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Automated Order Management using Robotic Process Automation

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Abstract: The main objective of Robotic Process Automation is to offer improved customer experience and operational excellence by increasing performance, efficiency and agility. RPA is a software robot installed in a user's computer, machine or device that tracks human actions and replicates them to perform the complex, redundant and rule-based work which is performed on a daily basis.

In order management which includes reading the item details as sent by customer in PDF or Excel format, checking those items in inventory. If the stock is not present in inventory then displaying a message that order could not be processed and if the stock is present in inventory then processing it to generate an invoice and then email the generated invoice to the customer in which invoice contains the details of the items, its quantity required and the total cost generated by these items. This entire task could be automated using UI-Path which is a tool to implement Robotic Process Automation. As this tool is not capable of generating invoice, then a third party application invoicely.com is used generate invoices which could be sent to the customer directly.

***Keywords*- RPA, UI-Path, Automation, Order Management, Inventory Management**

1. Introduction

Management is the word used to organize. Being a good manager means that one is a very organized person and can handle things better than others. Automated order management using robot process automation is the future of the way sales are processed. RPA is a technology that mimics the human action that are associated with a multitude of businesses. In the order processing industry, RPA offers a lot of benefits by automating the order processing and fixing all the difficulties and loopholes of this industry with the help of various software. Automated order management using robot process automation saves times, handles complex workflow, flexible and gives high return investment.

In recent times, after pitching quotations, when supplier receives order in PDF format file, it is read by supplier manually and then the stocks are checked in inventory. If the stocks are present then order is confirmed manually through e-mail. Due to the problems mentioned above, the staff members of an order processing company had to invest a lot of time in determining the instructions, comparing typical orders and shipping addresses so as to process the purchase order. The entire process usually took around 20-30 minutes which is surely an inordinate amount of time.

In automated order management, the management of the orders that are processed on different e-commerce websites. Nowadays when the online websites for shopping are replacing the offline shops, the order management is the most important factor that is needed in this business. Automated management of orders is that orders are managed by preset robotic software which needs a onetime input, though regular updates are required, and the rest of the processing of orders is done automatically. Thus removing the need of any man power and building a future that will be time saving and human friendly.

2. Robotic Process Automation

Robotic Process Automation or RPA is the technology which allows configuration of computer software, or a "robot" to integrate and emulate the actions of a human being interacting with digital computer systems to accomplish a business process. These RPA software robots make use of the user interface to capture data and manage applications in the same way as humans do. They illustrate, generate responses and communicate with other systems in order to accomplish on a vast variety of repetitive tasks. Only considerably improved, these RPA software bots or robots never sleep, makes no mistakes and costs a lot less than an employed person.

2.1. Working of Robotic Process Automation

RPA bots or software robots are suited for copying many; if not most human actions. They log into applications, could move folders and files, copy and paste data to different locations, fill form data, could extract both structured and semi-structured data from documents, scrape web-browsers, and many more. Thus RPA or Robotic Process Automation is a technology that mimics the human actions that are associated with a multitude of businesses. The "robots" involved in this process are not the same robots deployed in a physical sense; rather they are the software that are used in computers and works with all business applications.

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2.2. UI-Path Tool for RPA

UI path is one of the widely used robotic process automation tools and it was founded by the Romanian entrepreneur in the year 2015 to provide software which can eliminate the tedious time consuming back office works. It converts boring tasks into automated ones with the help of unique tools. It enables your processes to be more effective and reliable.

UI-Path is a Robotic Process Automation tool which is used for Windows desktop automation. UI-Path is a software company that develops a platform to implement robotic process automation. It is used to automate a repetitive or redundant task and eliminates human interference. This tool is simple to use and has a drag and drop functionality for activities.

UI-path is an advanced tool that is use to design automation processes visually, through diagrams. UI-path executes the processes built in Studio, as a human would. Robots can work unattended (run without human supervision in any environment, be it virtual or not) or as assistants.

In UI-Path, the Automation is associated with multiple aspects and it enables you to automate the rule-based process. To achieve effective automation, each work should be assigned to a specific thing and can be performed effectively. Each activity in UI-Path has to undergo small activities like reading a file, clicking a button, writing a log panel, etc.

These are some of the essential workflows of the UI-path :

Sequence: It best suits for the linear process in moving from one stage to another without causing any disturbance to the workflow.
Flowcharts: It is designed to suit the organizations whose automation requires some logical ability. It clears all the problems in a diversified manner through multiple branching operations.
State machine: It is well designed to suit the needs of the organizations which have huge workflows and a large number of transactions. State machine uses an infinite number of states in their execution which are triggered by a condition (transition) or task.

3. Order Management Using RPA

Order management using RPA is the future ahead in the order processing. It will improve order quality, reduced order-fulfillment time and savings in the order rework costs are the primary plus points of using it in the order processing industry.

3.1. Benefits of RPA in Order Management

1. *Save Time*: The RPA robots work behind the scene, verify the orders, pull out data from multiple systems, check the billing and delivery address and every other customer related information within the time span of a few seconds. In addition to this, they also ensure that there aren't any duplicate orders. And if it is by any chance, the order is further sent to a staff member who resolves the issue manually. This means the entire task which previously took around 20 minutes to solve can now be done within seconds, and with more accuracy and precision.

2. *Handling complex workflows:* Earlier when the workload used to be complex or more than usual, the staff used to resort to 'swivel-seating' process between multiple systems wherein the staff members would spend an exorbitant amount of time in dealing with orders. Such slow service also negatively impacted the order fulfillment. But with the right blend of RPA tools, the multi-system work can be effectively done in a nonintrusive manner due to which handling or accommodating complex workflows becomes easier than ever.

3. *Round the clock operational feasibility*: Since RPA does not require any manual input, the software will make 24*7 operations feasible. Also, the speed of performing tasks of software is many times faster than a human. This will decrease the cycle times and enhance the accuracy and throughput.

4. *Flexibility:* Flexibility is an add-on benefit of using RPA for automating the order processing. Once you define the process and lay down the instructions that the robot software can execute, you can schedule the operation any time. Also, any number of robots can be deployed to work upon the project. In addition to this, you can always reassign tasks to a robot in case there is an influx of other important processes.

5. *High returns on investment:* RPA offers financial benefits to the company as well. Of course, such software can surely seem expensive but the cost of hiring additional employees to manage the order processing and the costly admin mistakes made due to a human error far surpass the cost of software. This is surely an attractive proposition for the order processing industry.

The operating cost of a robot is much lesser as compared to the cost of maintaining a full time labor force and it also adds to the quality of service being delivered. There are many other additional benefits that RPA offers which also reinforce the fact that the software is and will continue to transform the future of order processing automation.

3.2. Excel Sheet to Invoice Generation

As UI-Path tool itself is not capable of generating invoice for the order to delivered to the customer, a third party application invoicely.com

is used to generate invoice of the items required by the customer and processed by the supplier and it is capable of sending the generated invoices directly to the customer. Fig. 1 depicts the complete working which includes PDF extraction, inventory management, generating and sending of invoice.

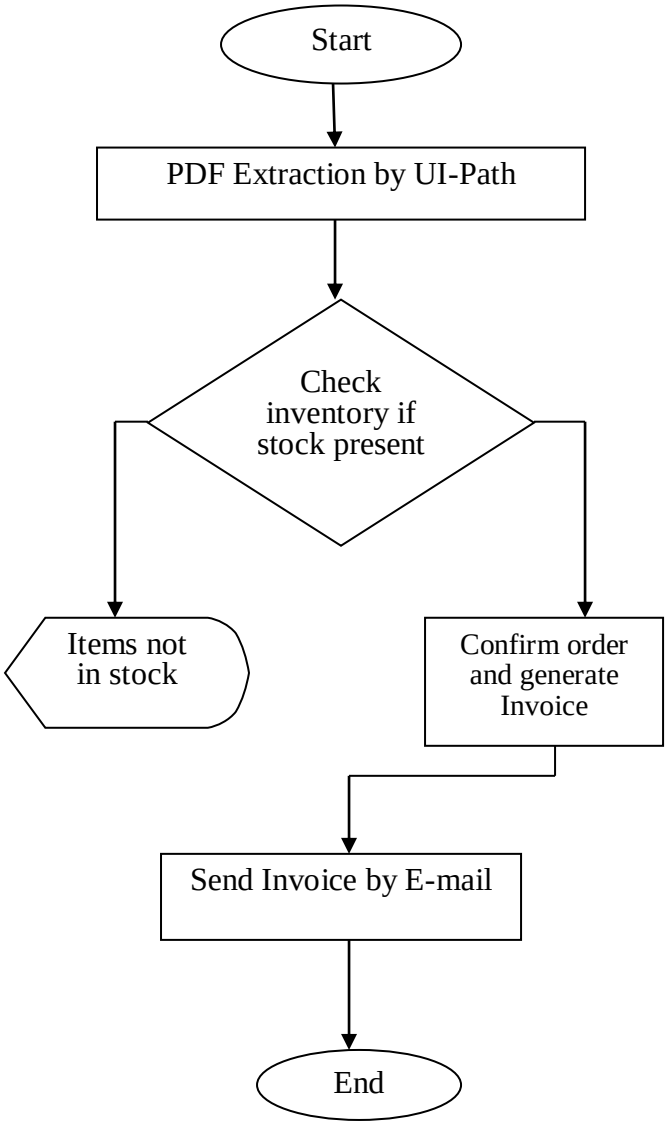

Fig. 1- Flowchart of process for automated order management

4. Result and Discussions

The approach is to read excel data and write specific data into another sheet, and then data is used for generation of invoices.

4.1. PDF Extraction

In PDF extraction, the complete data present in PDF is extracted and then data is written in notepad if required for further processing. In PDF extraction with anchor based Optical Character Recognition (OCR) method, extracting a particular piece of information from complete PDF file present could be done. Thus only required piece of information could be easily selected from complete PDF file. So when PDF file is supplied as input to UI-Path tool, required data present in file is converted into excel sheet.

4.2. Inventory Management

Inventory management includes checking of required stocks in inventory and updating both seller and customer whether the order could be placed or not depending on the quantity of stock present in inventory. It is done on basis of each item as and when required and also the demand when new stock is to be ordered by seller is a part of inventory management. Here inventory management is implemented using flow decision method.

4.3. Excel Data Generation

After the Inventory management, excel sheet is generated for the required items to be supplied to invoicely.com for the generation of invoice. Here write cell method is used to create an excel sheet.

Since all the task is automated, it could be completed in about a minute which includes reading of order details received in PDF format through e-mail, checking the inventory for all the items required by customer and updating the seller about it, generating the invoice for the order as demanded by customer and sending the final generated invoice to customer's e-mail. If this task is done manually, then it might take days for large orders just to check the inventory and the whole process is completely dependent on each person's efficiency of completing a task. Reading all the PDF data manually is itself a tedious task which could be completed in a fraction of seconds by automating the process. By automating, human errors could be removed while generating an excel sheet and generating invoice. Also the humans could be deployed in much skilful work other than data entry operations for processing order, saving several man-hours each day for any organisation, leading to overall growth of both humans and the organisation.

5. Conclusion

In the paper, the problem of manual order management is addressed. It includes receiving order from the consumer, checking order in inventory, managing the order, creating invoice for the items required by consumer

and then mailing the invoice to the customer. All this manual tasks which required investment of both time and money could be accomplished by deploying software bots to work in place of humans, so that humans could do much creative work.

6. Future Work

The robotic process automation is basically software in which a robot is involved and used to perform human activities. These robots are used to carry out the organizational tasks and they are organized in such a way that they can manage any data or actions for the current applications which are used to carry out several business processes.

The future scope of RPA is relatively very high because of following points:

1. *Efficiency*: The software robots are highly efficient they can operate 24/7 without taking any break.
2. *Accuracy*: In order to carry out data entry task, the robots can perform it in the same way as the human beings without making any mistakes.
3. *Cost Reduction*: The software robots help to reduce the organizations cost.
4. *Change management* can be performed easily by the RPA as it reserves the application and data integrity.
5. *Enhanced audit and monitoring compliance*: A detail audit logs are offered by the robots by allowing the advanced business analytics and enhanced compliance.

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