

## AUTOMATION IN BRIEF

Berest Oleg, *SU-51*

Automation - is the use of control systems such as computers to control industrial machinery and processes, replacing human operators. In the scope of industrialization, it is a step beyond mechanization. Whereas mechanization provided human operators with machinery to assist them with the physical requirements of work, automation greatly reduces the need for human sensory and mental requirements as well.

It is easier to understand the essence of automation when it is divided into four stages: ancient times, middle ages, the end of 18th - the beginning of 20<sup>th</sup>, from 1960 till our days. Here you can find short description of this periods:

1) there were first attempts to create something new and useful to make the life of people more easier. Famous inventors of this period: Geron Alexandriyskiy, Akrit and many others.

2) a critical mass of needs, talents, materials, workmen, and markets developed in the 18th century that brought about the industrial revolution and the beginning of practical automation.

3) practical industrial automation really began in the late 18th century. It developed rapidly thereafter. The two world wars spurred advances in science and technology that were quickly adapted to industrial needs.

4) photo eyes, Hall effect sensors, servomotors, engineered materials, pneumatic components, hydraulic components, bearings, and a host of well engineered components, prime movers, and sub systems too numerous to mention are now readily available.

Automation consists of four main parts:

1) Control system. It is a device or set of devices to manage, command, direct or regulate the behavior of other devices or systems.

There are two common classes of control systems, with many variations and combinations: logic or sequential controls, and feedback or linear controls. There is also fuzzy logic, which attempts to combine some of the design simplicity of logic with the utility of linear control. Some devices or systems are inherently not controllable.

2) Industrialization. It is the process of social and economic change whereby a human group is transformed from a pre-industrial society into an industrial one. It is a part of a wider modernization process, where social change and economic development are closely related with technological

innovation, particularly with the development of large-scale energy and metallurgy production. It is the extensive organization of an economy for the purpose of manufacturing.

3) Numerical control (NC). It refers to the automation of machine tools that are operated by abstractly programmed commands encoded on a storage medium, as opposed to manually controlled via handwheels or levers, or mechanically automated via cams alone.

4) Robotics. It is the engineering science and technology of robots, and their design, manufacture, application, and structural disposition. Robotics is related to electronics, mechanics, and software.

Now automation is developing in next ways: autonomous automation, home and office automation

Autonomous automation refers to 'the use of autonomous software agents to adapt the controllers of computer controlled industrial machinery and processes'

The term autonomous automation has in the past, on a limited number of web-sites, been used mainly to refer to 'the use of autonomous computer controlled industrial machinery and processes'. Since automation implies autonomy to a great extent this usage can be considered as somewhat redundant.

Home automation (also called domotics) may designate an emerging practice of increased automation of household appliances and features in residential dwellings, particularly through electronic means that allow for things impracticable, overly expensive or simply not possible in recent past decades. The term may be used in contrast to the more mainstream "building automation," which refers to industrial settings and the automatic or semi-automatic control of lighting, climate doors and windows, and security and surveillance systems.

Office automation refers to the varied computer machinery and software used to digitally create, collect, store, manipulate, and relay office information needed for accomplishing basic tasks and goals. Raw data storage, electronic transfer, and the management of electronic business information comprise the basic activities of an office automation system. Office automation helps in optimizing or automating existing office procedures.

As a conclusion I want to say that automation is just at the first stage of development. And may be in five or ten years it will change our world into place without any problems, that human can not to decide. It is really very perspective science and I think a lot of ordinary things will be modified with it in future.

Dyadechko A.M., *ELA*