

AUDITING SPECIAL ORDERS IN THE AUTOMOTIVE PRODUCTION AREA - THE IMPACT OF AI AND RPA ON THIS ACTIVITY. A CASE STUDY.

Viorel - Costin Banta
The Bucharest University of Economic Studies
Faculty of Accounting and Management
Information Systems,
Management Information Systems Department,
Bucharest, Romania

Sabin – Alexandru Babeanu
The University of Bucharest,
Bucharest, Romania

Cristian Dragos Turcan
The Bucharest University of Economic Studies
Bucharest, Romania

Abstract: This case study was conducted in a company that produces car subassemblies for a number of road cars, the company's headquarters being in Germany. A series of steps were audited and verified, drawing a parallel between the implementation of AI - Artificial Intelligence (for certain steps in the economic process), and whether RPA solutions - Robotic Process Automation, can help in this context. What we wanted to achieve through this article is the fact that these newly created applications can help in carrying out an activity in the production area, the elimination of errors being currently a priority. Errors for this process were initially around 46%, a fairly high percentage. After a series of process improvements were tested by adopting AI and RPA, the error rate decreased by ~ 12%. A number of other improvements could be made, their proposal being shown in the content of this scientific article. The company uses an integrated ERP system - Enterprise Resource Planning - SAP - Systems Applications and Products in Data Processing. The system is hosted in Germany, the Romanian factory being an independent customer - but with implications in the parent company. The use of the integrated system, for the area in Romania, involves the use of several modules, from financial-accounting (FI), sales and distribution (SD), material management (MM), to production planning (PP). The adoption of other solutions was imperative with the last two years in which the pandemic situation in the world required a deep involvement of what meant the automation of economic processes. A series of other economic processes will be analyzed in the future, wishing through this series of scientific articles to be able to bring a feasible point of view and the resulting data to be used by future researchers.

JEL classification: C61, M15, M41, P41

Key words: AI – Artificial Intelligence, ML – Machine Learning, Project implementation, RPA, SAP, ERP, PP – Production Planning, Orders planning

1. INTRODUCTION

From the very beginning, the analysis of the steps to be taken, as well as the automation of some of them, if necessary, was a great challenge for the authors of this article, so the involvement of the business was auspicious. Two perspectives were analyzed: one from an accounting point of view - digital accounting - and another from a production point of view - and here we go to the digital production part. Regarding the concept of digital accounting (Vial G., 2019), it has appeared in the area of accounting practitioners (it is a common language today), moreover, Big 4 audit companies investing very important resources in digitizing accounting processes to create a competitive advantage in terms of business environment - its approach, identifying certain opportunities to improve the business (Gotthardt M., et. al. 2019).

Every organization, which has an ERP system in use, will have to automate its economic processes more and more in the coming years. This is also the case in our case, when this company, together with the pandemic, wanted its activity not to be completely stopped and thus it came to the attempt to robotize certain existing processes. But things were not so easy to do, the collaboration of employees being very low, the fear of losing their job, being one of the fears that the authors of this article faced when starting a modeling and implementation project of the economic process we are discussing in this case study. Several possibilities of collaboration were tried, bringing into discussion the aspect according to which, the loss of the job is not taken into account, the need for staff being very high. Moreover, the desire to automate the existing processes in the factory somehow followed the trend that the parent company launched 3 years ago. This trend proved to be very good in terms of branch management (factories in 6 countries), the error rate decreasing considerably.

Moreover, even the managers of the companies had a significant contribution in setting up these internal audit departments, their purpose being to periodically verify the activity carried out by subordinates as well as the analysis of economic processes - if the steps taken are entirely the ones initially designed of two directions, namely an increased complexity of the managerial act as well as an increasing decentralization of activities in companies - we can speak here of a transfer of authority to department heads, functional teams from different geographical areas - business expansion - so that practically , it is impossible to verify the correctness of what is happening, so the achievement of the company's objectives is difficult to control).

The adaptation of the economic process, called "planning and tracking method for special orders", has as protagonists the employees from the Financial, Logistics and Procurement departments. Each of the actors involved in this process has three types of actions, as follows: R - Responsibility for execution; C - Obligation to co-operate and I - Information. During the implementation of the adaptations brought by the use of AI and RPA tools, each step had to be Verified by (Name) and Approved by (Name, Signature). The purpose of automation was to try to eliminate as much as possible human and process errors, see how reliable such an implementation is and how much it adapts to such changes in the business from Romania.

2. LITERATURE REVIEW

Regarding the research / documentation part, after a series of read articles, we noted that the digital accounting part is defined and used as a synthesis term, in terms of research efforts in the area of digitization and automation of economic processes based on

emerging technologies (Quattrone P., 2013), we can say that the role of technologies is very well defined in both quantity and reporting (Güney A., 2014), (Ghasemi M., et al., 2011), (Taipaleenmäki J., Ikäheimo S., 2013), the adaptation of information systems so that they can adapt and integrate new technologies, the necessary skills their use (Sledgianowski D., Gomaa M., Tan C., 2017), and to the detection of fraud, where possible (Janvrin D.J., Weidenmier Watson M., 2017).

Thus, it is possible to discuss a continuous integration of the new possibilities of interrogation, storage and display of the data necessary for the audit. The digitalization part of accounting is an interdisciplinary field, putting together the part of information technology as well as accounting (Pearson T., Singleton W. T., 2008). The field of accounting (financial / management) is a major one, the digitization of accounting will expand greatly in the coming years (Lehner O., Leitner-Hanetseder S., Eisl C., 2019), the research that will follow will be extremely laborious, the digitization part being found in other areas, such as auditing, education and engineering, business law, ethics and organizational theory, accounting education, etc. ().

In the following I will detail some of the areas of artificial intelligence (AI - artificial intelligence), as well as the machine learning part (ML- machine learning) are beginning to have results: clearing invoice payments - currently many companies are struggling with the pairing of payments made by customers who have been sent several invoices and who have made a single payment, for everything, they incorrectly paying the agreed amount, do not pass the invoice numbers - this way you would know very easily which documents (invoices) would be automatically closed in the issuing system. To close the system-generated documents (invoices) for the customer in question, someone will need to try to distinguish which invoices are part of the payment a customer made.

A smart system could help by immediately suggesting invoices that could match the amount paid and, based on set thresholds, automatically delete short payments or automatically generate a delta invoice. Another area where the benefits of artificial intelligence as well as machine learning can be used is related to auditing expense claims: a common workload in companies - it is related to the cost side, of their follow-up, their audit. Any employee of a company who wishes to make an expense and who is approved, must bring supporting documents, covering the amount received. Each time he (the employee, who requested a sum of money) will bring the supporting documents, so that someone in the accounting will have to verify that the documents are authentic, the amounts correspond to those requested, moreover, to comply with company policy . A major impact (help) would be here for the artificial intelligence party to read these receipts, invoices, to verify them if they are authentic, to have a reading / verification algorithm in accordance with the company's policy, and if there are doubts, to send them further to a manager, for approval. A third area of work (existing activity in a company) that we are talking about in terms of AI and ML involvement, is bonus - granting bonuses (determining bonus accruals). In each company, this activity involves giving a very long time to find ways in which the amounts to be granted as bonuses can be grouped according to certain well-established criteria. A team analyzes current salaries and bonus plans and tries to predict all the KPIs (key performance indicators) in the compensation plans. On this basis, financial managers try to calculate the most accurate forecast (and a difference (an extra amount) can be added, just in case). In fact, we often find out later that accuracy is more a matter of luck. By implementing AI solutions, we could leave this calculation to a machine that uses all available system data and predictive analytics capabilities to obtain an unbiased forecast. In addition, this would give accounting teams more time in the

precious closing period for activities that require human intervention or judgment. Another activity that we can discuss, in which the involvement of ML would bring major benefits, is everything related to risks - identification and assessment of risks (mapping risk assessment). The provision of services by a third party involves the performance of several activities. These activities carry with them a number of risks. So the realization of a project that pursues these risks (with all that means their diminution) is welcome.

3. THE PURPOSE, THE WAY OF ORGANIZING, PLANNING THE SPECIAL ORDERS - WORK STEPS

The detailed analysis of this economic process starts from a deep look at the master data, which must be maintained as efficiently as possible, and the data existing there must be accurate. We will then move on to the process itself (first point: client order), which involves analyzing several steps from checking the existence of codes and prices. Price verification, until Order delivery - which is the last step. Of course, at some point the production part will intervene where the following aspects will be analyzed: Contact the sector responsible / responsible persons where the part is produced and clarify details related to the possibility of execution, deadlines. One of the problems that arose after I presented the existing steps for this economic process was the implementation of the first UiPath robot (this was the solution chosen) - it had to be connected to the SAP system and it was necessary to go through three steps: logging in to SAP, identifying the order needed to verify a material code and the required price. If this information was not found, an previously completed excel file had to be called, the information in it being moved by the bots to SAP. If the information was completed, the order was created - this was done according to a well-defined template, human intervention being reduced by 20%. However, a verification is still performed by the company's employees, regarding the existing stocks in order to make the finished product. They want an automation of check stocks in this area as well - including sending supply orders, if there is not enough stock - this issue will be addressed in a future article.

The responsibility, planning and tracking method for special orders – solution proposed

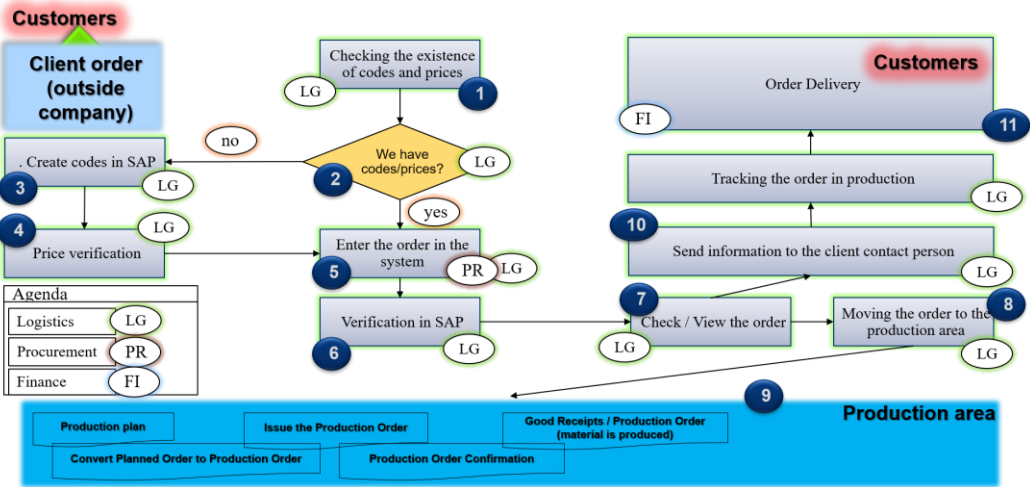


Figure no. 1 – The link between planning, tracking method for special order

4. THE RPA IMPLEMENTATION – SOLUTION PROPOSED

As seen in Figure 2, the solution implemented in the company that wanted automation was largely based on modeling the economic process so that the collaboration between the ERP computer system - in this case SAP and the application that models and automates the process - in the case in front of UiPath. The implemented RPA application was developed in two phases, in the first phase the interactions and the way in which the solution is taken over from the process steps were conceived, in the second phase it is desired to go through the necessary steps to automate the respective steps. The use of the BPM methodology was considered in order to reach a rethinking of the process so that its maturity can be reached. The interaction with SAP was done directly, the storage of the information that wanted to be added being an excel file - transformed into a delimited *.txt file, then imported into a Data table and later, filling in the fields from the SAP transactions chosen to be used. Therefore, the following eleven stages of the project were automated: order entry, verification of existing product codes and related prices, order verification, sending by e-mail the necessary data for a double verification, posting in Financial the accounting notes related to the process, as well as sending the confirmation to the final customer, so that he will be informed when the finished product has gone out of production. Another aspect that we took into account was that of auditing all the steps performed, this being done in SAP, with automatic export of logs, after each completed process. If the process has failed, an e-mail is automatically sent to the process owner who has 10 minutes to intervene and resolve the error. If it does not intervene, the next command is passed - to be solved. Thus, during the monitoring, for 3 months, a number of 23 errors were reported. They could not be compared with the other errors in the implementation of the solution, because their evaluation was not an integrated one.

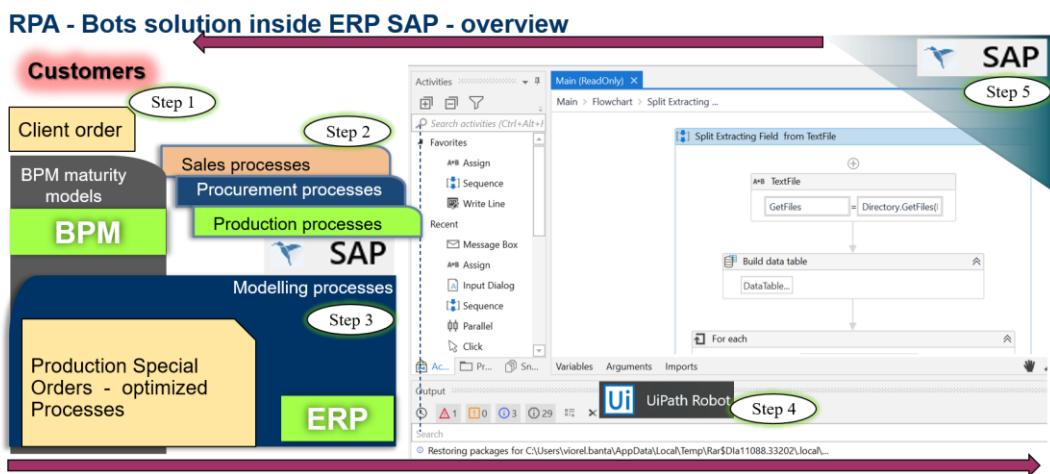


Figure no. 2 – The solution implementation – overview SAP - RPA

5. CONCLUSIONS

The final conclusions that we can draw after this implementation go in the direction of an independent procedure of the existing economic processes in the ERP type systems - in our case SAP. Auditing these processes can be done very easily if the maturity

of their implementation is reached. A number of aspects that we want to emphasize appeared with the last pandemic period, when many companies had to work, somewhat remotely. That is why it was seen that an automation of the existing economic processes in companies will be a must in the future. Not to think that through this stage of technology development jobs will be lost, but to think that highly experienced employees should be used to rethink many economic processes so that human intervention is made as little as possible. We strongly believe that if, analyzing this case study in which there was a decrease of ~ 20% of errors that occurred frequently, an automation would be done for each economic process (of course if it is the case), the errors will be reduced people will be able to be used to create new job opportunities, using the knowledge gained over years of experience. Just as the use of AI and RPA solutions added value, the authors propose the use of the existing audit module in IT solutions, moreover, the implementation of a robot that based on the data collected from that module can have / create an image of overall on the correctness of the steps executed in an economic process. It is clear that the intervention of an RPA solution can be transparent, so that the result is expected and correct in terms of company policies.

REFERENCES

1. Quattrone P. „Management accounting goes digital: Will the move make it wiser?“ Management Accounting Research 31: 118-122, 2016
2. Güney A. „Role of Technology in Accounting and E-accounting“, Procedia - Social and Behavioral Sciences 152: 852-855, 2014.
3. Ghasemi M., Shafeiepour V., Aslani M., et al., „The impact of Information Technology (IT) on modern accounting systems“, Procedia - Social and Behavioral Sciences 28: 112-116, 2011
4. Taipaleenmäki J., Ikäheimo S., „On the convergence of management accounting and financial accounting – the role of information technology in accounting change“, International Journal of Accounting Information Systems 14: 321-348, 2013
5. Sledgianowski D., Gomaa M., Tan C. „Toward integration of Big Data, technology and information systems competencies into the accounting curriculum“, Journal of Accounting Education 38: 81-93, 2017
6. Janvrin D.J., Weidenmier Watson M. „Big Data”: A new twist to accounting“, Journal of Accounting Education 38: 3-8, 2017
7. Pearson T., Singleton W. T. „Fraud and forensic accounting in the digital environment“, Issues in Accounting Education, 23 (4): 545–559, 2008
8. Lehner O., Leitner-Hanetseder S., Eisl C. „The Whatness of Digital Accounting: Status Quo and Ways to move forward“, ACRN Journal of Finance and Risk Perspectives 8 Special Issue Digital Accounting, (2019) I-X
9. Vial G. „Understanding digital transformation: A review and a research agenda“, The Journal of Strategic Information Systems, Volume 28, Issue 2, June 2019, Pages 118-144.
10. Gotthardt M., Koivulaakso D., Paksoy O., Saramo C.. „Current State and Challenges in the Implementation of Robotic Process Automation and Artificial Intelligence in Accounting and Auditing“, ACRN Oxford, JOURNAL OF FINANCE & RISK PERSPECTIVES, ISSN 2305-7394, Volume 8, 2019. Special Issue: Digital Accounting Hanken School of Economics.