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RPA prospects in transport and logistics

One of the form of digitalization is automatization and robotization. The goals of these processes are to increase the speed of operations, increase productivity and reduce errors due to the human factor. Improving technologies in this area can significantly increase the efficiency of enterprises.

Recent years have been characterized by intensive digitalization of all sectors of the economy and social life. The use of digital technology in everyday life is becoming routine. A thing like a mobile phone was a luxury twenty years ago, and today it is an imprescriptible companion of almost everyone.

One of the most interesting technologies that are changing the world is robotics. For example, in large airports such as Schiphol, the Netherlands and Munich, Germany robots ready to assist passengers. They accompany passengers on the way from the entrance to the airport to boarding and provide all the necessary information.

But robots are not only material objects, but also software products, the task of which is the robotization of business processes. In accordance with the IEEE Corporate Advisory Group, Robotic Process Automation (RPA) is the use of a "preconfigured software instance that uses business rules and predefined activity choreography to complete the autonomous execution of a combination of processes, activities, transactions, and tasks in one or more unrelated software systems to deliver a result or service with human exception management." [1]

In situations in which human labor or the construction and integration of business process management systems (BPMS) are too expensive or not justified by business needs, RPA serves as a transition element between human work and extensive business process automation. [2]

With software robots autonomously executing their choreography uninterruptedly, quickly, flawlessly, and traceably, RPA promises to improve process performance, efficiency, scalability, auditability, security, and compliance while at the same time being easy to implement at relatively low costs compared to traditional process automation [3-5]. Thus, RPA may help to improve process key performance indicators (KPIs), even though software robots do not engage in improving the processes themselves. If software robots execute predefined process flows on the basis of processes that contain inefficiencies or errors, they will also execute inefficient process steps, causing additional costs and superfluous resource use.

The main characteristics of RPA are shown in Fig. 1.

In every large organization there are many such processes that can work for it. About 45% of all typical processes and tasks in organizations can be automated. In the long run, this means not only financial consents, but also a significant increase in the company's operating productivity.

Optimal for redirecting software robots are tasks that do not require analysis and decision-making, but take a lot of valuable working time. These are mostly manual, highly structured tasks based on clear rules that are performed on schedule or

when a certain event occurs (for example, filling out forms, reconciling data, collecting and consolidating data from multiple systems, updating the same data in different systems, re-entering data, processing of invoices and orders using optical character recognition systems, complex calculations, etc.).
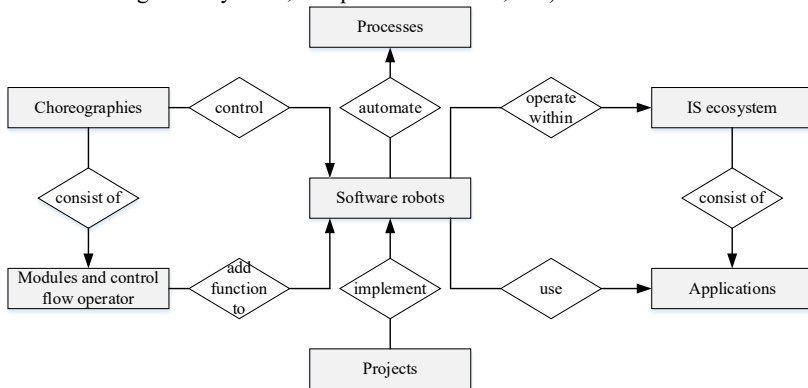

Fig. 1. The nature of robotic process automation, [2]

Robotization of business processes allows you to transfer these tasks to robots that perform them much faster, more accurately and more efficiently, minimizing the possibility of miscalculations, inevitable for human intervention.

RPA can be implemented in a lot of business activity and in logistics too. RPA in transportation and logistics can be used for: shipment scheduling and tracking, invoice processing and credit collections, order and inventory processing, capturing, researching and closing out loads, communication, procurement and inventory, speed invoicing, order and inventory tracking etc. [6]

There are some RPA solutions in logistics [7]:

1) Danish startup SmartRPA automates shipment tracking data like pick-up, reload and delivery status between any Transportation Management System (TMS) and external customers or suppliers.

2) American startup Prompp offers a cloud-based system that enables improve the efficiency of warehouse operations including import and export procedures.

3) Singapore-based GleeMatic uses RPA in order to achieve a three-fold increase in the speed of all transactions due to on-time, error-free documentation.

4) British startup Shipamax uses RPA to extract data from a company's own emails with customers and vendors. It then prepares and structures this data for further analysis.

5) Australian startup CiGen prepares notifications as proof of delivery and pre-payment notifications to keep clients aware of the status of shipments. They automate high volume, low-frequency tasks – such as annual, quarterly or ad hoc batch processing.

Another interesting RPA case was implemented in air cargo transportation. One of the world's leading suppliers of aviation equipment and services has initiated a project to robotize the process of collecting data on air waybills from more than 10 external web portals for tracking air cargo for further processing and entering the data

into the internal accounting system with subsequent notification and emailing reports to the responsible business user.

RPA process includes: monitoring of the e-mail box for receiving letters with attachments, containing a list of air waybills for further processing; search and read data from the relevant external web portal for each air waybill; entering data into the internal accounting system for each individual air waybill, which was successfully read from the web portal; sending the resulting report file with processing statuses to the responsible business user. [8] The following results were obtained: full compliance with internal regulations and operating procedures has been achieved; achieved 100% process automation within the approved requirements; achieved an increase in operational efficiency of more than 400%; achieved 100% accuracy of the obtained data; the duration of the software development period in the customer's environment was 15 days.

Automation and robotization of business processes can significantly increase their efficiency. The experience of the implemented solutions shows that the efficiency increases several times. However, along with the advantages of this technology, there are reasons why it could fail, for example, misunderstanding bots, non-scalable bots, misunderstood IT dependency and selection RPA implementation partner. An integrated approach to the robotization of business processes, taking into account these factors, will allow enterprises to successfully achieve the desired result.

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