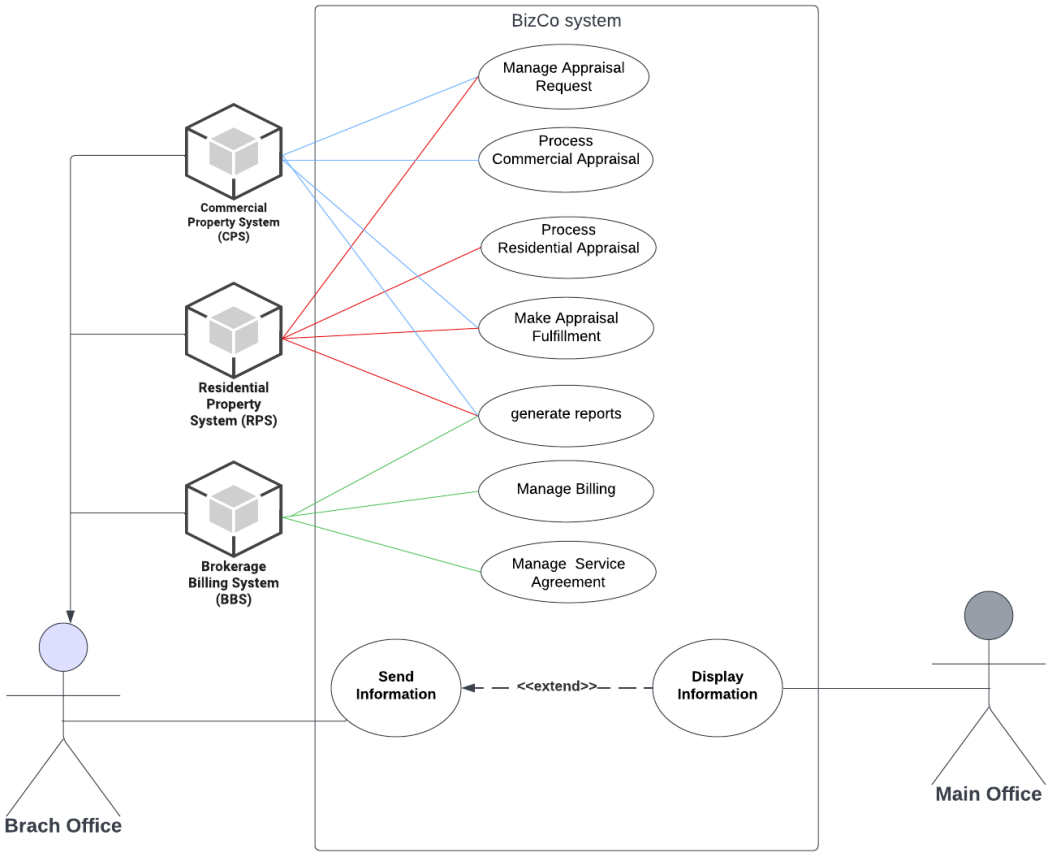
BizCo System

[section: SC7]

Student Name	ID Number
Ashjan Alharthi	2006689
Nouf Alsubhi	2005929
Najwa Aldahri	2006983
Alyaa Ahmad	1895049

1. Use case Diagram

From your understanding of the system and assumption, draw use case diagram and construct a table that explain each use case.



2. Use case Diagram description:

Use case	Management Appraisal Request
Actor	**CPS, RPS**
Preconditions	The presence of appraisal requests.
Postcondition	Start managing requests.
The flow of the use case	1- Branch office manages the appraisal requests. (Branch office) 2- Each system receives its own appraisal request. (CPS, RPS)
Operation	The system allows the branch office to manage the appraisal requests.
Extend use case	None
Include use case	None

Use case	Process Commercial Appraisal
Actor	**CPS**
Preconditions	The requests belong to CPS.
Postcondition	System can successfully complete the appraisal.
The flow of the use case	1- The branch office continues process through the system. 2- The CPS system executes the appraisal.
Operation	The system implements the commercial evaluation process through the CPS.
Extend use case	None
Include use case	None

Use case	Process Residential Appraisal
Actor	**RPS**
Preconditions	Request for the aappraisal evaluation
Postcondition	System can do the residential appraisal procedure
The flow of the use case	1- The RPS system continue with the appraisals process 2 - Get the results of the residential evaluation
Operation	The system allows residential appraisal processing through RPS.
Extend use case	None
Include use case	None

Use case	Make Appraisal Fulfillment
Actor	**RPS, CPS**
Preconditions	Receives the results of appraisal for each system
Postcondition	Start with the appraisal Fulfillment by compiling results.
The flow of the use case	1-The branch office allows system to create bill 2- The system allows the branch office to have the result of the Appraisal Fulfillment stage.
Operation	The system enables the fulfillment appraisal.
Extend use case	None
Include use case	None

Use case	Manage Billing
Actor	**BBS**
Preconditions	Receive the appraisals results
Postcondition	System can successfully complete the billing.
The flow of the use case	The branch office manage billing.
Operation	The system allows branch office to manage billing for the appraisal
Extend use case	none
Include use case	none

Use case	Generate reports
Actor	**CPS, RPS, BBS**
Preconditions	Receives all system details.
Postcondition	Reports completed.
The flow of the use case	The system must generate reports
Operation	The system allows to subsystems **generate reports**.
Extend use case	none
Include use case	none

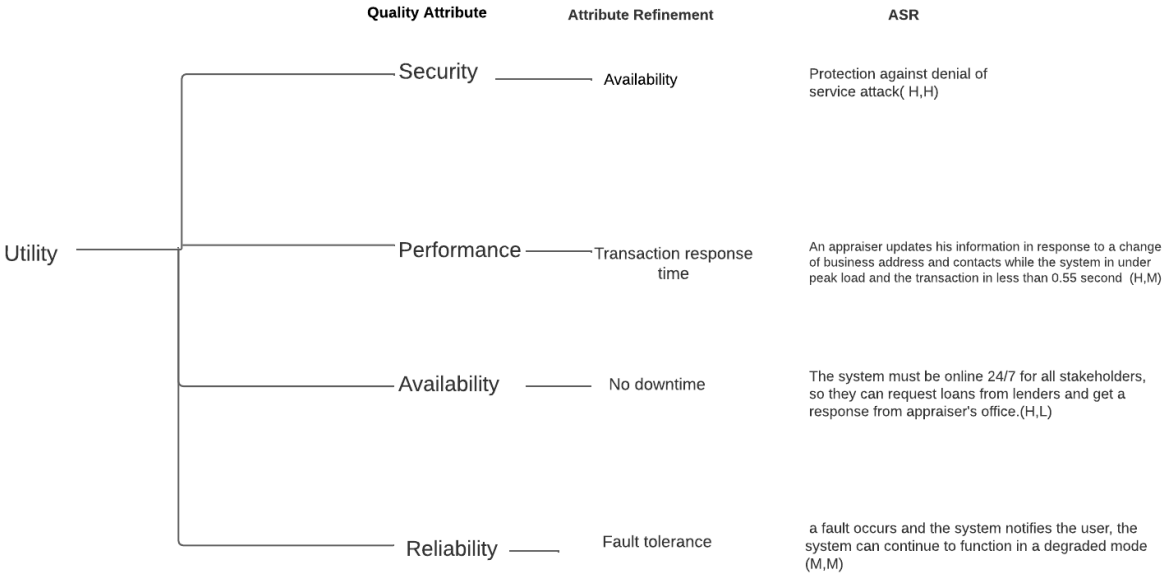
Use case	Manage Service Agreement
Actor	**BBS**
Preconditions	Service agreements
Postcondition	Process service agreement updates
The flow of the use case	The BBS system allow to user manage the service agreement.
Operation	The system allows BBS system to manage service.
Extend use case	none
Include use case	none

Use case	Send Information
Actor	**Branch Office**
Preconditions	Collect all information
Postcondition	send all information successfully.
The flow of the use case	Sends information to main office
Operation	The system allows branch office to send all information.
Extend use case	none
Include use case	none

Use case	Display Information
Actor	**Main Office**
Preconditions	Receives information from branch office.
Postcondition	Display all information.
The flow of the use case	Display all information related to the systems.
Operation	The system allows to main office represent all information.
Extend use case	Send information
Include use case	none

3. Identify the quality attribute requirements.

1) Create a utility tree for the current system. Consider a minimum of four different quality attributes. Ensure that the goals and scenarios that you elucidated at the leaf nodes have explicit responses and response measures.



2) Using the following table, write down what you think are the most important quality attributes for the Messaging Infrastructure layer and prioritize their relative importance on a scale from 1 to n=3, where 1 is most important quality attribute requirement for the messaging infrastructure and n is the least important. Then you should justify your choice for each quality attribute.

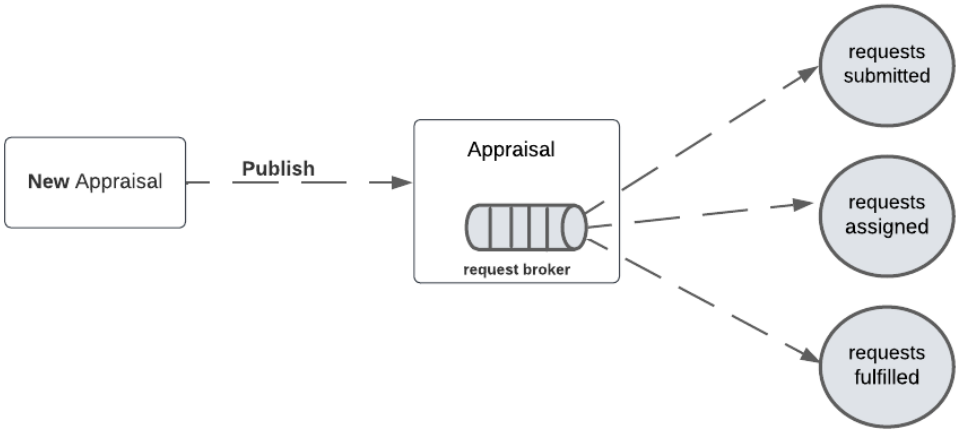
Hint: Review the business goals

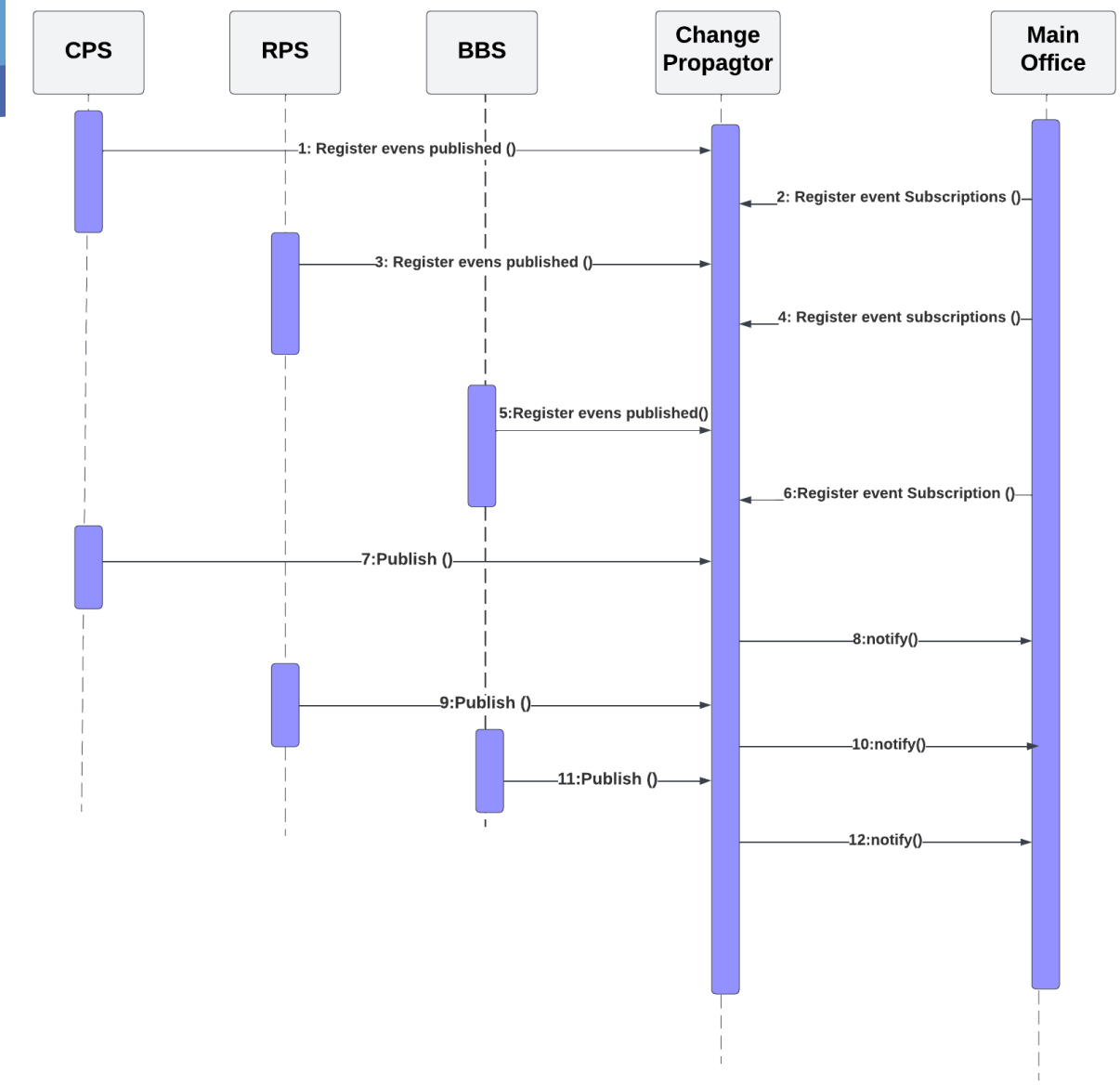
Relative Importance	Quality Attribute	Justification (Source)
1	Performance	BizCo must have a high-efficiency and powerful hardware server that can handle a large number of enders and appraiser offices, reducing system response time.
1	Security	BizCo must have access to brokerage data that contains payment, appraiser, and lender information. It must be safe from any attack on the information and system.
2	Availability	BizCo must be online 24/7. The system must have high availability so they can request each other without any losses.
3	Reliability	BizCo facilitates communication between lenders and appraisers, so the system must be highly reliable so that they can always communicate without interruption.
3	Modifiability	The system have high modifiability which allow us to modify each layer without effecting other layers.

3) Using the above description

select and draw the pattern that you think will best meet the messaging infrastructure requirements. Instantiate the pattern by describing the roles of its constituent participants, their responsibilities and relationships, and the ways in which they collaborate.

Publisher-Subscriber pattern




CPS
RPS
BBS
Change Propagtor
Main Office
1: Register evens published ()
2: Register event Subscriptions ()
3: Register evens published ()
4: Register event subscriptions ()
5:Register evens published()
6:Register event Subscription ()
7:Publish ()
8:notify()
9:Publish ()
10:notify()
11:Publish ()
12:notify()

4) Fill out the table and identify the tradeoffs using this pattern.

Pattern	**Publisher-Subscriber pattern**
Overview	Events are published and subscribed to by components. When a component announces an event, the connector infrastructure sends the event to all other components. registrations of users.
Elements	• Any C&C component with at least one publish or subscribe port. • The publish-subscribe connector, which will have announce and listen roles for components that wish to publish and subscribe to events
Relations	The attachment relation associates components with the publish-subscribe connector by prescribing which components announce events and which components are registered to receive event.
Constraints	All components are connected to an event distributor that may be viewed as either a bus—connector—or a component. Publish ports are attached to announce roles and subscribe ports are attached to listen roles.
Tradeoffs	According to the Publisher-Subscriber pattern's advantages, which include: • Publishers can send events to Subscribers concurrently without blocking. • Publishers and Subscribers are separated by asynchronous communication, allowing each to be active and available at different times. • The location and identities of Publishers and Subscribers are unknown to one another.

4. Applying Tactics (Bonus)

1) **Based on your design decision for the BIzCo BIS, what quality would you like to improve?**

The main issues of this pattern are throughput and latency.

Therefore, we decided choose **performance** to improve it.

2) **What tactics would you choose to improve your design of the messaging infrastructure for the system?**

Increase resource efficiency: add faster processor and additional memory and use faster network to reduce latency.

Maintain multiple copies of data: we can add multiple copies of publisher-subscriber connectors to reduce the overhead and conflict will occur in single connector.

3) **Consider the tradeoffs. What are the issues associated with the selection of thosetactics?**

Increasing resources has the following effects:

- Increase resources mean increase cost.
- difficulty in managing resources.