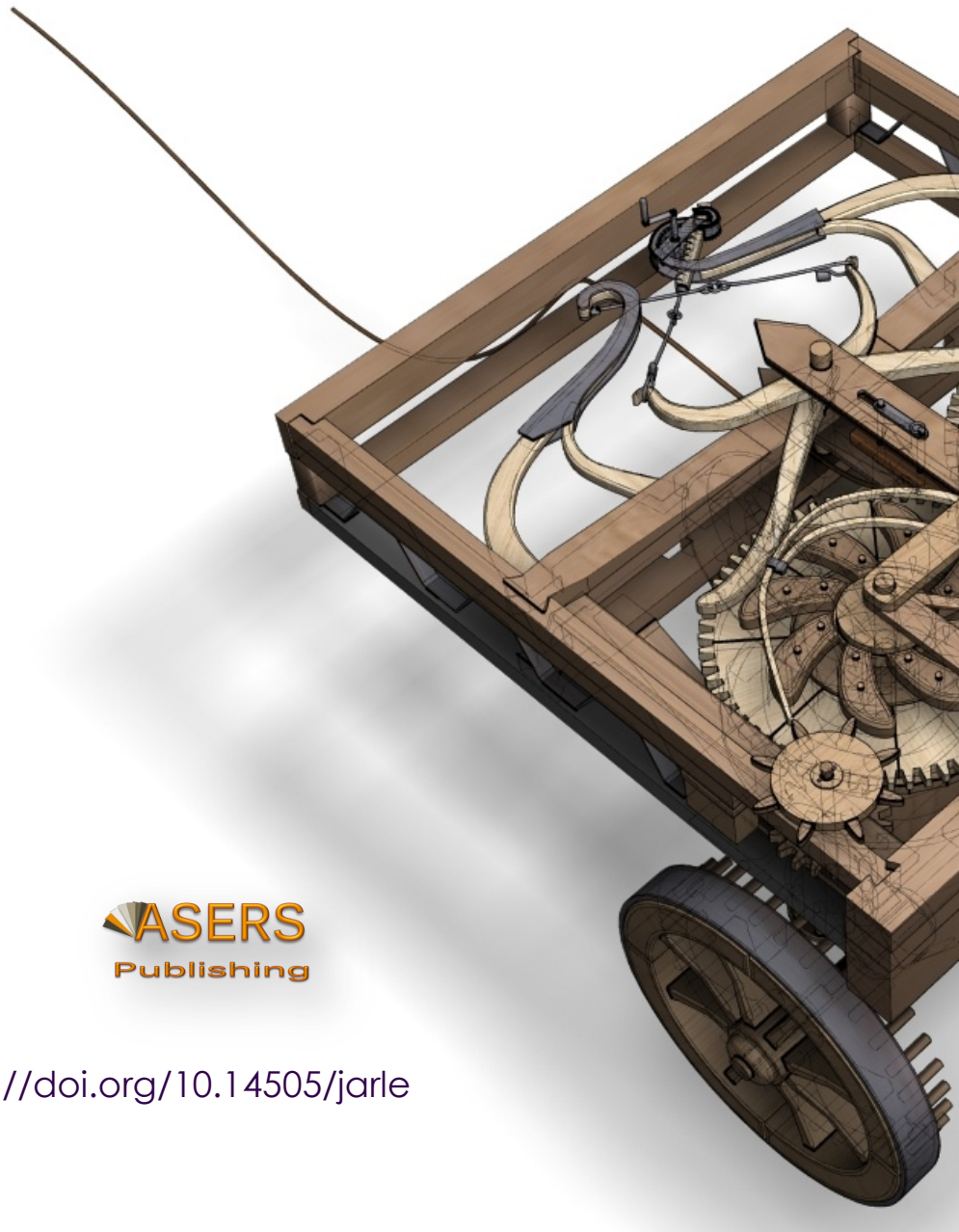
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Methodological Support of Organizations Implementing Innovative Activities Investment Attractiveness Estimation

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Abstract:

Development of modern economy in the context of globalization and business integration, competition stiffening in virtually all sectors of the national economy, makes it impossible to develop large enterprises without significant investment infusions. Therefore, the topic is relevant and necessary for consideration. The main goal of the work is to disclose various aspects of methodological support for assessing the investment attractiveness of innovative companies that are necessary to meet the information needs of their owners, investors, grant holders, and financial professionals. To achieve this goal, the authors used methods of analysis and synthesis. The authors clarified the definition and essence of the 'investment attractiveness' concept and structured the analytical characteristics and indicators of the organization's investment attractiveness. A critical review of the existing methods of analyzing the investment attractiveness of organizations made it possible to identify their advantages and disadvantages, adapt existing methods taking into account the innovative features of companies developing intellectual products. It was proposed universal methodology for rating the investment attractiveness of companies that carry out innovation activities.

Keywords: methodology for assessing investment attractiveness; rating evaluation of investment attractiveness; intellectual products; financial accounting.

JEL Classification: B41; E22; O31.

Introduction

The investment attractiveness of an enterprise is a certain set of characteristics of its production, as well as commercial, financial, to some extent managerial activities and features of an investment climate, which, according to the results, indicates the expediency and necessity of investing in it. An investment-attractive object in which investments are made wins, as a rule.

Innovative activity of economic entities is aimed at achieving competitive advantages through the creation of high-intellectual assets that ensure a leading position in the markets through the development of high-tech industries, the introduction of advanced technical, technological and organizational innovations, inventions and developments. The development of innovative programs in the organizations' activities in various sectors of the economy contributes to the growth of business capitalization through the formation of internal goodwill based on intellectual human capital, high professionalism and creativity of approaches in the solution of various management problems (Kogan *et al.* 2017, 665-712).

The management of innovation activities should be based on the identification and assessment of the factors of its activation in order to achieve the parameters of the Russian economy development established by state policy and to strengthen its competitiveness. The capital inflow into the innovation sphere is impossible without a comprehensive justification of the future economic benefits of investors, the choice of financing objects is largely determined by the investment attractiveness of innovative companies. The formation of a system of investment attractiveness' characteristics involves the use of various financial indicators, for the calculation of which adequate information is needed. At present, the quality of financial information disclosure by Russian economic entities of innovation activity does not fully meet the requirements of reliability, transparency, completeness, timeliness. The algorithms for calculating the analytical indicators of investment attractiveness and the justification of the criterial parameters of their evaluation also need to be improved, so the relevance of this scientific problem is rather high (Harding and Pagan 2017).

There is practically no clarity in determining the essence of investment attractiveness and the correct system of its evaluation in the modern economic literature. For example, Glazunov argues that the assessment of investment attractiveness should give an answer to the question of where, when and how much resources an investor can channel in the process of making investments. Rusak and Rusak reduce the definition of the investment attractiveness of the object mainly to heuristic methods associated with the ranking of the investigated objects on the basis of the experts' assessment. Hence, the investment attractiveness concerns the comparison of several objects in order to determine the best, worst, average.

Many specialists equate investment attractiveness to the effectiveness of investment projects evaluation (Lin *et al.* 2017, 226-241).

So, the first priority task, the fulfillment of which predetermines success in this very difficult competitive struggle, is the maximum qualitative increase in investment attractiveness.

The first step in solving this problem will be to determine the necessary parameters for the existing level of investment attractiveness within a given object. That is, there is a need for a qualitative and qualified assessment of multi-level investment attractiveness, namely: international, interstate, sectoral, intersectoral, interindustry, specific enterprise, project.

The main objectives of the assessment of investment attractiveness are:

- determination of the current state of the enterprise and prospects for its development;
- development of measures to significantly increase investment attractiveness;
- attraction of investments within the framework of the relevant investment attractiveness and volumes of obtaining an integrated approach for the positive effect of attracted capital's development.

The final stage in the process of studying the investment market is a qualitative analysis and an objective assessment of investment attractiveness for individual companies and firms, considered as potential investment objects.

1. Literature Review

The review of scientific economic literature devoted to the research of this category makes it possible to single out two approaches to interpreting the investment attractiveness of an enterprise. According to the traditional approach, the focus of research is exclusively on the financial condition of the industrial enterprise, its financial potential, access to sources of financial support, and the actual diagnosis of investment attractiveness is reduced to the financial analysis of the enterprise's activities (Asness *et al.* 2015, 27-63).

In particular, the traditional approach to the disclosure of the investigated category can be found in the works of Kreinina who underlines dependence of the enterprise's investment appeal from criteria of a financial condition.

The point of view of Kreinina is partially shared by Vlasova, Yegorova, Zhuravkova, and Krylov, as they talk about the availability of dependence of investment attractiveness on the structure of formation sources of the company's assets, i.e., on the ratio of the share of own and borrowed funds, their location, efficiency of use. At the same time, the group of researchers considers it necessary to take into account other criteria that are 'non-financial' in nature (criteria of competitiveness, innovation activity, etc.). Another approach to exploring the category of investment attractiveness is multifaceted and multicriterial. At the same time, a number of authors (Babushkin, Baturina, Yendovitsky) put forward the characteristics of the market environment in which a certain industrial enterprise operates, not the aggregate of financial characteristics. Researchers argue that investing resources in an enterprise that has positive characteristics and a stable state based on the analysis of financial statements is more likely to generate a lower profit level in the future and will achieve a lower level of profitability than investing in an enterprise with worse financial performance, which, together with the company conducts its business in a dynamically developing market. Investing in such an enterprise can bring a multiplicative effect.

As key factors influencing investment attractiveness, Babushkin, Baturina and Yendovitsky single out the stability of cash flow generation, industry specificity, the features of the produced product, the level of innovation of the applied production technologies, the possibility of achieving a synergistic effect. Separately, researchers highlight the existence of a relationship between investment attractiveness and investment risk. They emphasize the fact that a participant in the investment process, primarily an investor, evaluating an enterprise as an advantageous object of investment, is ready to take risks, i.e. is ready to invest in it one's financial and other resources with a certain level of risk, otherwise with a certain probability of losing part or all of one's funds. A number of researchers, considering the category of investment attractiveness of the enterprise, connect it with the concept of investment attractiveness of the industry, the region, the country as a whole. So, according to the interpretation of Ye.V. Vologdin, investment attractiveness is a system of natural, territorial, social, political, economic and other factors that determine the appearance of the region as an investment object, which directly affects the decisions made by the investor regarding the effectiveness of investing their funds. A comprehensive approach to the study of investment attractiveness is also found in the works of Valinurova, Kazakova, Matveyev and others. In particular, Matveyev considers investment attractiveness as an integral criterion determining the expediency and profitability of investing resources in a particular industrial facility. In the author's opinion, the following factors should be highlighted in assessing the investment attractiveness of an enterprise: - the political and economic situation in the country and (or) the region; - the perfection of the legislative power; - the level of corruption in the region; - provision with highly qualified personnel; - the level of financial independence, etc. The 'investment attractiveness' category is more fully disclosed in the studies of Kazakova and Valinurova, according to who it is a system of objective properties, features, capabilities and means that determine the potential demand for investment resources.

Taking into account the fact that today a variety of factors are singled out by different authors to determine the level of investment attractiveness, most of the available interpretations ultimately come down to the fact that it is primarily a system of any factors or attributes, properties, criteria, counted, evaluated, ranked by potential investors (Robert *et al.* 2012, 288-302). Moreover, investors compare the level of investment attractiveness with their goals, correlate the possible level of profitability and investment risk. Thus, the most complete rendering will be the one in which the factors determining the 'investment' image of the enterprise, the goals of the potential investor, the level of profitability and the riskiness of investing that are acceptable to them are interrelated. In other words, under the investment attractiveness of an industrial enterprise, one must understand its current state, determined by a complex of endogenous and exogenous factors, on which the potential possibilities for the investor to achieve their investment goals, characterized by a certain level of risk and profitability, depend.

2. Materials and Methods

Within the framework of the conducted research, the analysis of world and domestic experience in developing the methodological base necessary for the formation of high-quality information support for investment decisions related to the selection of innovative financing facilities based on an assessment of their investment attractiveness was carried out. As the review of existing publications and practice of using basic methods of financial analysis with the use of retrospective data of financial statements, as well as forecast parameters of innovation projects, showed, the overwhelming majority of analysts are based on traditional sets of financial indicators and template parameters of business project performance indicators (Zhukov 2010, 200; Shaposhnikov 2009, 22). A number of analysts believe that the assessment of the investment attractiveness of the organization can be limited to using the apparatus of investment analysis (Yendovitsky and Babushkin 2008, 62; Yendovitsky 2012, 3-12). Another opinion is held by specialists who justify the judgment about the investment attractiveness of the organization, relying on calculations of its market value (Zlobina 2006, 65; Veretennikova and Paiusov 2008, 65). A very important

methodological tool for assessing investment attractiveness is the traditional retrospective analysis of the organization's financial statements, as well as the use of methods of rating evaluation (Zhukov 2010, 200; Tsymbalenko and Tsymbalenko 2008, 118). Existing methods for assessing investment attractiveness need to be systematized, to form their systemic representation and utilitarian orientation for practical application in relation to various economic subjects under study, taking into account industry specificity, scale, phase of the life cycle, etc.

3. Results and Discussion

First of all, it should be noted that the evaluation of investment attractiveness depends on the entity that does it: the management of the innovative enterprise, the project developer, its owners, strategic investors, lending organizations, organizers of innovative tenders, departments that place government orders for the development and production of innovative products, etc. In each case, the methodology for assessing the level of investment attractiveness of an innovative company will differ in terms of analyzed characteristics set's fill rate and their reference parameters taking into account the specificity of the assessed object.

Our efforts were aimed at adapting and universalizing existing methods and techniques for assessing investment attractiveness for their use in relation to companies whose main activity is the development and commercialization of intellectual products (works, services). As a rule, such companies cannot boast of high financial stability, liquidity, profitability at the initial stages of the innovation process development, and the traditional methods for assessing their investment attractiveness require substantial transformation and refinement.

One of the fundamental elements of the investment attractiveness of an innovative organization research methodology is the substantiation of its essence, the definition of this concept as such. Analysis of existing approaches to the interpretation of the 'investment attractiveness of the enterprise' concept, from the point of view of the conditions availability that affect the investor's choice of a particular investment object, showed that the authors, as a rule, combine characteristics that can be conditionally structured in three areas: the prevailing level of market stability and competitiveness; perspective business operation conditions; financial stability; efficiency of capital investment (Yendovitsky and Babushkin 2008, 62; Yendovitsky 2012, 3-12; Mozgoyev 2002, 48-51; Tryasitsyna 2006, 5). Each of these areas, forming a complex definition of investment attractiveness, should be based on the use of a system of quantitative and qualitative characteristics that comprehensively reflect the object of investment. Combining and supplementing the existing definitions, we can formulate the notion of investment attractiveness of an innovative company *as a set of reliably measured, achieved and potential parameters, used by various entities to make managerial decisions regarding the allocation of capital and (or) raising funds for the implementation of innovative projects*.

An approximate list of indicators revealing the filling of three main areas for assessing the investment attractiveness of innovative companies is presented in Table 1.

Table 1. An approximate list of indicators of investment attractiveness of companies carrying out innovative activities

Market stability and competitiveness		Financial stability		Efficiency of capital investment	
achieved level	predicted level	achieved level	predicted level	achieved level	predicted level
▪ availability of a general strategy for the development of innovative business and its components (marketing, production, technology, technical, resource, financial, etc.); ▪ the stage of the life cycle of the innovative product (from the origin of the idea to commercial production); ▪ availability of necessary types of resources; ▪ effectiveness of resource use (resource productivity); ▪ quality of products (works, services); ▪ quality of management, staff qualification; ▪ technological and technical level of production development; ▪ dynamics of sales' volumes (in quantitative terms), etc.		▪ availability of funding sources, their availability to expand the scale of activities and the cost of their services; ▪ taxation conditions; ▪ financial stability; ▪ dynamics of sales volumes (in value terms); ▪ dynamics of financial results; ▪ profitability of activities, etc.; ▪ liquidity and solvency; ▪ dynamics of net cash flow from operating activities; ▪ turnover of circulating assets; ▪ return on equity; ▪ dividend yield, etc.		▪ net present value (NPV); ▪ internal rate of return (IRR); ▪ modified internal rate of return (MIRR); ▪ marginal return on invested capital (MRIC); ▪ payback period of investments in innovation (PB, DPB); ▪ accounting rate of return (ARR); ▪ investments profitability index (PI); ▪ annual equivalent costs (AEC), etc.	

The study of certain methodological approaches to the evaluation of investment attractiveness has shown the absence of a universal one, the use of which would allow using the maximum number of initial indicators for investment decision making, regardless of their quantitative measurement and the nature of the link with the effective complex characteristics.

For this purpose, it seems reasonable to use a generally accepted rating approach based on the inclusion of a certain list of separate initial indicators reflecting various areas of investment attractiveness estimation in the calculation of the aggregated indicator. To calculate the complex indicator for assigning an appropriate rank to each of the five companies that are engaged in innovative activity and assess their investment attractiveness, the most suitable mathematical tool for calculating rating values is used the distance method, using the formula:

$$R_j = \sqrt{(1 - x_{1j})^2 + (1 - x_{2j})^2 + \ldots + (1 - x_{nj})^2} \quad (1)$$

where $x_{1j, x2j, \ldots, xnj}$ are standardized indicators of the *j*-th organization, calculated as the ratio of the initial value of the *i*-th indicator to the best value for participating companies in the rating;

n – is the number of indicators included in the rating calculation.

It is worth noting that the number of indicators included in the calculation of the rating assessment and the number of companies being evaluated is almost unlimited.

As a result of the calculations, each organization was assigned the appropriate place in the ranking. Calculations of the rating indicators received by each innovation company are presented in Table 2.

Table 2. Standardized indicators and calculation of integrated rating for ranking companies in terms of investment attractiveness

The number of indicator	The number of the innovative company, Participating in the rating				
	1	2	3	4	5
1	0.75	0.9	0.7	1	0.8
2	1	0.91	0.89	0.77	0.63
3	0.86	0.71	1	0.74	0.69
4	0.74	0.68	0.63	1	0.55
5	0.86	1	0.76	0.94	0.81
6	0.4	0.57	0.86	0.51	1
…n	…	…	…	…	…
Integrated rating evaluation (R_j)	0.728	0.624	0.562	0.603	0.715
Places by rating	5	3	1	2	4

Using the distance method for ranking organizations performing innovation activity, it is necessary to assign the highest rating to the one that has the lowest value of the complex rating evaluation, and to assign the appropriate place in the order of the rating number's increase to the rest. As follows from the calculations, the highest rating was taken by the company under №3, which has the minimum value of the integrated rating mark – 0.562. At the same time, judging by the initial standardized values of the indicators among all five applicants, the greatest number of the best values was in company №4 (the best values of the standardized indicators in the table have values equal to one), but as a result, it took only the second place.

The rating assigned to the surveyed companies can serve as a basis for the investor to choose the company under №3 as the investment object, claiming to receive financial resources for the further development of innovation activity along with others.

Since the initial indicators included in the calculation of the rating estimates may differ in importance (significance) taking into account the subjective analysts' judgments, then for increasing (decreasing) their impact

on the rating results, it is possible to establish an individual score of significance for each indicator using expert methods evaluations. In this case, the formula for calculating the complex rating evaluation takes the following form:

$$R_{\beta j} = \sqrt{\beta_1(1 - x_{1j})^2 + \beta_2(1 - x_{2j})^2 + \ldots + \beta_n(1 - x_{nj})^2} \quad (2)$$

where $x_{1j, x2j, \ldots, xnj,}$ - are the standardized indicators of the *j*-th organization, calculated as the ratio of the initial value of the *i*-th index to the best value for five companies;

n – the number of indicators included in the rating calculation;

β_1 – weight value (score) of the *i*-th indicator.

Calculations of the rating values received by each innovation company using the high-valued coefficients of significance of the initial indicators are presented in Table 3.

Table 3. Standardized indicators and calculation of integrated rating for ranking companies in terms of investment attractiveness with the use of weighting factors (scores)

The number of indicator	The number of the innovative company, participating in the rating					β_1
	1	2	3	4	5	
1	0.75	0.9	0.7	1	0.8	4
2	1	0.91	0.89	0.77	0.63	5
3	0.86	0.71	1	0.74	0.69	6
4	0.74	0.68	0.63	1	0.55	8
5	0.86	1	0.76	0.94	0.81	2
6	0.4	0.57	0.86	0.51	1	4
…n	…	…	…	…	…	…
Integrated rating evaluation (R_j)	1.5452	1.4642	1.3074	1.2797	2.0133	…
Places by rating	4	3	2	1	5	…

As can be seen from the calculation results, with the use of a modified approach to the rating of companies and an estimation of investment attractiveness, taking into account the weight points, the leading position was taken by company №4, and company №3 moved to second place.

Specialized software was used that allowed aggregation, grouping and detailing of initial data obtained from open sources (published corporate and financial statements of companies carrying out innovative activity), including the use of pivot tables and conditional formatting, to conduct research using the proposed methodology for rating the investment attractiveness of innovative companies and to obtain scientifically grounded results.

It should be noted that the proposed methodological approach to justify the assessment of the company's investment attractiveness can be used not only for making investment decisions and choosing preferred financing facilities, but also for holding tenders announced by grant holders, and also to determine the directions of state targeted support for innovation activities.

Conclusions

The proposed methodological approaches and algorithms for calculating the aggregated characteristics for the formation of a representation of the investment attractiveness level of various companies in the innovation sector of the economy are universal. The presented method of rating innovation companies is aimed at improving the system of methodical support of investment decisions of state and private investors with regard to financing innovative projects, allowing them to optimize their directions and volumes. It allows to rank the evaluated companies more objectively, using a virtually unlimited list of various initial indicators, which will help stimulate innovation activity at the macro and micro levels of management, ensuring the flow of capital into the innovation sphere, increasing the resource efficiency and efficiency of operations by expanding the production of competitive products, goods and services using intellectual technologies, materials and means of production.

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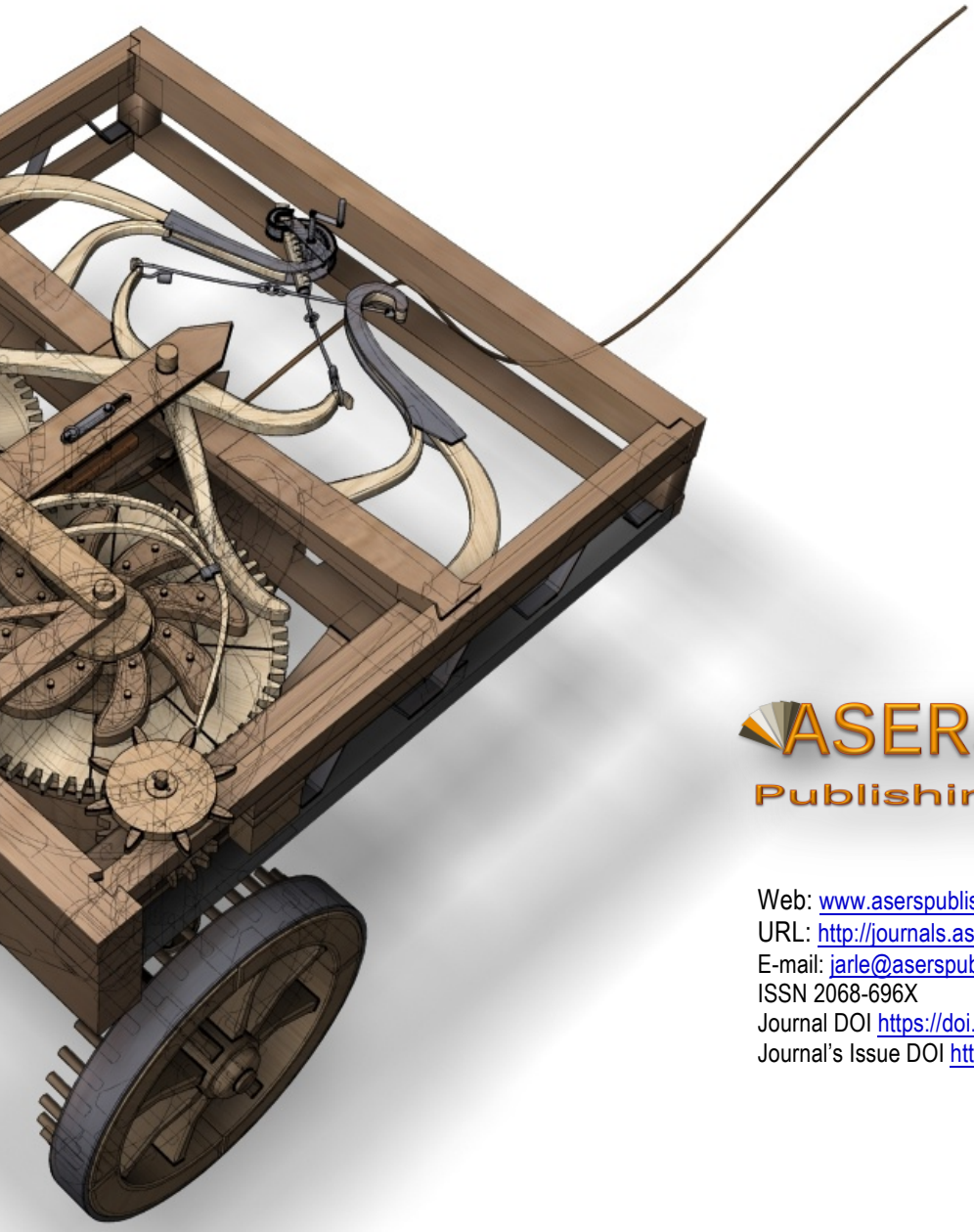
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