**RPA(Robotic Process Automation):**

            It allows Organizations to automate repetitive tasks , role - based tasks , documentation etc. by bots. (Generally Mimics Human Actions)

            These bots run in a server like how a normal human would and run the Programmed Tasks at scheduled time (or Need Basis)

            NOTE: Every process can't be automated.

**Where are RPA Used?**

        Scenario 1 - Credit card Fraud Detection

        Scenario 2 - Data Entry (Single Source and Multiple Source)

**Credit Card Fraud Detection:**

        RPA Checks the constraints To Find Whether there is Fraud on  Credit Card.

        The constraints Might be Like

            1.Location of Last  Access

            2.usual amount of transaction

            3.No. of times , wrong pin entered

        Traditional Method of Credit Card Fraud Detection is  done using Machine Learning Model. It can't take actions , it either needs RPA or a Backend System

**Pros of RPA:**

        1.Saves cost

        2.More Accurate in Lesser Time

        3.Easy to implement and learn

**Top RPA Tools Used:**

        1.UiPath

        2.blueprism

        3.Automation Anywhere (Tool we are Using)

**RPA LifeCycle:**

**1.Discovery Phase:**

        Every Organization has their own Process Architect ( that is 'Business Analyst (BA)' )

        They act has the bridge b/w Client and the development Team.

        They Collect the Information about the process and all other required data for that process that client wants to automate.

        They Would analyse the Process and Check whether the  given task is feasible for Automation

        If the process is not possible (RPA is not possible) , BA would inform the client with the Proper reasons.

        If it is feasible (RPA is possible) , next BA would Provide the Requirements for the Use – case , (Complexity is Measured)

                ->(Infrastructure): SERVER ram, processor , storage , os

                ->Tools

                ->Sample Dataset with proper format ( .csv , .json or directly in DB) for Testing

                ->Encryption of Sensitive data

                ->Role Based access to RPA Dashboard

                ->Output Datasheet Extracted by RPA bots

                Requirements change according To the Required Process to be automated

        Every Together Forms the 'Process Definition Document (PDD)'

**Complexity and Benefits for use-case:**

                ->Less Time required to read the dataset

                ->No errors in storing data

                ->Keeps Updating the dataset as and when the old one is updated

**2.Solution Design Phase:**

                Solution Designer Creates 'Solution Definition Document(SDD)' by the report(PDD) submitted By the BA.

                SDD is the report which consist of how the RPA bot can be Built

                ->RPA tool to be Used (Automation Anywhere)

                ->Where Credential Will be stored

                ->Time to Schedule Bot (if regular)

                ->Handling Internal Errors (Login Error etc.)

                ->Sending Email ( via Outlook API )

                Solution Definition Document Consists of Object Model Diagram (OMD).

                OMD represents the complete of flow of requested Process.

                That is let us assume a process where client requests you to generate a report of Accounts that have deposit

                amount greater than 10Lakhs

                The OMD Looks Like,

**1.Identitfy the Key Objects:**

                                        ->AccountHolder - person Who owns a Bank Account

                                        ->Account - details of the bank account

                                        ->Transaction - each deposit or withdrawal

                                        ->Report - the monthly excel report generated

**2. Attributes of Each Object:**

                                        01.AccountHolder:

                                                ->holder\_id(pk)

                                                ->name

                                                ->email

                                                ->contact\_number

                                        02.Account:

                                                ->account\_id(pk)

                                                ->holder\_id(fk to AccountHolder)

                                                ->account\_type

                                                ->created date

                                        03.Transaction:

                                                ->txn\_id(pk)

                                                ->account\_id(fk to Account)

                                                ->tnx\_type(Deposit/WITHDRAWAL)

                                                ->amount

                                                ->date

                                        04.Report ( To be Genrated By RPA Bot):

                                                ->report\_id(pk)

                                                ->month

                                                ->generated\_date

                                                ->total\_accounts

                                                ->file\_path

                                3.Relationship :

                                        ->   One Account Holder can have MANY Accounts

                                        ->   One Account can have many TRANSACTIONS

                                        ->   One Report can list many Accounts

                                4.OMD:

                                        ->If Account has deposit more than 10Lakhs , then extract dataand write to Report , USe counter to store data

                                        ->Save the task

                                        ->Execute the Bot

                                        ->Tasks end when all the data is read in Input File

**3.Development Phase:**

                This is phase in which developers create or build a bot using a RPA tool (Automation Anywhere) based

                on the report generated by Solution Designer if available , else by the report generated by Business Analyst

                1.Import the Process Definition from SDD or PDD

                2.Bot Development: Using RPA Tools (Automation Anywhere) to build Workflows

                3.Integrate Business Logic : Conditions, validations , error handling

 4.Add System/Application Connectors: Email,Excel,SAP (These are either UI (Click operations etc.) or API(Send mail via Outlook)

                5. Testing Each Component (Sub Bots - Unit testing - part of process are tested separately)

                6.Version Control(Git etc..)

                7.Code Documentation ( Inline comments (For understanding Purpose) , Bot descriptions)

**Automation Script:**

Written set of instructions provided that tells the bot what to do automatically, without human intervention

                        (Written using Tool)

**RPA tool (Automation Anywhere ) - All in One (All in one tool)**

                        Python Automation - Python Script using selenium,pyautogui,openpyxl

                        Shell/Bash Script - Runs command to copy files , launching program etc.

                        Selenium Web Automation - Java/Python code that  opens browser , fills form,clicks submit

                        Robotic Automation - Workflow script that run taks like extracting  data and sending mails

**4.UAT(User Accceptance Testing):**

                This is the Testing Phase where End-users(Client) test the bot running on development server for various situations and All possible edge Cases by the dataset provided.

                This Occurs After Development and Before Deployment

                Once UAT  is completed , the QA Team of the Organization Test the bot under QA server

                (We have Two separate QA server , sometime when there is not enough Production Servers Available , The QA server are Used as Production Server)

**5.Deployment Phase:**

                This is the phase where the bot is deployed to the production server so that it could run on live data

**NOTE:** Scheduling , Triggering bots are done through Automation Anywhere Control Room

**6.Execute Bots :**

                Executing Bots on production server ,

                1.**Scheduled** On a particular Time Interval

                2.On **Client Request** (Client Post Email Requesting to run the bot to the Organization , then they run the bot)