**Air Ticket Inquiry RPA Project**

**Process Design**

Revision History

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **SN** | **Contents** | **Version** | **Drafted by** | **Reviewed by** | **Modified on** | **Remarks** |
| 1 | Drafted the initial release of the document | V1.0 | Devneet Mohanty |  | 2021.09.30 |  |

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# Flowchart



Diagram

Description automatically generated

# Process Step Description

|  |  |  |
| --- | --- | --- |
| Step | Process description | Automatic or manual |
| 1 | Increment Retry Count | Robot |
| 2 | Fetch process parameters and credentials from Laiye Commander | Robot |
| 3 | Check if parameters and credentials got fetched properly? If no, go to Step 4 and if yes, then go to Step 5 | Robot |
| 4 | Log Error and go to Step 17 | Robot |
| 5 | Check If Configuration File Exists? If no, go to Step 4 and if yes, then go to Step 6 | Robot |
| 6 | Fetch configuration details from the configuration file | Robot |
| 7 | Check if configuration details got fetched properly? If no, go to Step 4 and if yes, then go to Step 8 | Robot |
| 8 | Kill all the running applications such as Chrome and Excel | Robot |
| 9 | Call Open Exchange API to get Exchange rate for Chinese Yuan in terms of USD | Robot |
| 10 | Check if Open Exchange API call is successful? If no, go to Step 4 and if yes, then go to Step 11 | Robot |
| 11 | Get the exchange rate value for Chinese Yuan in terms of USD | Robot |
| 12 | Check if output template file exists? If no, go to Step 4 and if yes, then go to Step 13 | Robot |
| 13 | Check if output report file with current date naming convention exists? If no, go to Step 15 and if yes, then go to Step 14 | Robot |
| 14 | Delete the current date output report file | Robot |
| 15 | Save the template file as output report file with current date naming convention | Robot |
| 16 | Write credentials fetched from Laiye Commander in the output report file | Robot |
| 17 | If Any Exception Occurred in the above steps and error got logged? If no, go to Step 19 and if yes, then go to Step 18 | Robot |
| 18 | Send exception email to Business as given in configuration file and stop the execution | Robot |
| 19 | Launch Chinese Southern Airlines website on Chrome Browser | Robot |
| 20 | Check if the website go loaded properly within the specified timeout? If no, go to Step 21 and if yes, then go to Step 22 | Robot |
| 21 | Log Error and go to Step 35 | Robot |
| 22 | Select “One Way” as the mode of travel | Robot |
| 23 | Enter place of departure and arrival fetched from Configuration File | Robot |
| 24 | Enter the date of departure as one day ahead of the current date | Robot |
| 25 | Click on Search button | Robot |
| 26 | Check if the search results got loaded properly within the specified timeout? If no, go to Step 27 and if yes, then go to Step 22 | Robot |
| 27 | Check if “No search results” message is not found? If no, go to Step 28 and if yes, then go to Step 22 | Robot |
| 28 | Extract all the displayed flight details for Chinese Southern Airlines website | Robot |
| 29 | Check if the Economy Seat price is provided in Chinese Yuan? If no, go to Step 31 and if yes, then go to Step 30 | Robot |
| 30 | Convert the Economy Seat price in USD using the USD conversion rate fetched from Open Exchange API | Robot |
| 31 | Check if Economic seat price for any of the row item null or “--“? If no, go to Step 33 and if yes, then go to Step 32 | Robot |
| 32 | Convert the economic seat price for such row item to 0.0 USD | Robot |
| 33 | Generate the data array for all the flights after determining the Economy seat price for all the flights | Robot |
| 34 | Close Chinese Southern Airlines website | Robot |
| 35 | If Any Exception Occurred in the above steps and error got logged? If no, go to Step 37 and if yes, then go to Step 36 | Robot |
| 36 | Is Current Retry Attempt > Maximum Number Of Retries? If no, go to Step 1 and if yes, then go to Step 18 | Robot |
| 37 | Launch Chinese Eastern Airlines website on Chrome Browser | Robot |
| 38 | Check if the website go loaded properly within the specified timeout? If no, go to Step 39 and if yes, then go to Step 40 | Robot |
| 39 | Log Error and go to Step 51 | Robot |
| 40 | Select “One Way” as the mode of travel | Robot |
| 41 | Enter place of departure and arrival fetched from Laiye Commander & Configuration File | Robot |
| 42 | Enter the date of departure as one day ahead of the current date | Robot |
| 43 | Click on Search button | Robot |
| 44 | Check if the search results go loaded properly within the specified timeout? If no, go to Step 39 and if yes, then go to Step 45 | Robot |
| 45 | Check if “No search results” message is not found? If no, go to Step 39 and if yes, then go to Step 46 | Robot |
| 46 | Extract all the displayed flight details for Chinese Eastern Airlines website | Robot |
| 47 | Check if Economic seat price for any of the row item null or “--“? If no, go to Step 49 and if yes, then go to Step 48 | Robot |
| 48 | Convert the economic seat price for such row item to 0.0 USD | Robot |
| 49 | Generate the data array for all the flights after determining the Economy seat price for all the flights | Robot |
| 50 | Close Chinese Eastern Airlines website | Robot |
| 51 | If Any Exception Occurred in the above steps and error got logged? If no, go to Step 52 and if yes, then go to Step 36 | Robot |
| 52 | Launch Trip website on Chrome Browser | Robot |
| 53 | Check if the website go loaded properly within the specified timeout? If no, go to Step 54 and if yes, then go to Step 55 | Robot |
| 54 | Log Error and go to Step 67 | Robot |
| 55 | Select country as “US” and language as “English (United States)” | Robot |
| 56 | Select “One Way” as the mode of travel | Robot |
| 57 | Enter place of departure and arrival fetched from Laiye Commander & Configuration File | Robot |
| 58 | Enter the date of departure as one day ahead of the current date | Robot |
| 59 | Click on Search button | Robot |
| 60 | Check if the search results go loaded properly within the specified timeout? If no, go to Step 54 and if yes, then go to Step 61 | Robot |
| 61 | Check if “No search results” message is not found? If no, go to Step 54 and if yes, then go to Step 62 | Robot |
| 62 | Extract all the displayed flight details for Trip website | Robot |
| 63 | Check if Economic seat price for any of the row item null or “--“? If no, go to Step 65 and if yes, then go to Step 64 | Robot |
| 64 | Convert the economic seat price for such row item to 0.0 USD | Robot |
| 65 | Generate the data array for all the flights after determining the Economy seat price for all the flights | Robot |
| 66 | Close Trip website | Robot |
| 67 | If Any Exception Occurred in the above steps and error got logged? If no, go to Step 68 and if yes, then go to Step 36 | Robot |
| 68 | Check If any data is available in extracted Chinese Southern Airlines flight data array? If no, go to Step 82 and if yes, then go to Step 69 | Robot |
| 69 | Get first record from the extracted Chinese Southern Airlines flight data array | Robot |
| 70 | Get first record from the extracted Trip flight data array | Robot |
| 71 | Check If flight number of current Chinese Southern Airlines row item is equal to the flight number current Trip row item? If no, go to Step 80 and if yes, then go to Step 72 | Robot |
| 72 | Check If economy price of current Chinese Southern Airlines row item is less than the economy price of current Trip row item ? If no, go to Step 73 and if yes, then go to Step 74 | Robot |
| 73 | Set resultant economy rate and Source Information value as that of Trip row item and go to Step 75 | Robot |
| 74 | Set resultant economy rate and Source Information value as that of Chinese Southern Airlines row item | Robot |
| 75 | Add new row to resultant array and update the flight details along with resultant item values | Robot |
| 76 | Check if next row item is available for the extracted Trip data? If no, go to Step 78 and if yes, then go to Step 77 | Robot |
| 77 | Get next record from the extracted Trip flight data array and go to Step 71 | Robot |
| 78 | Check if next row item is available for the extracted Chinese Southern Airlines data? If no, go to Step 81 and if yes, then go to Step 79 | Robot |
| 79 | Get next record from the extracted Chinese Southern Airlines flight data array and go to Step 70 | Robot |
| 80 | Add new row to resultant array and update the flight details from current Chinese Southern Airlines row item and go to Step 78 | Robot |
| 81 | Check If any data is available in extracted Chinese Eastern Airlines flight data array? If no, go to Step 94 and if yes, then go to Step 82 | Robot |
| 82 | Get first record from the extracted Chinese Eastern Airlines flight data array | Robot |
| 83 | Get first record from the extracted Trip flight data array | Robot |
| 84 | Check If flight number of current Chinese Eastern Airlines row item is equal to the flight number current Trip row item? If no, go to Step 93 and if yes, then go to Step 85 | Robot |
| 85 | Check If economy price of current Chinese Eastern Airlines row item is less than the economy price of current Trip row item? If no, go to Step 86 and if yes, then go to Step 87 | Robot |
| 86 | Set resultant economy rate and Source Information value as that of Trip row item and got o Step 88 | Robot |
| 87 | Set resultant economy rate and Source Information value as that of Chinese Eastern Airlines row item | Robot |
| 88 | Add new row to resultant array and update the flight details along with resultant item values | Robot |
| 89 | Check if next row item is available for the extracted Trip data? If no, go to Step 91 and if yes, then go to Step 90 | Robot |
| 90 | Get next record from the extracted Trip flight data array and go to Step 84 | Robot |
| 91 | Check if next row item is available for the extracted Chinese Eastern Airlines data? If no, go to Step 94 and if yes, then go to Step 92 | Robot |
| 92 | Get next record from the extracted Chinese Eastern Airlines flight data array and go to Step 83 | Robot |
| 93 | Add new row to resultant array and update the flight details from current Chinese Eastern Airlines row item and go to Step 91 | Robot |
| 94 | Sort the resultant data array as per “Economy price” in ascending order | Robot |
| 95 | Write resultant array data in the output report file | Robot |
| 96 | If Any Exception Occurred in the above steps and error got logged? If no, go to Step 97 and if yes, then go to Step 36 | Robot |
| 97 | Send output report email to Business as given in configuration file | Robot |
| 98 | If Any Exception Occurred in the above steps and error got logged? If no, stop the execution and if yes, then go to Step 36 | Robot |

# Exception Description

|  |  |  |
| --- | --- | --- |
| SN | Operation Step | Description |
|  | 2 | Parameters and credentials could not be fetched from Laiye Commander due to server timeout issue. |
|  | 7 | Configuration details could not be fetched properly due to Office not being installed on the machine. |
|  | 9 | Open Exchange API call issue due to server unavailability. |
|  | 19 | Chinese Southern Airlines website loading issue due to server unavailability or cookies changing the UI of the webpage. |
|  | 26 | Chinese Southern Airlines website search results loading issue due to server unavailability. |
|  | 27 | No search results available for the flights in Chinese Southern Airlines website. |
|  | 28 | Chinese Eastern Airlines website loading issue due to server unavailability. |
|  | 44 | Chinese Eastern Airlines website search results loading issue due to server unavailability. |
|  | 45 | No search results available for the flights in Chinese Eastern Airlines website. |
|  | 53 | Trip website loading issue due to server unavailability. |
|  | 60 | Trip website search results loading issue due to server unavailability. |
|  | 61 | No search results available for the flights in Trip website. |
|  | 18,97 | Emails not being sent due to Outlook server unavailability issue. |

# Creator Design Flowchart

***A picture containing text, sky, map, indoor

Description automatically generated***

# Creator Block Description

|  |  |  |
| --- | --- | --- |
| Step | Block name | Steps included |
|  | Initialization | 1-16 |
|  | Get Southern Data | 19-34 |
|  | Get Eastern Data | 37-50 |
|  | Get Trip Data | 52-66 |
|  | Finalization | 68-95,97 |
|  | Notify Exception | 18 |
|  | Common Function | Used to store refined functions |
|  | Exception? | 17,36,51,67,96,98 |
|  | Retry? | 36 |

# Process Public Block Design

The public block function is as follows:

* CleanUp(processName):   
    
  Cleans up any running application whose process name has been specified
* Parameter input: processName
* Parameter description: Fetch the process name from the configuration file. The function will take the process name to forcefully kill the application to ensure no process IDs are running in background via Command Utility.
* InitializeFromCommander():   
    
  Fetches the parameters for the process from Laiye Commander and sets up the global configuration variable
* InitializeFromConfig(configFilePath):   
    
  Fetches the parameters for the process from the specified configuration file.
* Parameter input: configFilePath
* Parameter description: The configuration file usually set up at the res folder consisting of all the configuration details when unattended process will be triggered. In case of attended version of the process, the parameters, and the credential name to be retrieved from Windows Credential Manager is also defined in the file.
* FetchCredentialsFromWindows(credentialName):   
    
  Fetches the credential details for the credential name supplied from the Windows Credential Manager. The credential stored should be of generic type.
* Parameter input: credentialName
* Parameter description: The credential name under Windows Credential Manager where the credential details are stored and need to be fetched.
* SendEmail(senderEmailId, receiverEmailId, emailSubject, emailBody, emailAttachment): Sends the email with specified email subject, body and attachment if provided to the receiver email id specified from the email configured under the Outlook profile of the machine.
* Parameter input: senderEmailId
* Parameter description: The mail ID of the business user who needs to be notified. This is maintained in the configuration file in case of Attended version or is set up at Laiye Commander in case of unattended version.
* Parameter input: receiverEmailId
* Parameter description: The mail ID of the under which the Outlook profile has been configured on the machine where the process needs to be deployed. This is maintained in the configuration file.
* Parameter input: emailSubject
* Parameter description: The email subject which needs to be the part of the email to be sent. The email subjects for both positive and negative scenarios are maintained in the configuration file.
* Parameter input: emailBody
* Parameter description: The email body which needs to be the part of the email to be sent. The email body template for both positive and negative scenarios are maintained in the configuration file which needs to be updated accordingly in the blocks before call this command.
* Parameter input: emailAttachment
* Parameter description: The email attachment file path which needs to be the part of the email to be sent. The email attachment can be passed as a blank string if no attachment needs to be sent along with the email.

# Custom Plugins Used

* DevneetExcelPlugin.getRangeOfCells(filePath,sheetName);  
    
  Input parameter: File path of the excel file, Sheet name in the excel file

Function: Get the range of cells used in the given sheet name in the specified excel file path.

# Configuration Documents

An excel configuration file has been used for setting up the configuration related details consisting of three columns, namely Name, Value and Description. For unattended version of the process, we are setting up additional configuration details which are not defined at Laiye Commander. For attended version, we are setting up all the details including the credential name to be fetched from Windows Credential Manager system as well.

 

Attended version configuration file

Unattended version configuration file

# Exception Handling

For the possible exception mentioned in Chapter 3 in this process, ‘try statement’ will be used to try to catch the exception, and to try to handle the exception by re-execution. The maximum number of re-executions will be set, and the maximum number of executions is a configurable item. When an exception occurs in the process and the retries number exceeds the maximum, the process will send the process name and exception information to relevant people through email via Outlook respectively for prompting. Notification receiver is a configurable item.