

FLEXIBLE TECHNOLOGIES OF THE RECONFIGURABLE AUTOMATIC PLANTS

A V Gurjanov¹, A V Shukalov², D A Zakoldaev², I O Zharinov²

¹ Director, Stock Company «Experimental Design Bureau «Electroavtomatika» named after P A Yefimov, 40, Marshala Govorova St., Saint Petersburg, 198095, Russia

² Faculty of Information Security and Computer Technologies, ITMO University, 49, Kronverksky Av., Saint Petersburg, 197101, Russia

E-mail: igor_rabota@pisem.net

The scientific problem is to analyze and to synthesize modern plants resource, which manufacture the devices in engineering. There is an analysis and scheme of plants resources in the existing enterprises, which use the flexible technologies of computer numerical control (CNC) as a base for devices manufacturing. Obviously that CNC robotic cell potential today has run out its possibility. There is an analysis and some ready theoretical solutions (scheme) in the subject area of the new paradigm reconfigurable manufacturing resource. Obviously that synthesis of new reconfigurable plant is based on flexible assembly technologies, which have some application for the industrial reconfigurable manufacturing systems. Reconfigurable manufacturing infrastructure elements of the existing enterprises and the modern plant are defined as well as new robots specialized for the reconfigurable automation plant.

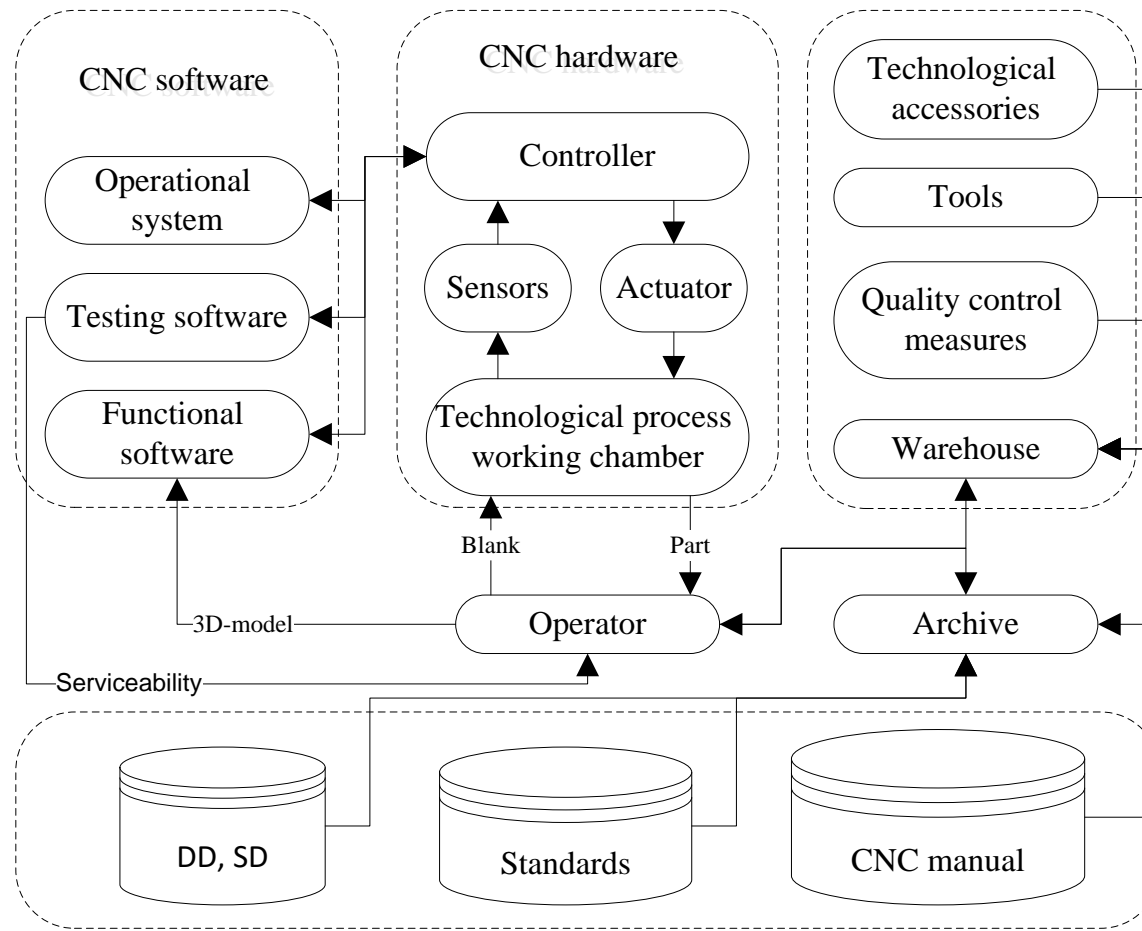


Figure 1. The functional scheme of the existing plants components.

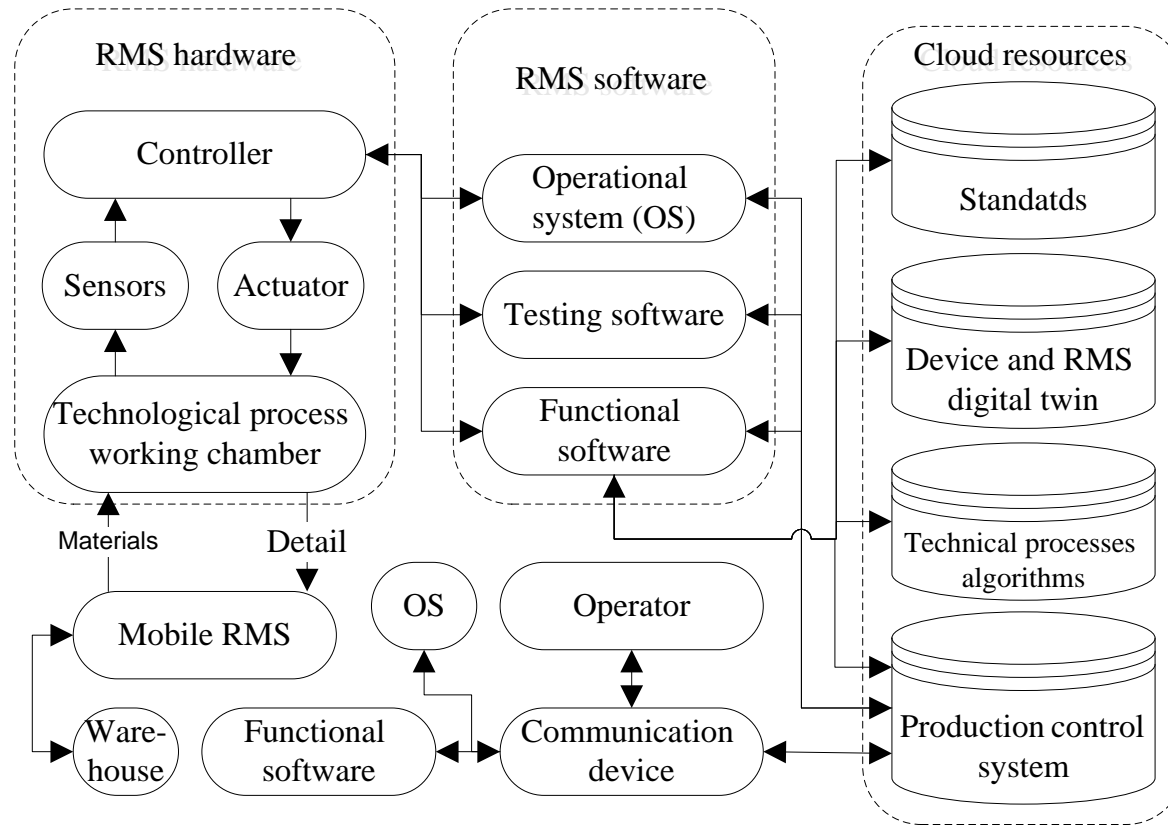


Figure 2. The functional scheme of the reconfigurable plants components.

The existing plants and the reconfigurable plants manufacturing resource has some substantial components in common, include:

- computer machine controlled with a software, which use the principles of automation software control;
- electronic formats of device representation, which will be manufactured in RMS;
- humane high qualification, which run the CNC, RMS and make running in the subject area of works to organize a scalability plant and other.

New types of automatic reconfigurable resources, which are particular for the self-reconfigurable plants are:

- reconfigurable manufacturing system to make the full cycle of device manufacturing operations;
- flexible and advanced technologies, which provides the RMSs self- reconfigurable principles using artificial intelligence methods;
- virtual sensors of reconfigurable manufacturing systems and the reconfigurable plant in general placed in the factory cloud environment.

The reconfigurable plants resource main advantages are the greater role of automatization in completion of manufacturing operations, which helps to develop of RMSs.