evaluate the BB.



# Non-functional Requirements

- 
- Reusability
  - Extensibility
  - Comprehensibility
  - Flexibility
  - Availability
  - Ease of Implementation
  - Performance
  - Design Effort Reduction
  - Completeness
  - Business Components Align with Typical Applications
  - Business Components follow Domain Roles & Responsibilities


# SB Evaluation: Satisfaction of Non-functional requirements



## Evaluate:

- SB degree of compliance to Site BB
- SB satisfaction of non-functional requirements
  - Compliance with prescribed BB design patterns
- Discovery of emerging SB design patterns

# Participation Exercise – For Fun !

- 
- Find an article talking about architectural styles or patterns
    - ▣ Example implementation of a particular architectural style or pattern
    - ▣ Pros and cons of respective architectural styles or patterns
    - ▣ Features of a particular architectural style or pattern
  - Do you think that architectural styles and patterns would be useful guidance as you developed the Business Blueprint?