# THE STAGES OF EVOLUTION OF THE LABOUR CONTENT

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***Abstract*** *The paper analyses the evolution of the labour content from the historical point of view by adopting the concept of waves of human civilization defined by A. Toffler (1983). It is remarked that industrial revolutions generated crucial mutations in the labour content. It is detected a continuous increase of the degree of complexity of the systems of production organization as the labour force was less directly implied in the production of primary needs goods and energy sources and was more and more allocated to the activities concerning the processing of the informations. In this context, the evolution of the labour content is not determinated only by the technological changes, but also by the other factors, such as the economic paradigms, labour market institutions and the features of the labour supply. A special attention is dedicated to the polarization of qualifications and to the role of the human capital in sustaining the long run economic growth. It is revealed the importance of the adequate definition of labour content in order to ensure the rational use of labour resources and the continuous growth of labour productivity.*

***Keywords:*** *Industrial revolution, value theory, system of production organization, institutional framework, teleworking, human capital*

***JEL Classification*** *B20, D46, E 24, J24, O14, O33*

## Introduction

During the last five decades the large scale implementation of the informational-communicational tehnologies in the productive apparatus has generated sensible changes in labour content. Thus, both the theorists and the practitioners have multiplied their efforts to emphasize the changes of the employment model and labour content determinate by the new technological and organizational context. For a better understanding of the sense and intensity of the changes of the labour content, we have

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to investigate the modelling factors of the respective changes from a historical perspective related to the waves of human civilization and the paradigms of economic science. This way, it is possible to reveal the correlations of the development of productive apparatus and the changes of labour content and the employment model. Also we are able to highlight the role played by institutional factors in the modelling of the labour content.

## 1. The Waves of Human Civilization and the Labour Content

The concept of the "three waves of the human civilization", defined by A. Toffler (1983) has many advantages in explaining the mutations in the labour content from a historical perspective. Therefore, we may remark that during the long run economic development and technological progress, the mankind has passed from the activities mainly related to the production of food and other primary needs goods to the production of material goods on industrial scale and then to large scale processing of the informations and to the activities which respond to cultural needs of the population (F. M. Pavelescu, 1997). The first civilizational wave lasted from 8000 B.C. till the middle of the 18-th century. In the respective period the most important of economic activity was dedicated to the production of food and other primary goods in the context of nastural economy. The second wave of human civilization lasted from the middle of the 18-th century till the middle of the 20-th century, in case of USA and England, and its main feature was the production of material goods on industrial scale. From the 1960's, in case of USA, from late 1970's, in case of western European countries, and from the last decade of the 20-th century in many emerging economies we can identify the considerable increase of the role played economic activities dedicated to the satisfaction of human non-substantial needs and to the information's processing.

Each of the three of civilizational waves generated specific systems of the production organization and labour content. The link between the civilizational wave and the labour context have manifested as a trend, because the institutional factors have had an important contribution in the concrete determination of the labour content. Thus, during the first civilizational wave, the almost exclusive domination of the agricultural activities, in the context of natural economy and of scarcity of motive power generated a reduced division of labour and, implicitly, a certain homogeneity of manual labour supplied in the respective economic branch. The other manual labour was related to handicrafts and trade. The intellectual labour was limited and reserved to close elites in the context of slave-owning or feudal society.

The second wave of human civilization was essentially determinated by the first industrial revolution. The occurrence and the development of mechanical production led to the clear delimitation of the roles played by intellectual labour and physical labour,

respectively. Also, the working tools were sensibly transformed in concordance with the principle of the mechanics. Another factor which sustained the first industrial revolution was the use of new energetical sources, especially the steam power. The practical implementation of the principle of heat engine determinated not only a substitution of the human or animal energy with fossil or steam energy but also important mutations in the labour content. Thus, the labour force interacted more directly with the system of material goods production and less with the aspects related to energy supply (N. N. Constantinescu, 1981).

The development of mechanical production had major impact on labour demand, from both quantitative and qualitative point of view. The traditional economic branches experienced sensible increase of labour productivity. Consequently, the quantitative labour demand sharply decreased. In the same time, the workers have to fulfil new qualificational requirements in the context of an increased labour intensity. In this context, the implementation of technical changes, which are emblematic for the first industrial revolution, were confronted with the oppposition of the workers, the most known being the ludhism[1].

The labour content experienced notable changes even after the first industrial revolution. Among the factors which decisively influenced the changes of the division of labour and the labour content we have to mention the progresses obtained in the field of the internal combustion engines and electrical engines. The extension of the use of internal combustion engines and the increase of their energetical efficiency stimulated the development of mechanic production into new economic branches. The use of electric engines created new premises for sensible increase of the labour productivity. The respective engines allowed the individual command of the tools and equipments.

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[1] The Ludhism was a protest movement against the the implementation in the textile factories of the mechanical weaving looms. The above-mentioned techical change contributed to the ruinatrion of an important part of the the handicraft workshops of of manufacturing type and implicitly to the occurence of the unempoyment for the displced workers. Under these conditions, some of the workers of the textile factories, where the mechanical weaving looms were instaled tried to distroy the working means, hoping that this way the techical changes which determinated large scale labour saving could be stopped. One of the best known protesters was Ned Ludham. We may not ignore that respective technical change had implortant implication for the distribution of the incomes of the workers families. Even in families of the workers employed in the textile industry the consumption experienced a polarization. In the families of the workers which succcessfully adapted to the requirements of mechanical production the incomes sensibly increased, while in the families of the displaced workers or of those which did not find jobs faced great difficulties in order to earn the subsistence income.

Also, the electrical engines, in comparison with the internal combustion engines, considerably decreased the costs related to the production processes.

The occurrence and the first uses of the electrical engines was concomitant with the entrance of the world economy in a new development phase. Conventionally, the respective phase is assumed to be the period 1870-1914. The respective time interval is considered in some papers as the second industrial revolution[1]. In the analysis of the development of economy and technology during the 1870-1914 period and of the implications on the labour content we have to consider the mutations implemented in the field of production organization and firms' management. Besides, the technological changes, which determinated sensible increases of the labour productivity, a process of capital concentration took place. The respective evolution favoured a series of innovation in the financial field and changes of the institutional framework.

Also, we may not ignore the changes occurred in the international economic relationships. The increase of the degree of globalization of the economic activity stimulated the extension of demand for goods and services, and acted for sustaining the technological innovations and for their implementation in the productive apparatus. In this context, the high size factories occurred, which imposed new methods of production organization and production factors management. The management innovations have had important impact on the labour content.

The most important managerial and firms' organization of the above-mentioned period were: a) the definition of scientific management by Taylor (1911) and Fayol (1916) and b) the organization of the fordist assembly lines. The respective management innovations determinated an impressive increase of labour productivity and labour intensity.

The taylorist vision on the production organization was concordant with the objective of the profit's maximization and of the sensible increase of labour productivity. In order to attain the respective objectives, the division of labour was strengthed. Thus, it was

[1] UNESCO (1987) reveals the existence of two industrial revolutions during the begining of the 19-th century and the begininmg of the 20-thcentury. The first industrial revolution was defined by the progrsses obtained in the development of consumption goods industry, especially of the textile industry, the processing of the iron and coal, and also by the occurence and extension of the railways network. The second industrial revolution was especially characterized by the use of new energy sources, primarly of oil, natural gas and electrical energy, the development of oragnic chemical industry, the progreses obtained in the field of metalurgy, mainly those related to the production of steel and other alloys, and by the occurrence of the motorcars. On this basis, important mutations of the production capacity were registered both in industrial subbranches and also in agriculture and transportations.

discovered the importance of the economy of movements and handlements realized by workers for the fulfilment of technological operations. Consequently, the technological operations were sensibly simplified. An important attention was paid to the coherent record of the production expenditures and to the adequate methods of work and to worker's selection. On this basis, the labour consumption was rationalized and the labour intensity considerably increased. In the same time, there were created premises for the rigid automatization of production. The respective type of automation determinated sensible decrease of the labour consumtion in activities where the production processes were linear and the limitation of the presence of the labour force in the production processes where the working conditions were injurious to health.

The taylorist vision on the labour force management led to important changes in the firm's organization and in the definition of tasks required to the employees of functional departments. This way, the polarization of the qualifications was favoured while the impact of the psychological factors on the increase of labour productivity was neglected.

Fayol's vision on the management, by defining the five functions of management (planning, organization, command, coordination, and control) influenced in a certain manner the labour content. Especially, the clear definition of the coordination function of management revealed the positive impact of the managers' preoccupations for labour content for the firms' performances.

The management principles defined by Taylor and Fayol were firstly implemented on large scale in case of the assembly line of motor cars at Ford Works in USA [1].Later on, the respective form of production organization was adopted by an increasing number of great companies, due to the fact that this way it was possible to obtain impresive increases of labour productivity and sustain the long run competitivity.

The taylorist principles of production organization were implemented in an increasing number of countries as the industry a more and more important role in economic activity during the first three quarters of the 20-th century. Even in Central and Eastern

[1] The large scale implementation of the taylorist principles of production organization firstly at Ford Works was possible due to some favourable premises, such as: a) high complexity of the motorcars production, b) the existence of a mass production, which allows to obtain increasing returs to scale and c) the existence of an oligopol situation in case of the motorcar production. The "fordist"assembly line became famous for their high labour productivity. The sensible increase of the respective productivity was obtained by combining the extreme simplification of the content of technological operations, which had to be performed by workers, the imposing of a high labour intensity and the considrable increase of the hourly wages paid to the workers. In fact, the fordism may be consideration as one of the first large scale implementation of the "efficiency wages", long before the rigourous definition of the respective concept during the 1980's.

European countries, where the command economy was imposed at the end of the World War Two, the method of production organization were essentially taylorist[1].

As the countries with consolidated market economy passed to a new phase of their development and implicitly the entering in the situation of „industrial saturation" (A. Vela, 1986), the methods of taylorist type were more and more contested. Among the reasons of the contestation was the fact that the respective system of production organization acted as one the main factors which favoured the occurrence of the one-dimensional man defined by H. Marcuse (1964).

Another factor of the decrease of the supremacy of the taylorist methods used for the production organization, beginning with the second half of 1960's, was the occurrence of a trend of decrease of the share of industry in the total employment and the increase of the share of service sector. The respective evolution marked the beggining of the USA transition to „post-industrial society", defined by D. Bell (1973). The faster growth of the number employed persons in the service sector in comparison to the total employment manifested in all the countries with consolidated market economy. The activities grouped in the services sector required a more flexible production organization. It is to be noticed that the increase of the share of the services in the total employment was also a consequence of the consolidation of the role played by scientifical and technological research in sustaining the economic development.

During the second half of 1970's, in the context of the two oil shocks, but also of disruptive scientific discoveries and technological changes[2] , the premises of the third

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[1] The production organization of the firms in the command economy of Central and Eastern european countries was essentially taylorist for various reasons. Therefore, even the taylorist methods were officially critized, bercause they were representative for the exploitation of the workers by the capitalists, practically the respective methods were extensively used for the production organization and the management of state-owned firms. This way it was possible to grow in the short run the labour productivity and to offer arguments in favour of socialist economy. Also the use of taylorist methods was favoured by the trend of production concentration in great state –owned enterprises and by the facilitation of the managers control on the employees in order to fullfill the planned objectives fixed by bureaucratic coordiantion authorities.

[2] Among the inventions which created the premises for the occurence of the third industrial revolution we have to notice the invention of the silicon microprocesor in 1971. This way, it was possible to obtain a sensible increase of the capacity of informations stockage on material supports of small sizes. On this basis, it was considerably enlarged the dissemination of informations related to the functioninig of the production systems and improve the processing of the respective informations. Thus, it was stimulated the development of the production of the electronic computers. We notice that the functioning principles of the electronic computers

industrial revolution have occurred. The main feature of the above-mentioned industrial revolution was the possibility of implementation of the flexible automation in more and more industrial and services activities. In the same time, the precision of technological operations and the accuracy of technical control of the production processes, as well as the quality of the produced goods registered sensible improvements. The above-mentioned mutations of the systems of production organization represented an outcome of the large scale implementation of the informational communicational technologies firstly in the industrial branches and then in the other economic activities. The use of informational- communicational technologies has generated a sensible increase of the role played by information's processing in the production of goods and also in the other important sector of economic and social activities. In fact, the third industrial revolution marked the transition to the third wave of human civilization revealed by A. Toffler.

In this context, the structure of the labour demand at the level of economic branches and sectors sensibly changed. The significant decreases of the number of the employed persons were registered in industry especially in manufacturing. The respective trend has especially manifested in the countries with consolidated market economy. In the emerging economies of Asia, Africa and Latin America, which were in different phases of the industrialization process, the labour demand generated by manufacturing continued to grow. In the same time, the employed persons in the primary sector, which include agriculture, forestry and hunting, experienced a trend of decrease as a consequence of the implementation of new technologies, on the one hand, and of the ageing of the rural population, on the other hand.

The service sector has benefited from the implementation of the informational communicational technologies and have registered increases both of value-added and number of employed persons. Thus, practically all the developed countries (with consolidated market economy) experienced an acceleration of the transition to post-industrial society and became in fact, „economies of services"[1]

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were defined by. A Turine in 1937 year, while the practical implementation of the above-mentioned principles was made by von Neumann in 1946 year.

[1] We may notice that, from theoretical point of view, the large scale implementation of the informational- communical technologies does not automatically lead to the occurence of the economies of services, revealed by the share of services sector both in the total value-added and employed population. An alternative to the respective type of economy would be "info-industrial economy", in which the secondary sector (industry and constructions) play an important role in generation of value-added and labour demand.
The essential condition for the existence of an "info-industrial economy„ is maintaining of a high competitivity of the manufacturing production in the same time with the implementation of

In the valuation of the dynamics of the number of employed persons in the services sector after the second oil shock (1979) it is important to consider not only the direct impact of the implementation of the new technologies, but also the implicit impact of the above-mentioned structural changes and the other structural changes manifested during the last two decades of the 20-th century. Therefore, the growth of the labour demand determinated by the service sector was favoured by the decentralization of economic activities as an outcome of the implementation of new technologies. The decrease of the size of the many industrial firms stimulated the externalization of some activities, which, previously were accomplished in the framework of the big firms. In many cases, the externalized services were supplied by small and medium firms, established by a new generation of entrepreneurs, which are favourable to the innovation of the methods of production organization and to flexibilization of the employment model.

The increase of the employment opportunities supplied by the services sector was also sustained by the changes of the economic mechanism and external environment, *i.e.* the sensible extension of the role played by market mechanims and the increase of the degree of globalization of economic activity. The above-mentioned structural changes acted for the growth of the labour demand of the services sector. The new economic and social context favoured a sensible increase of the role played by firms which offered specialized services in the field of the processing of the informations related o economic conjuncture, the use of best practices, financial intermediation. This way, it was possible to stimulate the creation of the new small and medium enterprises and then to consolidate their potential of technological innovation and their contribution to the improvement labour employment.

At the microeconomic level the third industrial revolution generated not only the flexible automation of the production processes, especially in manuifacture, but also the transfer of some intellectual activities of the human operators to the robots or to the digital command machines or equipments. This way, it was possible to obtain impressive growth of both labour and total factor productivity, on the one hand, and a considerable flexibilization of the supply of goods and services, on the other hand. The respective changes of the organization of the production processes generated not only an

changes in the productive appararus in concordance with the features of the the development of the informational-commnicational technologies. This way, it is possible to emphasize that the third ndustrial revolution represents, in a certain measure a denial of the classic industry (based on the paradigm of mechanics), on the one hand, and a redefinition of the respective economic branch regarding the capacity of absorbtion of informational-communicational technologies, de-centralizing of activvity and multiplication of linkges between firms and other econonic and social actors.

impressive rationalization of labour consumption, but also ample mutations in the labour content. Therefore, the extension of the different forms of automation contributed to the diminish of number of the workers which were directly implicated in the operation of the production systems. In the same time the demand has increased for the employees implied in the maintaining and repairs of the machines and equipments. Also, the role played by engineers and technical staff became more preeminent, due to the fact that their scientific knowledges and professional abilities were crucial for the implementation and then for the maintaining of the performances of the production systems mentioned above.

The changes of the professional structure of the employed persons have highlighted one of the laws detected by empirical studies (D. H... Autor et all, 2003, i.e. the use of the computers has substituted the routine activities by implicit decrease of the demand for employees with medium level of qualification and stimulated the development of non-routine actiities and implicitly the demand for personnel with a higher educational level and creativity.

The trend of the polarization of the qualification in the context of the extension of the flexible automation was remarked even at the middle of 1980's (A. Schaff, G. Friedrichs (coord.), 1985). The extension of the automation impoverishes the labour content of the workers which are directly implicated in operation of the assembly lines or in the functioning of the production systems. On the contrary, the labour content of the employees which were implied in the design and the maintenance of the production systems tended to enrich. For the respective category of labour force new requirements for professional knowledge have occurred, especially those concerning the informatics and computer science. Thus, the labour became more and more abstract. The polarization of the qualifications determinated a trend of increase of labour intensity. Consequently, in the short run, the firms reported positive evolutions of their activities as the labour productivity and profitability have registered a constant improvement.

But in the long run, the polarization of the qualifications has created premises of the occurrence of the digital divide in the active population between the persons which possessed knowledge and abilities related to the use of informational- communicational technologies and the persons, which, from various reasons have not achieved the respective competences and became vulnerable in the context of labour saving technological changes.

The extension of use of informational- communicational technologies in almost all of the economic and social fields, as well as the anticipation of new and continuous technological advances of disruptive type, such as those related to artificial intelligence, robotics, tridimensional printing, biotechnologies and nanotechnologies have favoured

the vision of the occurrence in the near future of the fourth industrial revolution (K. Schwab, 2016).

Among the argument, which are brought in favour of the definition of the concept of ”the fourth industrial revolution”, we mention that the new technologies which occurred at the beggining of the second decade of the 21-st century are principially different from those which are now implementated in the productive apparatus and their innovative potential is still in the emergent phase. For these reasons, the techological changes induced by the fourth industrial revolution would generate not only radical transformations of the productive apparatus, but also ample mutations of the economic and social environment. The futurologists anticipate a redefinition of the ”borders” between the traditional economic branches and also a significant increase of the interconnectivity of the economic and social activities.

Thus, in the context of the previsible fourth industrial revolution the polarization of the qualification will continue to manifest. The jobs with low level of qualification and routine activities would coexist with jobs which require a considerable creativity and solid professional knowledges. It is to be noticed that area of the professional knowledges and abilities would be a considerably enlarged one, because together with the knowledges related to informatics and computer science, the professional performance would be more and more conditoned by the specialised knowledges related to the internal structure of the matter and the life sciences.

## 2. Economic paradigm and the labour content

Even the technological changes represented the main factor of the evolution of labour content, during the development stages of economy and society, we have not neglect the influences of the other factors. Among the factors which have influenced the labour content it is to be mentioned the economic paradigm which was dominant in the economic and social system. The modern economic science was built and have developed under two great paradigms, namely: a) the classical paradigm and b) the no-classical paradigm. The differences of the two economic paradigm are multiple, but essentially they start from the definition of the concept of ”value”.

**The classical economists** have defined and supported the objective theory of value, while the neo-classical school of economy have argued consistently in favour of subjective theory of value. Due to the appreciable lag of time between the occurrence of the two paradigms of the modern economic science influenced the vision related to the importance of labour content for the economic development and labour market operation. We may notice that the classical economy privileged some aspects of the economic and social situation which were characteristic for first the industrial revolution

especially in England, while the neo-classic economy has built its scientific investigation methodology on the basis of the new economic environment generated by the second industrial revolution especially in the most developed European countries.

The objective theory of value assumes that the value of a good is given by the time which is socially necessary for its production. For this reason, the respective theory is mentioned in the economic literature as the theory of value-labour[1]. Consequently, the classical economists considered that the main factors of economic and social development were the capital accumulation and the continuous increase of the labour productivity.

The theory of value-labour represented one of the basic components of the Marxist economy. The respective economic doctrine paid a special attention to the labour of manual employees and revealed some contradiction between the manual labour and intellectual labour. The Marxist economists maintained the distinction between the productive (agriculture, industry, constructions transports and trade) and non-productive activities (especially the social services) made by A. Smith and considered that only the productive labour created value and consequently have ensured the long run economic and social development. It was also defined the notion of collective productive worker, which has the intention to reveal the linkages between the workers employed in the productive sphere of the economy.

The Marxist economists revealed the contradiction between the private entrepreneurs (capitalists) and the salaried workers, and the actions of the private entrepreneurs for the increase the labour intensity in order to obtain the profits maximization. In this context, the notion of ”reification” was defined, i.e. the transfer of the social relationships, determinated by a particular economic and social system to relationships among things, which not depend on the nature of social relationships. On this basis, the notion of ”alienation” of salaried workers in the context of capitalist society was defined. Inspired by the former concept, and also by the considerable extension of Fordist way of the production organization, H. Marcuse (1964) defined the notion of ”one-dimensional man” was especially used during the 1960's and 1970's by the representatives of the ”new left” in the context of the protest against the economic and social situation in some of the countries with consolidated market economy. The above-mentioned contestation movements put considerable pressure for the change of the Taylorist type systems of production organization and for the search of more flexible systems of production organization in order to avoid an excessive impoverishment of the labour content.

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[1] Historically, the objective theory of value was defined and promoted by the Engligh Classical school of economics, its most celebrated represenatives being W. Petty and D. Ricardo.

The forced adoption of the command economy in the Central and Eastern European countries was accompanied by the use of Marxist concepts related to the labour content. The rigid production organization and the distinction between the productive and non-productive activities acted in the context of ample structural changes as a disturbance factor for the material and human resources allocation. In Romania, in the early 1980's, there were made efforts, from theoretical point of view to enlarge the Marxist notion of ”collective productive worker” and implicitly the sphere of productive activities, on the one hand, and to reveal the economic and social impact of the technological changes induces by the development of electronics and computers (N. N. Constantinescu, 1981). The efforts to renew the conception of the productive labour and the system of production organization remained only at theoretical level. The constant worsening of the economic situation during the 1980's blocked the any initiative designated to really innovate in the managerial and organizational fields.

The concepts of Classical-Marxist economy have continued to be used for the investigation of the labour content even in the context of large scale implementation of the informational-communicational technologies and for the impact of the respective technological change not only in economic, but also in social and cultural activities. Therefore, it was elaborated the digital labour theory of value by considering concept which were more or less Marxist, such as ”socially working time”, ”rent”, ”productive labour” or ”commodity fetishism”, in order to explain the evolution of the consolidated market economies in the context of the new wave of technological changes (C. Fuchs, 2014). The respective conceptual framework has been adopted in order to investigate the impact of the extension of the social media network, such as Facebook on the users, and their role in promoting the advertisements, culture and ideology of capitalist type society (C. Fuchs, 2015).

Also, the use of some Classical –Marxist concepts allowed Farjoun and Machover (1983) to reveal the law of decreasing of labour content. The respective law assumes that in a market economy the dominant type of technological change is labour saving (progressive technical change). This way, the labour productivity grows constantly and the labour content, which is necessary for the production of the various goods and services diminish (P. Flaschel, R. Franke, R. Veneziani, 2010).

The methodology used in order to determine the labour content at the level of a national economy, includes both the use of some Classical –Marxist concepts and the input-output tables. Thus, it is possible to obtain interesting findings related to interbranch linkages of the labour consumption and to the impact of the structural changes on the dynamics of labour productivity. Also, there were proposed models for the measurement of the labour content which considered heterogeneous activities from the point of view of professional qualification (N. Yoshihara, R. Veneziani, 2013).

**The neoclassical economy** has treated the labour force by using the concept of production factor in the context of the existence of market mechanism. Therefore, the dynamics of the labour market is conditioned by the supply and demand. Both the labour suppliers (employees) and the demanders (employers) try to maximize the profit. For the employers, in the short run, the maximization of the firm's rentability can be achieved through the rationalization of the labour consumption. For the employee the main objective is to obtain the maximization of the wage received for their activities, which they carry out with the firm. The standard neo-classical approach on the behaviour of the labour supply considers the existence of both the substitution effect [1] and the income effect[2]. It is assumed that both labour supply and demand are homogenous. Also, the wages are perfectly flexible and ensure the conditions for the existence of the equilibrium between the supply and demand. Because the labour supply and labour demand are considered as homogenous, the standard neoclassical economy pays no attention to the features of labour content or to the impact of the technical changes on the respective aspect of the employment.

But during the last six decades the technological and structural changes revealed that both the labour supply and labour demand are not homogenous. To these economic and social challenges, the neoclassical economic theory has responded by defining the concepts of „human capital" and „endogenous economic growth".

The concept of human capital was defined in the early 1960's, in the works of T. W. Schultz (1961) and G. Becker (1964) in order to obtain a better understanding of the wages differentiation, which could be explained by the standard neoclassical theory[3]. The empirical

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[1] In case of the labour supply, the Substitution Effect defines the reaction of some employees to grow the number of working hours when the hourly wage increases. In other words, the employees acccept to substitute a part of the leassure time with a supplimentary working time in order to obtain an increase of the real income.

[2] In case of the labour supply the income effect defines the trend of the decrease of the number of working hours which some employees decide to supply when the hourly wage increases. In other words, the employees consider that their standard of living is in concordance with their aspirations. Thus, an increase of the hourly wage represents an ocasion to diminish the time allocated for the activity witih the firm and to increase the tine allocated for leasure or for other social-cultural activities.

[3] The concept of human capital was defined by considering the neoclassical paradigm of "homo economicus", which assumed that: a) profit maxinimization for each capital holder, b) the existence of the pure and perfect competition on all the markets of the goods, services and production factors and c) the substituability of the production factors. Consequently, the involvent in educational activities would be determinated by a rational behaviour. Each person would invest time and financial ressources in educational activities only if the graduation of a certain form of education led, in the predictable future, to an increase of his (her) professional

studies have validated the hypothesis that the education is one of the important factor of the wages differentiation. Also, it was revealed that the level of the wages obtained by workers or employees may represent an outcome of the self-denial in activity or of the loyalty for the firm (company), industrial relations and the financial results of the firm[1].

The use of human capital has determinated important changes of vision related to the qualitative improvement of the labour supply and of its role in the sustaining of the long run economic growth. At the end of the 1980's and the beggining of 1990's the concept of endogenous technological change was defined (P. Romer, 1990). The respective concept emphasizes the positive externalities induced by the improvement of the qualification level of the labour force qualification for the implementation of the technical change. In other words, it was assumed that the sensible increase of human capital (persons with a high level of qualification and creativity) would make the technological change to be an endogenous one. It was also pointed out that another condition for the occurrence of the endogenous technological change was the adequate allocation of financial resources for research-development activities.

Also, the special attention dedicated to the segment of labour supply with the highest level of qualification and creativity produced important modifications of the models of economic growth. Therefore, Ph. Aghion and P. (1998) proposed the model of endogenous economic growth. The respective model maintains some of the assumptions of the neoclassical growth model defined by R. Solow (1956), i.e. the role of fixed capital accumulation and of the labour supply in sustaining the economic growth. The main methodological novelty brought by the model of endogenous economic growth is the consideration of the human capital as distinct production factor.

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abilities or skills and implicitly to the level of real incomes. Also, in real terms, the supplementary incomes are higher than the financial resources alocated for the graduation of the respective form of education.

[1] The concept of human capital was criticized by the representatives of the Theory of Segmented Market. Considering the concept of ”internal labour market”, defined in early 1950's, P. Doeringer and M. Piore (1971) have remarked that the simple improvement of the educational-qualificational level of the workers did not guaranteed the increase of the wages or the access to better working conditions and implicitly to an enriched labour content. Thus, it is possible to identify at least two segments of the labour market, i.e. a) a primary labour market with ”good” jobs which offered high wages and creative activities and b) a secondary labour market with ”bad” jobs, characterized by low wages and routine or repetitive activities. It was emphasized that the labour market segmentation was generated not only by the features of technological process or by the level of education or qualification of the workers (employees), but also by institutional factors related to the protection of the traditions or hierarchies established in the firm or to ensuring the flexibility of activity in the context of macroeconomic fluctuations.

The above-mentioned assumption has important implications, namely: a) the labour supply is not homogenous one, being divided between human capital (the persons with high educational and qualificational level) and labour force (the persons with low and medium level of qualification) and their labour content and contribution to economic development is quite different, b) the human capital acts as a form of capital and its formation and development is modelled by the anticipated efficiency of educational investments, c) the technological change is endogenous and is sensibly conditioned by the quality of human capital and the incentives for the research-development activities and c) it is possible to obtain increasing returns to scale due to the interaction between the physical capital and the human capital.

## 3. The impact of the institutional framework on the labour content

The experiences accumulated at international level show that the mutations in the labour content were the generated only by the features of the technological changes and of the economic paradigms, but also by the peculiarities of the institutional framework during the economic development stages. The influence of the institutional framework firstly derives from the fact the labour force is a production factor. The organization and the operation of the markets of production factors is more dependent on the institutional framework in comparison with the markets of goods and services. Usually, the markets of production factors are more segment, favouring the occurrence and persistence of the situations of monopolies and monopsonies. The temptation of each holder of the various form of capital to maximize their profit make necessary the existence of some institutions designed to mediate and coordinate the allocations of the production factors in order to ensure the conditions for the sustainability of economic activity.

In case of labour market, the role played by institutional framework refers mainly to : a) the protection of the human capital against the shocks generated by the sudden fluctuations of the volume and structure of economic activity, b) the support of professional mobility in order to diminish the unbalances between the labour supply and demand, c) the protection of the rights of the workers(employees) to decent working conditions, freedom to association, remuneration according to their quantities and qualitative professional results obtained in the framework of the firm, d) creation of the premises for an equitable distribution of the income obtained by firms among the owners, managers and employees (F.M. Pavelescu, 2009). The impact of the labour market institutions on the employment model is revealed by the evolution of professional structure in comparison with sectorial structure of the employed population. M. Castells (1998) remarks that in the long run the evolution of the sectorial structure of employment is convergent, i.e. from the agrarian economy to services economy, being dependent on the development stage, while the professional structure may significantly

differ. The respective differentiation is the outcome of the operation of the particular labour institutions at national level.

In fact, during the end of the first industrial revolution, the concrete changes of the production organization and implicitly of the labour content were dependent on the features of the industrial relations and on the operation of the other labour market institutions. Oftenly, the implementation of the technological changes represents an instrument used by the managers (patrons) in order to obtain an increased flexibility of the employment of firm's personnel. But not any form of flexibility of the employment is acceptable for the workers (employees). For these reasons, we may detect many conflicts between the trade-unions of the workers (employees) and managers (patrons) concerning the implementation of the technological changes and the adjusting of the working methods and labour content in concordance with the respective changes.

Therefore, we may notice that crucial changes of systems of production organization were not only the outcomes of the managerial creativity or of the requirements imposed by the use of new technologies, but also of the level of qualification of the workers (employees) and of the features of the industrial relations. A relevant example is ones of the reasons of the implementation of the assembly lines at the Ford Motorcars Works at the beggining of the 20-th century. The respective system of production organization has represented a solution to the existence of a labour supply with a heterogeneous level of qualification and of conflictual relations between the trade-unionised workers and managers (C. Zamfir, 1986). This way, it was possible to obtain not only a sensible increase of the labour productivity, but also an important decrease of the pressure of the trade-unions of workers with high level of qualification. The above-mentioned change of the system of production organization have contributed to the decrease of the relative importance of the high-qualified workers and to the growth of number of the workers with a medium level of qualification, which were involved in repetitive activities.

After the World War Two, in many western European countries, in the context of the implementation of the social market economy, the principle of co-decision was promoted. Thus, oftenly, the changes of the systems of production organization were the outcomes of the negociations between the managers (patrons) and the trade-unions, which led to the adoption of the solutions, which, formally, were acceptable for both parties. This way, it was possible to obtain a high level of labour productivity and firms ret ability, on the one hand, and the stability and high quality for an impressive number of jobs, on the other hand.

The large scale implementation of the new technologies, which were definitory for the third industrial revolution, was made in the context of significant mutations of the industrial relations and of the insitutional framework, which led to the diversification of the occupational and professional status. Due to the increase of the degree of informatization of economic and social activities, the size of firms, by number of

employed persons, have tended to diminish. This way, the trade–unions have experienced a decrease of their negotiation power concerning both the level of wages and the implementation of changes of the systems of production organization.

Also, the growth of the employment capacity of the services contributed to the expansion of the atypical forms of employment, the most representative being the determinated duration contracts and the part-time employment. In the same time, the number of the self-employed in the field of informational- communicational technologies sensibly grew, partially as an outcome of the de-centralization and externalization of activities, which previously were performed by great industrial firms. Therefore, the employment model tended to be more flexible but at the price of an increased instability of jobs and of an impoverishment of labour content.

The innovations implemented in the systems of production organization were dominated by the requirements of the de-centralization of activities of the firms and of the flexibility of labour force employment. In this sense, a representative example is the teleworking. At the first sight, the respective method of labour (production) organization, essentially depending on the development of informational-communicational technologies, has generated positive effects both for employers and employees. From the point of view of the employees the main advantages were the creation of the premises of an increased flexibility of the working time and of high wages. The employers took the advantage of the sensible increase of the labour productivity, of the diminish of the costs with consumables raw materials, as well with the administrative staff and of fast reactions to the fluctuations of demand for the goods and/or services which their firms supplied.

As the time passed, some important drawbacks of the above-mentioned form of production organization have manifested. Therefore, it was detected a trend to excessively increase the labour intensity and the exposure on the electronic computers. Consequently, the teleworkers have experienced the worsening of their health status and the diminish of the leisure time and of the social contacts. For these reasons, some European countries have adopted regulations which limit the use of the teleworking. It was imposed the condition that the respective form of production organization may be implemented only if it is voluntary accepted by the employees or the self-employed, and their social and trade- union representation rights were guaranteed.

## Conclusion

The review of the long run evolution of the labour content and of its modelling factors reveals the essential role played by the features of the technologies implemented within the productive apparatus during the economic development stages. Also, it is important to consider the impact of the dominant economic paradigm on the appreciation of the social importance of the various professions and skills and on their labour content.

In the long run, the essential feature of the technological changes was the relative diminish of consumption of production factors and the substitution of the less abundant production factors by the more abundant ones. Often, the labour force represented the first production factor which was saved or substituted by the other production factors. This way, the labour productivity has continuously grown at the price of more or less ample mutations in the labour content. The crucial mutations of labour content were generated by the industrial revolutions. The essence of the revolutionary changes of the productive apparatus have been the use of new working tools built on the new scientific paradigms and of the new system of production organization.

The industrial revolutions generated not only the changes of the material consumptions but also sensible mutations in the sectorial structure of employment and in labour content. As a trend the physical labour was substituted by the intellectual labour. Implicitly, the above-mentioned trend has contributed to the acquisition by the active persons by the active persons of new knowledges and skills, which were adequate to the new development stage.

The changes of the labour content have been an outcome of the interactions between the characteristic features of the institutional framework and of the labour supply. Usually, market mechanisms have favoured the innovations of the production organization, but with contradictory impact on their labour content. The burocratic coordination mechanisms or the institutional arrangements which restricted the action of the market forces determinated an inertia of the system of production organization and, in the long run, the blockage of the economic and social development.

The educational and qualificational structure of labour supply have influenced in an important manner the changes of the systems of production organization and, implicitly, the labour content. Usually, the rigid systems of production organization were adopted in the context of a heterogeneous labour supply and of conflictual industrial relations. On the contrary a labour supply with a high educational and qualificational level has favoured the dialogue between the trade-unions and the managers (patrons) and also the implementation of systems of production organization which stimulate the creativity and implication of the employees in firms' development strategy.

In the context of new wave of technological changes, a special attention has to be paid to the concept of labour content, due to the trend of the polarization of qualifications. Thus, it is recommendable to define more clearly the concept of labour content from qualitative point of view. We consider that the respective concept refers to "technical" aspects of the labour of workers (employees), such as the professional knowledges, the share of creative activities during the working process, the working conditions and the labour intensity. On this basis it is possible to improve the methods of valuation of the

workers (employees) and implement changes of the systems of production organization in order to stimulate the growth of labour productivity

The study of the labour content has to consider not only the present days evolutions but also to anticipate the changes determinated by the fourth industrial revolution. The trends, which have manifested during the last years have revealed the wiping of the ”dividing lines” between the traditional industries and economic sectors and the increased opportunities for the interconnection of the various economic and social activities.

Hence, the extension of the use informational-communicational technologies would have important impact both on labour supply and demand side. On the labour demand side we anticipate that the polarization of the qualification will manifest, due to, at least, two reasons a) the maintaining of the trend of simplification of the qualification requirements in case of some parts of the productive apparatus as a result of the extension of the flexible automation and b) the enlargement of the level of knowledges of the ”breakthrough professions” due to the extension of the productive processes to intimate structure of the matter and/or to the use of the algorithms of high complexity in order to ensure the operation of the systems of production

On the labour supply side, the polarization of the qualification will also manifest. Thus, on the one hand, it is possible that parts of the active or schooling population will find few incentives to achieve a high level of qualification due to the existence of the low-qualified jobs and to the economic and non-economic barriers of access to higher forms of professional education.

On the other hand, there will be conditions for the occurrence of the over-qualified active persons as an effect of the multiple opportunities for education and professional training offered by the informational society. In case of a persistent surplus of the over-qualified persons in comparison with the demand generated by productive apparatus, the phenomenon of diplomated unemployeds will chronicize and irremediable losses of potential human capital will be registered.

Under these conditions, it is important to define the main features of the professions and occupations in the predictable future. Having in mind the respective features and the medium and long run strategies for economic and social development it is possible to implement changes of the educational and training system in order to obtain a significant decrease of the job mismatch and other labour market disequilibria.

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