**Nurturing Process - Capstone Project3– Part -1/2 V2D2 August 2024**

**Case Study 1(Q1-Q6 24 Marks)**

A customer can make a payment either by Card or by Wallet or by Cash or by Net banking.

**Q1. Draw a Use Case Diagram - 4 Marks**

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**Q2. Derive Boundary Classes, Controller classes, Entity Classes. - 4 Marks**

**Answer :**

**Boundary Classes :**

The Boundary class is a class that is the boundary of the system and other system or user ( which is actor in the use case diagram ).

The followings are the feature of the Boundary class.

1. This class is more easy to be changed than the Entity and Control class.

2. The attribute of this class and screen layout are defined at the basic design.

3. In a class diagram , there are cases that the stereotype (<<boundary>>) is added.

4. In a class diagram , there are cases that is shown by the following icon.

**Controller classes :**

The followings are the feature of the Control class.

1. This class has a few attribute.

2. In a class diagram , there are cases that the stereotype (<<control>>) is added.

3. This class is a class to achieves use cases in the Use case diagram.

4. In a class diagram , there are cases that is shown by the following icon

**Entity Classes :**

* The Entity class is a class that has data.
* The "E" of the ER diagram means "Entity" too, if you know the ER diagram, you easily understand.

The followings are the feature of the Entity class.

1. There are many cases that this objects of this class are perpetuated 1 in the DB.

2. The extraction of the class is like ER diagram 2 .

3. This class is related to the DOA (Data-oriented approach) 2 .

4. The module cohesion of this class is high 3 , and is not easy to be changed.

5. In a class diagram , there are cases that the stereotype (<<entity>>) is added.

6. In a class diagram , there are cases that is shown by the following icon

|  |  |
| --- | --- |
| **BOUNDARY CLASSES** | PaymentoptionBoundaryCardpaymentBoundaryCashpaymentBoundaryNetBankingpaymentBoundary |
| **CONTROLLER CLASSES** | PaymentinitiatedControllerCardpaymentControllerWalletpaymentControllerCashpaymentControllerNetBankingpaymentController |
| **ENTITY CLASSES** | CustomerPaymentCardWalletCashServer |

**Q3. Place these classes on a three tier Architecture. - 4 Marks**

Three-tier architecture also known as multi-tier architecture,is a software design pattern that divides an application into three interconnected layers

1. Presentation layer
2. Business Logiclayer
3. Data storage layer

**Presentation tier (front end)**

* The topmost level of the application is the User interface (UI).
* It focusses onnuser interaction.
* It handles user interface,user input and presentation logic.
* It consists of web pages,user interfaces,forms and client side scripts.
* The main function of the interface is to translate task and result to something that user can understand.
* Technologies used: HTML, CSS, JavaScript, Angular, React, etc.

**Example: E-Commerce website**

**Business Logic Tier**

* It is also known as Application layer or middle layer.
* This layer coordinates the application process commands, makes logical

decisions and evaluations and perform calculations.

* It contains the core functionality and business rule of the application.
* It orchestrates the flow of data between presentation and data storage layer.
* It also moves and processes data between to 2 surrounding layers. A dynamic content processing and generation level application server.
* It is often implemented using programming languages such as Java,C#,python.
* Technologies used: Java, C#, Python, Node.js, etc.

**Example: Printer and Payment gateways**

**Data Tier (Back end)**

* It is referred as the data access layer or persistence layer is responsible for managing data storage and retrieval.
* It handles tasks like data access,data manipulation,data querying and data integrity
* Here information is stored and retrieved from database or file system.
* The information is passed back to the logic tier for processing and eventually back to the user.
* Technologies used: SQL Server, MySQL, Oracle, MongoDB, etc.

**Example: MYSQL, Oracle database**

|  |
| --- |
| **USER LAYER** |
| PaymentMethodSelectionBoundary |
| CardPaymentBoundary |
| WalletPaymentBoundary |
| CashPaymentBoundary |
| NetBankingPaymentBoundary |
| **BUSSINESS LOGIC LAYER** |
| PaymentController |
| CardPaymentController |
| WalletPaymentController |
| CashPaymentController |
| NetBankingPaymentController |
| **DATA TIER** |
| Customer(Entity class) |
| Payment(Entity class) |
| Card(Entity class) |
| Wallet(Entity class) |
| Bank Account(Entity class) |

**Q4. Explain Domain Model for Customer making payment through Net Banking - 4 Marks**

* A **Domain Model** represents real-world entities, their attributes, and the relationships between them within a specific business domain.
* It helps in understanding the structure of a system **without focusing on implementation details**.
* Domain model is similar to the entity relationship model.
* The tables are connected to each other.
* In the below diagram, the customer table is connected to bank table, which is why the customer is able to make payment.
* Customer table is also connected to payment table, because he should make the payment.
* Now the payment is done by net banking, so payment table is connected to net banking table.
* The account is in the bank, so the account table is connected to the bank table.
* The authentication table is connected to both net banking table and bank table, because authencation is to be performed there.
* Also, the authentication table is connected to transaction table, because authentication will be done while transaction.

### ****Key Features of a Domain Model:****

### **Represents real-world objects** (e.g., Customer, Payment, Order)

### **Shows relationships between entities** (e.g., A Customer makes multiple Payments)

### **Includes key attributes** of each entity (e.g., Payment has Amount, Date)

### **Focuses on business logic**, not database design or code implementation

### ****Why is a Domain Model Important?****

### Helps Business Analysts and Developers **understand the system requirements**

### Provides a **clear structure** for database and API design

### Ensures **consistency and scalability** in software development



**Q5. Draw a sequence diagram for payment done by Customer Net Banking - 4 Marks**

* A **Sequence Diagram** is a type of **UML (Unified Modeling Language) diagram** used to illustrate how objects or systems interact with each other in a particular order over time.
* It shows the flow of messages between different entities (actors, systems, or components) in a structured way.

### ****Key Elements of a Sequence Diagram:****

### ****Actors (External entities or users):**** Represented as stick figures or labels, they interact with the system.

* **Objects/Components:** Represented as rectangles, these are the internal elements of the system.
* **Lifelines:** Dashed vertical lines that show the lifespan of each component or actor during the interaction.
* **Messages:** Arrows between objects showing interactions (e.g., function calls, API requests, responses).

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**Q6. Explain Conceptual Model for this Case - 4 Marks**

* A **Conceptual Model** for the payment process done by a customer using net banking provides a high-level understanding of the key concepts and their relationships involved in the payment transaction.represents the high-level design of a system, focusing on entities, relationships, and key attributes.
* It helps in understanding the system’s structure and flow of the payment process before moving to implementation.

It serves as a foundation for designing the database schema, defining the application

architecture, and implementing the necessary functionalities within the syste

**Entities and Relationships**

**1.Customer** (Customer\_ID, Name, Email, Phone)

A **Customer** can make multiple payments.

1. **Payment** (Payment\_ID, Amount, Date, Payment\_Type)
* Each payment belongs to one **Customer**.
* Payment can be made using one of four methods: **Card, Wallet, Cash, or Net Banking**.
1. Payment Methods (Specialization of Payment Entity)

**Card Payment** (Card\_Number, Card\_Type, Expiry\_Date)

**Wallet Payment** (Wallet\_Name, Wallet\_ID)

**Cash Payment** (No additional attributes, just transaction details)

**Net Banking** (Bank\_Name, Transaction\_ID)

**Q7.What is MVC architecture? Explain MVC rules to derive classes from use case diagram and guidelines to place classes in 3-tier architecture - 8 Marks**

The Model-View-Controller (MVC) is a well-known design pattern in the web development field. It is way to organize our code. It specifies that a program or application shall consist of data model, presentation information and control information. The MVC pattern needs all these components to be separated as different objects.

 **Model:**

It represents the business layer of application. It is an object to carry the data that can also contain the logic to update controller if data is changed.

**View:**

It represents the presentation layer of application. It is used to visualize the data that the model contains.

**Controller:**

It works on both the model and view. It is used to manage the flow of application, i.e. data flow in the model object and to update the view whenever data is changed.

**Advantages of MVC Architecture**

The advantages of MVC architecture are as follows:

o MVC has the feature of scalability that in turn helps the growth of application.

o The components are easy to maintain because there is less dependency.

o A model can be reused by multiple views that provides re usability of code.

o The developers can work with the three layers (Model, View, and Controller) simultaneously.

o Using MVC, the application becomes more understandable.

o Using MVC, each layer is maintained separately therefore we do not require to deal with massive code.

o The extending and testing of application is easier.

Three-tier architecture, which separates applications into three logical and physical computing tiers, is the predominant software architecture for traditional client-server applications.

**Rules to derive the classes from use case diagram-**

1. Combination of one actor and one use case results in one boundary class.
2. Combination of two actor and one use case results in two boundary class.
3. Combination of three actor and one use case results in three boundary class.
4. Use case will result in controller class.
5. Each actor will result in one entity class.

Consider the example of Online shopping application with the following use case:

**Model Classes**-Customer, Payment, Net Banking, Card, Cash

**View Classes-**Login View, Payment Option View, Net Banking View, Bank Selecton View, Credentials View, Payment Amount View, Payment Confirmation View, Logout View

**Controller Classes**-Login Controller, Payment Option Controller, Net Banking Controller, Bank Selection Controller, Credentials Controller, Payment Amount Controller, Payment Confirmation Controller, Logout Controller

**Q8. Explain BA contributions in project (Waterfall Model – all Stages) – 8 Marks**

* A waterfall model is very old and traditional model in IT industries. It

is a progressive implementation of the projects which is divided into

different phrases of SDLC.

* The business analyst will **verify the product is delivered as per the**

**requirements and it is meeting the business need**.

**Stages in Waterfall Model:**

1. Requirement Gathering and Analysis

2. Designing

3. Coding

4. Testing

5. Deployment

6. Maintenance

* **Requirement Gathering and Analysis:**

This is the initial stage of the project where is an involvement of the BA. BA is responsible for preparing BRD document (Business Requirement Document )

**Artifacts**: Functional Specification document. Bussiness Requirement Document.

**● Designing:**

In this phase the architect will start designing the system based on the business analyst inputs and requirement documents. The BA helps him to clear the doubts about the requirements.

**Artifacts**: Design Documents and UML diagrams get ready in this phase.

● **Coding :**

This phase is quite lengthy as the core development starts in this phase. Developer start product development based on the requirement document prepared by the BA. Developer may ask questions to BA regarding the requirement and he needs to answer the questions as and when required.

**Artifacts:** Code

● **Testing :**

After coding, the testing phase will start, In this phase BA helps the testing team to understand the requirements so that they will build proper functional test cases. BA has to review whether the test cases covering the whole functionality.

**Artifacts:** Test Cases and test results.

● **Deployment:**

Once the code is developed and tested,It is ready to deploy in the production environment. The BA will verify the product is delivered as per the requirements and it is meeting the business needs.

**Artifacts:** Implementation Review document.

● **Maintenance:**

Once the implementation is done the team has to give support by

installing patches, Handling change requests.A BA is the person who knows every nook and corner of the project. So every change request has to be reviewed by him and based on his inputs and reports the team will respond.

**Artifacts:** User Satisfaction review and change request review

**Q9. What is conflict management? Explain using Thomas – Kilmann technique – 6 Marks**

* Conflicts can occur due to various reasons, such as differences in goals, values, personalities, resources, or communication breakdowns.
* Conflict is an inevitable part of any workplace. So it is important to resolve it to promote learning and growth.
* Conflict management is nothing but the process of identifying and addressing conflicts in a healthy and constructive manner. It consists of strategies and techniques aimed at resolving disputes, disagreements, or differing perspectives among individuals or groups .
* By identifying the conflicts efficiently, it will in turn be helpful to reduce negative impact and increase positive impact.
* It is a process or skill to find creative ways to handle the disagreement.
* Thomas – Kilmann approach is widely used to recognize the approaches for conflict management

**5 options for conflict management:**

* Competing
* Avoiding
* Accommodating
* Collaborating
* Comprising

**Managing Conflicts:**

* Conflicts require high level of energy for resolution
* Managing conflicts is all about maintaining the relations.

**Steps to Conflict Management:**

* Identify the conflict
* Discuss the details
* Agree with the root problem
* Check for every possible solution for the conflict
* Negotiate the solution to avoid the future conflicts.

**Thomas – Kilmann technique**

**Y axis- assertiveness**

**X axis- co-cooperativeness**

**High Assertiveness and High Cooperativeness**

– Collaboration- means working together to find solution

**High Assertiveness and Low Cooperativeness**

– Competition- means defensive, that is standing for your individual beliefs and

trying to win.

**Low Assertiveness and High Cooperativeness**

– Accommodation- stakeholder will prioritize their needs over others.

**Low Assertiveness and Low Cooperativeness**

– Avoidance- means ignoring the conflict Assertiveness- the extent to which the

person attempts to satisfy his own concerns.

**Cooperativeness**- the extent to which the person attempts to satisfy the other

persons concerns.

**Q10. List down the reasons for project failure – 6 Marks**

**1. Poor planning**

Although sometimes overlooked in importance, lack of planning can make a project fail. Having a successful project depends on properly defining in detail the scope, the time frame, and each member’s role. This way, you’ll have a route laid out to follow.

**2. Inconsistently defined resources**

Let’s be clear: planning shouldn’t be limited to agendas, meetings, and responsibilities. It should also include human, intellectual, financial, or structural resources. If these are not consistently determined, deadlines can’t be met, which can jeopardize the project’s conclusion.

**3. Unclear objectives**

objectives should be clearly defined, so as time goes by, you’ll know if you’re doing what’s right or not. Remember that choosing measurable goals helps you better visualize your progress and helps you see how close you are to achieving your results.

**4. Lack of detail control**

Monitoring is essential for successful projects, even knowing the details of many projects simultaneously can be very challenging. As a result, it’s important to know how your project is going, if it is on schedule and if the budget is under control. This way, if there are any divergences from the initial plan, you can still correct them.

**5. Lack of transparency**

It’s essential that everyone involved in the projects have complete project visibility so that it doesn’t fail – not only the project manager, but other team members too.

This includes clear communication, good document management, and transparency about tasks’ status, all of which can be achieved with centralized, all-digital files.

**6. Lack of communication**

Communication is the key to good project management. Without the right tools and processes to allow interaction among team members and the project manager from the beginning, efficient communication can seldom be achieved.

**7. Change of direction**

Among the ways projects fail, a very common one is scope creep. This concept refers to changes requested when the project has already started which had not been planned before. This is very common when projects are not appropriately documented and defined beforehand.

**8. Unrealistic expectations**

When you want to do something fast, with a limited budget, and a reduced team, it can really make your project fail. You should be realistic when it comes to your teams’ capabilities, deadlines, and the resources available – only then can you obtain the results you want.

**9. Lack of monitoring**

Providing a schedule to the team is not enough for a project to be successful.

You should also make sure everything goes as planned. This means having frequent progress checks or meetings, as well as making adaptations, when necessary, is essential.

**10. Unrealistic due dates**

Planning co Unrealistic due dates tasks for short due dates is definitely one of the causes for project failure. It is vitally important to carefully consider how long each project phase will take, in addition to extra time for unexpected events. This is the only way to develop a quality project.

**11. Poorly assigned roles**

When each team member receives their responsibilities clearly, they will know what, when, and how to perform their activities without someone needing to constantly ask for it.

**Q11. List the Challenges faced in projects for BA – 6 Marks**

1. **Lack Of Domain Knowledge**

A Business Analyst needs to collaborate with the business users to understand the requirements. Domain knowledge plays a vital role in having a clear and complete understanding of the requirements.It is challenging for Business Analysts to be assigned to a wide variety of projects as learning new domains needs time and energy.

**Possible solution:** Whenever you are assigned a new project, sit with the responsible person and understand the project requirements. Take notes whenever necessary and understand them thoroughly. It is challenging to learn new domains sometimes, but you must make mistakes. Hence, go on a loop until you make a very bit of your knowledge count on your fingertips. It will help you while implementing and

processing the outcome of the project.

**2. Lack of Up To Date Process**

The success of a project does not happen overnight. First, much effort and mental exhaustion are poured in to bring results. Following this, the lion’s share is the up-to-date process of maintaining and evolving the project. The biggest challenge is the

lack of up-to-date techniques and documentation. In most cases, the Project Documentation is incomplete, which hampers productivity.

**Possible solution:** Testing a system is the most remarkable technique to learn about an existing project. It may seem odd, but it has been used for a long time. To further understand the flow, request a demo from a staff member or SME. Afterward, conduct extensive testing.

**3. Changing Business Needs or Requirements**

Business stakeholders frequently request revisions to requirements even after they have been finalized and approved, as experienced by Business Analysts.

It might happen more once, even for the exact requirement, making it one of the most frequent issues. These adjustments could have an impact on the Business Analysis effort as well as the total project effort, cost, and schedule.

**Possible solution:** A change in the implementation cycle might impact the delivery process even if there are approaches that, like Agile, accept change. Business Analysts and other essential stakeholders must therefore determine how the difference may be implemented in the best way.

**4. Inadequate Stakeholder Involvement**

One of the essential success criteria for every project is stakeholder involvement. You might encounter any of the following as a Business Analyst:

**Lack of crucial stakeholders:**If this occurs, there will be multiple problems since they will not be up to date on discussions about the most recent requirements. Either they won’t be able to express their ideas, or they will subsequently propose revisions.

**Stakeholders’ Lack of Cooperation:** Occasionally, you may encounter one or more stakeholders who are unwilling to cooperate. It could cause delays, sign-off problems, and even approval problems.

**Possible solution:** Business analystsmay record the requirement discussions, particularly significant decisions made, and distribute them to all stakeholders in the meeting minutes. Before the scheduled requirements sessions, they may ask everyone who wasn’t present to review the points. This will reduce the likelihood of miscommunication and reopening requirements items that have already been closed.

**5. Unrealistic Timelines**

As a Business Analyst, you may find yourself in a problematic situation where timelines might be the concern. In that case, pressure is created, which might hamper your work. In that case, understand how to tackle such a situation while maintaining the quality of the work.

**Possible solution:**Sales Team may be forced to accept a difficult situation for tactical reasons. As a Business Analyst, you cannot change the terms of the agreement, but you can evaluate its effects and inform management of the probable costs and losses. You have the option of starting over. Unrealistic Expectations from

stakeholders are widespread. It’s crucial to manage these expectations balanced without permanently damaging the relationships.

**6. Technical Skills**

When it comes to Business Analysts, it’s a myth that they don’t require technical skills. On the contrary, most of them are champions in coding, know how to maintain business processes, and have a knack for technically undertaking the requirements.

Moreover, Business Analysts are involved in every step of the product development cycle; hence, they must understand the technical and functional side of the business as well.

**Possible solution:** Working with multiple clients, customers, and stakeholders is not easy. It requires a lot of skills to put in to bring the best results. Therefore, develop your skills over time. Whenever you are available, read, take courses and understand the technicality of the Project and the business. This will help you in

developing better Project documents and will help in multiple ways.

**7. Professionalism**

Business analysts are one of the most underappreciated, underpaid, and ignored members of the IT world. They frequently serve as the binding agent between a project’s technical and business aspects. They are the one who contributes to the development of the project plan and who supports the project from beginning to end. They will collaborate with developers to ensure the project is constructed

following the most current standards and satisfies the business expectations.

**8. Managing Communication**

When you communicate effectively, you aid developers in understanding the needs, limits, and requirements of the business.You contribute to the development of solutions that benefit the client as well as the company. You guarantee the work is

completed on schedule and to the required standards. But communicating the point is difficult. It involves a variety of abilities and trade secrets.

**Possible solution:**Soft skills are part of better work opportunities and personality. Try to communicate your views clearly and confidently to your team so they can understand them easily. It will help incur the communication gap between the team. While intersecting with the stakeholders, try to break the idea into pointers and explain the leads to them.

**9. Conflict with Users**

Sometimes, you might find yourself in a situation where you cannot understand the user’s complaint. It happens during the product release stage and might come as rude feedback. Even conflict between stakeholders and business analysts may arise

when a team suggests a new strategy pertinent to the existing business process.

**10. Mindset**

Business analysts must be prepared to deal with various difficulties throughout their work, from limitations of the technologies they employ to push back from stakeholders and other team members. But how one approaches their task can significantly alter if they are ready for the most typical obstacles.

**Q12. Write about Document Naming Standards – 4 Marks**

All documents will be named using some standards

like [ProjectID][Document Type]V[X]D[Y].ext

**Example:**

PQ786BRDV1D2.docx

PQ786BRD1.2.docx

**Q13. What are the Do’s and Don't s of a Business analyst – 6 Marks**

* Never say “NO” to the client
* There is no word called as “BY DEFAULT”
* Never imagine anything in terms of GUI
* Question everything in the world
* Go to the client with plain mind that is with no assumptions
* Listen to the client very carefully and after he is done, then ask questions
* Don’t interrupt the client.
* Never try to give solutions to the client right away.
* Try to concentrate only on important and required things.
* Be like a lotus in mud- if a client comes with a fancy requirement, then talk to the project manager first.
* Requirement hurried-project buried.
* Never criticize the stakeholder. Always appreciate the stakeholder even for small efforts.

**Q14. Write the difference between packages and sub-systems – 4 Marks**

**Packages**

A Packages is a grouping and organizing element in which other elements reside, which must be uniquely named. In the UML, packages are used in a manner similar to the way directories and folders in an operating system group and organize files. For example, the project management system may be decomposed

into a collection of classes organized into packages.

* It is a group of classes or use cases that are used to organize model elements.
* Packages can be nested within other packages.
* These are used as containers to organize elements.
* It is very useful to represent system architecture.

**Sub-Systems :**

* It is logical grouping of related components.
* It is collection of classes, packages, libraries and other sub systems that work together to deliver a specific set of functionalities

Recall that a system is an organized collection of elements that may be recursively decomposed into smaller subsystems and eventually into non decomposable primitive elements.

For example, the project management system may be decomposed into the following:

* A user interface subsystem responsible for providing a user interface through which users may interact with the system
* A business processing subsystem responsible for implementing business functionality
* A data subsystem responsible for implementing data storage

functionality.

While a package simply groups elements, a subsystem groups elements that together provide services such that other elements may access only those services and none of the elements themselves. A subsystem is shown as a package marked with the subsystem keyword.

**Q15. What is camel-casing and explain where it will be used- 6 Marks**

* Camel case is a naming convention for writing file or object names

using compounded or joined words with at least of those words

beginning in a capital letter.

* Camel-casing refers to the naming convention of variable, parameters or properties. Here, multiple words are combined together.
* In camel-casing, the starting letter of first word starts with small letter and other words first letter starts with capital letters.
* Camelcase is used in programming language to name different files

and functions without violating the naming laws of the underlying

language.

* Camel case is also known as medial capitals and Pascal case.

The term camel case is derived from its appearance, which can

resemble a camel's back.

* It is used in many programming language that doesn't allow spaces in file names. Camel case enables the creation of names that are more unique and have more meaning for the developer.

For example, file names Bigball, BigBall and bigBall can be read

much more easily than bigball

* Camel Case is a way to separate the words in a phrase by making

the first letter of each word capitalized and not using spaces. It is

commonly used in web URLs, programming and computer naming

conventions.

**Use of Camelcase**

* In BA, camel-casing is used in requirements documentation.
* In requirement documentation, BA often use camel-casing to name the entities like use case, features, user stories like validateCustomerDetails, calculateInterestRate.
* Business rules, which should be satisfied by the system use camel-casing.
* While documenting business process or work flows, camel-casing can be used to individual in steps.
* This will help maintain consistency in the document.
* The database tables name also uses camel-casing.

Requirement naming- camel casing is used in requirement document also, to name the functional and non-functional requirements.

By using camel casing in the documents, it helps to maintain consistency in the entire document and also increases readability.

**Q16. Illustrate Development server and what are the accesses does business analyst has? -6 Marks**

* A development server is a type of server that is designed to facilitate the development and testing of programs, websites, software or applications for software programmers.
* A development server refers to a dedicated environment that is used during

the software development process.It provides platform for the developers and the testers to build, test, develop and debug the application.

* It provides a run-time environment, as well as all hardware/software utilities

that are essential to program debugging and development.

* A development server is the core tier in a software development environment, where software developers test code directly.
* It is comprised of the essential hardware, software and other components used to deploy and test the software under development, including bulk storage, development platform tools and utilities, network access and a high-end processor.
* Upon testing completion, the application is moved either to a staging server or

production/live server.

**The accesses a BA has are**

Business Analyst has the visualizing access in development server.

BA has the access to all the functional servers and not to the technical servers.

**Read Only**- BA’s may be granted with the read only access to the development server.

This will allow them to view the user interface of the application, navigate through the features and also, they will be able to observe the behaviour of the application.

**Limited Access**-Depending upon the project needs, the BA’s will be granted limited access to the specific modules in the application.

**Limited Configuration Access**- Means BA have the authority to make changes in certain areas of application where they have the access.

**Q17. What is Data Mapping 6 Marks**

**Ans**.

* Data mapping is the process of matching fields from one database to another. It's the first step to facilitate data migration, data integration, and other data management tasks.
* Data mapping bridges the differences between two systems, or data models, so that when data is moved from a source, it is accurate and usable at the destination.
* Data mapping has been a common business function for some time, but as the amount of data and sources increase, the process of data mapping has become more complex, requiring automated tools to make it feasible for large data sets.
* Data mapping is an essential part of many data management processes. If not properly mapped, data may become corrupted as it moves to its destination. Quality in data mapping is key in getting the most out of your data in data migrations, integration, transformations, and in populating a data warehouse.
* Data mapping is an essential part of ensuring that in the process of moving data from a source to a destination, data accuracy is maintained. Good data mapping ensures good data quality in the data warehouse
* The database contains multiple tables in it.
* There may come a scenario, where we need to map the data from one table to another.
* Data mapping is necessary in cases where we want quick manner.
* Data mapping is nothing but a process to establish connection between multiple data sources.
* The purpose of data mapping is to ensure that the data is accurately transferred or converted into different format.

**Purpose of Data Mapping:**

The main purpose of data mapping is

**Data integration**

While combining the data from different sources, it ensures that the data is properly

matched.

**Data Migration**

While migrating the data from legacy system(source) to the new system(destination), the data elements are mapped accurately into the new system.

Required techniques are applied to covert the data into the format that is required by the new system.

**Data Transformation**

Data transformation means converting the data from one format to other. In data mapping, data transformation plays very important role which ensures that the data of legacy system(source) is mapped correctly to the data in new system (destination

**Q18. What is API. Explain how you would use API integration in the case of your application Date format is dd-mm-yyyy and it is accepting some data from Other Application from US whose Date Format is mm-dd-yyyy 10 Marks**

* An API, is Application Programming Interface, is a software-to

software interface. APIs provide a secure and standardized way for

applications to work with each other and deliver the information or

functionality requested without user intervention.

* An API, or application programming interface, is a set of defined

rules that enable different applications to communicate with each

other. It acts as an intermediary layer that processes data transfers

between systems, letting companies open their application data and

functionality to external third-party developers, business partners,

and internal departments within their companies.

* It is a software intermediary that allows the two applications to communicate with each other.
* It is the set of rules, protocols and tools that define how different software application should interact with each other.
* API allows sharing of only necessary information and keeps the internal system details hidden, which helps the system security.

For the above scenario, Establish API communication- set up API communication between your application and other application to exchange data.

**Data formatting:**

While sending the data from one application to other, convert the date format from dd-mm-yyyy to mm-dd-yyyy

While receiving the data from other application, parse the data and extract the date, month and year and re-arrange them accordingly. Perform Data Validation and ensure that the converted date remains in a valid format.

**Data Parsing:**

When receiving date data from the other application,parse the mm-dd-yyyy formatted date into your application’s dd-mm-yyyy format.Again you will need to extract the day,month and year components and rearrange them accordingly.

**Data Validation:**

Perform data validation and ensure that the converted data remains valid after the format conversion.Check for edge cases,such as invalid dates or date ranges that might be affected by the format conversion,and handle them appropriately.