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## ROBOTIZED WORKPLACE IMPACT ON THE ENVIRONMENT

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## ВПЛИВ РОБОТИЗОВАНОГО РОБОЧОГО МІСЦЯ НА НАВКОЛИШНЄ СЕРЕДОВИЩЕ

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## ВЛИЯНИЕ РОБОТИЗИРОВАННОГО РАБОЧЕГО МЕСТА НА ОКРУЖАЮЩУЮ СРЕДУ

*Advanced systems allow the user to program the handling operations without detailed description of the individual motion instructions. The development also tend to develop libraries for frequently used programs, which can be re-used when describing specific tasks. Developed software modules are integrated into the system components.*

**Key words:** *generated image, computer support.*

*Fig.: 2. Bibl.: 6.*

*Розвинуті системи дозволяють користувачам програмувати вантажні операції без детального опису окремих рухів. А також розвиток вплине на оновлення бібліотек для часто використовуваних програм, які можуть бути повторно використані при описі конкретних завдань. Розроблені програмні модулі, інтегровані в системні компоненти.*

**Ключові слова:** *генеровані зображення, комп'ютерна підтримка.*

*Рис.: 2. Бібл.: 6.*

*Развитые системы позволяют пользователям программировать грузовые операции без детального описания отдельных движений. А также развитие повлияет на обновление библиотек для часто используемых программ, которые могут быть повторно использованы при описании конкретных задач. Разработаны программные модули, интегрированные в системные компоненты.*

**Ключевые слова:** *генерируемые изображения, компьютерная поддержка.*

*Рис.: 2. Библ.: 6.*

**Introduction.** Deployment of robots in the production process helped to improve environmental protection. First, to increase the purity of the individual sites and speed up the production of products. Human society in its rapid technological development is progressing and intellectually, came to the point where the protection of the natural environment appears to be a necessity for the further preservation of civilization. People are gradually realizing that increasing demands have resulted in expansion of production, which is concentrated in manufacturing enterprises. As these companies are almost at the very beginning of production, it is necessary to begin with the implementation of greening measures right away. Improving the quality of the production process always leads to a reduction of pollution in the environment. Any undertaking that invests in improving the quality of its production, it also means investing in improving the quality of the environment.

**1. Design automation and robotic systems.** The study area is currently define the specific directions of applications. Since robotic systems and clusters are in terms of their structural funds and technical track elements and implemented operational activities to the most complex, automated reference approaches their work are considered crucial.

Computer support project activities in this area is developing in the following groups:

**Indirect programming of robotic equipment and systems.** Real systems of this type go beyond pure programming. Allow to solve quite a wide range of design aspects such as the deployment of technical resources, design of operational procedures, simulation of operations, solving collision situations and under. The main objectives of which are specified in the development of systems for indirect programming, according to:

- automatic control of collision situations,
- automatic determination pathway active units,
- setting up standard containers handling tasks,
- dissemination to receive information from sensors,
- graphical verification of the travel path,

- modelling world interactive graphical techniques,
- interaction of technology and handling activities,
- communication in the native language.

### **Simulation of work activities and robotic systems and their technical elements.**

Software systems in this category allow solving a wide range of project tasks that as the key can be picked up:

- determining the robot configuration and the means of production,
- find the optimum layout of the robotic system,
- more appropriate choice of instruments envisaged purposes,
- off-line handling and simulation of manufacturing processes,
- simulation of spatial and temporal course of production,
- interference checking, collision situations, the functional activity of a system,
- comprehensive design animated robotic systems.

Top systems in this category allow complex simulation activity in a realistic 3D space technologies and tools through computer animation.

**Complex computer aided design of robotic systems.** Program modules and systems provide solutions in support of the main stages of formation of the technological project. By custom and practice is mainly the following stages:

- preparing a summary of the project, which contains a detailed statement, the role of its reasoning, the basic concept of solutions and endpoints to be achieved in the implementation of,
- analysis of product spectra, assessing their suitability for automated production and profiling product grouping,
- proposals of progressive and rational production methods and technical-economic indicators of production,
- proposals for appropriate organization of production (layout, equipment and service departments),
- design solutions of material and information flows,
- developing spatial solutions robotic system,
- preparation of drawings of the project,
- preparation of technical-economic part of the project and its economic rationale.
- the development of the plan of implementation of the project

The reference approach to the formation of the expert system architecture is illustrated on pic 1. For key parts of the system are considered to be user interface for promoting knowledge experts, custom knowledge base in which are recorded the structural aspects of the programs, their content and code generators, component documentation.

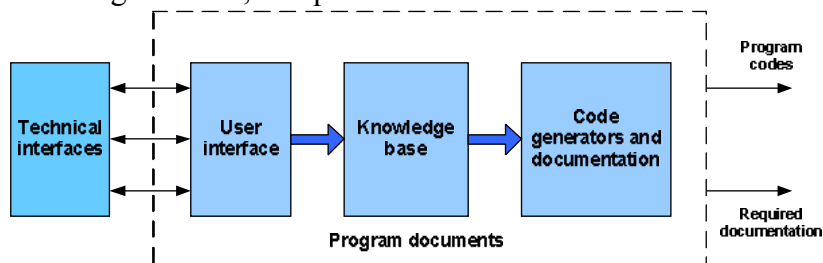


Fig. 1. Architecture experimental system for creating application software

**Graphic support means for the design of robotic manufacturing systems.** Labor-intensive nature of the graphic design requires implementation of different graphic support tools developed computer graphics. Graphics software systems are used in several areas:

- **Image generation** (generative computer graphics). Basic usage is in the generated image, the segmentation and transformation,

– **Image analysis.** By joining the graphical programming system is image information and the output is a formal description of the object to be imaged. Basic usage is in recognizing patterns, structures, when analyzing scenes, etc.,

– **Image processing.** By joining the graphical programming system is image information. The output of the image information. The main use is in increasing the resolution of the images and machine-made (artificial) intelligence.

Another approach to targeting of graphic software systems is derived from the principle of data processing. A distinction is graphic:

– **Scanning (points).** To create an image using the set of points. Each dot (pixel) is represented by one bit in the so-called. bit map in a computer memory. Pixel Graphics has several drawbacks and is not used for technical drawing.

– **Coordinate (vector).** Coordinate graphic uses coordinates of the points displayed objects stored in computer memory. Resolution and imaging accuracy depends on the accuracy algorithms and internal calculations. The methods used to coordinate and raster graphics are different due to the different representations and data structures.

In terms of the operator's work is an important way of communicating with graphical programming system. According to this criterion, it is possible to distinguish systems with passive and interactive graphical interface. Currently mainly used interactive methods to ensure dialogue between the operator and the graphical programming system. Interactive mode of work, however, also requires adequate hardware and software.

A qualification feature of the distribution of the graphical programming system can be a number of images generated per unit time. In this case the distinction between static and dynamic display software systems. When the image generation rate is so high, the impression of continuous movement of objects in real time, it is an animation.

**2. Environment and engineering.** Machinery, energy, technology, manufacturing, machinery representing the technical means by which man uses natural energy sources and raw materials, facilitate and replaces human labor, producing functional objects, transport of material and persons, protects and regulates the environment, retrieving and disseminating information.

In terms of effects on the environment are three categories of machinery:

1. Machinery, the mechanical effects, the production of waste products and waste energy sources act as depreciation of environmental pollution (transport, energy, manufacturing machines and equipment).

2. Specific machinery serving on the containment and use of waste materials and waste energy, which is emitted from technical sources (primarily other machinery) in environmental equipment (separators, filters and air emissions, wastewater and industrial wastewater treatment plants, sewage silencing and vibration).

3. Special machinery, which serve to modify the purity of air and the microclimate in the interior of residential and working environment (ventilation, air conditioning and heating systems).

The trend in the development of machines leads to the formation of complexes with each succeeding principles of transformation, transmission and processing. Formed aggregates lines - a set of devices equipped with metering and regulation devices and automatic control systems. In general terms these units as machinery. If they are used to the application of technical procedures that are technological devices if they are intended to produce the products they are manufacturing facilities.

As an example of the union machinery it includes energy facilities for heat supply, which include:

– Solid fuel boiler (conversion of chemical energy of fuel into heat energy and its transfer).

– The diesel, chemical, refractory particles (ash) from the flue gas (transfer agents, chemical processing agents).

- Trap gaseous impurities.
- Electric motors, pumps (energy conversion).
- Heaters, heat exchangers (transfer of heat energy).
- Measuring and automatic control (transmission and processing of information).

Machinery, like other technical devices are characterized by their utility function, and in the environment. Terms unilaterally raising the utility function were already in the majority of machinery overcome. Increasingly enforce aspects of evaluation functions of these devices in the environment - secondary function. Despite these tendencies Experience shows that a substantial part of the environmental burden caused directly or indirectly machinery. The main reasons for this unfavorable situation may be different.

The conversion process and transfer of energy and matter, process mechanical treatment substances in machinery are always accompanied by waste. Energy conversion and transmission shall take effect less than 100%, then loss-making energy environmentally harmful. Converting electric power to drive the machines generated by thermal load of the internal environment. The transformation of the chemical composition of substances is accompanied of side substances often with a more severe effect on the environment than had the starting material.

Machine, machinery, such as anthropogenic environmental spheres to interact on humans and other environment components, their mechanical factors, fabric, functional and aesthetic. Relationships between machines and other components of the environment and man expresses, pic. 2. As an example, the instantiation relationships include automobile. While driving one regime change affects engine exhaust emissions, noise and vibration. Climatic factors affecting human performance management of heating, respectively air conditioning. Automobile exhaust emissions affect climate through other parts of the environment, principally flora.

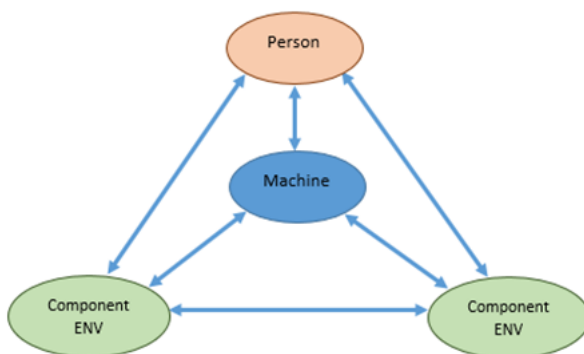


Fig. 2: Relations in the system of machine components ENV, person

Man as architect, designer of the design concept of the car affects the production of exhaust emissions and noise and the influence of man on the natural ingredients is limited and relates primarily to the elimination of consequences of the devastation of flora.

**Conclusion.** It is now possible to identify a high variability of project methodology and procedures to carry out only specific solutions. This fact substantially adversely affects the possibility of making the type of project or generally applicable procedures which would be reflected in the universal programming systems. Existing reference solutions of complex systems have therefore its specific peculiarities. It is expected that expert systems will represent the perspective of computer-aided design especially in areas where the absence of algorithmic procedures. Their wider use in the project activity is conditioned by solving problems related to development of methods of representation and description of the production of knowledge. Implementation of environmental policies in the current period is increasingly characterized by the precautionary principle, as a result, among other things, gives greater attention to the impact of products and technologies on the environment. Under

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these approaches range States adopt principles of environmental product policy and implemented systems of the environmental aspects of a product before it entered the market, combined with the direct ie legal regulatory mechanisms incorporated into a mandatory system of registration, certification and authorization of indirect instruments, which are in different countries various forms of valuation and favoritism. In European countries in recent years as one of the main instruments of environmental motivation producers pushed through environmental assessment and labeling. A system which ensures that the product complies in accordance with the current state of knowledge parameters, minimizing or even negative adverse effects on the environment. The issue of preference products that meet the criteria for protection of environment during their entire life cycle, however, is increasingly coming to the fore of interest not only to consumers but also businesses and communities.

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