Measuring the Quality of the Statistical Data in the Function of Qualitative Management

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1. Introduction

Information is a product of the informational system and as such it is able to satisfy the management needs which makes decisions on the bases of these information. The quality of the management decisions depends on the quality of the information.

The quality and the control of the information quality cannot be monitored partially. Quality control cannot be the final ring of the productive chain, but it is an engaging of all the productive forces before, during and after the ending of the productive information process.

The control of statistical data quality should be based on a modern concept and production of high-professional staff.

2. Control of the statistical data quality

The basic aim of the control of the statistical data quality during their gathering is the control of their accuracy. This control uncovers the sources of the errors and measures their influence.

As a basic parameter in measuring the statistical data quality during the subsequent control, will be the variant of response.

Let's suppose that the items in the extract are chosen with equal probability. The evaluation of probability for certain characteristic X of the appearance is:

$$P_{tu} = \frac{1}{n}\sum_{j=1}^{n} x_{jtu}$$

If the real probability of the characteristic H of the appearence is:

$$P = \frac{1}{N}\sum_{j=1}^{N} x_{ju}$$

The expected value of p_{tu} is:

$$P_u = Ep_{tu}.$$

Therefore,

$$D_u = P_u - P$$

is a partial evaluation of p_{tu}.

The middle square error of the evaluation (MSE) is

$$MSE(p_{tu}) = E(p_{tu} - P)^2 = E(p_{tu} - P_u)^2 + (P_u - P) = \sigma^2_{ptu} + D^2_u.$$

The first component is a total variant of the evaluation p_{tu}, while the second is a partial evaluation.

The disassemble of the total variant to a variant of extract and a variant of response is of fundamental meaning, that is,

$$G^2_{P_{tu}} = E(p_{tu} - P_u)^2 = E\left[(p_{tu} - p_u) + (p_u - P_u)\right]^2 =$$

$$= E(p_{tu} - p_u)^2 + E(p_u - P_u)^2 + 2E(p_{tu} - p_u)(p_u - P_u)$$

The first expression is a variant of response from p_{tu}, that is,

$$\sigma^2_{\bar{d}_t u} = E(p_{tu} - p_u)^2 = E\left(\frac{1}{n}\sum_{j=1}^{n}(x_{jtu} - P_{ju})\right)^2 = E\left(\frac{1}{n}\sum_{j=1}^{n} d_{jtu}\right)^2 = E\left(\bar{d}_{tu}\right)^2$$

Hansen and Hurwitz[1] present this variant as

$$\sigma^2_{\bar{d}_t} = \frac{1}{n}E_{d^2_{jtu}} + \frac{n-1}{n}\cdot E(d_{jtu}d_{ktu})$$

where the expectations are taken via all possible attempts including all possible extracts and also all possible responses, that is

$$\sigma^2_{\bar{d}u} = \frac{\sigma^2_{du}}{n} + \frac{n-1}{n}\cdot r_{du}\cdot\sigma^2_{du} \quad \sigma^2_{du} = E(d_{jtu} - E_{djtu})^2 = E_{d^2jtu}; (E_{djtu} = 0)$$

is the simple variant of response that reflect the variability of the response from one attempt to another and $r_{du} = E(d_{jtu}d_{ktu}) / \sigma^2_{du}$ is a coefficient of the correlation of the response withdrawal.

For this paper, the analysis of the simple variant of response is also interesting:

$$\sigma^2_{\bar{d}_t} = Ed^2_{jtu} = E(x_{jtu} - p_{ju})^2 = Ex^2_{jtu} + EP^2_{ju} - 2EP_{ju} - 2EP_{ju}x_{jtu}$$

because $x^2_{jtu} = x_{jtu}$ then,

$$\sigma^2_{\bar{d}_t} = EP_{ju} + EP^1_{ju} - 2EP^2_{ju} = E(P_{ju} - P^2_{ju})$$

Now, when these values are taken via all items in the appearance, the simple variant of response is:

$$\sigma^2_{du} = \frac{1}{n}\sum_{j=1}^{N} P_{ju}(1 - P_{ju})$$

REFERENCES

Laudon, K, C., :" Management Information Systems ", Prentice Hall,Inc.1998

Ivanovic, B.: "Theoretical statistic", Naucna knjiga, Beograd, 1973god.

ABSTRACT

La fonction de gestion réalise des décisions basées sur informations. Avec le contrôle de qualité des données on détecte les sources des erreurs et on mesure leur impact.

RESUME

Function of the management make decisions on the basis of the information.With quality control of the data, the sources of the errors are uncoverederte and their influence is measured.

[1] Hansen, M.H.; Hurwitz W.N.: "Response errors in surveys", JASA, vol. 46, 1951