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DEVELOPMENT OF LOGISTIC MODEL AS AN INNOVATION FOR DESIRED QUALITY OF SERVICE[1]

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Abstract

Each society makes everyday trials for improved management with communal waste. Each innovation that offers enlarged quality represents possibility for future improved strategy. Imperative of every man today is healthy living environment and maximally healthy way of living. Therefore in this paper one quite different concept will be represented – solution of the problems that the communal waste could create. If it is known that this phenomenon is inevitability and there is no possibility that no men could be exempted from the need to create a communal waste then this be solved upgraded and improved. The best and most suitable is every solution to be supported with a model. Here as a model is the desired quality of the service with completely justified scientific maintainability would be the presented logistic model - LMMCW about management with the communal waste and the possibility for qualitative and maintainable development with distinguished contributions for the people.

Keywords-Logistic model-LMMCW; benefit; concept – solution; influence;communal waste

[1] Original scientific paper

INTRODUCTION

Innovative solutions of the management with the communal waste MCW, are more and more present in the contemporary analyses. Consideration of new logistic model for management with the communal waste (LMMCW) and new logistic strategy about management with the communal waste (LSMCW) are possible only with the scientific rules product of the logistics concretely for these problems of the traffic transportation communal logistics.

The purpose of this paper is with scientific methodology to put the main parameters and indicators of LMMCW and LSMCW considered for Republic of Macedonia (RM) as a concrete example. Having in mind this the theoretical purpose is the possibility which is offered by the scientific methods and the possibility to allow application of measures and solutions from the domain of management with the communal waste (MCW). Concretely this has to allow successful identification, solution and implementation of the benefits for each resident, expression of quality which the new LMMCW and LSMCW possess. With this the social benefit of the development of new LMMCW represents a top quality and desired level of service in this domain.

PURPOSE ANDHYPOTHETICAL FRAME OF THIS PAPER

The purpose of this paper is the positive influence of the model strategically to feel every man.

The main hypothesis Is the creation and development of new LMMCW. Separate hypotheses are:

- The considered – logistical aspects, concepts, tasks, functions, levels and approaches really to portray the PARAMETERS of LMMCW (phase 1 of LMMCW).
- The trustworthy data about the populated places, the population, the communal waste (CW), the area, the density, the households and the apartments represented to give contribution as INDICATORS, (phase 2 of LMMCW represented officially through the State institution for statistics of Republic of Macedonia (SISRM).
- The proposed policies to be applicable in the future decisions expressed as output logistical elements and that is through development of real six SCENARIOS with by five ALTERNATIVES for each scenario and with by ten POSSIBILITIES as OPTION for each alternative represented as (phase 3 of LMMCW).
- This kind of concept represents an innovation in this domain.

SCIENTIFIC METHODS

During the analysis, research and the realization of this paper, the following scientific methods will be applied: ((method of analysis, synthesis and classification), (inductive and deductive method of conclusion), (method of abstraction, concretization and generalization), (method of description and comparison), (method for collection of data), (method of interpretation), (methodology of modelling of systems), (application of series of logistical, mathematical, computer and statistical methodologies and procedures), and (systematically approach)).

LOGISTICAL MODEL FOR MANAGEMENT OF THE COMMUNAL WASTE

Concrete steps during modelling of this unique LMMCW are:

- STEP 1: Defining of system or problem of LMMCW.
- STEP 2: Establishing of criteria for decision or purposes of LMMCW.
- STEP 3: Formulation of the connections between the parameters and criteria in other words forming of the model (LMMCW) really supported with real data indicators.
- STEP 4: Generating of certain alternative conditions product of LMMCW, and
- STEP 5: Selection of certain action with which the most number of the alternatives will be fulfilled as output elements of LMMCW and access in LSMCW.

Defined like this it should work out and allow clear precision of the logistical performances about the DESIRED STATE of desired optimum when it is MCW in question and also its possibility for future DEVELOPMENT.

BASIC ELEMENTS OF THE LOGISTICAL MODEL FOR MANAGEMENT OF THE COMMUNAL WASTE

The basic elements of LMMCW are chain, centre, technology, system, process, principle, expense and control.

IDENTIFICATION AND PERFORMANCE OF THE LOGISTICAL MODEL FOR MANAGEMENT WITH THE COMMUNAL WASTE

The performance of the model most often is in phases and that is:

- Phase 1: Defining of the problem and the necessity (defined in this paper),
- Phase 2: where and how the logistical model shall have certain effect (RM as a state),

- Phase 3: which will be the connections and relations that will be base or foundation of the model (the entire road and organizational infrastructure for MCW in RM – as an input through defining the parameters and indicators of LMMCW),
- Phase 4: how the functionality of the model will be (selection of scenarios, alternatives and possibilities as options as output elements),
- Phase 5: how certain benefits of the model will be realized (concrete estimation and influence expressed with clear and precise explanation), and at last,
- Phase 6: how the model will be controlled (transition from alternative into alternative or higher scenario with clear and precise economical, technical technological or ecologically useful action).

The performance of LMMCW is defined through the following scales of influence of the model are defined a sequence of scales of influence. Concretely for LMMCW is modified one scale of values which are in function of performance of the concrete LMMCW. These tables of performance of the concrete LMMCW are given in the following table number 1, respectively interpreted.

Table 1. Logistical aspects, concepts, tasks, functions and levels and approaches as indicators part of LMMCW

Coefficient	Influence	Interpretation
0,1	Very little	*
0,2	Little	*
0,3	Medium	*
0,4	Medium high	*
0,5	High	*
0,6	Verihight	*

*interpretation is different for aspects, concepts, tasks, functions, levels, approaches.

TESTING, FUNCTIONALITY AND APPLICATION OF INDICATORS IN THE LOGISTICAL MODEL FOR MANAGEMENT OF THE COMMUNAL WASTE

The testing is a procedure which should offer maximally desired conditions of desired quality of all elements.

The functionality would be for one state that is divided regionally and at municipal centres. The application is given with coefficients for influence for one state. That is given in table 2.

The application of LMMCW offers unique ranked conditions for phase 1 of LMMCW and is represented in table 3 and ranked condition for phase 2 represented in table 4 of logistical model is different in different variants.

Table 2. Populated places, Population, CW, Area, Density, Households and Apartments, as parameters part of LMMCW

Table 2.1 Populated placesTable 2.2 Population and CW

Number of P.P,	Class	Estimation and Influence	Number of residents	Communal Waste	Estimation and Influence
1 - 20	**1**	**0,1 (**Very little**)**	1 - 10000	1-9000	**0,1 (**Very little**)**
21 - 40	**2**	**0,2 (**Little**)**	10001 - 30000	9001 - 27000	**0,2 (**Little**)**
41 - 60	**3**	**0,3 (**Medium**)**	30001 - 60000	27001 - 54000	**0,3 (**Medium**)**
61 - 80	**4**	**0,4 (**Medium high**)**	60001 - 80000	54001 - 72000	**0,4 (**Medium high**)**
81 - 100	**5**	**0,5 (**High**)**	80001-100000	72001 - 90000	**0,5 (**High**)**
Over 101	**6**	**0,6** (Very high)	Over 100 001	Over 90001	**0,6** (Very high)

Table 2.3 Area Table 2.4 Density

Area (km^2)	Class	Estimation and Influence	Density	Estimation and Influence
1 - 200	**1**	**0,1 (**Very little**)**	1 - 20	**0,1 (**Very little**)**
201 - 400	**2**	**0,2 (**Little**)**	21 - 40	**0,2 (**Little**)**
401 - 600	**3**	**0,3 (**Medium**)**	41 - 60	**0,3 (**Medium**)**
601 - 800	**4**	**0,4 (**Medium high**)**	61 - 80	**0,4 (**Medium high**)**
801 -	**5**	**0,5 (**High**)**	81 - 100	**0,5 (**High)

1000				
Over 1001	**6**	**0,6** (Very high)	Over 101	**0,6** (Very high)

Table 2.5 Households

Table 2.6 Apartments

Households	Class	Estimation and Influence	Apartments	Estimation and Influence
0 - 2000	**1**	**0,1 (**Very little**)**	0 - 2000	**0,1 (**Very little**)**
2001 - 5000	**2**	**0,2 (**Little**)**	2001 - 5000	**0,2 (**Little**)**
5001 - 15000	**3**	**0,3 (**Medium**)**	5001 - 15000	**0,3 (**Medium**)**
15001 - 25000	**4**	**0,4 (**Medium high)	15001 - 25000	**0,4 (**Medium high**)**
25001 - 35000	**5**	**0,5 (**High**)**	25001 - 35000	**0,5 (**High**)**
Over 35001	**6**	**0,6** (Very high)	Over 35001	**0,6** (Very high)

Table 3 Rank for aspects, concepts, tasks, functions and levels and approaches, as parameters part of LMMCW

Coef	Influence	Interpretation
0,1	Very little	Aspects (to 0,5); Concepts (to 0,3); Tasks, functions and levels (to 0,3) and Approaches (to 0,5) Remark that all influences are minimal (the limit of influence is minimal). **RANK A**
0,2	Little	Aspects (to 1); Concepts (to 0,6); Tasks, functions and levels (to 0,6) and Approaches (to 1) Remark minimum one influence not to be minimal, or all influences are in second limit (the limit of influence is of minimum one minimal influence to all influences to be maximally in second interpretation). **RANK B**

0,3	Medium	Aspects (to 1,5); Concepts (to 1); Tasks, functions and levels (to 1) and Approaches (to 1,5) Remark minimum one influence not to be in second limit, or all influences are in the third limit (the limit of influence is of minimally one second limit to all influences to be maximally in third interpretation). **RANK C**
0,4	Medium high	Aspects (to 2); Concepts (to 1,4); Tasks, functions and levels (to 1,4) and Approaches (to 2) Remark minimum one influence not to be in third limit, or all influences are in fourth limit (the limit of influence is of minimally one third influence to all influences to be maximally in fourth interpretation). **RANK D**
0,5	High	Aspects (to 2,5); Concepts (to 1,8); Tasks, functions and levels (to 1,8) and Approaches (to 2,5) Remark minimum one influence not to be in fourth limit, or all influences are in fifth limit (the limit of influence is of minimally one fourth influence to all influences to be maximally in fifth interpretation). **RANK E**
0,6	Very high	Aspects (to 2,5); Concepts (above 1,8); Tasks, functions and levels (above 1,8) and Approaches (above 2) Remark minimum one influence not to be in fifth limit, or all influences above fifth limit (the limit of influence is of minimally one fifth influence to all influences to be maximally in fifth interpretation). **RANK F**

Table 4 Rank for Population, Populated places, CW, Area, Density, Households and Apartments, as parameters of LMMCW

Logistic influence	Coef	Estimation
Populated places, (Population, CW),(Area and Density) (Apartments and Households) **PP, P, CW, AD, AH**	From 0,7	**Very bad A**

PP, P, CW, AD, AH	From 0,71 to 1,4	**Minimal B**
PP, P, CW, AD, AH	From 1,41 to 2,2	**Good C**
PP, P, CW, AD, AH	From 2,21 to 2,8	**Optimal D**
PP, P, CW, AD, AH	Above 2,81	**Maximal E**

POSSIBILITY FOR STRATEGICVIW OF THE LOGISTICAL MODEL FOR MANAGEMENT WITH COMMUNAL WASTE

The possibilities that are offered by LMMCW are six unique scenarios: Scenario 1 – Scenario with very small influence, Scenario 2 – Scenario with small influence, Scenario 3 – Scenario with medium influenceScenario 4 – Scenario with medium big influence, Scenario 5 – Scenario with big influence and Scenario 6 – Scenario with very big influence

These possibilities from LMMCW offer unique access in LSMCW. These possibilities modelled and programmed are represented in the following title of this paper where six windows are represented, that are compound part of the new LMMCW.

PROGRAM VIEW OF THE LOGISTICAL MODEL FOR MANAGEMENT WITH COMMUNAL WASTE

The program view of LMMCW modelled and formed with the previous scientific methodology is represented at the following figure number 1. At figure number the basic first window of LMMCW is represented. The textual further explanation is valid, which is the following: LMMCW as a model modelled and formed upon previous scientific methodology is functional with that at the start it must clearly be defined the state for which the research is performed, the number of regions in that state defined with concrete name, the number of municipalities defined with concrete name and at last defined the character of the municipalities (urban or rural). In the phase one of LMMCW the adequately represented data of table 1 defined with parameters as influences of the logistical aspects, concepts, tasks, functions and levels, and also approaches for each municipality (as real and also desired) – expressed as logistical estimations. In the phase 2 (represented influences in the table 2) are represented the indicators as real data for each municipality as an influence for the inhabited places, the population, the communal waste, the area, the density, the households and

the apartments – expressed as logistical influences. And at last phase 3 selection of real and desired scenario represented in table 5 as one segment of the six possible scenarios which LMMCW offers as options. The model offers possibility for selection of state, region and community, calculation of the logistical estimation, logistical influence and offers selection of concrete scenario. That is given in the following figure 1 where it is emphasized the selection of state, region and community and also the calculations of the logistical estimation and influence and also the selection of the alternative in other words the real scenario.

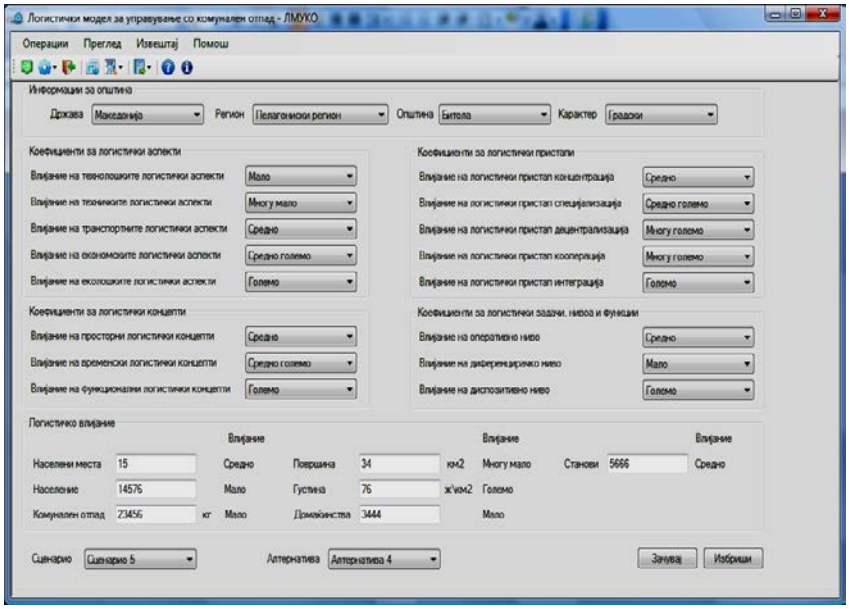

Fig. 1 Program view for REAL CALCULATIONS

CREATION OF THE FUNCTIONAL LOGISTICAL STRATEGY ON A BASE OF LOGISTICAL MODEL FOR MANAGEMENT WITH COMMUNAL WASTE

The creation of LMMCW is on a base of the input parameters, the input indicators, the output elements as scenarios, alternatives and possibilities that are product of LMMCW with desired application of valid and verified alternatives and possibilities represented in table 6.

Table 6 Application, validation and verification of LSMCW – through LMMCW

APPLICATION would be final logistical solution LMMCW and LSMCW for the needs of MCW in RM considered by traffic transportation character.
VALIDATION means new LMMCW and new LSMCW as a unique model and strategy.
VERIFICATION is the maintainable application of LMMCW and LSMCW in RM as state constituted legally defined entirety, tested anywhere and on any state constituted legal entirety.

SCIENTIFIC CONTRIBUTION OF THIS PAPER

After finishing this paper the following results are offered: (Proof about the validity of the logistics at MCW. Scientifically analysed logistical parameters expressed through adequate logistical estimation. The planned division of the regions in RM should be scientifically and legally defined. Scientifically analysed logistical indicators expressed through adequate logistical influence.

The methodologies are scientifically represented (with their latest phases) for creation, forming, modelling and programming of new LMMCW and new LSMCW with application of the methods at multi criteria analysis, influences and decisions for obtaining optimality at this field with survey of RM. At the end it has proof for the applicability of LMMCW through application, valorisation, validation and feasibility of technological, effective and productive) viewing the matters.

At last this paper should have to offer the following theoretical and practical scientific contributions in applicative sense, and that is:

Theoretically: development of theoretic frame (new LMMCW and LSMCW) at level of regions in RM, based on the behaviour of the users, and the technical possibilities that are available in RM in accordance with the valid Laws.

Methodologically: This paper is justified because for the first time aspects and policies for creation new LMMCW and LSMCW in RM were outlined.

Practically: through considering of more aspects, a possibility was created for analysis and prediction of the behaviour of the individuals in new LMMCW and LSMCW and establishment of the most effective (cost effective) way of offering of better logistic services in the process of MCW in RM.

BENEFITS OF THIS PAPER

Encircled in this way this paper deserves scientific view which fulfils the requirements of such one research. The benefit of this work should have the whole science which comprises the technological disciplines with a special accent on the traffic transportation engineering. The basis for scientific contribution is the logistics, transportation logistics and the communal logistics as disciplines which are unbreakable part of the traffic transportation engineering and planning.

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