TEAM 3

AliExpress Live

Architecture Design - version 2

Minchang Choi | Peiheng Li

Review inputs

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omain.
produce a detailed
the construction of

Review inputs

All quality attribute scenarios, constraints and concerns are selected as architectural drivers.

Scenario ID	Importance to the Customer	Difficulty of Implementation According to the Architect
QA-1	Medium	Medium
QA-2	Medium	High
QA-3	High	Medium
QA-4	Low	Low
QA-5	High	Medium

Primary Functional Requirements:

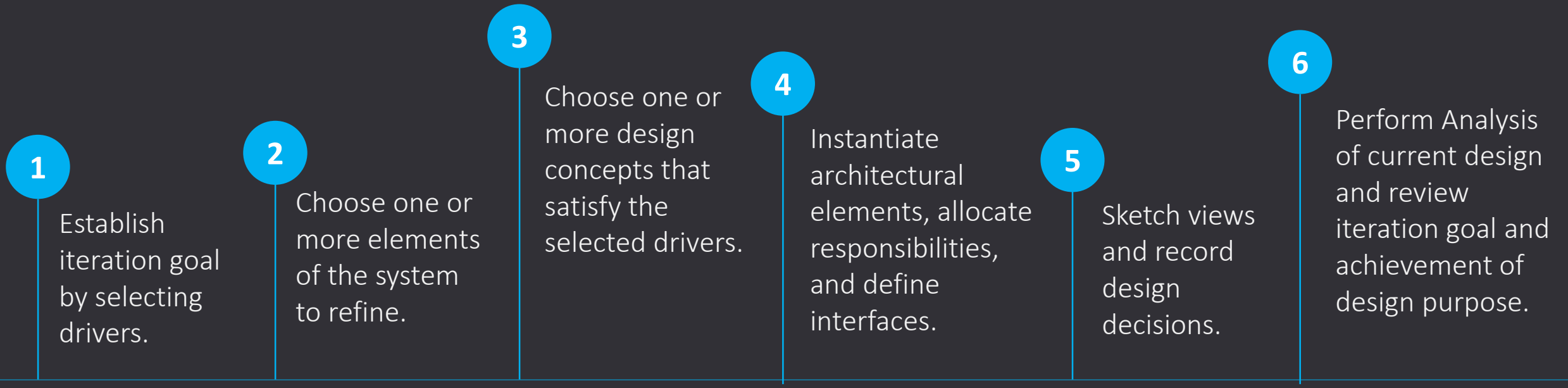
- UC-6: Customer watches live video.
- UC-12: Customer browses product items in the channel and gets detailed information with selecting specific item.

ADD Iteration 1

Establishing an Initial Overall System Structure

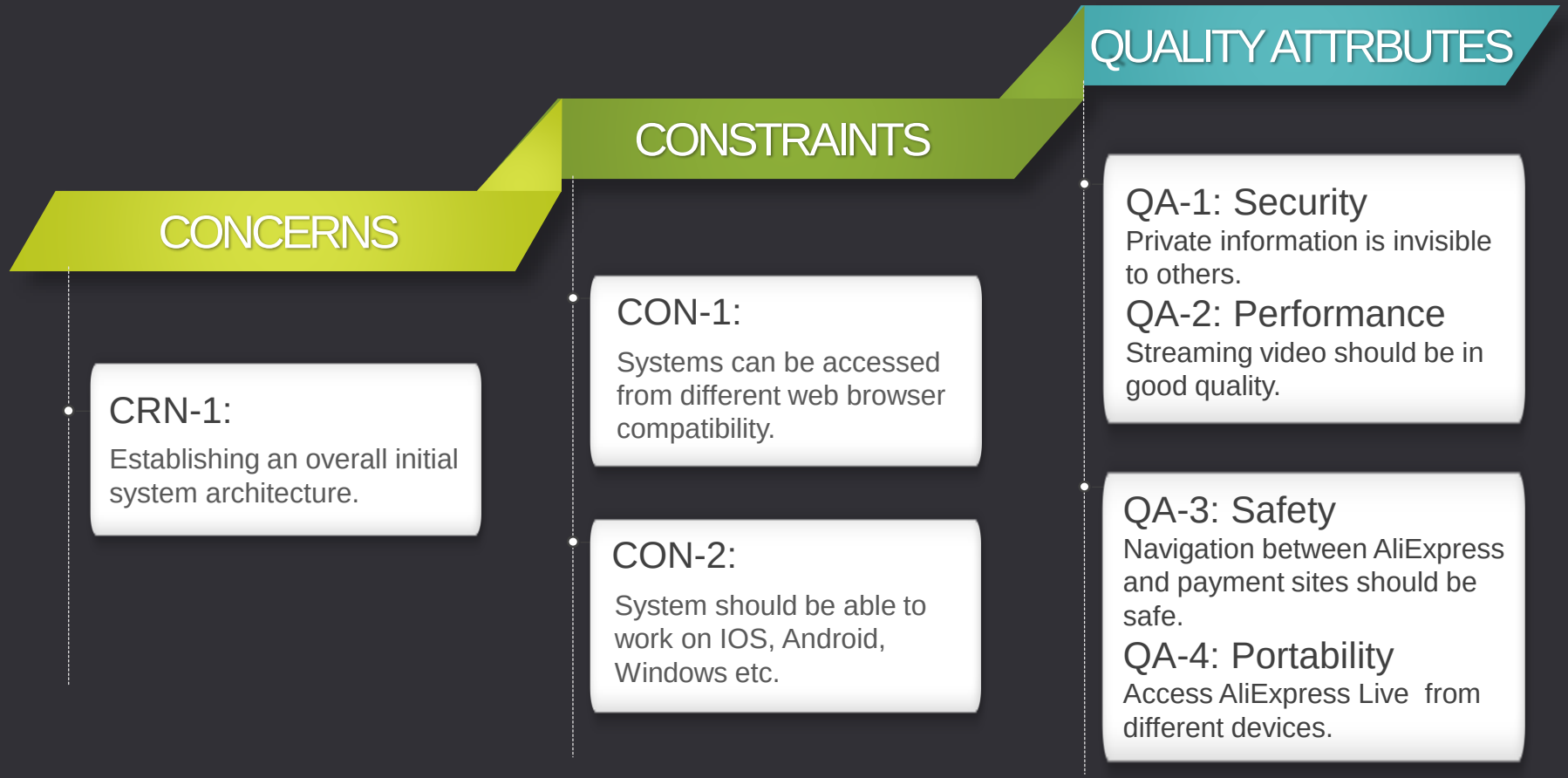
ADD Iteration 1

GOAL: *This is the first iteration in design of a greenfield system, so the iteration goal is to establish an initial overall structure for the system.*



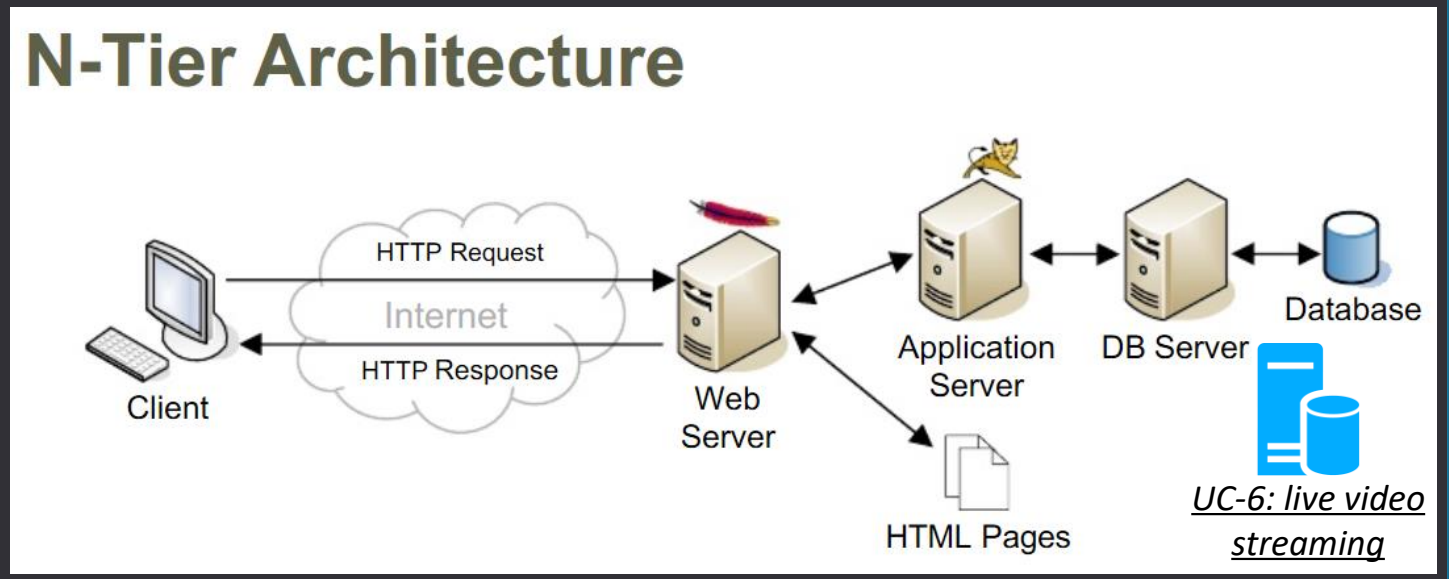
Step 1: Establish Iteration goal by Selecting Drivers

Goal: Deriving overall structure of system with considering all of the drivers that may influence the general structure of the system.



Step 2: Choose one or more elements of the system to refine

Step 3: Choose one or more design concepts that satisfy the selected drivers



Design decisions and locations

Using “N-tier architecture” as reference architecture.

Rationale and Assumptions

N-tier architecture” may include:

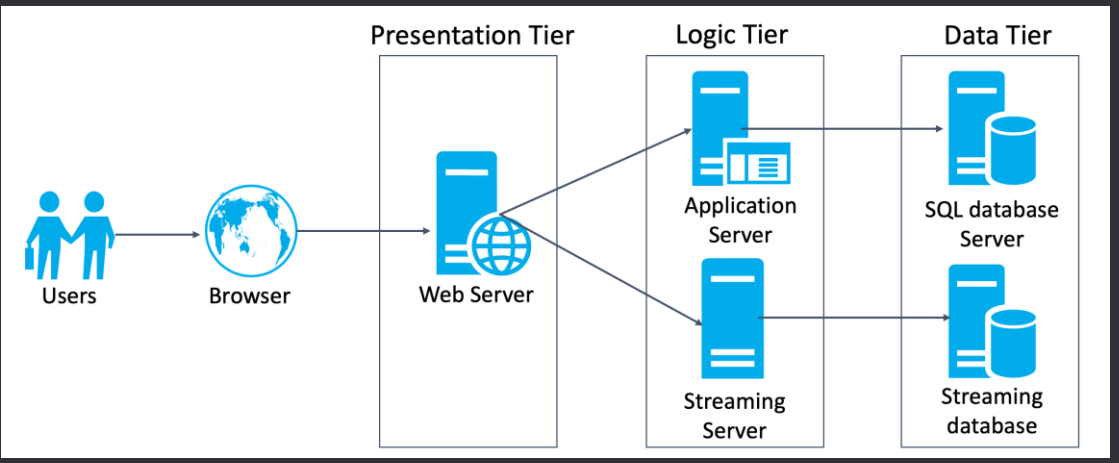
- Web servers(UC-12)
- Application servers(UC-15);
- Database servers(UC-11);
- Other underlying servers or devices.

Add/delete/ modify components without influence on other tiers (QA-5).

Step 4: Instantiate architectural elements & allocate responsibilities & define interfaces.

Instantiate Tiers

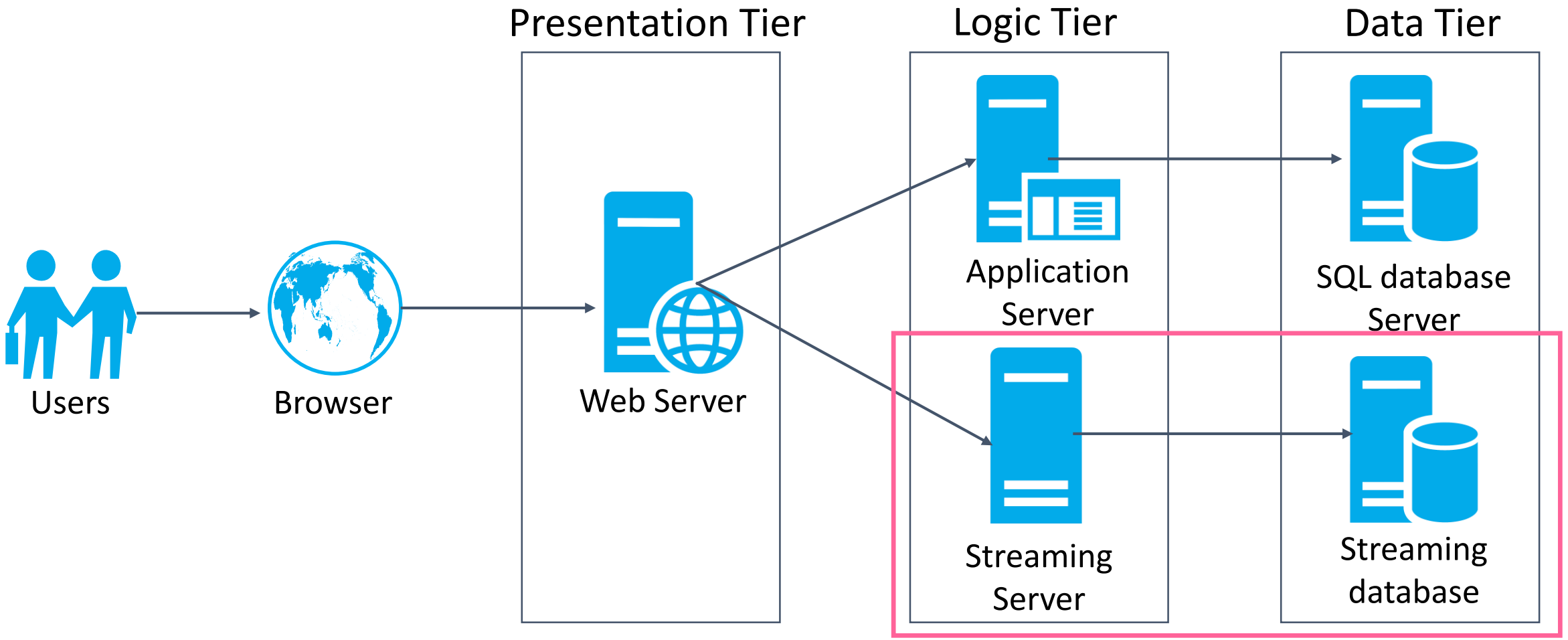
- Web server: presentation tier
- Application server: logic tier
- Database server: Data tier



- Web servers are used to present information such as web pages advertisements and shopping cart contents to the consumer's web browser.
- Application server performs a variety of processing functions and should never be publicly accessible.
- Data-storage tier includes database servers and any other system or media used to store data.

- The system is a live e-commerce system, so the system should include streaming server for live video streaming service. (UC-6)
- Extend the module for streaming server and add new data storage to manage media data.

Step 5: Sketch views and record design decisions.



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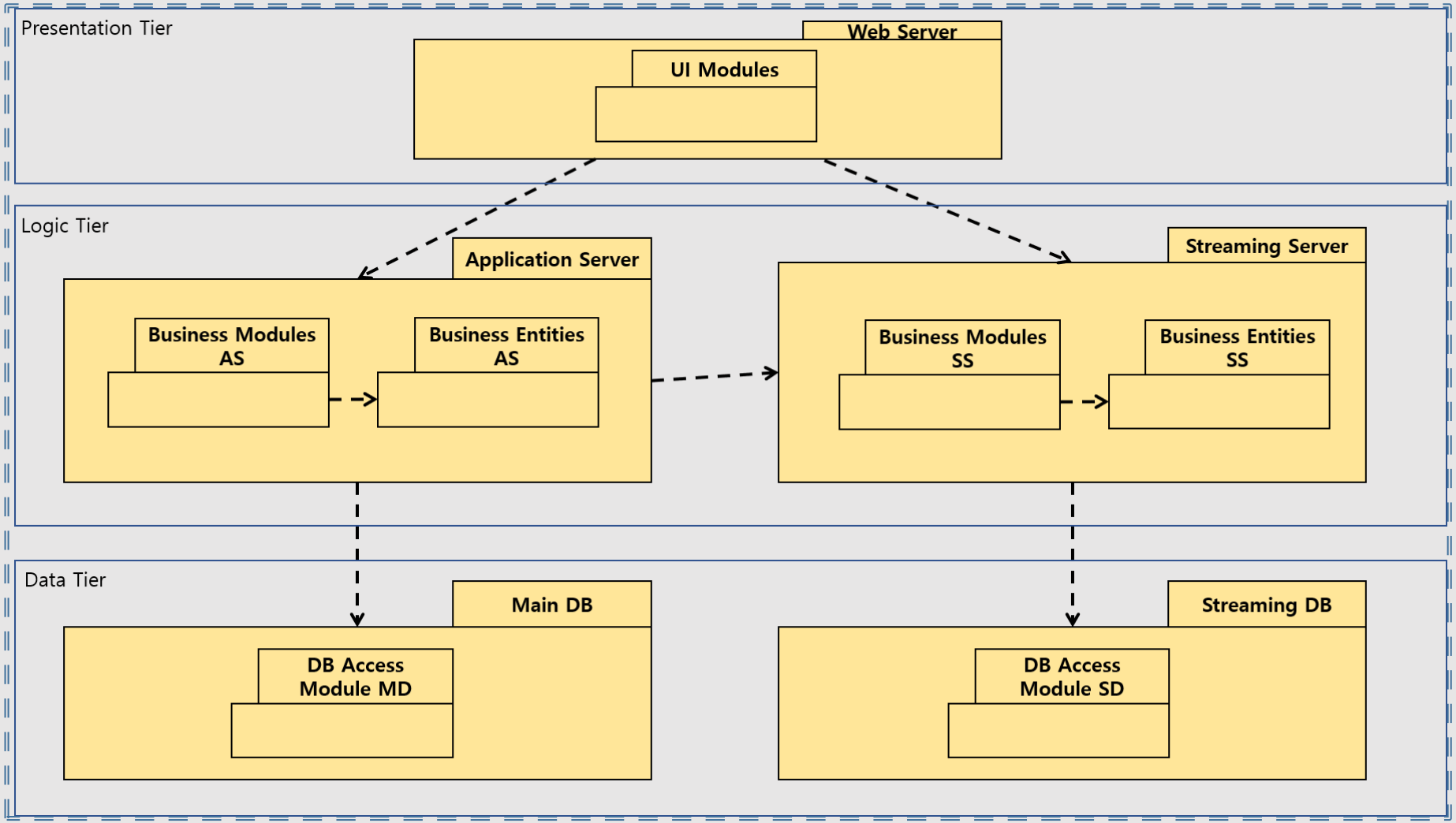


Step 6: Perform Analysis of current design & review iteration goal & achievement of design purpose.

Partially Addresses

- UC-6, UC-11, UC-15: Modules established by N-tier architecture will support this functionality;
- QA-1: Elements are identified for supporting the UC.

Completely Addressed

- QA-5: Modules across the tiers and preliminary interfaces to support this UC;
- CRN-1:Overall initial architecture has been formed from N-tier architecture.

Not Addressed

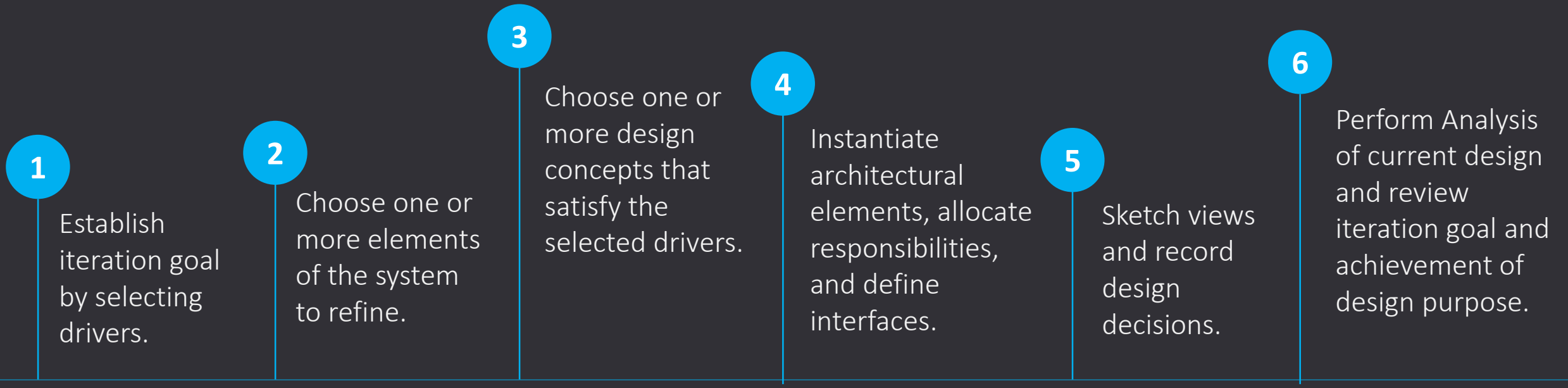
QA-3: No relevant decision made, as it is necessary to identify whether the elements that are participate.

ADD Iteration 2

Identifying structures to support primary functions.

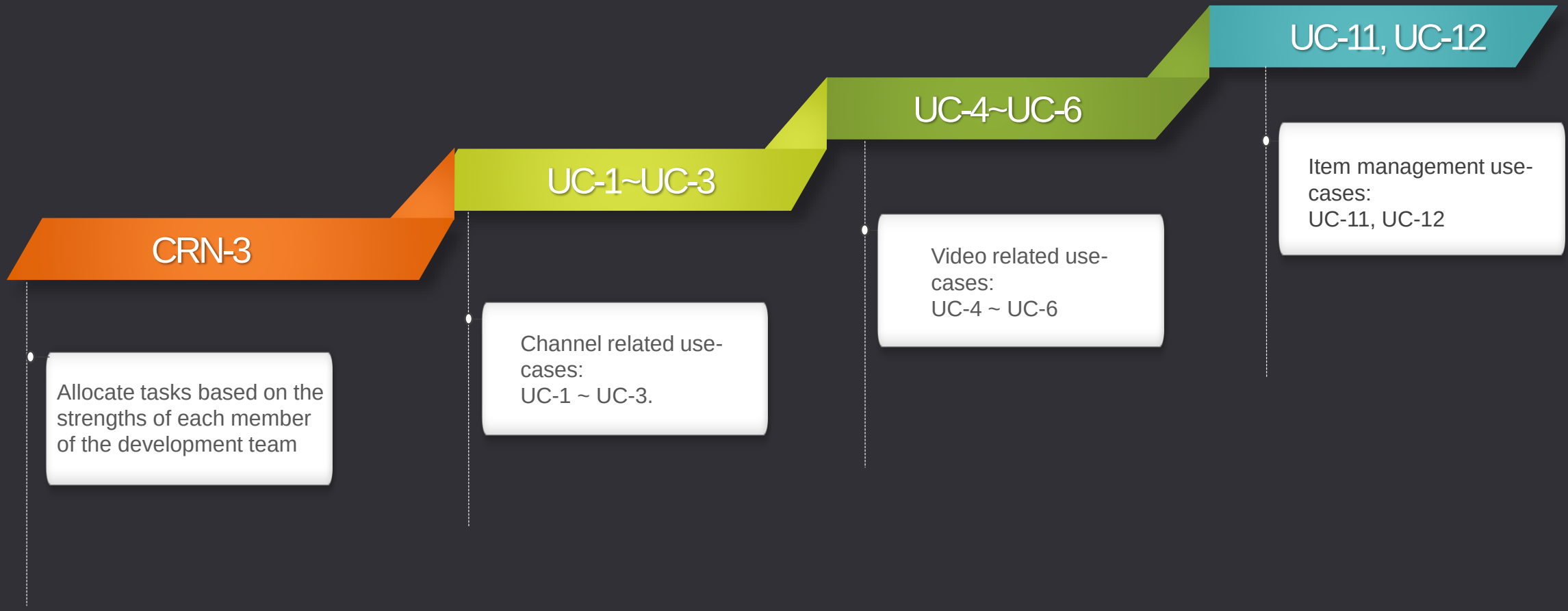
ADD Iteration 2

GOAL: *This is the second iteration in design of a greenfield system, so the iteration goal is to identify the structure to support primary functions.*



Step 1: Establish Iteration goal by Selecting Drivers

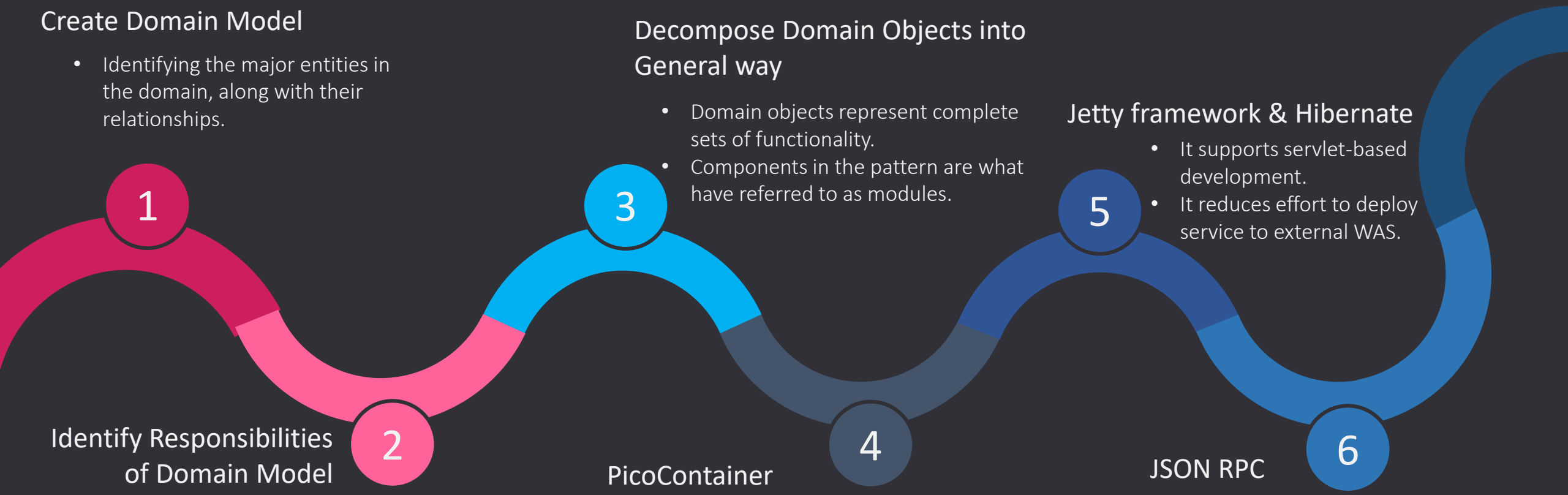
Goal: Identifying structures to support primary functionalities.



Step 2: Choose one or more elements of the system to refine

The elements that will be refined in this iteration are the modules located in the different tiers defined by the architecture derived from previous iteration.

Step 3: Choose one or more design concepts that satisfy the selected drivers



Create Domain Model

- Identifying the major entities in the domain, along with their relationships.

Identify Responsibilities of Domain Model

- Identifying the major entities in the domain, along with their relationships.

Decompose Domain Objects into General way

- Domain objects represent complete sets of functionality.
- Components in the pattern are what have referred to as modules.

PicoContainer

- PicoContainer is applied for object injection and is the most light-weighted framework.

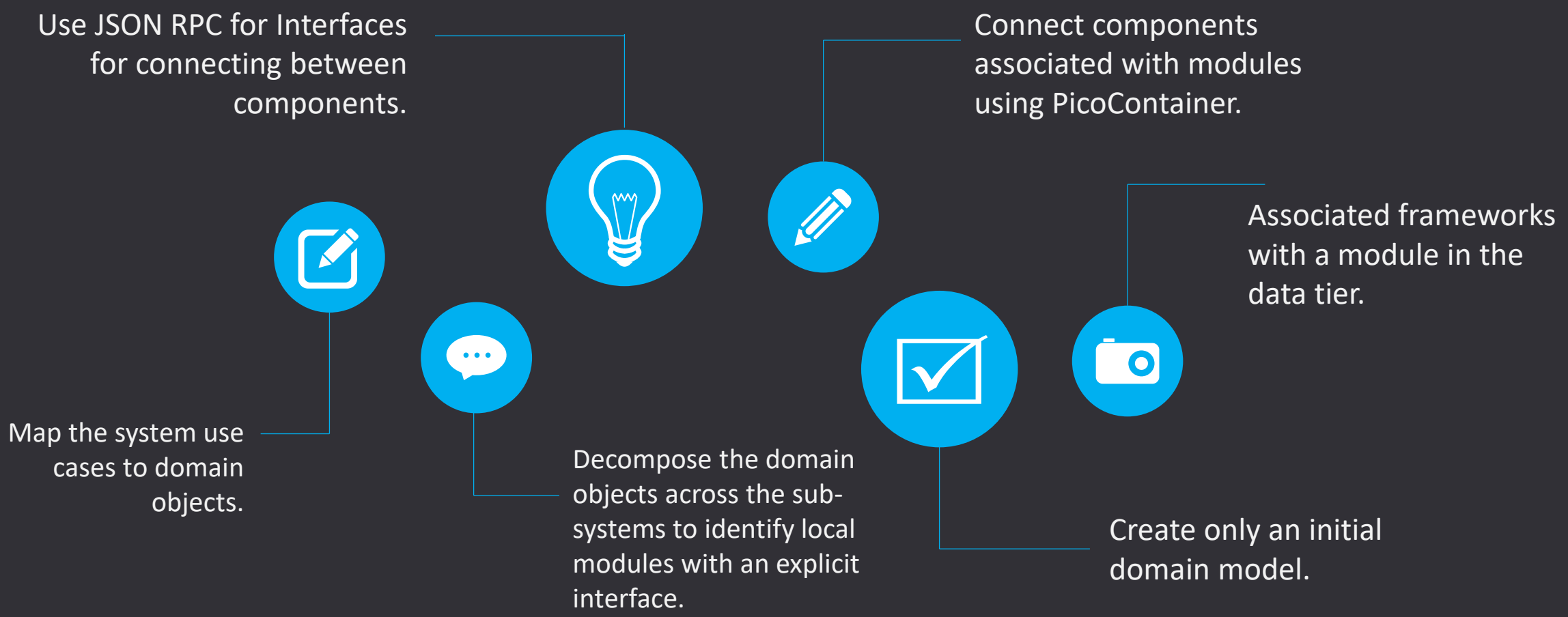
Jetty framework & Hibernate

- It supports servlet-based development.
- It reduces effort to deploy service to external WAS.

JSON RPC

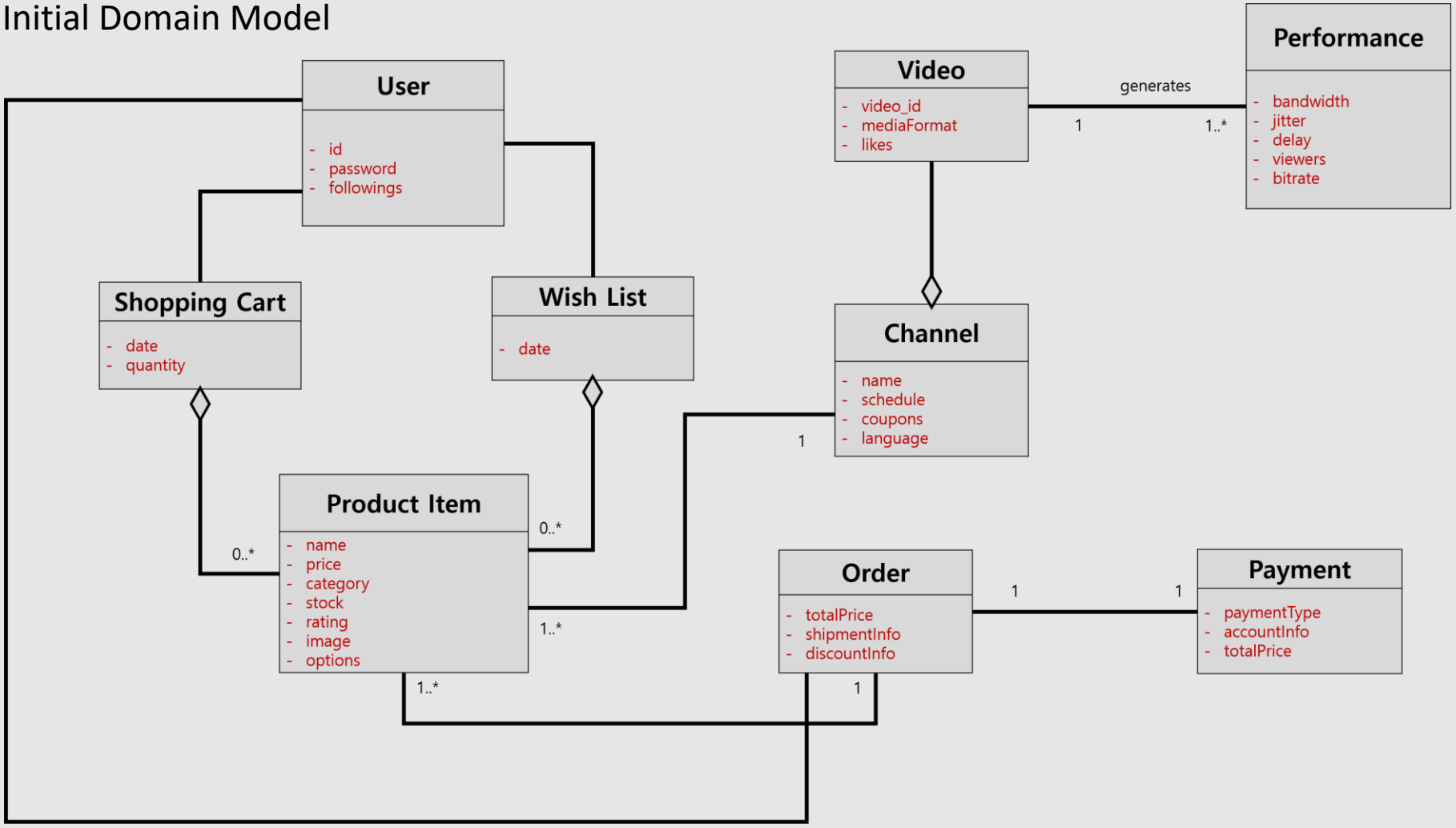
- JSON RPC is a remote procedure call protocol encoded in JSON.

Step 4: Instantiate architectural elements & allocate responsibilities & define interfaces.



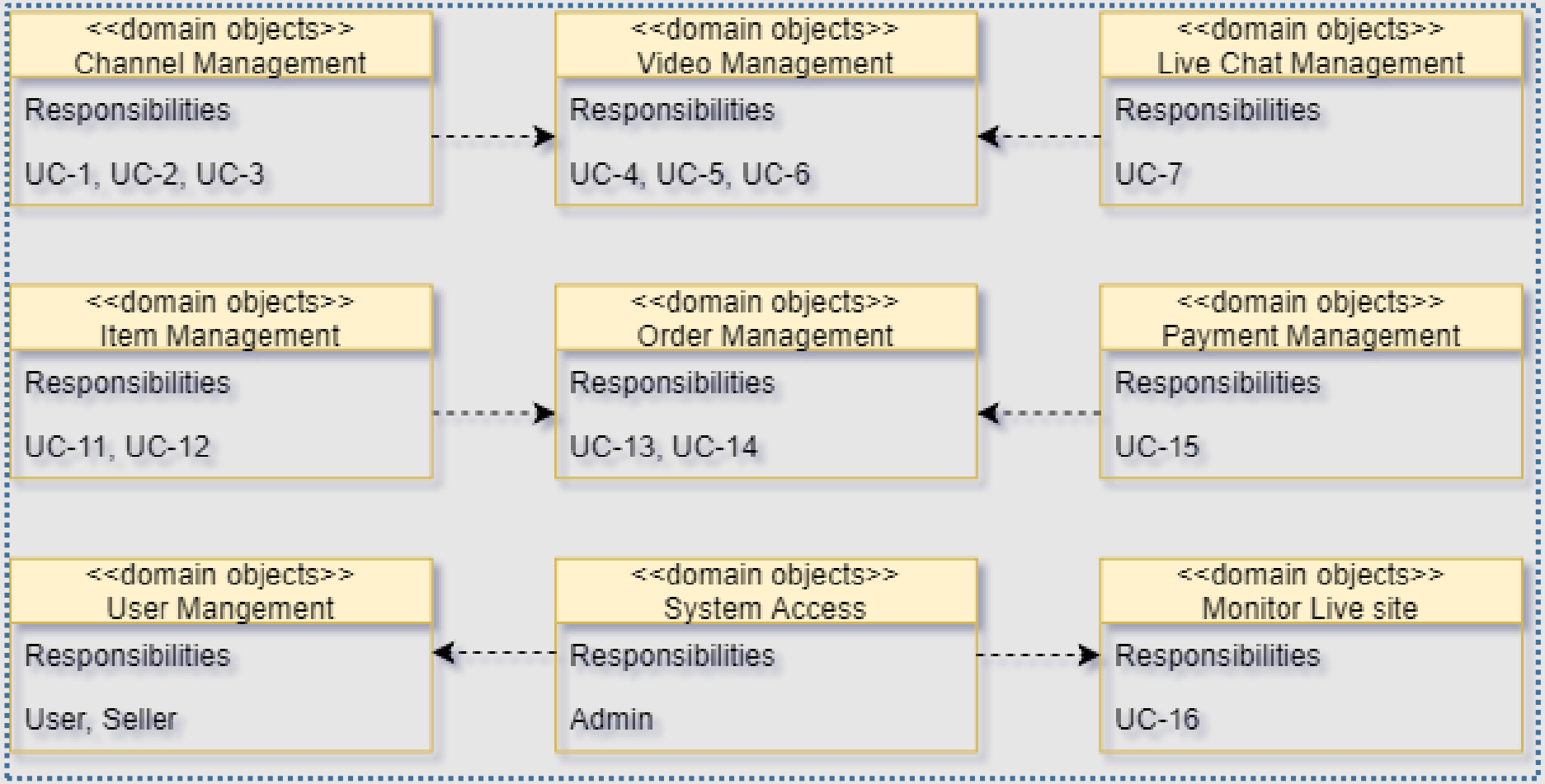
Step 5: Sketch views and record design decisions.

Initial Domain Model



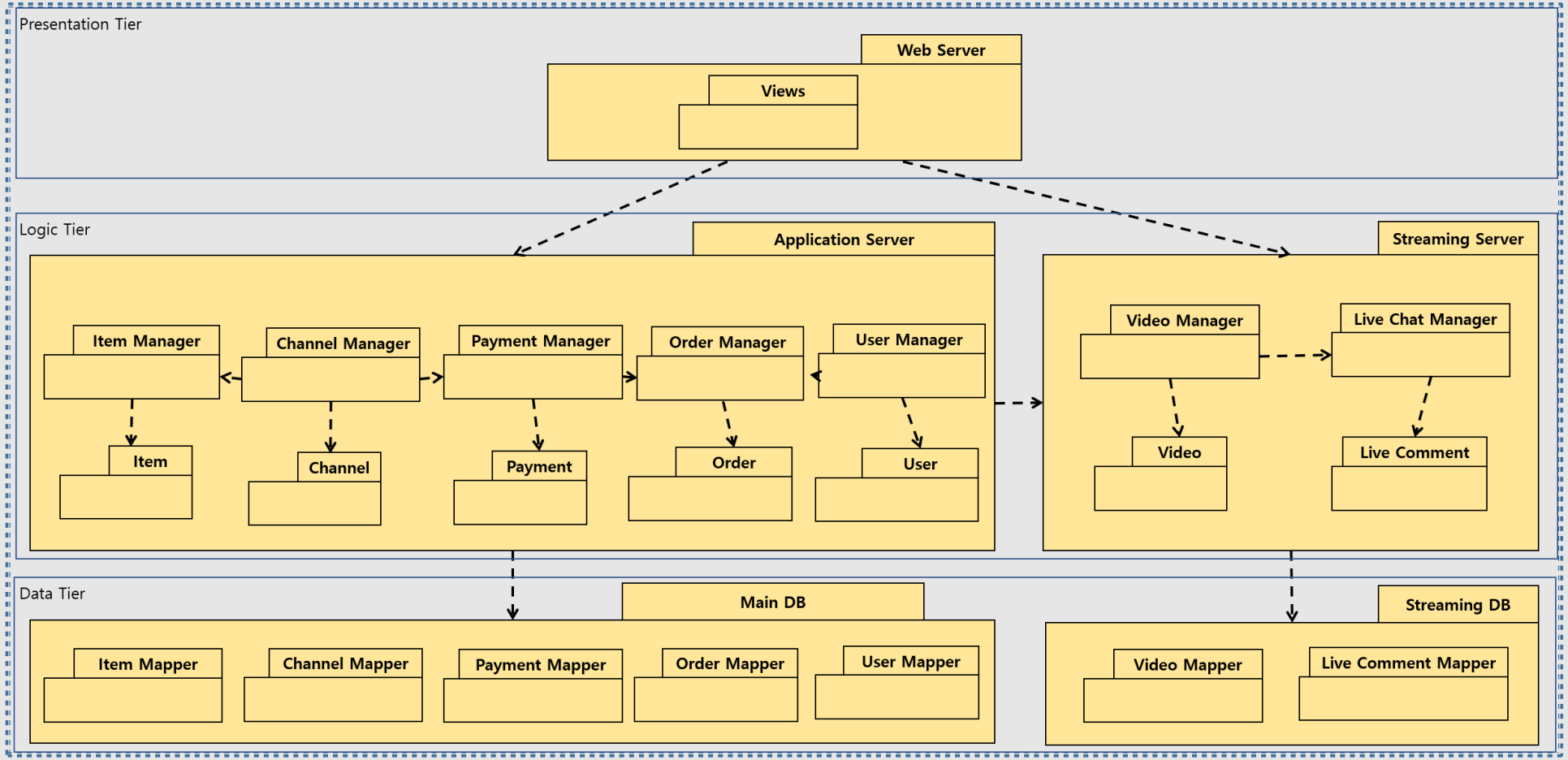
Step 5: Sketch views and record design decisions.

Domain objects associated with the use case model



Step 5: Sketch views and record design decisions.

Modules that support the primary use cases



Step 6: Perform Analysis of current design & review iteration goal & achievement of design purpose.

Partially Addresses

- QA-1, QA-2, QA-3, QA-4;
- CRN-4: Introduction of new functionality must avoid modifications to the existing core functionality.

Completely Addressed

- UC-1~UC-16

All modules across the sub-systems preliminary interfaces to support this use cases have been identified.

Not Addressed

QA-5: The system should be able to increase its scale with relatively small effort.

THANK YOU :)

Have a nice day ☺

Appendix A

Element	Responsibility
Browser	It is responsible for the visual interface between the customer and the web server. (such as internet explorer, chrome, Firefox…)
Presentation Tier	This tier contains modules that control user interaction and use case control flow.
Logic Tier	This tier contains modules that perform business logic operations that can be executed locally
Data Tier	This tier contains modules that are responsible for communication with the server.
Web Server	It is publically accessible and are used to present information such as web pages, forms, advertisements, merchandise, and shopping cart contents to the consumer's web browser.
Application Server	It performs a variety of processing functions and should never be publicly accessible.
SQL database	It should store information about product items, payment and personal information.
Stream server	It performs live video streaming services.
Stream database	It should store media data(video) for video streaming service.

Appendix B

Element	Responsibility
UI Modules	These modules are for the user interface and receive user inputs.
Business Modules AS	These modules implement business operations. (User identity information, Payment and order management)
Business Entities AS	These entities make up the business model.(User account, Payment/Order information)
Business Modules SS	These modules implement streaming service. (Live video service, chatting service)
Business Entities SS	These entities implement streaming data.(Multimedia, interactive chat text)
DB Access Module MD	This module is responsible for people identity information, payment and order information. (UC-13,15)
DB Access Module SD	This module is responsible for storing video in the streaming service.
UI Modules	These modules are for the user interface and receive user inputs.
Business Modules AS	These modules implement business operations. (User identity information, Payment and order management)

Appendix C

Not addressed	Partially addressed	Completed addressed	Design decisions Made During the Iteration
		QA-5	Modules across the tiers and preliminary interfaces to support this use case have been identified.
		CRN-1	Overall initial architecture has been formed from the N-tier reference architecture.
	UC-6		Selected reference architecture establishes the modules that will support this functionality.
	UC-11		Selected reference architecture establishes the modules that will support this functionality.
	UC-15		Selected reference architecture establishes the modules that will support this functionality.
	QA-1		The elements that support the associated use case UC-11 have been identified.
QA-3			No relevant decision made, as it is necessary to identify the elements that participate in the use case that is associated with the scenario.

Appendix D

Element	Responsibility
Views	Constructs views which users will faces
Item Manager	Item Manager is used to perform activities such as Upload item and browse item.
Channel Manager	Channel Manager contains modules that controls activities such as open channel, follow channel and enter channel.
Payment Manager	Payment Manager where all the payment process will be handled.
Order Manager	Order Manager contains modules that activities related with user's order.
User Manager	User Manager contains modules that add/remove/modify user information.
Video Manager	Video Manager contains modules that performs Live streaming operation.
Live Chat Manager	Live Chat Manager is used to control chat operation during live stream.
Entities	Every entities like Item, Channel, etc. are representation of data in DB.
Object Mappers	Object Mappers like Item Mapper, Channel Mapper, etc. queries data from DB and maps it to class.

Appendix E

Not addressed	Partially addressed	Completed addressed	Design decisions Made During the Iteration
		UC-1 ~ UC-16	Modules across the sub-systems preliminary interfaces to support this use cases have been identified.
	CRN-4		Modules need to be unit tested are identified
	QA-1		The elements that support the associated use cases have been identified.
	QA-2		The elements that support the associated use cases have been identified.
	QA-3		The elements that support the associated use cases have been identified.
	QA-4		The elements that support the associated use cases have been identified.