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INTRODUCING SOFTWARE SOLUTIONS INTO THE MANAGEMENT OF PUBLIC ENTERPRISES WHOSE FOUNDERS ARE LOCAL SELF-GOVERNMENT UNITS IN THE EXAMPLE OF THE REPUBLIC OF SERBIA

Miloš Dragosavac, Slavica Anđelić, Ognjen Bakmaz, Milan Radaković, Ivan Arnautović, Tatjana Davidov, Sanda Nastić & Slobodan Popović

Abstract: The purpose of this work was to analyze the importance of implementing software solutions in public enterprises whose founders are local self-government units in the Republic of Serbia. The author's focus was on identifying problems in the real functioning of public companies, as well as establishing comparative links between self-introduced software and software purchased from third parties. The study was based on the analysis of the software implementation process. The usefulness of the study was reflected in the study of the evaluation of the top management of the mentioned public companies, on the one hand, and on the other hand, the possibility of comparing the results of the evaluation with the results of the management of local self-government units was left. The urgency of the research study is based on the existence of major global changes in the IT sector. Our contribution is pointing to the fact that the total income of a public company can be predicted based on the evaluated and analyzed factors of influence on the introduction of software in the regular business processes of public companies.

Keywords: software, management, public companies.

1. Introduction

Scientific verification of the introduction of software solutions into business processes can be seen as an activity in which the application of a set of specific recommendations will be considered in connection with the development of software solutions that will be adapted to heterogeneous users, which can essentially be seen in the works of authors such as (Aguiar et al., 2022).

The novelty of this study essentially represents the presentation of the process of introducing software solutions in the business of legal entities, which is based on a realistic approach to the analysis of relevant factors influencing the processes of introducing software into the business of specific legal entities, more precisely in the business of the public sector. In such an observation of software implementation, the research problem in the study was based on discovering the importance of the influence of factors on the processes of introducing an acceptable model of software

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implementation in the public sector. At the same time, the application of a valid software introduction model should be accompanied by the existence of as few errors as possible in the software, as pointed out by authors such as (Wang, 2017).

The goal of the author's research was aimed at discovering an innovative and applicable solution for the application of the entire process related to the introduction of software in the public sector business. The author's focus, thus observed, was based on the comparison of the introduction of software solutions in companies through the analysis of two models of the implementation of software solutions in the real business of public companies whose founders are local self-government units.

The first innovative approach was focused on the analysis of a model that was independently developed by employees of public companies.

The second model of introducing software solutions into the real business of the company was based on the analysis of the model of purchasing software through tenders on the market from software houses.

The research methods conducted by the authors of the study essentially focused on those two models of software implementation in the operations of public companies. This was achieved by applying the analysis of the impact of important factors on the software introduction process, by evaluating the impact factors based on the results obtained from the surveyed respondents (top management and heads of local self-government units). In addition to the analysis, a t-test was used with the aim of increasing the certainty of the author's conclusions regarding the entire software introduction process. At the end of the study, the results of the forecast related to the formation of the influence of the total income and the analyzed influencing factors on the introduction of the software were given in relation to both groups of respondents.

The common starting point of the analyzes carried out was the trend towards a cost-based view of the software introduction process, which coincided with the already stated views of the authors (Kerrigan, 2019; Calero et al., 2019; Ronchieri & Canaparo, 2023).

Creative software solutions in the business of legal entities should be realistically applicable in the business of heterogeneous legal entities (Chang et al., 2022; Marchal et al., 2022; Hafi et al., 2022). Apart from applicable creative software solutions, it is very important to have an applicable software platform in legal entities that apply software in business processes (Rosbottom et al., 2021; Vandewalle et al., 2021; Terrazas et al., 2022; Mayer et al., 2023).

The possibility of applying software in the business of legal entities should be viewed through the application of the set architecture in legal entities, as pointed out by authors such as (Belfadel et al., 2022; Beghelli & Jones, 2022). The application of software solutions in the business of legal entities should consider the existence of the application of the impact of the growth of new knowledge in this area (Ghatak & Mahanty, 2021). In addition, in the implementation of any innovative solution, and therefore the introduction of new software solutions related to management functions in the organization of the company, it is necessary to respect the views and expectations of the top management, which we see in the expressed views of authors such as (Arnautović et al., 2022). This appreciation of reality in the frameworks related to the possible improvement of business is present in the works (Martínez et al., 2022), but it should be emphasized that there is also an existential need for the appreciation of numerous macro-economic factors, which has been highlighted by numerous authors (Athari, 2021; Yan & Shi, 2021; Azimli, 2022; Barak, 2022; Michie, 2022).

The introduction of new software solutions is a reality in the business of numerous heterogeneous companies. However, the very implementation of such activities carried out by the company's top management should be aligned with the economic policy of the state (Kupfer & Zorn, 2020; Yu et al., 2021; Seo & Mun, 2022; Ye et all., 2022). In addition, it should be emphasized that the market positions of numerous companies have been fundamentally changing in recent decades, which should be regarded as a constant, as pointed out by authors such as (Dubuisson-Quellier, 2021; Koenig & Tennert, 2022).

Appreciation of the urgency of implementing new business improvements, the application of which can significantly improve the business decisions of top management, comes to the fore in the operations of public companies, as pointed out by numerous authors such as (Aulich & Wettenhall, 2019; Tremml, 2021; Kim & Lee, 2021; Lin, 2022; Kim, 2022; Singh & Slack, 2022). In addition, it should be emphasized that during the management of public enterprises, a whole series of specificities must be taken into account, such as, for example, the wage policy in the public sector, as pointed out by (Sameer & Priyadarshi, 2021; Boll et al., 2022), which can essentially influence to the reduction of numerous risks in public sector operations (Mahama et al., 2022; Lorena & Costa, 2023).

The real functioning of local self-governments largely depends on the efforts of local communities that invest in their structural progress, as pointed out by authors such as (Christensen & McQuestin, 2019), but also on the peculiarities of local communities themselves (Mello, 2021). In addition, it should be emphasized that in recent years there have been many discussions about the importance of essential decentralization in the functioning of local self-governments (Rudakiewicz, 2022). As mentioned, it essentially affects the business operations of public companies whose founders

are local self-government units, especially through the indirect influence of the management bodies of the formed administration of local self-government units (Han et al., 2019).
The future existence of successful public companies in local self-governments depends on the existence of an agile and successful local government, as pointed out by the authors in their work (Barnett et al., 2020). Therefore, the future of the successful functioning of local self-government administrations that control and manage the work of public enterprises whose founders are local self-government units essentially depends on the strategic decisions made by the administrative bodies in local self-governments (Hortas-Rico & Gómez-Antonio, 2020).
The views expressed by the author regarding the functioning of local self-governments and public enterprises in them were the first framework of appreciation by the authors of this study. However, the authors of the study went one step further and carried out an essential investigation of the behavior of public enterprises whose founders are local self-government units regarding the introduction of software solutions into the real operations of the mentioned enterprises. In this way, the research in this study essentially represents an innovative research in which the importance of applying innovations in public sector management is highlighted, primarily as an important factor for achieving improvements in public sector management by top management (Silva & Medeiros, 2022). Such an approach does not imply an individual action related to the improvement of the overall management of the public sector, but should have a permanent basis that will have features of the business trend, i.e. the trend of improving the management (Oszlak, 2022) of the overall business of the public sector.

2. Analytical framework

Strategic monitoring of the public sector in the Republic of Serbia should be a continuous activity aimed at improving the management of the mentioned companies. Overall, in the Republic of Serbia, there are two forms of functioning of public enterprises within the public sector.
The first form of public sector organization is regulated on the basis of the adopted Law on Public Enterprises in the Republic of Serbia ("Official Gazette of the Republic of Serbia", no. 15/2016 and 88/2019). With its application, important public companies were established, which function at the state level. For example, the Public Company Elektroprivreda Srbije was founded with the aim of unhindered public supply of electricity to the entire population of the country.
The second type of organization consists of public companies whose founders are local self-government units. The establishment of such companies was made possible by the adoption of the Law on Local Self-Government in the Republic of Serbia ("Official Gazette of RS", no. 129/2007). These companies should meet the needs of the population of a specific local community. Local self-governments establish utility companies: for the construction and maintenance of roads in the city, maintenance of animal and veterinary hygiene, public heating of apartments, calculation of utility services and delivery of bills to citizens, funeral services, maintenance of housing stock of local self-governments, public markets (markets), greening of public areas, maintaining cleanliness, water supply to the population as well as the removal of sewage and other waste water, regulation of vehicle parking on public areas, etc., local self-government units can also establish public companies for the regulation of urban planning issues in the city, organizing public sports events, organizing public transportation in the city and another.
Public companies that were established by local self-government units should adapt to modern business conditions. This implies, above all, the introduction of innovative solutions aimed at optimizing business operations. These companies operate using budget funds in a high percentage in their regular operations. For the preparation of the study, the authors used insight into the founding acts (Statute of the City of Belgrade, "Official Gazette of the City of Belgrade", number 39/08, i.e. Statute of the City of Novi Sad "Official Gazette of the City of Novi Sad", number 11/19) for the reason that about 40% of the population in the Republic of Serbia lives and works in the mentioned two cities.
Local self-government units, in accordance with their needs and capabilities, establish public and public utility companies that will perform the tasks for which they were established. Acknowledging the above, the authors conducted research that included the application of software solutions in the operations of public companies whose founders are local self-government units. In a broader sense of observation, there is a similarity of this study with already published views of authors such as (D'Alauro, 2020; Rodgers et al., 2022), who emphasized the importance of the effects of certain activities within the business of public utility companies that they analyzed in their works.

3. Materials and methods

The authors of the study took into account the presented theoretical frameworks that were related to the application of software solutions in the business of public companies. However, they went a step further and did a systematic research setup, which included research into the application of two forms of introducing software solutions into the regular operations of public companies, in such a way that it was done by surveying two key categories of management

structures that are related to the operations of the mentioned companies. Essential surveying was done, on the one hand, by filling out a survey by top management in 140 public companies whose founders are local self-government units, and on the other hand, it included surveying the same number of heads of management bodies in local self-government units. This was done with the intention of revealing the difference in the observation of the introduction of software solutions in the business of public companies. Therefore, the research in the study was done on the basis of observation from two angles of viewing important factors for the introduction of software in business. The research period in which the research was conducted was January-March 2023.

The goal of the research was to discover the attitude of the top management of public companies, as well as the management of the administrations that control the work of the mentioned companies in relation to the application of new software solutions in the regular business processes of the mentioned companies. Five factors influencing the application of the software were analyzed, with the respondents being able to evaluate the analyzed factors in an interval from 1 to 10. A score of 1 was the influence of the factor with the lowest impact, and a score of 10 was extremely high. The analyzed factors were: security of software introduction, user satisfaction, return on investment in software solutions by selling to another company, software price, software maintenance costs and total costs related to the introduction of software solutions in the business of public companies.

The study included the analysis of the implementation of two forms of new software solutions in the operations of public companies. The first form referred to the analysis of software that was independently introduced by employees of a public company. The second form referred to the analysis of the introduction of software that is purchased in the public procurement procedure, through a tender, from a professional software company.

At the end of the study, the authors performed a multiple linear regression. The author's goal was to make a relevant prediction of the total revenue of public companies based on the overall evaluation of factors made by top managers of public companies, that is, heads of administrative bodies in local self-government units. The authors guaranteed anonymity to all survey participants.

In order to form a research flow related to the application of software solutions in the business of public companies, whose owners are local self-government units, the authors put forward the following hypotheses.

Hypothesis 1, there are no differences in the evaluation of the top management of public companies regarding the individually analyzed five factors that can influence the introduction of software.

Hypothesis 2, there are no differences in the overall evaluation of the top management of public companies regarding the analyzed five factors that can influence the introduction of software.

Hypothesis 3, there are no differences in the individual evaluation of the leadership of the administrative bodies of local self-government units in relation to the analyzed five factors that can influence the introduction of software.

Hypothesis 4, there are no differences in the overall evaluation of the leadership of the administrative bodies of local self-government units in relation to the analyzed five factors that can influence the introduction of software.

Hypothesis 5, there are no differences in predicting the movement of total income, which were stated based on the evaluation of the top management of public companies, depending on the expected amount of funds allocated for software solutions.

Hypothesis 6, there is no difference in predicting the movement of total revenues, which were stated based on the evaluation of the leadership of the management bodies of local self-government units, depending on the expected amount of funds allocated for software solutions.

Statistical data processing and analysis were done using the software IBM SPSS (Statistical Package of Social Science) version 25. The t test of independent samples was applied in the paper to examine the differences between the evaluation of the top managers and the governing body of the local self-government unit in relation to the introduction of software solutions and multiple linear regression to predict total revenue. A level of 0.05 was used for the threshold value of significance.

4. Research

The research results presented in this study show that there is a great importance of introducing software solutions in the business of public companies whose founders are local self-government units.

Results were obtained after completing the survey by two groups of respondents. The results were obtained after the presentation of the software implementation in the mentioned companies, based on two observations. The first form of observation included the results after the evaluation of the independently developed software, by the employees of the public company, and the second observation included the evaluation of the factors after the introduced software, which was purchased from the software houses, on the market.

The results of the author's research are grouped into four units.

The results of the first part of the research refer to the evaluation of top managers of public companies in relation to the analyzed factors related to the introduction of software into the regular business process. This was done using an

independent samples t-test. The results show that there are significant differences in the evaluation of top managers in relation to the individual evaluation of the analyzed factors, as well as in relation to the overall evaluation of all analyzed factors regarding the introduction of software solutions in the regular business processes of the mentioned companies.
The obtained results of the evaluation of the top management of public companies whose founders are local self-government units are presented by the author in Table 1.

Insert Table 1

The presentation of the results in Table 1 shows the level of significance of the t test. Its values show that it is lower than the threshold level of significance for all analyzed factors ($p<0.0005$*), as well as for the total score of all five analyzed factors. Thus, in this presentation, we get visible results that show that there are significant differences in the ratings given by the top managers of public companies.

The results of the second part of the research refer to the evaluation of the leadership of the administrative bodies in local self-government units in relation to the analyzed factors related to the introduction of software into the process of regular business in public companies. The results show that there are significant differences in the evaluation of the managers of local self-government units in relation to the evaluation of the analyzed factors, as well as in relation to the overall evaluation of all the analyzed factors regarding the introduction of software solutions into the regular business processes of the mentioned companies.
The obtained results of the evaluation of the leadership of the administrative bodies in the units of local self-governments were obtained using the t-test of independent samples and are shown in Table 2.

Insert Table 2

The presentation of the results in Table 2 shows the level of significance of the t test. Its values show that it is lower than the threshold level of significance for all analyzed factors ($p<0.0005$*), as well as for the total score of all five analyzed factors. Thus, in this presentation, we get visible results that show that there are significant differences in the ratings given by the managers of local self-government units, whose work is used to control and verify the work of public enterprises established by local self-government units.

The results of the third part of the research indicate that the prediction of the total income of public companies whose founders are local self-government units can be predicted based on the analysis of five factors that have an impact on the introduction of software solutions in the mentioned companies. This was achieved by applying multiple linear regression, based on the evaluation of the analyzed factors by the top managers who manage the mentioned companies. The presentation of the obtained results is given in Table 3.

Insert Table 3

Table 3 shows the multiple linear regression. It was applied in order to be able to predict the total revenue of public companies on the basis of the evaluated five factors of the introduction of the software for the ratings of top managers. The obtained coefficient of determination is (R2) of 0.998, based on which it can be seen that the obtained model is statistically significant because its significance ($p<0.0005$, $F=13237.58$) is lower than the observed statistical level. Based on the presentation in Table 3, it can be seen that the total revenue of the company can be predicted based on the evaluated five factors of software introduction.

The results of the fourth part of the research indicate that the prediction of the total income of public companies whose founders are local self-government units can be predicted based on the analysis of five factors that have an impact on the introduction of software solutions in the mentioned companies. This was done after the application of multiple linear regression, and based on the evaluation carried out by the management of the local self-government units.
The presentation of the obtained results is given in Table 4.

Insert Table 4

Table 4 shows the results of multiple linear regression. It was applied to predict the total income of public enterprises based on the evaluated five factors of the introduction of software for evaluations of administrative bodies of local self-government units. The obtained coefficient of determination is (R2) of 0.983, on the basis of which it can be seen

that the obtained prediction model is 98.3% of the total variance. It is statistically significant because its significance is ($p<0.0005$, $F=1552.12$), that is, it is lower than the observed statistical level, on the basis of which it can be seen that the total revenue of the company can be predicted based on the evaluated five factors of software introduction.

5. Discussion

Public and public-utility companies established by local self-government units depend to a large extent on the approved budget funds of local self-government units, because the public needs of local community residents are largely financed from the budgets of local self-governments. However, it should be emphasized that the business of public companies, which takes place with the use of the budget of local self-governments, must be carried out with emphasized control in all phases of business. We find such attitudes in the author's works, such as (Popović et al., 2017), but also in the author's later works, especially in those that emphasized the importance of controlling the spending of public funds (Radović et al., 2021). The stated views of the mentioned authors served as a conceptual framework for setting up research by the authors of this study.

In the first part of the research, such an observation comes to the fore especially when comparing the valuation of self-developed software in relation to software that is purchased on the market from software houses through public procurement. In essence, the authors took into account the already expressed views of the authors given in the works of the authors such as (Vitomir et al., 2020) in which the importance of respecting the procedures when announcing tenders in the functioning of the public sector was emphasized.

The author's settings, given in hypothesis 1 and hypothesis 2, were such that they started from the assumption that there are no differences in the evaluation of the top management of public companies in terms of individually but also overall observed analyzed factors that can affect the process of introducing software into regular business. The obtained results (Table 1) show that the level of significance of the t-test is lower than the threshold level of significance for all analyzed factors as well as for the value of the total score. Based on that, the existence of significant differences can be seen in the evaluation of top managers of public companies in relation to the introduction of software in regular business processes. They are expressive for all five analyzed factors, as well as the factor of the total score, because the results are such that there is visibility of clear significance, i.e. $p<0.0005$*.

Nevertheless, top managers of public companies gave higher marks for: security, user satisfaction and return on investment by selling to another company in the case when the introduction of the software was done by purchasing it at a tender from a software company, while higher marks are present in relation to: software price, costs of software maintenance and overall evaluation in conditions when the software was independently developed by employees of a public company. On the basis of the obtained results, hypothesis 1 and hypothesis 2 can be rejected with certainty, that is, it can be said that there is a substantial agreement between the obtained results and the published views of the author (Tomas-Miskin et al., 2022) regarding the importance of top management decision-making and the introduction of realistic controls in public enterprises whose founders are local self-government units in the Republic of Serbia.

In the second part of the research, the authors took into account theoretical and empirical evaluations regarding the reliability of software in regular business, as a postulate that is visible in the author's published works, such as (Tao et al., 2022). However, the authors of the study went one step further. In the impact analysis, they included the evaluation of the leadership of the administrative bodies of local self-government units, with the aim of gaining confidence that can be obtained from the perspective of the body that approves and finances to a large extent the activities of public companies that it founded with the aim of meeting the needs of the population of a certain local community.

On the basis of the above, the authors made hypothesis 3 and hypothesis 4. They assumed that there are no differences in the evaluation of the heads of local self-government units regarding individually but also overall analyzed factors that can affect the process of introducing software into the regular operations of public companies. The obtained results (Table 2) show that the level of significance of the t-test is lower than the threshold level of significance for all analyzed factors as well as for their total score ($p<0.0005$*).

Managers of local self-government units evaluated the following factors with higher marks: security, user satisfaction and return on investment by selling to another company in the case when the software was purchased by a software company on the market, while they gave higher marks to: software price, software maintenance costs and the total score in case the software solution was independently developed in a public company by employees.

Based on the obtained results, we can safely reject hypothesis 3, that is, there is a significant difference in the evaluation of the leadership of local self-government units based on all analyzed factors related to the introduction of software into the operations of public companies whose founders are local self-government units (Table 2). In the mentioned table, we can see the results on the basis of which we can safely reject the propositions of hypothesis 4, i.e. there are significant differences in the evaluation of the leadership of local self-government units based on all the analyzed factors related to the introduction of software into the operations of public companies whose founders are local self-government units.

In the third part of the research, the authors started from the already expressed views of the authors, who emphasized the importance of applying transparency in the work of public companies (Vitomir et al., 2021). The authors of the study have essentially upgraded these views, by introducing forecasting of the realization of the amount of total income in relation to the done analysis of factors that can influence the introduction of software in the regular operations of public companies whose founders are local self-government units. In this part, hypothesis 5 was used, that is, that there are no differences in predicting the movement of total income, which depends on the evaluation of the top management of public companies, depending on the amount of funds allocated for the implementation of software solutions. Multiple linear regression was used to obtain clear beliefs. It was applied to predict the total income in companies based on the evaluated five factors important for the introduction of the software according to the evaluation of the top managers of public companies. The coefficient of determination (R2) of 0.998 was obtained by regression analysis, on the basis of which it can be seen that the obtained prediction model amounts to 99.8% of the total variance. The obtained model is statistically significant, because its significance ($p<0.0005$, $F=13237.58$) is lower than the observed statistical level. Therefore, the total revenue can be predicted based on the evaluated five factors that influence the introduction of the software. A detailed analysis of the individual contribution of each independent variable in the process of forecasting the company's total income shows that there is a significant contribution of all five factors, as their significance is lower than the observed threshold level (Table 5).

In the fourth part of the research, the authors used the views of authors such as (Mi et al., 2022) in which they emphasized the importance of continuous learning when using software in the application of legal entities, as well as the importance of predicting software errors as a starting point for their research. However, the authors of the study included in the research a new way (dynamic) of observing the entire issue of software implementation in the business of legal entities. It meant forecasting the total revenue of public companies whose founders are local self-government units based on the introduction of software solutions based on the evaluation of factors that were collected from the management of local self-government units. In the study, a coefficient of determination (R2) of 0.983 was obtained. Based on this, it can be seen that the resulting prediction model has 98.3% of the total variance. It is statistically significant, because its significance ($p<0.0005$, $F=1552.12$) is lower than the observed statistical level. Based on what has been said, it can be safely concluded that the total revenue of public companies can be predicted based on the analyzed five factors influencing the introduction of software solutions in the business of public companies whose founders are local self-government units. By looking more closely at the individual contribution of each independent variable in the process of predicting the total revenue of public companies, it can be seen that the factors of user satisfaction and software prices have a significant contribution in predicting the total revenue of the company (Table 4).

Therefore, the forecasting of the total income in relation to the implementation of software in the business of public companies has, in the author's opinion, fully justified this, in a way, new way of observing this extremely important process that takes place in the business of public companies.

6. Conclusions

In the author's opinion, the original study makes its contribution to the theoretical and practical observation of the real implementation of software application in the business of public companies whose founders are local self-government units in the Republic of Serbia. The essential contribution of the author refers to highlighting the importance of an innovative approach in the process of introducing software into regular business processes. The authors emphasized the importance of this process based on the analysis of factors: the security of introducing software solutions, user satisfaction, the return on investment factor by selling the software to another company, the price of the software, the costs of maintaining the software, as well as the overall evaluation factor, i.e. the total score of the mentioned factors based on a survey conducted in public sector.

The observation of software application in the study referred to two forms of software application. The first form involved observation of events in the case of independent software development by the company. The second form included observing the introduction of software by purchase by a public company on the free market, through a public tender.

After that, a forecast of the total revenues of public companies was made based on the evaluation of the top management of public companies on the one hand, and on the other hand, the leadership of local self-government units was surveyed on the same issue. The goal of such an observation was to look at the evaluation of the introduction of software from the point of view of those who make management decisions in public enterprises, and then those who control the use of funds in the public sector. The analysis was twofold. First, an evaluation of the factors that influence the introduction of software solutions when it is developed independently, by the work of workers in public enterprises, was done. After that, the valuation was analyzed in the case when the software was purchased at a tender from professional companies that deal with the development of new software solutions.

Based on the results presented in this study, basic conclusions can be grouped.
First, that the evaluation of top managers was weaker in the case when the software was introduced by employees of a public company compared to the case when the software was introduced by purchasing it on the free market.
Secondly, that similar results were achieved in the case when the evaluation was done by the management of local self-government units.
Thirdly, it is possible to forecast the formation of total revenue based on the assessment of the top management of public companies (significance is $p<0.0005$ of the observed statistical level).
Fourth, based on the application of regression analysis, it is possible to predict the formation of the value of the total income, based on the evaluation of the head of the management body of the local self-government units (significance is $p<0.0005$ of the observed statistical level).
Fifth, looking at both important subjects (top managers and management of administrative bodies in local self-government units), which can influence the making of valid management decisions regarding the implementation of software solutions in real application in public companies whose founders are local self-government units, it can be concluded that of great importance to use representative factors that influence the introduction of software.

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Table 1: Presentation of the differences in the ratings obtained by top managers regarding the introduction of software solutions in regular business processes

Analyzed factors	The form of introducing software solutions into the operations of public companies whose founders are local self-government units	Mean	Standard deviation	T-value	p
Security	Self-introduced software by the company (N=51)	5.76	0.42	-24.749	<0.0005*
	Software made by professional software companies (N=89)	7.70	0.45		
Customer satisfaction	Self-introduced software by the company (N=51)	5.76	0.42	-25.087	<0.0005*
	Software made by professional software companies (N=89)	7.71	0.45		
Return of investment by sale to another company	Self-introduced software by the company (N=51)	4.23	0.42	-31.883	<0.0005*
	Software made by professional software companies (N=89)	6.71	0.45		
Software price	Self-introduced software by the company (N=51)	7.76	0.42	51.930	<0.0005*
	Software made by professional software companies (N=89)	3.71	0.45		
Software maintenance costs	Self-introduced software by the company (N=51)	8.76	0.42	64.470	<0.0005*
	Software made by professional software companies (N=89)	3.70	0.45		
Overall rating based on all five analyzed factors	Self-introduced software by the company (N=51)	32.29	1.28	13.478	<0.0005*
	Software made by professional software companies (N=89)	29.57	1.06		

Source: authors' calculation.

Table 2: Presentation of the obtained differences in the assessment given by the managers of the administrative bodies of local self-government units in relation to the introduction of software solutions in the process of regular business operations of public companies

Analyzed factors	The form of introducing software solutions into the operations of public companies whose founders are local self-government units	Mean	Standard deviation	T-value	p
Security	Self-introduced software by the company (N=51)	7.23	0.42	-19.047	<0.0005*
	Software made by professional software companies (N=89)	8.71	0.45		
Customer satisfaction	Self-introduced software by the company (N=51)	7.15	0.36	-19.226	<0.0005*

	Software made by professional software companies (N=89)	8.57	0.49		
Return of investment by sale to another company	Self-introduced software by the company (N=51)	5.23	0.42	-31.492	<0.0005*
	Software made by professional software companies (N=89)	7.70	0.45		
Software price	Self-introduced software by the company (N=51)	8.76	0.42	51.930	<0.0005*
	Software made by professional software companies (N=89)	4.71	0.45		
Software maintenance costs	Self-introduced software by the company (N=51)	9.76	0.42	69.338	<0.0005*
	Software made by professional software companies (N=89)	4.85	0.35		
Overall rating based on all five analyzed factors	Self-introduced software by the company (N=51)	38.15	0.36	17.607	<0.0005*
	Software made by professional software companies (N=89)	34.57	1.85		

Source: authors' calculation.

Table 3: Presentation of the individual contribution of independent variables in relation to the prediction of the total income of public companies, based on the ratings obtained by top managers

Factors	Beta	t	p
A constant	-	9.873	<0.0005*
Security	0.219	24.154	<0.0005*
Customer satisfaction	0.133	14.224	<0.0005*
Return of investment by sale to another company	0.058	4.042	<0.0005*
Software price	-0.340	-23.146	<0.0005*
Software maintenance costs	-0.299	-14.468	<0.0005*

*Statistical significance at the 0.05 level

Source: authors' calculation.

Table 4: Presentation of the individual contributions of independent variables in relation to the prediction of the total income of public enterprises based on the ratings obtained from the heads of the administrative bodies of local self-government units

Factors	Beta	t	p
A constant	-	8.319	<0.0005*
Security	0.047	0.982	0.328
Customer satisfaction	0.199	5.055	<0.0005*
Return of investment by sale to another company	-0.065	-0.772	0.442
Software price	-0.516	-2.438	0.016*
Software maintenance costs	-0.339	-1.685	0.094

*Statistical significance at the 0.05 level

Source: authors' calculation.