

Software-as-a-Service Programs and Project management: A Case Study on Odoo ERP

Codruța Cornelia Dura^{1*}, Imola Drigă¹, and Ana Maria Mihaela Iordache²

¹ University of Petroșani, Department of Economics, 332006 Petroșani, Romania

² Romanian-American University, Department of IT, Statistics and Mathematics, No.1B, Expoziției Bld., Bucharest, Romania

Abstract. The paper aims at presenting the particular way of implementing Odoo ERP (Enterprise Resources Planning) within the Cloud environment, in order to manage the activities involved by a research project. To successfully achieve the objectives of the project - from choosing the research topic to writing the main body of study and disseminating critical information - the Odoo Project module allows the researchers to establish the stages involved in the implementation process, the description of related tasks, the appointment of persons responsible with the procedures of carrying out of the planned activities, the management of tasks in Kanban system, the drawing up of Gantt charts etc. The employment of Odoo ERP in scheduling research activities is highly accessible and easily opens the possibility to connect with other Odoo modules (such as accounting module or e-signature module), thereby saving significant amount of time and efforts related to the analysis of project status data. Moreover, the project progresses can be tracked by using simple devices with an Internet browser and a stable connection, which allow the access to the application via modern Cloud technologies.

1 Introduction

Since ancient times, mankind has been concerned with performing actions according to social norms, rules, traditions and customs. With the increasing amount of information and knowledge available in various domains, it became a great challenge for any organization and employee to find the necessary data at a given moment and in a short span of time. Hence, time has become a pivotal resource in the decision-making processes in any field of activity and due to its non-renewable nature, it must be used as efficiently as possible. By organizing data according to certain models and optimized procedures, one can make rational use of this invaluable resource.

The recent Covid-19 pandemic crisis has brought to the fore the need to retrieve information, regardless of the location of the organization or the person who needs it. The employment of modern techniques for information storage, usage and management has enabled the accelerated development of remote working, in the case of which the information must be available in real-time to the decision makers.

Corresponding author: codrutadura@upet.ro

Due to the financing difficulties that often accompany the current operations conducted by an entity operating in the education and research field, both in normal and exceptional times, it becomes obvious that managers should take into account the necessity of bringing up to date their current processes, under the circumstances of diminishing costs and boosting revenues. To this end, a substantial raise in the managers' awareness regarding the efficiency of cloud computing tools is acutely required.

2 Literature review

Cloud computing denotes an IT service model that gives access to a common pool of customizable computing assets - such as databases, networks, servers, storage capabilities, applications etc. - which can be instantaneously provided to costumers on their request, through the Internet irrespective of their location or accessing devices [1-5]. The innovation behind the concept of cloud computing resides in the opportunity of delivering IT services as utilities, by the same token as other public utilities are provided (water, gas and energy, for instance) [6].

Generally speaking, there are three main models of providing cloud computing services which are put forward by the literature [1-2, 7-11] (fig. 1):

Web Browser

SaaS: Available-for-use application softwares (*Examples: CRM, ERP, Google Aps., Social networks, Act-On etc.*)

Cloud Development Environment

PaaS: A hosting platform which is available for scalable software development according to costumers' needs (*Examples: Salesforce Platform, Microsoft Azure, LongJump, AppScale etc.*)

Virtual Infrastructure manager

IaaS: Focus on storage capabilities, database management, computing power (*Examples: Amazon EC2, Amazon S3, DropBox, IBM BlueHouse, WMWare, RightScale, GoGrid etc.*)

Fig. 1. Types of Cloud Computing services. Adapted from [12].

- Software-as-a-Service (SaaS) represents a paradigm through which the user gets access from the provider to different software applications through the internet, without the incumbency of downloading or updating any software or computer program. Under the circumstances, the manager can achieve significant cost savings related to the acquisition of IT infrastructure, pre-and/or post- support operations, security issues, maintenance services etc. In view of the fact that SaaS cloud technologies frequently show high levels of comprehensibility and that their development represents a fairly easy process, they are extremely widespread among small size organizations;
- Platform-as-a-Service (PaaS) designates another approach in cloud computing whereby the costumers is provided with a ready-to-use platform from which he can avail himself of the desired services, without any load regarding the installing, the setting up or the maintenance of the infrastructure. In this case, significant decreases in costs are also

expected to occur, both in terms of getting the necessary infrastructure and the management issues;

- Infrastructure-as-a-Service (IaaS) settles another paradigm based on virtualization technologies, according to which hardware and software IT capabilities are entirely outsourced to a cloud provider, from operating systems and storage facilities to networks and other components. As a general rule, the client doesn't have to manage the basic hardware components of the cloud infrastructure, but he may control the operating systems, the storage facilities and the employed applications. Managers who choose this "modus operandi" will purchase only components they desire; therefore they will have significant cutoffs on costs related to the IT elements procurement and their continuous operation.

According to Fazli et al. [1], three groups of decisive impact factors may be identified as main determinants that could have a significant effect upon the Cloud Computing adoption process by a small organization (fig. 2):

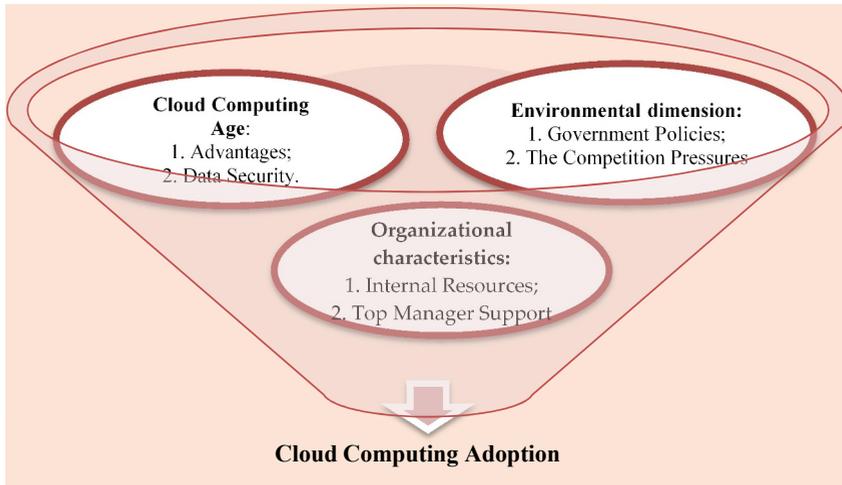


Fig. 2. Main Determinants of Cloud Computing Adoption. Adapted from [1].

- The emergence of Cloud Computing age - which brings before the managers a series of advantages regarding the improvement of processes and the significant decrease of operating costs; nonetheless, it should also be able to offer a proper answer for a series of challenges determined by necessity if providing the security of the data it administers [13];

- The environmental dimension - groups, at its turn, other two forces that operate from the outer business environment and influence the decision of the managers to migrate towards the on-line environment: government digitalization policies [14] and the pressure exerted by the main competitors. For instance, in Romania during the preparation of the Territorial Just Transition Plans [15], it was estimated that efficient schemes to encourage digital education and entrepreneurship were going to become functional during the following years and were capable, besides other properly adapted development instruments, to facilitate transition towards a low-carbon economy. Under the circumstances, by proclaiming the IT advancement as a crucial priority, the governmental authorities will be able to foster the process of Cloud Computing adoption, both in the commercial area and in education & research. In the same vein, local and national competitors with high innovative capacity are going to exert, at their turn, considerable influences in terms of speeding up the adoption process of digital tools;

- Organization's internal characteristics with respect to the appropriateness of internal resources and the top management support [16]. From the resources point of view, the ease of access to performing computers and the availability of a high-speed Internet network would represent the fundamental prerequisites. Furthermore, in order to fully benefit from the Cloud Computing advantages, the possibility of training highly qualified staff also represents a mandatory requirement. Finally, the Cloud Computing embracement endeavors involve top managers with high IT absorptive capacity that will profoundly comprehend Cloud Computing advantages and draw-backs, will bring passion towards their work and will encourage colleagues to take part in the change [17].

3 Project management in education and research entities with the help of Odoo ERP

The main objective of the research presented with the help of the Odoo Project module is to emphasize the techniques of automatic classification by using neural networks as a decision support and to develop classification models of different types of organizations, taking into account the economic context, their financial indicators and their performance on the capital market [18]. The work involved in the research project was performed into several successive stages, with the final results consisting from: i) two articles published in prestigious peer-review scientific journals; ii) one paper disseminated in national and/or international conferences; iii) one book released on the specified topic.

The classification or cluster analysis methods aim at grouping individuals, identified by a series of attributes - numerical variables - into several classes, as few homogeneous as possible. The main feature of these classes consists in fact that they perform a global analysis of the individuals being studied, by using a large number of variables while the assumptions required are minimal. It should also be highlighted that the object of classification could be represented not only by the individuals (which can be found in the rows of the data matrix) but also by different type of variables considered during the analysis approach (these specific variables can be met in the columns of the data matrix).

The main purpose of the classification analysis is to generate different groups in such a way that individuals belonging to the same group are as similar as possible to each other in terms of the values of variables assigned to them while the individualized groups (classes) are as different as possible. We can say that carrying out a cluster analysis involves the necessity of going through two stages: i) choosing a proximity measure or, more precisely, defining a measure of closeness between individuals on the basis of all the variables examined; ii) specifying rules for constructing classes in such a way that that the difference between groups is the greatest possible, while the individuals in the same group exhibit similarities to a great extent.

As far as the applications of classification analysis are concerned, they could be very numerous and could impact various domains such as: marketing research, classification of economic entities according to their performance and/or organizational structures, market positions, managerial strategies etc. The main macro-activities projected in order to ensure the implementation of the research project cover the following phases:

- ✓ Drawing up the research plans in order to prepare two scientific research articles;
- ✓ Identifying and selecting the information needed in order to contextualize the research topic;
- ✓ Collecting the necessary bibliographical resources (statistical data, scientific articles, databases etc.);
- ✓ Elaboration of clustering models by using the above-mentioned classification techniques and the collected data;

- ✓ Identifying critical data for the dissemination processes;
- ✓ Disclosing research results through the articles published in Clarivate Analytics indexed journals;
- ✓ Preparing a manuscript of a research paper in order to take part in an international conference;
- ✓ Designing a plan in order to write a scientific book;
- ✓ Editing and proofreading of the book.

Bellow, we shall present the *Project* module in Odoo ERP (Enterprise Resource Planning), which allows the efficient management of project activities in a specific organization, by highlighting deadlines, distributing resources to each task, assigning responsibilities to persons in charge with the main activities, providing effective tools to enable project work coordination etc. Odoo belongs to SaaS ERP programs which are very useful to streamline the activity of any education and research entity in order to move as quickly as possible to a fast-paced digital transformation and to find solutions for improving time management strategies [19-21].

Generally speaking, ERP products cover all functions performed by a small organization, each area being represented in the program by one or several modules. The use of *Project* module in Odoo can be combined with other modules such as invoicing, correspondence and electronic signature, for a complete digitization of the entity within which it is implemented. Through this module, tasks can be visualized in various ways, such as Kanbans, Gantt charts, Calendars views (set by day, month, year etc.). Consequently, an accurate and complete view on establishing the tasks to perform, defining the project's schedule and establishing the degree of compliance with deadlines is achieved [22-23].

After the user has created an account on the Odoo platform, it is necessary to enter the identification data of the specified organization and then to select the APPS option to identify the desired module (fig. 3). Further on, it is possible to choose the *Project* option in order to enter data about the project in progress.



Fig. 3. The selected Odoo modules for Project Management.

Further on, one can press the *Create* button to design a new project, to enter the project's name and to specify each step and activity contained in the project. The project is separated into several stages and assignments; each task can contain several activities and each column will be a new stage of the research project. In order to append a new stage to the project and set the name of each stage and the person responsible for carrying it out, one can click on the *Add* button. Odoo can add as many tasks as needed to each project (fig. 4). Once added, they can be edited by pressing the *Edit* key or deleted by pressing the Trash option at the bottom of the screen.

For each task there is a certain status at a specific moment: *done*, *in progress* and *blocked* (fig. 5). The status done is given by the green bubble next to the initials of the person responsible. The status in progress has a grey bubble, while the status blocked has a red bubble. The importance of the tasks is given by the yellow tick.

For a better view of the tasks, these can be filtered according to various criteria. Depending on the research project peculiarities, it is also possible to identify unassigned tasks, starred tasks or conflicting tasks. In order to visualize tasks and their status at a

certain moment, there is the *Filters* option located at the top of the screen, just below the search bar, on the central-right corner.

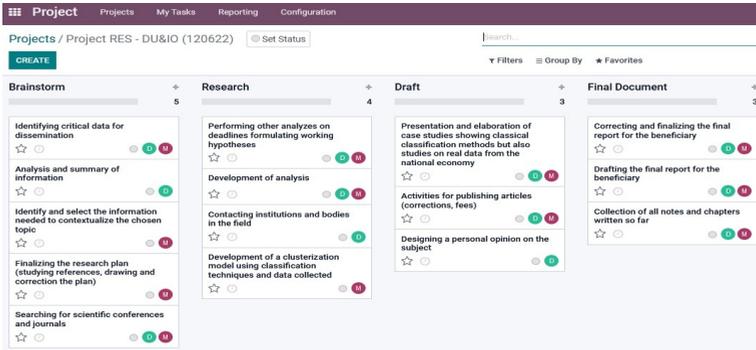


Fig. 4. The assignment of tasks to a research project.

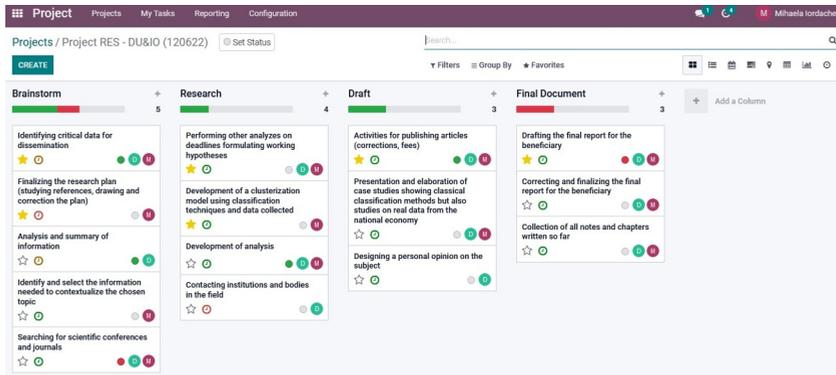


Fig. 5. The activities for each stage of a research project.

As the research project encompasses a rather sophisticated set of processes, it is possible to group and filter tasks in accordance with various criteria by selecting the grouping option on the right side of the screen, next to the filter button. Among the filtering criteria, the following are available: project's final deadline, the creation date, the targeted customers, the person in charge with implementation of each task and several others. There is also the possibility to organize the activities in Kanban style (fig. 6), in such a manner that will ease the identification of issues that influence the projects' performance and will determine the team to focus on performing those activities that maintain the optimal workflow.

Following the definition of a particular task, it is later possible edit it (fig. 7), in order to define or modify some parameters, such as: the responsible person, the client gone after, the final deadline, the dates planned to accomplish the task, the description, the importance of the task in the project and the running mode ("completed", "in progress" or "blocked").

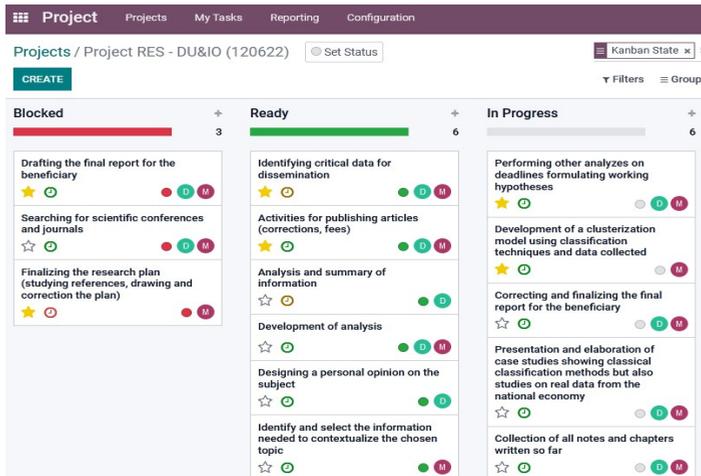


Fig 6. Kanban - style tasks management.

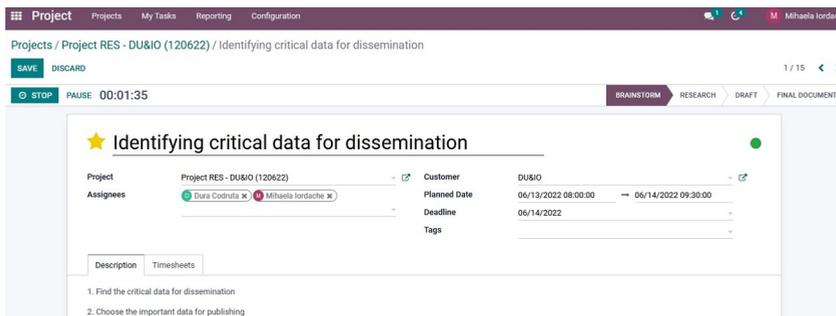


Fig 7. Editing a task in Project management module.

When an activity is completed, the option "Done" can be marked by the responsible person (fig. 8). Activities are not automatically marked as done; they change their status only when the person in charge flags them as finished. Thus, communication can be easily done, documents can be sent and even some tasks can be tracked by having a log note at the bottom of the screen. If a participant in the project has two simultaneous tasks to fulfill, the user will be warned about this situation (fig. 8).

During each stage of the project, there are several actions that can be performed such as archiving, duplicating, deleting and distributing information related to the status of the research project, by pressing the *Action* button at the top of the page. Documents can be distributed between team members by using the *Action* option and then by pressing the *Send* button. Each task can be highlighted with a different color depending on its priority or importance (fig. 9) by clicking on the three dots on the right hand part of the task. At the beginning of each project, it is recommended to choose the colors used and their meaning of each color in order to prevent interpretation difficulties. The platform does not provide explanations for each color, leaving this decision up to the team's choice.

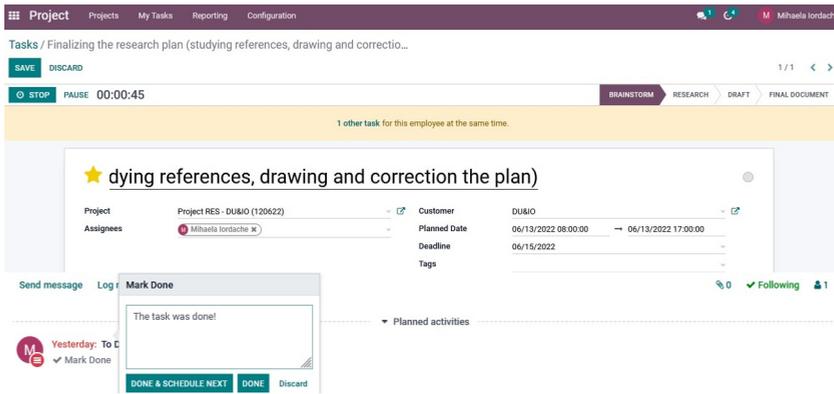


Fig 8. Tagging of a completed work activity.

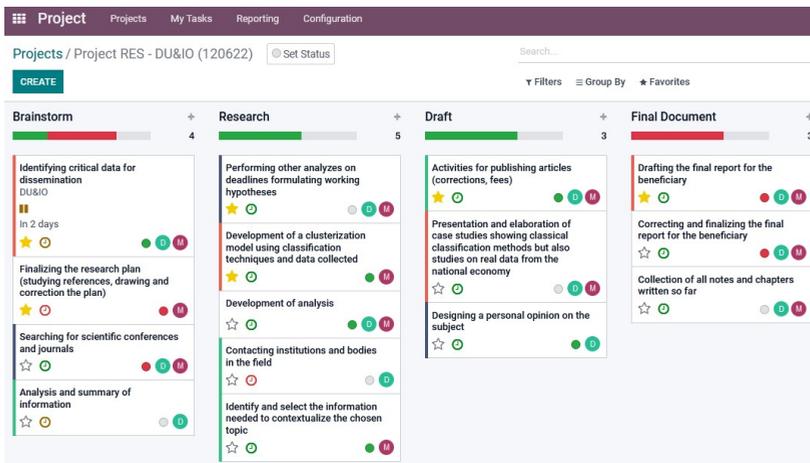


Fig. 9. Flagging tasks by their importance in the project (red - high importance, blue - medium importance, green - low importance).

In order to increase the efficiency of managing project's activities, it is possible to schedule them with the help of the *Calendar*, the option being present on the top right of the screen, after the *Filters* and *Favorites* buttons. In order to successfully schedule an activity, there are two different possibilities: either by selecting a date and adding the activity or by editing the activity already defined and setting the deadline assigned to it. The activities in the calendar can be viewed according to several criteria; one of these models is represented by the Gantt chart (fig. 10). As it is already known, the Gantt chart symbolize an effective project management tool that outline the projects' timeline, with the possibility of being generated by year, month, week or day, according to the complexity of the research endeavors involved.

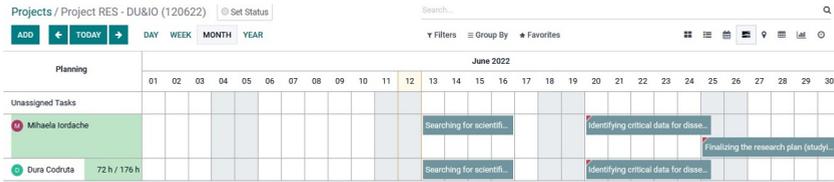


Fig 10. Example of a Gantt chart for the research project.

In the Gantt chart generated by Odoo (fig. 10) there is a counter for each member of the project team, by taking into consideration the number of hours expected to be spent on planned research work. Thus, if the name of a team member is dragged over, then the number of hours available in the selected month will be displayed, together with the total number of hours undertaken by the team member till the final deadline of the entire project.

4 Conclusion

As it became evident from the content of our paper, the Odoo *Project management module* could help in managing any research endeavor in a simple, agile, social, flexible and real-time manner. By means of its facilities, it becomes easy to track the status of each activity/task, to make tasks more organized and more visible. Thus, tasks can be divided into several activities and assigned to different members of the staff. In addition, it is possible to use the calendar, which proficiently highlights of the deadline of each task. Furthermore, visibility of certain tasks can be prioritized according to the main objectives of the research project.

As compared to other project management software products, the advantage of using Odoo is that a small organization can purchase any time other interrelated modules, depending on the amount of the financial resources available. Thus, as a future research concern, we shall be able to simulate the manner in which the *Project Management* component works together with the other modules, corresponding to each function fulfilled by a particular research & education organization.

From the point of view of limitations, these are mostly of technical nature, the quality of the Internet connection being vital both for an appropriate use of SaaS products and for the proper hosting of the organization's servers. Thus, any technical disruption between the server (the software provider) and the client (the entity using Odoo) could impede organization's speed of response to rapid challenges in its environment and could impact its level of profitability.

References

1. S. Fazli, H. Shirdastian, M. Laroche, *Int J Business Env* **7** (4), 415-433 (2015)
2. K.F. Parate, *Cloud Marketing*, *Int J of Research in Finance and Marketing* **8** (5), 1-7 (2018)
3. S. Khan, I.J. Ed and Manag Eng **4**, 44-56 (2019)
4. M. Ivanov, *SHS Web Conferences* **65**, 04019 (2019)
5. M.S. Aswal, *Proceedings of the International Conference on Next Generation Computing Technologies (NGCT), Dehradun, India*, IEEE: New York, NY, USA, 621-625 (2016)
6. A. Shaqrah, *Int J Adv Comput Sci Appl* **7** (4), 39-43 (2016)
7. H. Abid, *Applications of Cloud Computing in Modern marketing*, Working paper series - Botffred Research Society (2020)
8. M.A.M. Abdelmaged, *Investigating the Impact of Omni-health Integration on Waiting Time in Health Care Centers*, *ResearchBerg Review of Science and Technology* **1** (1), 41-49 (2021)
9. M.I. Alam, M. Pandey, S.S. Rautaray, *I J Inf Techn and Comp Sc* **02**, 68-79 (2015)

10. P. Rosati, T. Lynn, Measuring the Business Value of Infrastructure Migration to the Cloud in Measuring the Business Value of Cloud Computing, T. Lynn, J.G. Mooney, P. Rosati, G. Fox Eds., Plagrove Studies in Business and Enabling Technologies, Switzerland, 19-38 (2020)
11. L.D. Radu, *Symmetry* **9**, 295 (2017)
12. C. DaSilva, P. Trkman, K. Desouza, J. Lindič, *Technol Anal Strateg Manag*, 1161-1173 (2013)
13. M. Yin, S. Liu, *Am J Ind Bus Manag* **4**, 94-99 (2014)
14. K. Kim, G. Lim, *J Theor Appl Electron Commer Res* **17**, 199-211 (2022)
15. Report on the Transition Process towards Climate Neutrality for Romania (DRAFT) 22.01.2021, Support to the Preparation of territorial Just Transition Plans in Romania, Frankfurt School of Finance and Management, Available on <https://www.cjhunedoara.ro/>
16. J. Costa, R. Castro, *J Theor Appl Electron Commer Res* **16**, 3043-3062 (2021)
17. A. Priyono, A. Moin, V.N. Aini Oktaviani Putri, *J Open Innov Technol Mark Complex* **6**, 104 (2020)
18. C. Dura, A.M.M. Iordache, A. Ionescu, C. Isac, O. Breaz, *Sustainability* **14**(9), 5567 (2022)
19. S. Gupta, S. Kumar, S. Kumar Singh, S. Foropon, C. Chandra, *Int J Logist Manag* **29**, 659-675 (2018)
20. B. Johansson, A. Alajbegovic, V. Alexopoulo, A. Desalermos, Cloud ERP Adoption Opportunities and Concerns: The Role of Organizational Size, *System Sciences (HICSS), 48th Hawaii International Conference*, 4211-4219, IEEE-Institute of Electrical and Electronics Engineers Inc. (2015)
21. P. Rosati, T. Lynn, Measuring the Business Value of Infrastructure Migration to the Cloud in Measuring the Business Value of Cloud Computing, T. Lynn, J.G. Mooney, P. Rosati, G. Fox, Eds., Plagrove Studies in Business and Enabling Technologies: Switzerland, 19-38 (2020)
22. C.Y. Gómez-Llanez, N.R. Díaz-Leal, C.R. Angarita-Sanguino, *Aibi Rev DelInvestig Adm E Ing* **8**, 145-153 (2020)
23. J.Y. Wu, L.T. Chen, Odoo ERP Business Intelligence Tool for a Small Medium Enterprise: A Scenario Case Study, *Proceedings of the 11th International Conference on e-Education, e-Business, e-Management and e-Learning*, Osaka, Japan, 10-12 January (2020)