

On-premises Vs The Cloud :-

On-premises RPA

① Requires own hardware and server housed on-site.

② Limited scalability, expansion requires additional hardware procurement and setup.

③ Requires ongoing maintenance and updates for hardware and software.

④ Limited accessibility, primarily within the organization premises.

⑤ Deployment may take longer due to hardware procurement and setup processes.

The cloud RPA

① Utilizes cloud-based servers and infrastructure managed by the RPA provider.

② Highly scalable, resources can be easily scaled up or down based on demand without significant setup efforts.

③ Maintenance tasks are handled by the cloud service provider, reducing the burden on the IT Team.

④ Accessible from anywhere with an internet connection.

⑤ Faster deployment as infrastructure is already in place, allowing for quicker implementation of RPA solutions.

* **OCR :-** Optical Character Recognition in RPA is a technology that enables robots or software robots to interpret and extract text from images, scanned documents or other type of visual content. OCR technology allows RPA bots to recognize and understand text within images or documents, enabling them to process and automate tasks that involve reading and extracting information from such content.

(*) Benefits of OCR :-

- ① Improved accuracy :- OCR technology helps in achieving higher accuracy levels in data extraction from documents compared to manual data entry. This reduces the risk of errors and improves data quality in automated processes.
- ② Automation of document processing :- OCR enables RPA tools to automate tasks that involve processing documents such as invoices, receipts, forms or contracts by extracting text and relevant information from them.
- ③ Time Savings :- By automating the extraction of text and information from documents, OCR in RPA reduces the time required to process documents manually. This results in faster turn around times for tasks such as invoice processing, document verification or data entry.
- ④ Scalability :- OCR technology integrated into RPA solutions enables organization to scale document processing capabilities as needed without significant additional resources.
- ⑤ Compliance and Audit trail :- OCR in RPA helps organization maintain compliance with regulation by accurately capturing and processing data from documents.

Web technology in RPA :-

- ① Web scraping :- Web scraping involves extracting data from website, web pages or web application. RPA bots use web scraping technique to navigate web pages, locate specific elements and extract relevant data for further processing.
- ② Web automation :- RPA bots leverage web automation capabilities to interact with web browser and perform action such as clicking buttons, filling out forms, submitting data, and navigating through web pages.
- ③ Browser extension and Add-ons :- Some RPA tools offer browser extension or add-ons that enhance their web automation capabilities. These extension enable bots to interact with web browser directly, providing seamless integration with web-based application and systems.
- ④ Web services integration :- RPA bots can integrate with web services and API to access functionality and data from external system or cloud-based platform. This integration enables bots to perform a wide range of tasks, such as retrieving data from online databases, sending notifications via email or messaging services.

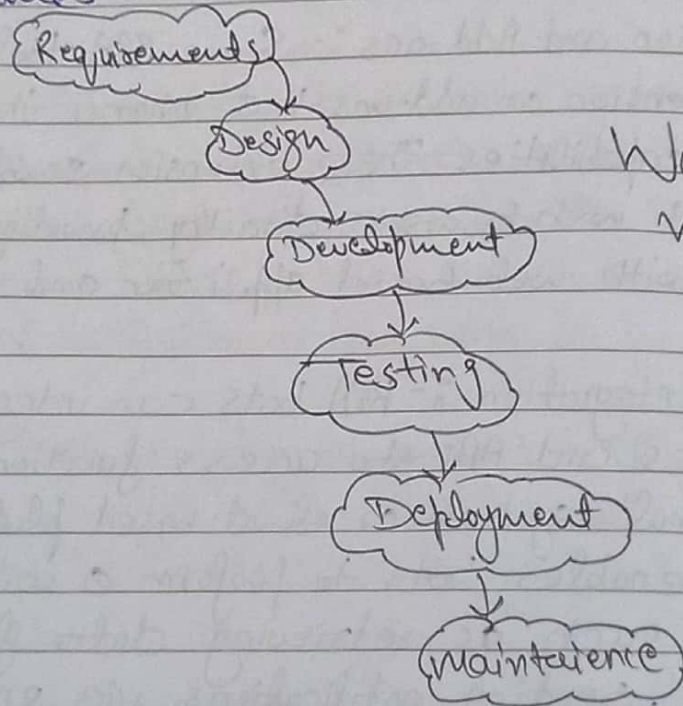
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(*) Waterfall

→ Waterfall is a linear, sequential approach to project management, where each phase of the project is completed before moving on to the next phase.

Application in RPA

→ In an RPA project using the waterfall methodology, the development process progresses through pre-defined stages, starting with requirements gathering, followed by design, development, testing and deployment. This approach may be suitable for well-defined RPA projects with stable requirements and predictable outcomes.



Waterfall model.

(*) Agile

→ Agile is an iterative and incremental approach to project management, emphasizing flexibility, collaboration and continuous improvement. It breaks down the project into small, manageable increments or iterations with each iteration delivering potentially shippable product increments.

Application in RPA

→ In RPA projects following Agile principles, development is done in short iterations, typically 1-4 weeks long, called sprints. Agile allow for faster delivery early validation of feature and adaption to changing business needs. This approach is suitable for RPA projects with evolving requirements or where rapid delivery is essential.

(*) Scrum

→ Scrum is a specific framework within the agile methodology, providing a structured approach to project management through roles (product owner, Scrum master), events and etc.

Application in RPA

→ In RPA projects using Scrum the development team works in sprints to deliver increments of automation functionality. The product owner prioritize tasks from the product backlog, and the team commits to completing a subset of these tasks during each sprint. Scrum provides a framework for collaboration, transparency and development in RPA projects.

(*) Kanban

→ Kanban is a visual management method that focuses on continuous delivery and flow of work. Work items are represented as cards on a Kanban board, with columns representing different stages of the workflow.

Application in RPA

→ In RPA projects utilizing Kanban, tasks related to automation development and deployment are visualized on a Kanban board. The board helps team manage and prioritize work. It helps in emphasizing flexibility, efficiency and minimizing work in progress.

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(*) DevOps in RPA :- It stands for development and operations is an approach that emphasizes collaboration, communication, integration and automation b/w software developers and IT operations team. DevOps principles can be applied in the context of RPA :-

① Collaboration :- DevOps encourage collaboration between developers, operation and other stakeholders. In the RPA context, this means fostering collaboration b/w RPA developers, business analyst, subject matter experts to ensure alignment b/w automation initiatives and business goals.

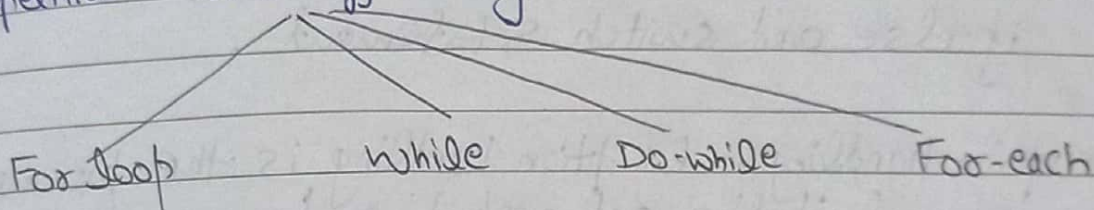
② Continuous integration (CI) :- CI involves frequently integrating code changes into a shared repository. In RPA, CI can involve regularly integrating automation scripts and workflows into a version control system like GIT.

③ Continuous delivery (CD) :- CD extends CI by automatically deploying code changes to production or testing environments after passing automated tests. In RPA, CD practices can automate the deployment of automation processes to production environments, enabling faster delivery of new functionalities and updates.

④ Infrastructure as Code (Iac) :- Iac involves managing and provisioning infrastructure using code and automation technique. In RPA, Iac principle can be applied to manage the infrastructure required for running automation bots, ensuring consistency, reliability and scalability across environments.

⑤ Automated testing :- DevOps promotes automated testing to ensure the quality and reliability of software release. In RPA, automated testing frameworks can be used to validate automation scripts and workflows, ensuring that they perform as expected and meet business requirement.

(*) Loops in RPA :- In RPA, loops are used to repeat a set of action or steps multiple times based on certain conditions or criteria. Loops are a fundamental programming construct that allows robots to automate repetitive tasks efficiently.



- (i) For loop are used when you know in advance how many times you want to execute a set of actions.
- (ii) While loops are used when you want to repeat a set of action until a specific condition is met. The loop continues iterating as long as the condition remains true.
- (iii) Do-while loops are similar to while loops but they execute the loop body at least once before checking the loop condition. This ensure that the loop body is executed at least once, regardless of whether the loop condition is initially true or false.
- (iv) Foreach loop are used to iterate over each element in a collection or array. The loop automatically iterates through each item in the collection, allowing you to perform a specific action for each item.

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④ (iv) Advance Control flow :- Advanced control flow in process automation (RPA) refers to the use of complex logic and branching structures to control the flow of execution in automation scripts. Advanced control flow technique enable RPA developers to build more sophisticated and flexible automation solution that can handle a wide range of scenarios. Some advanced flow techniques are :-

① Conditional Statement :- Conditional statement allow robots to make decision made on specific condition. Common conditional statement include if-else and switch statement.

② Exception handling :- Exception handling is the process of anticipating and responding to errors or exception that may occur during automation execution.

③ Error handling :- Error handling involves detecting and responding to specific error conditions or unexpected situation that may arise during automation execution.

④ Dynamic control flow :- Dynamic control flow technique enable robots to dynamically adapt their behaviour based on runtime condition or external inputs. RPA developers can use dynamic control flow technique such as dynamic branching and dynamic-decision making.

(*) Sequence :- A sequence is a linear set of actions or steps that are executed in a predetermined order. In RPA, a sequence represents a series of activities that are performed sequentially, from start to finish, without any branching or decision-making logic. Sequence are typically used to automate straight-forward processes where the steps follow a fixed sequence and do not involve complex decision-making or branching.

(*) Flowchart :- A flowchart is a visual representation of a process or workflow that uses symbols and arrows to illustrate the sequence of steps, decision and branching logic involved. In RPA, flowcharts provide a visual roadmap of the automation process, showing the flow of control from one activity to another, as well as decision points, loops and conditional logic.

(*) Scaler Variable

→ A scaler variable refers to a simple data storage unit that holds a single value. Scaler variable are used to store and manipulate data within automation scripts or workflows. Scaler variable stores only one value at a time. Scaler variable can hold various types of data, including numbers, strings, dates and boolean values.

Commonly used in :-

- ① Storing and manipulating data.
- ② Tracking and controlling the flow of execution.
- ③ Passing values between activities.
- ④ Handling dynamic data.

- Overall, scalar variables play a crucial role in RPA development by providing a flexible and efficient way to store, manipulate, and manage data within automation scripts, enabling users to perform complex tasks and automate business processes efficiently.

1*) Collection :-

- ① Collections are data structures that can hold multiple values of the same or different data types.
- ② They are typically used to store lists of items, such as customer names, product IDs etc.
- ③ Common types of collections include arrays, lists and sets.
- ④ Collections can be dynamic, meaning they can grow or shrink in size as items are added or removed.
- ⑤ Example :- Lists of email addresses, arrays of invoice amounts etc.

2*) Tables :-

- ① Tables are structured data sets consisting of rows and columns, similar to spreadsheets or database tables.
- ② They are used to organize and manage tabular data, such as employee records, financial transactions or inventory information.
- ③ Each row in a table represents a single record or entity, while each column represents a specific attribute or property of the records.
- ④ Tables support operations such as sorting, filtering and searching, making them suitable for data analysis and reporting tasks.
- ⑤ Example :- Employee databases, customer contact lists.

(*) Text manipulation

→ Text manipulation involves performing operations on textual data, such as string of characters, to extract information, modify content or perform tasks.

Common text manipulation tasks in RPA :-

- ① String concatenation: Combining multiple strings into a single string.
- ② String splitting: Breaking a string into smaller parts based on delimiter.
- ③ Substring extraction: Extracting a portion of a string based on its position or length.
- ④ String manipulation: Modifying the content of strings, such as changing case, replacing character etc.

(*) Data manipulation

→ Data manipulation involves working with structured data, such as tables, arrays or dictionaries to perform operation such as filtering, sorting, transforming or aggregating data.

Common data manipulation tasks in RPA :-

- ① Data extraction: Retrieving specific data elements from structured sources such as databases, spreadsheets etc.
- ② Data filtering: Selecting or excluding data based on specific criteria or conditions.
- ③ Data aggregation: Combining multiple data elements into summary values such as sums, averages or counts.