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## THE POSITION OF WORKERS AND WORKING CONDITIONS THROUGHOUT THE INDUSTRIAL REVOLUTIONS

### Summary

This paper analyzes the impact of the industrial revolutions on the world of work, expressed through urbanization as a process that arose due to the need to concentrate the workforce in urban areas and the formation of industrial centers. The focus is on the impact of the first, second and third industrial revolutions and its embodiment in the practices of Great Britain, the United States of America, as well as the countries of Western Europe. The creation of industrial capacities for mass production undoubtedly affected the position of workers in the work process. The development of technology, on the other hand, had an impact on the individual and collective rights of workers. This paper presents the working conditions of workers between the first and third industrial revolutions, as development projections and harbingers of the emergence of the fourth industrial revolution.

**Key words:** industrialization, working conditions, industrial relations, technological progress, labour relations.

### 1. INTRODUCTION

The manifestation of labor in the historical-transitional period between feudalism and capitalism was catalyzed by several factors. First, in Europe, a process of urbanization began, caused by industrialization. The process of urbanization in certain parts of Europe began around 1500 in Northern Italy, while by 1750, the process of urbanization was observed and present in England, Belgium, Northern Italy, Spain, as well as in the

Netherlands, during which the labor force and the population engaged in agricultural activities almost halved in this 250-year period (Malinowski & Sander-Faes, 2023). This trend, in turn, catalyzed the transition from feudalism to capitalist urbanization, aided by the trend of population growth in Europe, which, according to some analyses, the number of living people from 70 million in the 1500s grew to 130 million in the 1800s.<sup>1</sup>

The transition between feudalism and industrialization, as well as the transition between manuscript and printed culture in England in the 15th century, also affected the mode of production (Robertson & Uebel, 2004). In addition, we will consider the manifestation of labor within capitalism as a form of socio-economic organization, which is accompanied by a period of fluctuation in technological progress on the basis of which the contours of the industrial revolutions were embodied and developed.

## 2. THE FIRST INDUSTRIAL REVOLUTION

The First Industrial Revolution catalyzed the transition and shift from manual to machine-assisted work, that is, it changed the way of working in Europe. The First Industrial Revolution represents a historical turning point from agricultural-agrarian societies to machine-based, that is, industrial society. In other words, the First Industrial Revolution caused a demographic revolution, an agricultural-agrarian revolution, a commercial revolution, and a transportation revolution (Deane, 1979).

The main carrier of the process of the first industrial revolution is Great Britain. What characterized the British population before the beginning of the first industrial revolution was a high level of literacy compared to other societies in the pre-industrial period (Clark, 2014). Even in terms of energy technology and its application in the 1780s, it is noticeable that the decisions they made and the choices they made were based on a specific knowledge and skills base that was present in Great Britain (Jacob, 1997). Accordingly, the period of the first industrial revolution began in Great Britain between 1750 and 1760 and lasted between 1820 and 1840.

From the perspective of the creation of a new economic and social formation, this period saw technological development in several directions:

- The rise of the factory system of production, especially in the textile industry
- The development of the steam engine as the main driver and the development of the railway and the increased demand for coal
- The development of iron smelting which allowed coke to be substituted for coal and led to a huge increase in the production of iron and steel, which influenced the increase in the demand for coal and the development of town gas (Braun, 2010).

Consequently, the first industrial revolution influenced:<sup>2</sup>

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<sup>1</sup> Ibid.

<sup>2</sup> Ibid.

- The rise of the industrial city
- The rise of the industrial workforce, and thus the working class or proletariat
- A huge expansion of the total consumption of manufactured goods

This period of the first industrial revolution had both negative and positive effects on the position of workers. On the one hand, the Ordinance of Labourers of 1349 and the Statute of Labourers of 1351 were applied, which legal act is considered the founder of English labor law. This Ordinance was adopted during a period of shortage of agricultural labor due to the extinction of 30-40% of the total population in Great Britain due to the existence of the Black Death of 1348-1350. The decree establishes and regulates several subject components, namely:

- All persons under 60 years of age must work
- Employers may not employ surplus workers
- Employers may not pay and workers may not receive wages higher than the pre-plague level
- Food must be reasonably priced without excess profit, while no one was allowed to give anything to able-bodied beggars "under the pretext of pity or charity".

However, on the other hand, this configuration, several centuries later, faced a new reality and a new challenge. That is, during the first industrial revolution, there are records that indicate that on the one hand the working week increased from 5 to 6 working days, or an additional 550 to 654 working hours in the period from 1760 to 1830, whereby, as Douglas Hay points out, industrialization created space for the increase and expansion of poorly paid child and female labor in both factories and rural industry, as well as low-paid agricultural and industrial employment for men (Hay, 2018).

On the positive side, the shortage of labor gave the working classes greater power of influence. Accordingly, due to the disparity and imbalance of power, the bargaining position of workers gradually increased, which led to a state of increasing workers' rights. As some authors point out, through the prism of the company founded by James Watt and Matthew Boulton, as employers they had a problem to meet the needs of a suitable workforce with an appropriate set of skills in the milling industry, because their millers were poached by other companies and foreigners offering higher wages and working conditions (Kelly, Mokyr & Grada, 2022). It is also stated that the inability of this employer to retain employees, or to hire new ones with the specific skills required to operate the most complex machine at the time, resulted in unreliable engines, long delays in delivery, and a complete absence of after-sales service from Boulton and Watt (Tann, 1970).

But at the same time, there are views that indicate that the period of industrialization also led to a certain degree of inequality in the societies of that time. The proponent of modern economics, Adam Smith, who lived and worked before the beginning and during the first industrial revolution, indirectly notes that technological progress should be concretized towards the overall wealth of nations, but at the same time points out that the inequality that developed during that period also occurred according to the nature of the

work engagement. The aforementioned inequality is also manifested in terms of the valuation and payment of labor. That is, the aforementioned inequality expressed in terms of wages for a certain work engagement is argued by Adam Smith to be due to several factors, namely:

- the wages of labor vary according to the ease or difficulty, the cleanliness or dirtiness, the honesty or dishonesty of the employment
- the wages of labor vary according to the ease and cheapness, or the difficulty and expense of learning the business - the wages of labor in different professions vary according to the permanence or inconstancy of the employment
- the wages of labor vary according to the little or great confidence that must be placed in the workers
- the wages of labor in different employments vary according to the probability or improbability of success in them (Smith, 1977)

Certainly, an additional characteristic that shaped the world of work within the framework of the first industrial revolution was the integration and exposure of women in the work process. Women and children were exposed to very intensive shifts and working hours during the day, from which reality their lives were unbalanced while work took a serious part of their time over the months and years. Although the treatment and exposure of children to work from a young age varied cyclically over the months and years, variable by a multitude of factors, it is considered that the first serious step towards introducing a kind of order for improving the working conditions of children was actually established through the adoption of the Factory Act a few years before the end of the first industrial revolution, more precisely in 1833 in Great Britain. Namely, this law introduced several improvements to the rights of children who were involved in the work process, namely:

- work of children younger than nine years is prohibited
- night work of children under 18 years is prohibited
- children aged 9-13 may not work more than nine hours a day
- children aged 13-18 may not work more than 12 hours a day
- employers must have a certificate of age for their child workers
- children may not be employed without a certificate from a surgeon about their strength and appearance (a kind of classifier for assessing work capacity)
- Certificates (for work capacity) should be prepared by a surgeon or doctor
- The right to attend school and two hours of daily schooling for children has been established
- Inspectorates have been introduced to check night work of children
- Meal times (breaks) have been established
- Allowing (absence from work due to the celebration of) holidays<sup>3</sup>

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<sup>3</sup> UK Factories Act 1833, 3 & 4 Will. 4, c. 103.

A striking feature of this period was the introduction of machines into the work process. That is, forms of automation appeared in some industries, such as textiles, where certain work tasks that were traditionally performed manually were now performed by machine, as was the case with hand weavers. This was due to the fact that cloth made with the help of machines was made faster and easier compared to cloth made by hand. By pointing to the example of this industry, it was consequently approached to build large factories filled with machines for the production of various types of fabric, with the number of labor that had to be engaged in these factories also being significantly large. In terms of the first industrial revolution and its impact on the world of work at that time, we can conclude that:

- A process of urbanization occurred, i.e. migration from rural to urban areas
- Agricultural and agrarian work was reduced at the expense of industrial work in factories
- Specialized skills and professions were created for work in factories, which led to a division of labor
- Child labor was exploited
- Work was done between 12 and 16 hours a day for low wages
- There was exploitation of the labor force
- In factories, there were often unsafe working conditions that threatened the health of workers
- Monotony developed in the work process of workers who worked in factories and who had repetitive work tasks, compared to workers who worked in rural areas, i.e. on farms, where their work responsibilities were varied and mixed

### 3. THE SECOND INDUSTRIAL REVOLUTION

The main carriers of the second industrial revolution are considered to be Great Britain and the United States. Great Britain had the technological continuity of the first industrial revolution, while the United States managed to commercialize society and, since 1820, to position itself as the largest producer in the world. The second industrial revolution developed in the United States due to its technological and industrial progress at the end of the 19th and beginning of the 20th centuries. In terms of this industrial revolution, Nikola Tesla had a great scientific and technical contribution in this period, in terms of his creation and research, he directly had a catalytic influence on the industrial flow in this period with his invention and development in terms of the production, transmission and use of electricity and the introduction of alternating current, more precisely with the creation of the induction motor in 1887. After the introduction of electric motors, as Paul Turner notes, the use of electric motors expanded from about 5% of mechanical horsepower in American industrial production in 1899 to over 82% by 1929 (Turner, 2021).

The Second Industrial Revolution began in 1870 and ended in 1914 with the outbreak of World War I. David Landes (1969) points out that this cycle of the Industrial Revolution shifted the emphasis from consumption to investment due to the need for capital to build industrial plants. Other authors such as Galbraith (1998) point out that the social equality of a society depends on what is produced, i.e. "the line that divides our area of wealth from our area of poverty is roughly that which divides privately produced and marketed goods and services from publicly rendered services." Accordingly, from an economic perspective, Galbraith (1998) reasons that with regard to working hours "a reduction in the work week is an exceedingly plausible reaction to the declining marginal urgency of product. Over the span of man's history, although a phenomenal amount of education, persuasion, indoctrination and incantation has been devoted to the effort, ordinary people have never been fully persuaded that toil is as agreeable as its alternatives." Characteristic of the world of work during the second industrial revolution are several components.

First, the process of transformation from manual to machine work continued. Machines continued to become more sophisticated. This, in turn, meant that the trend of reducing agricultural and agrarian work engagements was decreasing at the expense of factory and industrial work. Consequently, there was a need to develop an adequate workforce that possesses professional skills, and in this period the vocational and technical education system was seen towards its concretization and provision through two channels:

- Developing a system in which vocational and technical education is predominantly carried out in the workplace
- Developing a system in which vocational and technical education is carried out in schools (İşler, 2021)

Urbanization continued to concentrate people in urban areas. This was a feature of both the United States and the United States. Second, it is not observed that during this period workers' rights in the United States and Europe improved drastically. On the contrary, trends in work organization that were not particularly favorable to workers continued. This, in turn, contributed to the development of labor union organization for the collective protection and defense of their rights. Industrialization, as in the case of the United States, involved the construction of capital facilities, such as highways, factories, and other facilities of strategic importance, on which workers worked in conditions of visible social inequality. In addition, the growth of specialized skills for specific jobs, as well as the search for a higher standard and compensation for the work performed, contributed to a significant number of the labor force in Europe emigrating to the United States, with the urbanization process further coming to the fore.

Third, there are known historical visible events that shaped the formation of unions in the search for better working conditions. In the case of the United States, this manifested itself through the prism of the Haymarket Riots (Green, 2007) and the Pullman Strike (Papke, 1999; Laughlin, 2006; Wish, 1939). In the early 20th century, the progressive

movement began as a stage in which the struggle for increasing women's rights and limiting the corporate power that employers reflected, both in terms of labor relations and in terms of socio-economic relations in the United States.

In the case of Great Britain, a series of laws were adopted to improve the position of women and children at work. The Education Acts and the Factory Acts are considered to be more significant. During this period, integrative efforts for the democratization and incorporation of the social strata of the working class were further strengthened in Great Britain. This period saw an active increase in the popularity of the Labour Party, which was considered a kind of workers' party at that time.

In terms of Western Europe, this period saw the economic growth of Germany and France, i.e. Western Europe was an active period of innovation and connectivity through the construction of railway networks. In parallel, there was an imperial race and ambition between European nations and also externally towards nations that were factored into multiple continents where they colonized, regarding which power would establish or maintain supremacy. Of course, in terms of the various processes that developed in the aforementioned period, from the perspective of socialist movements in Europe, it should be pointed out that during this period the First International Congress of Workers was held in Paris in 1889 and the Second International as a movement of socialist parties and trade unions representing the largest workers' organizations in Europe. This movement existed from 1889 to 1916, when due to complex military-social sentiments and operations in Europe it disintegrated.

Due to the serious technological advances and lifestyle changes due to the development of industry during this period, for many the Second Industrial Revolution is seen and considered as a harbinger of the First World War in terms of restructuring geopolitical and geo-economics influence primarily in Europe, but also in the world.

#### 4. THE THIRD INDUSTRIAL REVOLUTION

The Third Industrial Revolution, consequently, goes a step further in terms of the technological achievements of the Second Industrial Revolution. There are different views from which moment it is considered to have begun due to the Second World War. In general, the conclusion is that the full industrial-revolutionary potential of technology opens up in the relatively peaceful but cold polarized geopolitical social order after the end of the Second World War. This is important because the world of work after the end of this war manifested itself in two different geo-economic environments: the manifestation of labor in capitalist environments, as well as the manifestation of labor in socialist-communist environments. Of course, in the different environments, the position of the worker at the local and regional level was unconsolidated, i.e. there were differentiations in the treatment of workers in the two aforementioned blocks. In the capitalist bloc, as was the case in the societies of the United States, Great Britain and Western Europe, work engagement had a

kind of flexibility in terms of the interoperability of workers to change job positions but also to transit from one labor market to another. This momentum led to the continuation of the process of emigration of labor from different parts and continents of the planet to these societies, whose professional emigration of the labor force was most pronounced in the United States of America. On the other hand, socialist-communist societies directed the labor potential of workers in a centrally planned economic system. This meant that private ownership of industrial capacities was extremely low or non-existent, with capital producers of goods being state-owned. In these societies of the socialist-communist bloc, class differences were much more moderate and not as pronounced as in the capitalist bloc.

From the perspective of technological development during this period, a characteristic moment is the technological race and competitiveness of these two blocs. There was mutual technological competitiveness in every field, from the arms race and sending astronauts beyond Earth's orbit, to the use of technology to innovate production capacities.

The third industrial revolution sets the contours of process automation, mechatronization of machines used in the production process, the development of computers composed of advanced hardware and software components, i.e. contributed to the development and evolution of the use of technology for work. Computer potential was further strengthened, processes of numerical data processing in digital format began, and the contours of the Internet and its use in a civilian context were set. These technological processes transformed work processes, making a step towards the transition from machine to machine-informational transformation of jobs. Furthermore, the use of mobile telephony also became an integral part of work processes during the transition and transition from the 19th to the 20th century. In this regard, technology used in the workplace is defined by certain authors as "any tool developed from scientific knowledge that is used to perform work. Technology is constantly shaping the nature of work as we seek ways to complete tasks more efficiently and effectively" (White, Behrend & Siderits, 2020). In this regard, through the prism of the flexibilization of the capitalist world of work in the United States during the third industrial revolution, the work ethic of workers has also changed, i.e. the focus has shifted towards teamwork, as a characteristic of adaptability to circumstances in which cooperation and soft skills take hold (Sennett, 1998).

Towards the end of the first decade and the beginning of the second decade of the 21st century, professional networks developed in a civilian context to connect workers and employers in a digital environment, whereby the supply and demand for labor could also manifest in a digital, or virtual, environment.

## 5. CONCLUSION

Visible from the progression of the first, second and third industrial revolutions, we can conclude that there is a certain continuity in the development of technology, which



reorganizes social relations, and thus reorganizes working conditions across different time perspectives. It should be pointed out that the improvement of working conditions of workers, no matter how bad they were before any attempts at regulation were made, actually begins as a parallel process of the industrialization of American, British, as well as segments of European society, i.e. Western Europe.

Consequently, it should also be pointed out that the aforementioned three industrial revolutions develop the space for the manifestation of better starting positions for the protection of employee rights and the protection of mechanisms for channeling processes for the improvement of working conditions of workers within the framework of the fourth industrial revolution, taking into account that at the beginning of the first industrial revolution, due to the continuity of the development of labor law, the aforementioned mechanisms were practically non-existent.

Finally, this paper points to the significant modalities and conditions that workers went through, faced with processes of urbanization and factory work, in often substandard working conditions, with exploited and inconsiderate working hours, where workers spent more time in factories than with their families. Of course, it is evident from the indicated developments in the feeling of dignified treatment for work, throughout the course of the industrial revolutions contributed to the establishment of a more acceptable equilibrium for the position of workers within the framework of the employment relationship.

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## ПОЛОЖАЈ РАДНИКА И УСЛОВИ РАДА ТОКОМ ИНДУСТРИЈСКИХ РЕВОЛУЦИЈА

### Апстракт

У овом раду анализира се утицај индустријских револуција на свет рада, изражен кроз урбанизацију као процес који је настао услед потребе концентрације радне снаге у урбаним срединама и формирања индустријских центара. Фокус је на утицају прве, друге и треће индустријске револуције и њиховом оличењу у пракси Велике Британије, САД и земаља Западне Европе. Стварање индустријских капацитета за масовну производњу несумњиво је утицало на положај радника у процесу рада. С друге стране, развој технологије је утицао на индивидуална и колективна права радника. У раду су приказани услови рада радника између прве и треће индустријске револуције, као развојне пројекције и претече настанка четврте индустријске револуције.

**Кључне речи:** индустријализација, услови рада, индустријски односи, технолошки напредак, радни односи.

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