

Modelling decision-making process when choosing a import multifunctional logging equipment for the conditions of the Russian Federation.

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Abstract:

This article describes a mathematical model of managerial decision-making when choosing a multifunction logging equipment imported for the conditions of the Russian Federation with regard to its technical and economic indicators.

Keywords: logging equipment, modeling, decision-making process

1 Introduction

With the development of logging equipment industrialists and manufacturers make basic rate on the multifunction machines. Using this equipment increases productivity of machine systems and reduces the cost of the finished product. Consumer multifunctional logging equipment has always preferred product, the most satisfying of his needs, and the manufacturer, which ensures optimum match of quality, consumer characteristics and price of the commodity nature and specifics of its demands. It is important to find out exactly how the consumer makes evaluation and selection of imported multifunctional logging equipment according to its technical and economic indicators.

2 Results

Based on the analysis and synthesis of models and the factors influencing the decision of consumers logging equipment, the model behavior can be represented in a diagram (Fig. 1), whose essence is as follows [1,2]:

Determining the need for equipment i-th destination, the consumer forms a list of its technical characteristics, we denote them as $j = \overline{1, s_1}$, the most important to meet the demand. In parallel, the consumer creates a list of the most important economic indicators for his equipment $j = \overline{1, s_2}$, such as price, payment terms etc. This sets the value of each indicator, where the item needs to be satisfied in full P_{jt}^{TH}, P_{jt}^{EH} . In this case, the characteristics required for technical I_i^T and economic I_i^E level of multifunctional logging equipment, and consumer demand on the criterion of "quality-price" I_i^{T-E} will equal one.

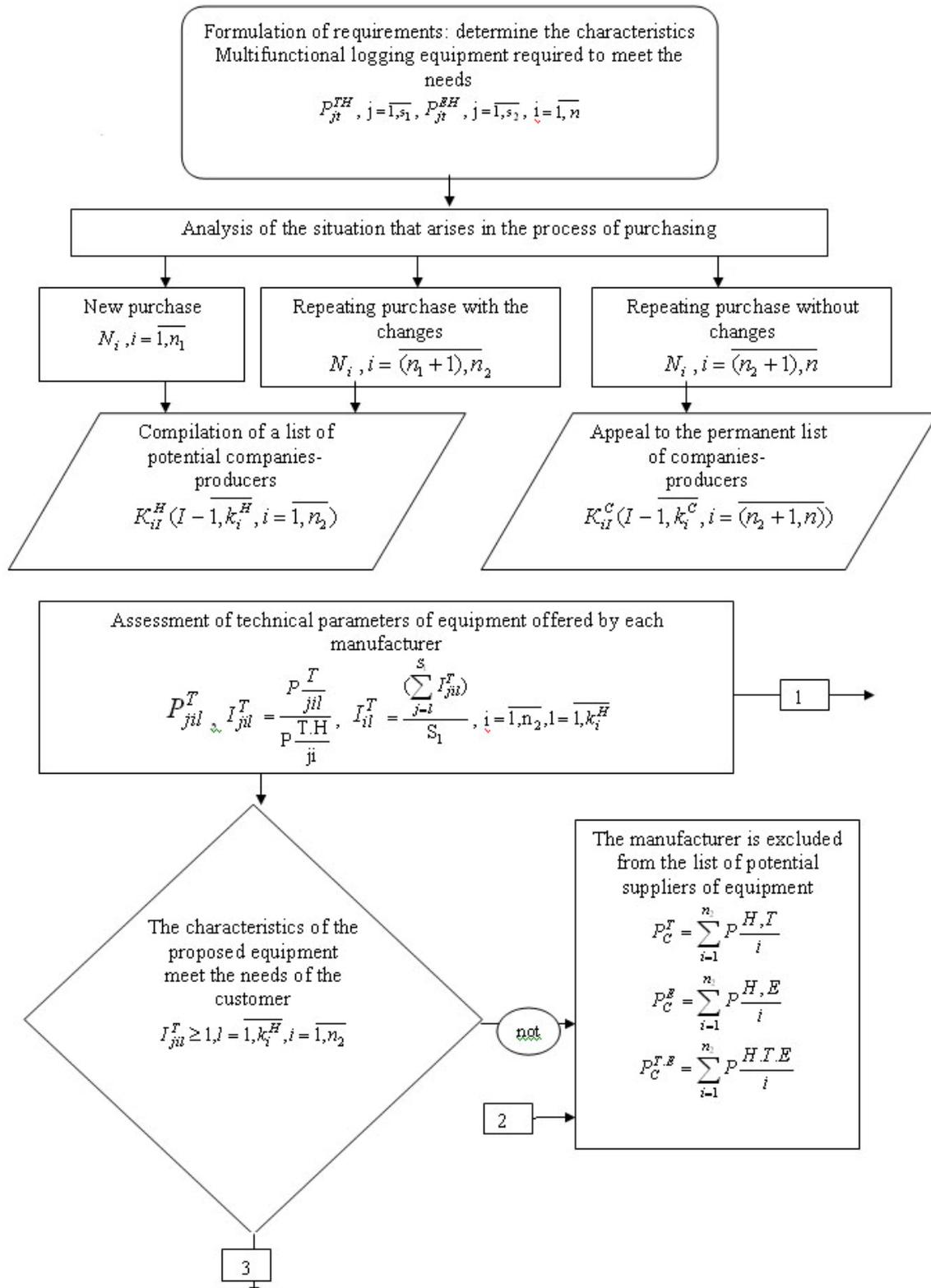


Figure 1: Algorithm simulation model

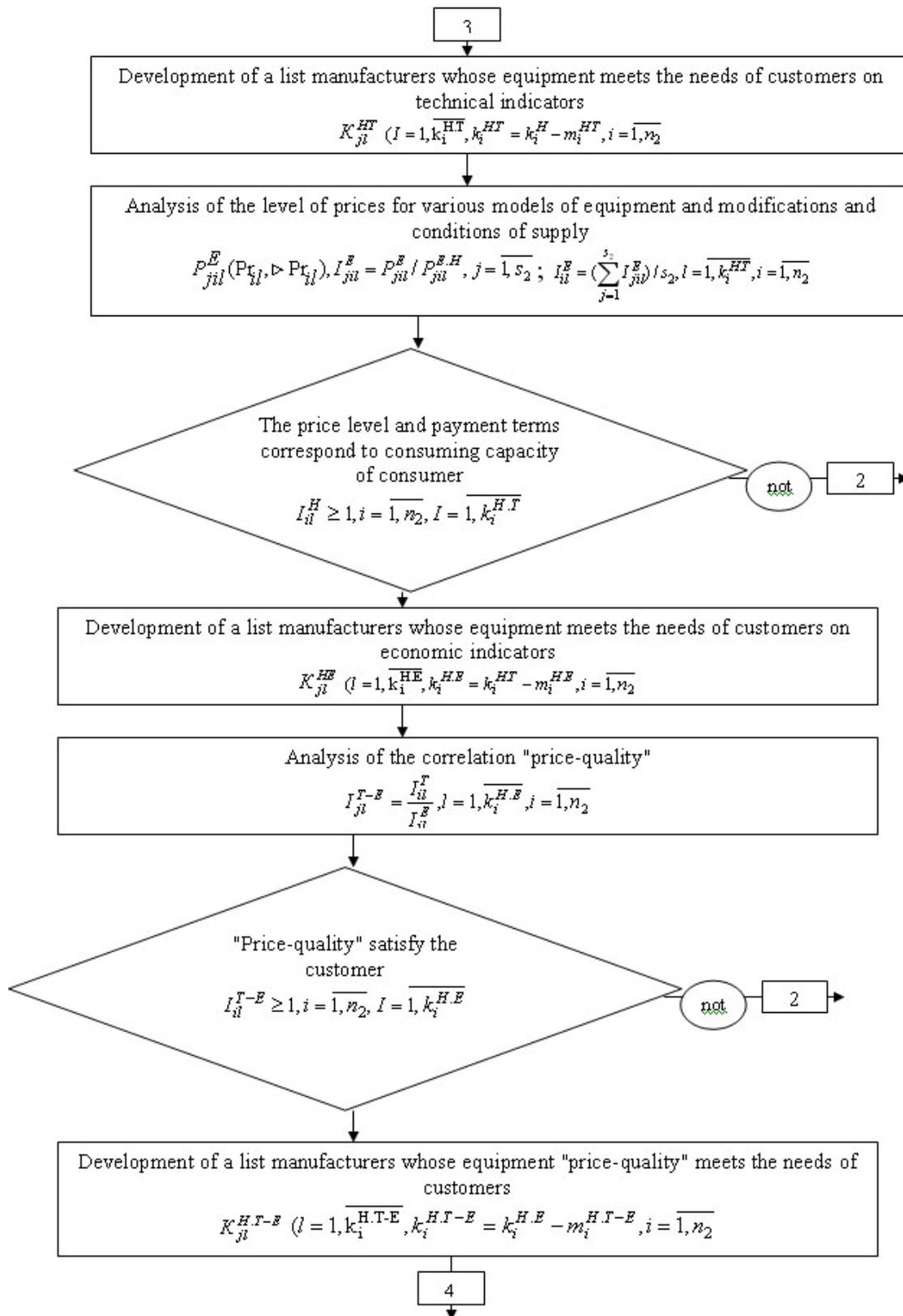


Figure 1: Algorithm simulation model (continued)

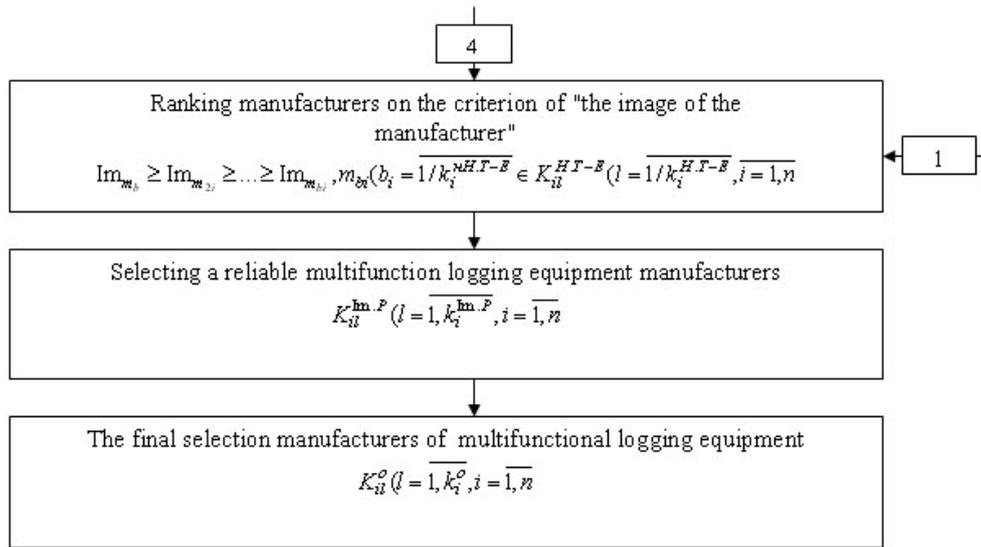


Figure 1: Algorithm simulation model (continued)

Equipment to meet new needs, is classified as "new purchase" $i = \overline{1, n_1}$. Equipment purchased before and do not meet the consumer for some indicators $i = \overline{(n_1 + 1), n_2}$. For these two categories of equipment is a list of potential manufacturers $K_{il}^H (i = \overline{1, n_2})$, where k_i^H - amount of analyzed potential manufacturers the i -th multi-logging equipment.

If the analyzed equipment that meet this need, has been acquired before buyer is completely consistent with its requirements, and if at the time of purchase decision and the quality of technical and economic level of the equipment continues to meet the consumer because of the immutability of his claims, or by a specific excess of the requirements of the equipment consumer, the equipment $i = \overline{(n_2 + 1), n}$ is classified as "recurring purchase no change" and encourage consumers to automatic renewal provision, the reference to the permanent list of suppliers $K_{il}^C (i = \overline{(n_2 + 1), n}, l = \overline{1, K_i^C})$, where K_i^C - the number of providers of i -equipment involved in the re-buying process.

At the first stage of selection import multifunctional logging equipment is assessed technical parameters of each i -th equipment $i = \overline{1, n_2}$ offered by each i -th $l = \overline{1, k_i^H}$ producer. For these units are calculated metrics I_{jil}^T for each j -th parameter from the list of technical $S_1 (j = \overline{1, s_1})$ and general I_{jil}^T technical indicators, where:

$$I \frac{T}{jil} = \frac{P \frac{T}{jil}}{P \frac{TH}{jil}}, I \frac{T}{il} = \frac{\sum_{j=1}^{s_1} I \frac{T}{jil}}{s_1}$$

(1)

Then, the figures obtained are compared with customer requirements. If $I \frac{T}{il} \geq 1$, i-th equipment complies with the requirement of the buyer, and manufacturers, whose equipment, which satisfy this condition are included in the list K_{jl}^{HT} ($l=1, \overline{k_i^{HT}}$, where $k_i^{HT} = k_i^H - p_i^{HT}$, p_i^{HT} - the number of producers who are excluded from further analysis due to inconsistencies technical parameters of the equipment requirements of customers).

In the following stage of selecting a multifunctional logging equipment manufacturers produced an analysis of economic indicators of the proposed equipment $p \frac{E}{jil}$: price \mathbf{Pr}_{il} and terms of payment $\triangleleft \mathbf{Pr}_{il}$. Calculated individual indicators $I \frac{E}{jil} = P \frac{E}{jil} / P \frac{EH}{jl}$ for each j-th parameter from the list of economic $S_2(j = \overline{1, s_2})$ and generalized economic indicators:

$$I \frac{E}{il} = \left(\sum_{j=1}^{s_2} I \frac{E}{jil} \right) / s_2, i = \overline{1, n_2}, l = \overline{1, k_i^{HT}}$$

(2)

Obtained results are compared with customer requirements. If $I \frac{E}{il} \geq 1$, l-th manufacturer included in the list K_{jl}^{HE} ($l=1, \overline{k_i^{HE}}$, where $k_i^{HE} = k_i^{HT} - p_i^{HE}$, p_i^{HE} - the number of manufacturers who are excluded from further analysis due to inconsistencies economic indicators equipment with the requirements of customers).

Further is analysis of conformity the prices of technical and economic level of equipment and complete service. To this end, comprehensive indicators of the competitiveness of of each equipment:

$$I \frac{T-E}{il} = \frac{I_{il}^T}{I_{il}^E}, l = \overline{1, k_i^{HE}}, i = \overline{1, n_2}$$

(3)

According to the results comparing the integrate indicators producents customer requirements with producents, producing equipment to meet the condition $I \frac{T-E}{il} \geq 1$ are included in the list K_{il}^{HE} ($l=1, \overline{k_i^{HE}}$, where $k_i^{HE} = k_i^{HT} - p_i^{HE}$, p_i^{HE} - the number of manufacturers whose equipment does not satisfy the consumers in terms of price and quality).

Further to determine from the lists K_{il}^{HT-E} , K_{il}^C of the most reliable manufacturers held their rankings by the factor of fame ("company image") and on the prospects of a factor produced goods. On the basis of ranking by the final choice of company-producers K_{il}^o ($l = 1, k_i^o$, where k_i^o - the number of finally selected multifunctional forestry equipment manufacturers).

3 References

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