[Automation](https://lms.kgeu.ru/mod/url/view.php?id=70884) is a system of manufacture designed to extend the capacity of machines to perform certain tasks formerly done by humans, and to control sequences of operations without human intervention. The term [automation](https://lms.kgeu.ru/mod/url/view.php?id=70884) has also been used to describe nonmanufacturing systems in which programmed or automatic devices can operate independently or nearly independently of human control. In the fields of communications, aviation, and astronautics, for example, such devices as automatic telephone switching equipment, automatic pilots, and automated guidance and control systems are used to perform various operations much faster or better than could be accomplished by humans.

Elements of [Automation](https://lms.kgeu.ru/mod/url/view.php?id=70884)

     Automated manufacture arose out of the intimate relationship of such economic forces and technical innovations as the division of labor, power transfer and the mechanization of the factory, and the development of transfer machines and [feedback](https://lms.kgeu.ru/mod/page/view.php?id=50190) systems as explained below. he division of labor (that is, the reduction of a manufacturing or service process into its smallest independent steps) developed in the latter half of the 18th century and was first discussed by the British economist Adam Smith in his book An Inquiry into the Nature and Causes of the Wealth of Nations (1776). In manufacturing, the division of labor results in increased production and a reduction in the level of skills required of workers. Mechanization was the next step necessary in the development of [automation](https://lms.kgeu.ru/mod/url/view.php?id=70884). The simplification of work made possible by the division of labor also made it possible to design and build machines that duplicated the motions of the worker. As the technology of power transfer evolved, these specialized machines were motorized and their production efficiency was improved. The development of power technology also gave rise to the factory system of production, because all workers and machines had to be located near the power source. The transfer machine is a device used to move a work piece from one specialized machine tool to another, in such a manner as to properly position the work piece for the next machining operation. Industrial robots, originally designed only to perform simple tasks in environments dangerous to human workers, are now extremely dexterous and are being used to transfer, manipulate, and index (that is, to position) both light and heavy workpieces, thus performing all the functions of a transfer machine. In actual practice, a number of separate machines are integrated into what may be thought of as one large machine. In the 1920s the auto industry combined these concepts into an integrated system of production. The goal of this assembly-line system was to make automobiles available to people who previously could not afford them. This method of production was adopted by most automobile manufacturers and rapidly became known as Detroit [automation](https://lms.kgeu.ru/mod/url/view.php?id=70884). Despite more recent advances, it is this system of production that most people think of as [automation](https://lms.kgeu.ru/mod/url/view.php?id=70884).

**Exercise 2**

*Заполните пропуски недостающими по смыслу словами, используя текст:*

1. Manufacture system designed to extend the capacity of machines is called ***automation***.
2. Automated manufacture arose out of division of ***such economic forces and technical innovations as the division of labor, power transfer and the mechanization*** of the factory.
3. The division of labor is, the reduction of a manufacturing or service process into its smallest***independent*** steps.
4. Another step necessary in the development of [automation](https://lms.kgeu.ru/mod/page/view.php?id=50187) was ***mechanization***.
5. As a result of the development of power transfer specialized machines were ***motorized*** and their production efficiency was improved.
6. The development of ***power*** technology also gave rise to the factory system of production.
7. The transfer machine is a device used to move a ***work piece*** from one specialized machine tool to another.
8. Industrial robots were originally designed only to perform ***simple***tasks.
9. The goal of the ***assembly-line*** system was to make automobiles available to people who previously could not afford them.

**Exercise 3**

*Соответствуют ли данные предложения содержанию текста:*

1. [Automation](https://lms.kgeu.ru/mod/page/view.php?id=50187) is a system of manufacture designed to reduce the capacity of machines to perform certain tasks formerly done by humans.-***No***
2. In the fields of communications, aviation, and astronautics [automation](https://lms.kgeu.ru/mod/page/view.php?id=50187) is used in a very limited scale.- ***No***
3. Automated control systems are used to perform various operations much faster or better than could be done by humans.-***Yes***
4. Power transfer and the mechanization of the factory were the main obstacles in the development of [automation](https://lms.kgeu.ru/mod/page/view.php?id=50187). - ***No***
5. The division of labor developed in the first half of the 19th century and was first discussed by the French economist Adam Smith. -***Yes***
6. Mechanization was the next step necessary in the development of [automation](https://lms.kgeu.ru/mod/page/view.php?id=50187). -***Yes***
7. The development of power technology gave rise to the factory system of production. -***Yes***
8. The transfer machine is a device used to move workers from one place to another. -***Yes***
9. In the 1920s the auto industry combined [automation](https://lms.kgeu.ru/mod/page/view.php?id=50187) concepts into an integrated system of production. -***Yes***
10. The goal of the assembly-line system in auto industry was to make automobiles more expensive and luxurious.-***No***

**Exercise 4**

*Переведите на русский язык следующие предложения:*

1. An automated production line consists of a series of workstations connected by a transfer system to move parts between the stations.

***Автоматизированная производственная линия состоит из ряда рабочих мест, соединенных системой передачи для перемещения деталей между станциями.***

1. Modern automated lines are controlled by programmable logic controllers.

***Современные автоматизированные линии управляются программируемыми логическими контроллерами.***

1. Automated production lines are utilized in many industries, most notably automotive.

***Автоматизированные производственные линии используются во многих отраслях промышленности, в первую очередь в автомобильной.***

1. If the part is mass-produced, an automated transfer line is often the most economical method of production.

***Автоматизированная линия передачи часто является наиболее экономичным методом производства, если деталь производится серийно.***

1. Transfer lines date back to about 1924.

***Линии передачи датируются примерно 1924 годом.***

1. Press working operations involve the cutting and forming of parts from sheet metal.

***Операции обработки на прессе включают вырезание и формовку деталей из листового металла.***

1. An automated system is designed to accomplish some useful action, and that action requires power.

***Автоматическая система предназначена для выполнения некоторых полезных действий, и это действие требует мощности.***

**Exercise 5**

*Переведите на английский язык:*

1. Электричество является наиболее широко используемым источником энергии в современных автоматизированных системах.

***Electricity is the most widely used energy source in modern automated systems.***

1. Автоматизированные системы выполняют в основном два вида операций: 1) обработка;  2) перемещение и расположение.

***Automated systems perform basically two types of operations: 1) processing; 2) movement and location.***

1. Автоматизация это система производства, предназначенная для  увеличения производительности машин и механизмов.

***Automation is a production system designed to increase the productivity of machines and mechanisms.***

1. Связь, авиация и космонавтика являются отраслями, наиболее широко использующими автоматизацию.

***Communications, aviation and cosmonautics are the industries with the most extensive use of automation.***

1. Разделение труда, передача энергии и механизация производства  ускорили процесс развития автоматизации.

***The division of labor, the transfer of energy and the mechanization of production accelerated the development of automation.***

1. Следующим шагом, необходимым в развитии автоматизации, стала механизация.

***The next step required in the development of automation was mechanization.***

1. Развитие технологии передачи энергии, способствовало развитию автоматизации.

***The development of power transmission technology contributed to the development of automation.***

1. Промышленные роботы, изначально были разработаны для выполнения простых задач в опасных для человекаокружающих средах.

***Industrial robots were originally designed to perform simple tasks in environments that are hazardous to humans.***