



## A the Development of the Industry 4.0 Program in Uzbekistan is the Example of a Leather Shoes Manufacturer

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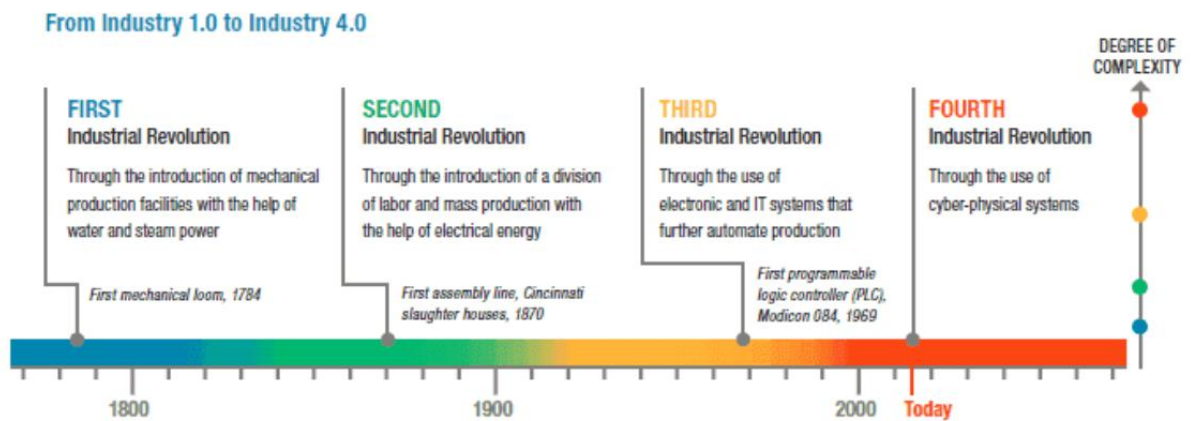
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**Abstract:** *Fast work combined with perfect organization of work promises to save time and costs. Thanks to the latest automation, production processes can be controlled with the help of robots. With the help of leading IT systems, communication between individual machines can be established digitally. Information exchange allows them to organize and work independently. Connected systems create an ideal cooperation between man and machine and strengthen the "brain power" and "work force" of its operators. network systems provide an opportunity to immediately recognize unexpected failures and deviations.*

**Keywords:** *Work force, brain power, network, leather shoes, industry, economy, IT, communication, production, market.*

Today's business markets are looking for modern manufacturing technologies to quickly respond to the high demands of variability, efficient supply chain and optimized energy consumption. As a solution, Industry 4.0 takes advantage of the integration of modern manufacturing technologies and information systems to promote manufacturing capabilities. In this context, smart manufacturing improves long-term competitiveness by optimizing labor, energy and materials to produce high-quality products, and by quickly responding to changing market demands and delivery times.

In a world that is constantly changing, it is important to find ways to quickly overcome new problems. You have to adapt, react and act quickly. The irony is that there is no single solution that will solve every problem. But there is one concept worth pursuing and becoming a smart company. A new way of thinking and the concept of acquiring skills and competencies that enable you to quickly adapt to a changing environment and thereby ensure sustainable growth for your company. A smart company is not a trend or a catchphrase, but a clear concept. Even if a smart company does not belong to a specific technology or system, companies that do not deal with the precise implementation of Industry 4.0 now risk missing out on the competition. When it comes to implementing Industry 4.0 solutions, speed is of the essence. Individual successful examples show what opportunities exist in the implementation of Industry 4.0, but there are still many companies that do not sufficiently deal with the potential of Industry 4.0. The industrial revolution in the form of Industry 4.0 is one of the most important economic development factors of our time for manufacturing companies. Developments have led from the steam engine (Industry 1.0), to assembly line work (Industry 2.0), to automation (Industry 3.0). Digital transformation is changing the future of the world of production. Today, Industry 4.0 technology aims to manage all production processes through advanced Internet services.



Modern digitization allows many factories to organize their work processes in production. Machines need to communicate with each other more independently using new technologies and thereby increase production. Fast work combined with perfect organization of work promises to save time and costs. Thanks to the latest automation, production processes can be controlled with the help of robots. With the help of leading IT systems, communication between individual machines can be established digitally. Information exchange allows them to organize and work independently. Connected systems create an ideal cooperation between man and machine and strengthen the "brain power" and "work force" of its operators. network systems provide an opportunity to immediately recognize unexpected failures and deviations. This technology allows for quick response in production. The Industry 4.0 solution has the following advantages:

- ✓ Reducing the cost of production;
- ✓ Smart optimization of the value chain;
- ✓ Increase in income;
- ✓ Strong competitiveness;
- ✓ Great flexibility in production;
- ✓ Common point to all supply chain;
- ✓ Increase in sales volume;

Currently, about 30 percent of German companies state that Industry 4.0 is of great importance. More and more companies see the trend towards the fourth industrial revolution. In the near future, the development of modern digitization will continue to grow. In two to three years, the relevance of Industry 4.0 is expected to increase from 29.3% to 35.4%.

The following segments are leading the market for Industry 4.0 solutions in Germany: hardware, software and IT services. IT services have the greatest growth opportunities and thus the highest sales. They amount to 3.564 billion euros and increased by 22.2%. Software is in second place with 1.195 billion euros and increased by 23.8%. Below that, the turnover is 1111 million euros and is growing by 14.2%.

Researching the issues raised in the scientific article, detailed study, analysis of numbers, interpretation of Industry 4.0, study of its driving forces and obstacles, systematization of analysis results, development of proposals and recommendations, induction, deduction, observation, comparison, Research methods such as SWOT analysis, expert assessment, targeted development were used. Grounded theory aims to develop a comprehensive explanation of a certain phenomenon. The method is usually used to generate theories based on systematically collected and analyzed data.



Very few people think of "shoes" when it comes to Industry 4.0. Because this industry is not sufficiently developed in our country. Several small shoe manufacturing enterprises in Namangan city were studied as a research. In these small enterprises, almost all of the production process is carried out with the help of manual labor. Industry-4.0 is undoubtedly the fundamental basis of the future economy. It includes not only engineering devices or economic calculations, but also informational programs and internet systems.

In this matter, many studies have been conducted on a global scale and conclusions have been reached. That is, for the implementation of Industry-4.0, the following basic additions to Industry 3.0 will be necessary:

- Industrial application of Internet of Things (IoT);
- Completed real database (used for various purposes, including selection of various parts of structures in the warehouse, instructions for repair and maintenance of equipment);
- Big data and business analysis (analysis allows working with big data, which allows to increase the performance of equipment and save energy, optimize product quality);
- Cloud technologies (used by advanced companies to solve tasks. When working with large amounts of information, it is necessary to improve cloud services);
- Autonomous works (system's independent processing of information and independent issuing of standard conclusions);
- Horizontal and vertical integration of systems (organization of close cooperation within the enterprise at different levels and between partner enterprises in the production cycle);
- Information security (cyber security, protected access, reliable communication, full control of access to management networks);
- Additive manufacturing (use of 3D printers to achieve mastery of additional technologies in industry, as well as to create prototypes and produce individual details);
- Digital modeling is one of the basic directions of the implementation of the Industry 4.0 program. Transfers the physical world to a virtual model. It is also called cyber physical system in scientific direction.

This system digitizes every physical activity in the enterprise. Industry-4.0 has rapidly entered the world business and has taken place among the major projects of developed countries. This can be seen from the fact that 74% of the trade in the robotics industry is accounted for by five countries: China, Japan, South Korea, the USA and Germany. In order to introduce the Industry-4.0 program to a leather-shoe manufacturing enterprise in Uzbekistan, it is appropriate to first analyze the current state of this industry. The leather footwear industry accounted for 1.1% of the manufacturing industry in 2020, 1.2% in 2021, 0.9% in 2018, and 0.5% in 2019. In 2022, compared to 2011, the export volume of industrial production increased by 115%.

Compared to 2021, the growth rate of production of leather and related products decreased by 21% (in 2021, this indicator was 102.1%), and the volume of production of leather and related products decreased by 20.08% (116 ,49) we can see. The volume of production of leather and related products in the Uzbek industry creates financial and organizational problems in the implementation of Industry 4.0. The reason is that currently there are not enough skilled IT specialists in our country, the energy system is not up to the demand, the price of IT devices is expensive, in addition, the volume of production of leather and related products in 2021 was 0.5% of the production industry. it is necessary to remove at least 5-6 percent of the output volume. For this purpose, it is necessary to support the investors who are setting up industrial enterprises with benefits and preferences. Increasing the weight of enterprises with high-tech capabilities in the



composition of industrial enterprises increases the possibility of implementing the Industry-4.0 program in Uzbekistan. The heart of the Internet evolution in today's industrial world is based on the interconnection of systems to offer faster data transfer and processing to meet the growing agility needs of industry.

In conclusion, it can be said that in order to eliminate the above problematic situations, it is advisable to implement the Industry-4.0 program with the following solutions:

First, to improve the quality of the Internet network for the stable operation of IoT, cloud technologies, cyber security, 5G Internet network and 3D technologies, including the radical reform of communication operator technologies, communication cables and telecommunication networks, and to create a service that meets the needs of the times. reach

Secondly, in order to ensure data security, develop, use, improve and control the effectiveness of information protection tools, develop secure telecommunication systems, increase the reliability of special software, use telecommunication equipment and automated information in accordance with information security requirements. improving the software certification system for processing systems, identifying technical devices and programs that threaten the normal operation of information and telecommunication systems, and developing an effective way to combat them.

Thirdly, in order to develop the energy system, it is important to increase the number of wind power stations, which convert the kinetic energy of the wind flow into electrical energy from solar batteries, a current source based on semiconductor photocells. Given that the wind power plant is often used as a source of electricity in regions with high average annual wind speed (greater than 5 m/sec) and far from centralized power supply networks, this indicator is suitable for the Fergana Valley. With this, it is possible to generate electricity from 8 kW to 1.2 mW in a wind power plant.

Fourthly, in order to increase the number of personnel in the field of IT in our Republic, to increase the number of IT lessons in schools, to include modern programming languages in the science curriculum, to increase the quality of their use of Internet networks in order to increase computer literacy among young students, to provide access to the Internet in remote areas of residential areas. network provision. Organization of various online platforms for training computer programmers (One million Uzbek coders), presentation of various grant projects in the field of IT. To radically reform the activities of currently operating IT parks and to reshape them by attracting qualified employees. Because most of the IT-parks are staffed with insufficiently qualified employees, and as a result, the IT-parks have not yet achieved any results.

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