



Review paper

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MANAGING MEDIUM SIZED AGRICULTURAL ENTERPRISES AND MACHINERY PROCUREMENT: -THE IMPACT OF COMPREHENSIVE vs PARTIAL IT SYSTEM SUPPORT

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Abstract: Procurement of agricultural machinery is one of the economically important factors in the business of a large number of legal entities in agriculture. This is of particular importance for the business of medium-sized agricultural companies that are looking for ways to improve procurement. It was established that there is a significant difference if the procurement of agricultural machinery is carried out with the full support of the IT system in relation to the way of doing business of medium-sized agricultural enterprises where the procurement is carried out with a partial determination of the procurement procedure of agricultural machinery. This is reinforced by the presentation of the results in Table 1, where for all forms of procurement, i.e. for: large investment parts for the maintenance of agricultural machinery, for the procurement of agricultural tools, parts for the maintenance of attachment machines, parts of procurement for the maintenance of trailers, i.e. for their total score, higher values appear, which indicates greater trust of the decision-maker if the procurement was made with the systemic support of the IT system compared to the business, i.e. the procurement where there is partial support from the IT support system.

All of this is strengthened after the presentation in Table 2, that is, the forecast of the procurement, where the value of the procurement of large investment parts for the maintenance of agricultural machinery was taken as the basis, using the system support of the procurement through the IT system.

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The obtained results are in favor of IT system support during the procurement of parts for the maintenance of agricultural machinery in relation to partial support for all analyzed forms as well as their score, because the values are significant ($p < 0.0005$) in the functioning of the procurement of parts for agricultural machinery in the business of medium-sized agricultural enterprises.

Key words: *procurement, IT, agricultural machinery, maintenance.*

INTRODUCTION

The operations of medium-sized and other agricultural enterprises depend on the realistic application of numerous management factors, where the factor of purchasing agricultural equipment is often the focus of interest due to costs [1-5].

The procurement of agricultural equipment should take into account the assistance of a number of heterogeneous factors, especially IT support system factors, which can positively influence the making of valid management decisions [6-11].

The procurement of agricultural equipment as part of the overall process in managing medium-sized agricultural enterprises in Serbia is a current issue due to the overall consideration of business costs [12-17].

The issue of practical and valid application of IT within the overall procurement of agricultural mechanization is increasingly being given great importance to procurement processes, which refers to the modern management of one of the most important forms of organization in agriculture, i.e. in the operations of medium-sized agricultural enterprises [18-20].

MATERIALS AND METHODS

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 difference between the systematic procurement of agricultural parts using the IT support system in connection with the maintenance of agricultural machinery and the partial support of procurement of the aforementioned parts of the maintenance of agricultural machinery.

The following were analyzed: major investment parts of maintenance of agricultural machinery, agricultural tools, maintenance parts of attached machines, maintenance parts of trailers, i.e. their total score.

The survey included a survey of 226 medium-sized enterprises that were completed by the owners or top management of the mentioned enterprises, in such a way that the system procurement with the application of IT included 143 entities, as well as with the partial application of the IT system in the procurement of parts by 83 entities included in the survey.

The survey gave the opportunity to evaluate trust in the form of procurement in an interval of 1-10, with the highest trust being possible to rate with 10 and the weakest with 1.

In the second part of the research, a multiple regression analysis was used to predict the purchase of large investment parts for the maintenance of agricultural machinery.

A level of 0.05 was used for the threshold value of significance.

RESEARCH RESULTS AND DISCUSSIONS

The research provides an overview of the differences in the two models of procurement of agricultural machinery in the work of medium-sized enterprises operating in the Republic of Serbia in January 2026.

The t test of independent samples was used to examine the differences.

The obtained results are shown in Table 1.

Table 1. Differences in relation to the partial and majority application of the IT support system in the procurement of agricultural parts for the maintenance of agricultural machinery

	System implementation of the IT procurement support system (N=145)	Partial implementation of the IT procurement support system (N=82)	t	p
	Average value			
Large investment parts of maintenance of agricultural machinery	7.67 ± 0.41	3.88 ± 0.44	61.768	<0.0005*
Agricultural tools	7.59 ± 0.38	6.88 ± 0.45	13.598	<0.0005*
Maintenance parts for	9.01 ± 0.40	6.21 ± 0.41	45.499	<0.0005*
railer maintenance parts	8.38 ± 0.30	7.09 ± 0.87	15.756	<0.0005*
Total	6.97 ± 0.26	6.37 ± 0.85	8.491	<0.0005*

Based on the results of the t-test shown in Table 1 it can be observed that for all types of procurement of parts of agricultural machinery as well as the total score, there is a statistically significant difference, where the value in terms of security of procurement in favor of IT system support as a support system in the procurement of parts of agricultural machinery is higher compared to the same when there is partial support for procurement by the IT system at the beginning of 2026 in the Republic of Serbia.

The second part of the research was the application of multiple linear regressions with the aim of seeing the impact of the possible forecasting of the large-scale purchase of agricultural machinery through a systematic procurement approach.

The systematized results are presented in Table 2.

Table 2. Forecasting the procurement of large investment parts for the maintenance of agricultural machinery and the system application of IT systems

	Beta	t	p
Constant	-	19.921	<0.0005*
Agricultural tools	-0.751	-17.101	<0.0005*
Excessive supply of agricultural products	-0.321	-9.472	<0.0005*
Maintenance parts for attachment machines	-0.021	-0.289	0.713
Trailer maintenance parts	0.016	0.342	0.604

The regression analysis yielded a coefficient of determination of 0.32, on the basis of which it can be concluded that the obtained model describes 32% of the total variance.

This shows that predicting the procurement of large investment parts for the maintenance of agricultural machinery with the system support of the IT procurement system is statistically significant as a model ($F=68.002$, $p<0.0005$).

Based on the results shown in Table 2, it can be seen that the systematic application of the IT procurement support system for all analyzed forms of procurement of agricultural machinery is a much safer procurement system, which is such that the owner and top management have much more confidence compared to the model of partial application of IT in the procurement of the mentioned forms of procurement of agricultural machinery.

CONCLUSION

The practical functioning of medium-sized agricultural enterprises in the Republic of Serbia is extremely important when viewed through the procurement of means of maintenance of agricultural machinery. The obtained results indicate the following peculiarities within the overall overview of procurement of means for the maintenance of agricultural machinery.

First, the procurement of funds for the procurement of agricultural machinery is much safer ($p<0.0005$) based on the evaluation of the key holders in the business of medium-sized enterprises if it is carried out with systematic procurement support using the IT system compared to the procurement where it was carried out with partial support of the IT system.

Secondly, the systematic application of the IT procurement support system for all analyzed forms of procurement of agricultural machinery is a much safer procurement system in the opinion of the owners and top management because they have much more confidence in relation to the model of partial application of IT in the procurement of the mentioned forms of procurement of agricultural machinery.

Thirdly, it is possible to predict procurement based on large-scale investment parts for the maintenance of agricultural machinery with the systemic support of the IT procurement system because a model was obtained that is essentially statistically significant ($F=68.002$, $p<0.0005$) for all other analyzed forms of procurement of parts necessary for the operation of agricultural machinery that are used in the business of medium-sized agricultural enterprises.

CONFLICT OF INTEREST

None is declared

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UPRAVLJANJE SREDNJE VELIKIM POLJOPRIVREDNIM PREDUZEĆIMA I NABAVKOM MEHANIZACIJE: -UTICAJ SVEOBUHVAATNE NASPRAM DELIMIČNE PODRŠKE IT SISTEMA

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Abstrakt: Nabavka poljoprivredne mehanizacije je jedan od ekonomsko bitnih faktora poslovanja velikog broja pravnih lica u agraru. To je od naročite važnosti za poslovanje srednjih poljoprivrednih preduzeća koja traže načine unapređivanja nabavke. Ustanovljeno je da postoji bitna razlika ukoliko se nabavka poljoprivredne mehanizacije sprovede uz potpunu podršku IT sistema u odnosu na način poslovanja srednjih poljoprivrednih preduzeća gde se nabavka obavlja uz delimično utvrđenje procedure nabavki poljoprivredne mehanizacije. To je potvrđeno prikazom rezultata u Tabeli 1, gde se kod svih oblika nabavki odnosno za: krupne investicione delove održavanja poljoprivredne mehanizacije, za nabavku poljoprivrednih alata, delova održavanja priključnih mašina, delova nabavki za održavanje prikolica, odnosno za njihov ukupni skor javljaju vrednosti veće što ukazuje na veće poverenje nosioca odlučivanja ako je nabavka urađena uz sistemsku podršku IT sistema u odnosu na poslovanje odnosno nabavku kod koje postoji delimična podrška IT sistema podrške. Navedeno je potvrđeno nakon prikaza rezultata u Tabeli 2, odnosno urađenog predviđanja nabavke gde je za osnovu uzeta vrednost nabavki krupnih investicionih delova za održavanje poljoprivredne mehanizacije primenom sistemske podrške nabavke putem IT sistema. Dobijeni rezultati su bili u korist sistemske podrške IT sistema primenjenog prilikom nabavki delova za održavanje poljoprivredne mehanizacije u odnosu na delimičnu podršku i to za sve analizirane oblike nabavki kao i njihovog skora, jer su dobijene vrednosti bile značajne ($p < 0.0005$) u funkcionisanju nabavki delova za poljoprivrednu mehanizaciju, kod poslovanja srednjih poljoprivrednih preduzeća.

Ključne reči: Nabavka, IT, poljoprivredna mehanizacija, održavanje.

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