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MODELLING OF TECHNICAL OPERATION IN RELATION TO MEASURING MEANS

One can notice a great need of improvement in designing quality. This problem concerns also a specific branch of factories that produce electronic measuring instruments. We are using new generation electronic circuit, for example: the microprocessor system. They are further called „functors". Their application to get unified functional scheme of measuring instruments. Their use simplifies assembling. A short term „measuring means" is proposed in order to search uniformity of terminology. It describes technical means for measurement purposes. The MM′s is created as a result of realisation of multistage process of technical operations. The process can be divided into to parts. The first one contains „creations" and another contains „products". The model presented can be useful for training future engineers with respect to creation and understanding the creation process.

Keys words: methodology, measuring instruments.

1. INTRODUTION

One can notice a great need of improvement in designing quality. This problem is illustrated in Fig.1.

Three fundamental parameters have considerable influence on the global quality of manufacturing. They are quality control, manufacturing control and optimum designing of future products. The contribution of these parameters underwent changes during the technical process and the role of the design processes has increased.

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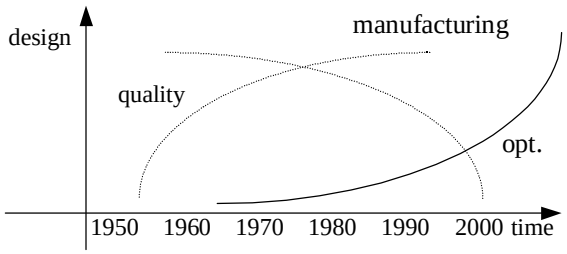

Fig. 1. Parameters have influence on the global quality

2. NEW PROBLEMS WITH ELECTRONICS INSTRUMENTATION

This problem concerns also a specific branch of factories that produce electronic measuring instruments. The designing quality of measuring instruments has to be reached an activities process.

The hitherto development of metrological did not give an indication for universal methods of their activities or their creation. The structures and algorithms of these meteorological devices depend fundamentally on kind of measured quantities and any kind of electronic elements, which are used.

The first generation of measurement instruments was used to measure the basic electrical quantities. These were electromechanical instruments and the so-called analogue instruments.

The next step of the instrument construction was „electronization". Same mechanical blocks and elements were replaced by speciality designed electronic circuits. The structure and work algorithms were stilling the same in the previous group of instruments.

The electronic measuring instrument construction realised devices and elements with low quality of technical parameters.

Further, these parameters were changing by manufactory factors and by some other outside factors such temperature, time, power, supply variation et. .

In such conditions it was very hart to predict of the design process because the models of devices and elements were very simple.

The essential moment in the manufactory process was introduction of new generation electronic circuit (for example the microprocessor system). They are future called „functors". The functors characteristics are following:

- large possibility of processing of the signals measured, sometimes far larger than the actual need,
- good and stable technical parameters,
- notes applications make them easier to be used to build electronic measuring instruments.

We are using more and more universal functors, to get unified functional scheme of measuring instruments. Their use simplifies assembling.

3. MEASURING MEANS

A short term „ measuring means" is proposed in order to reach uniformity of terminology. It describes technical means for measurement purposes. (Fig. 2.)
MM's have to have the following properties:

- the delivery of information environment
- possibility to determine action on environment

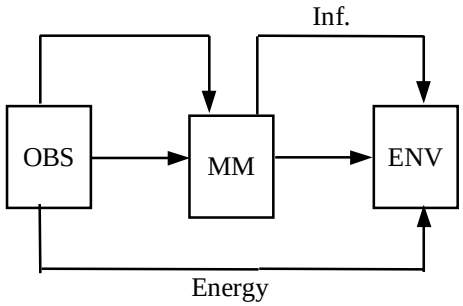

Fig. 2. Scheme of measuring means

Additional conditions are accomplished with the above ones.
These are:

- exactness of transformations must be known,
- so-called condition of information's and energetic matching must by both perform.

Representation of MM's is so called megasystem (MS) which is abstractive operating complex circuit composed from the basic units - functors. Example of such a structure is shown on the Fig.3.

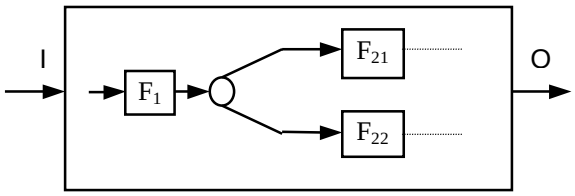

Fig. 3. Structure of megasystem (MS)

The MM's are created as a result of realisation of the multistage process of technical operations. The elements of motioned operations are following: design, construction, production, exploitation. (Fig. 4).

The process can be divided into two parts. The first one contains „ creations" and another contains „products".

As a result of the technical operations one obtains a product which has the following properties:

$$\langle MM\ 's \rangle = \langle I, O, \Pi, D \rangle$$

I - input, O - output, Π - appearance, D - processing performance

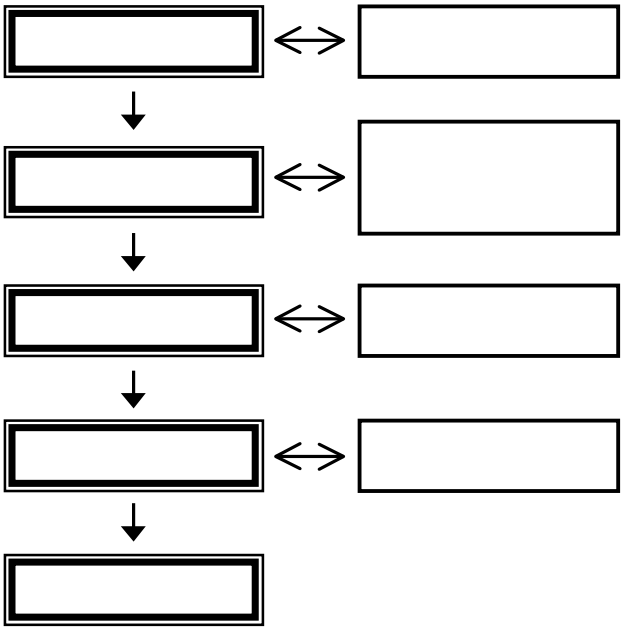

Fig. 4. The scheme of the multistage process of technical operations

These elements are subject to creator's implications. The model presented can be useful for training future engineers with respect to creation and understanding the creation process. The complexity of modern measuring instruments is reason that searching for their models and tools aided creation process is necessary.