



Short History of Industrialization: A Cinematographic Approach

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Abstract

The ultimate purpose of this study is to scrutinize industrialization via movies in a thematic way. Actually, industrialization, which occurs at the end of the 18th and the outbreak of the 19th century, is the process of mechanization of production and the rationalization of policy as a whole. It is economically the onset of mechanization, commercialization or fabrication of goods in a massive way and the utilization of logic on a political basis. Without logic or ration, it is quite impossible that there will be no transformation like this. At the same time, it is the direct outbreak of capital accumulation. There are a great many factors for its emergence to be debated; however, there is a green reality that this is not a linear process. In the stark contrast, it is electrical as well as progressive. History also whispers us that this innovative stage ranging from Industry 1.0 to Industry 4.0 converts into a development culture, which has been dominated by the West since Renaissance and Reform. Comprehending the reasons for the formation of this innovative culture is of great significance for all of us. In this study, our main objective is to read these spheres of improvement on the basis of four movies for four stages. Industry 1.0, associated with steam power is represented by *Oliver Twist* (2005); Industry 2.0 is related to *Modern Times* (1936), as for Industry 3.0, it is based upon *A Beautiful Mind* (2001) while Industry 4.0 is overviewed with *Replicas* (2018).

Keywords: Industrialization; Industrial Relations; Cinema; Stages of Industrialization; Labor Studies



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Introduction

Industrialization, which is actually a turning point for the world history, is the ideal process of political rationalization at first and scientific mechanization as a second. What I am trying to say that industrialization is the “baby” of innovation that gains its strength from logic, rationale, and the systematic framework for research, all of which are the ultimate outputs and the gifts of Renaissance, Reform, and the period of Enlightenment. Industrialization has altered everything in a radical manner including the ways of production, the praxis of daily routines, the traditions of consumption, the procedures of transportation, the strategies of marketing, the ways that the people dress, the cosmetics, the modes of work, and so on and so forth. It is absolute that this is an unending reformation and ceaseless transformation culture which triggered at the end of 18th century and quite probable to go ahead in the upcoming future with its distinctive forms.

As a matter of fact, industrialization has refreshed itself in a particular ways and in a particular time with specific contrivances and under tough and unusual circumstances, so it is quite indispensable to assess this long journey with some stages. Industry 1.0 represents the initial phase and it connotes ‘machinery’ and ‘fabrication’ associated with steam. Industry 2.0 is the

phase of ‘electricity power’. As for industry 3.0 and 4.0, the former one is the magic of ‘technology’ whereas the latter refers ‘artificial intelligence’, ‘digital transformation’, and ‘big data’.

The main objective of the study is to analyze these industrial stairs in a qualitative way and on the basis of concrete movies. To reach that target, four movies were picked out such as *Oliver Twist* (2005), *Modern Times* (1936), *A Beautiful Mind* (2001), and *Replicas* (2018). Content and discourse analysis, which are quite popular for these qualitative studies, were benefited. Content analysis was preferred to explore the content of the movie while discourse was used so as to ground the critical aspect of movie scripts. Industry 1.0 is oriented upon *Oliver Twist* (2005). Industry 2.0 is related to *Modern Times* (1936), as for Industry 3.0, it is based upon *A Beautiful Mind* (2001) while Industry 4.0 is overviewed with *Replicas* (2018). Actually, the study consists of three parts. In the first part of the study, industrialization and the real factors that give birth to this turning point was mentioned in a brief way. In this part, the derivatives of industrialization constitute the main skeleton of the paper. In the second part of the study, the correlation between industrialization and cinema was covered. When it comes to the third chapter of the study, the films mentioned well in advance were analyzed via content and discourse analyses methods.

Literature Review

The Cornerstones of Industrial Revolution

Renaissance and Reform, New Page for New Era: The pioneers of industrialization include a “beginning” and a “final point” paradox in itself. Some say that it is the onset of new term while others claim that industrialization is the final step of its predecessors. To put in another way, industrial revolution is a fresh start for new innovations age which converts the West into a scientific culture oriented location and which commences five centuries ago and perpetuates up till now. On the other hand, industrialization is a terminal point or an output stemming from Enlightenment and geographic discoveries which has shaped the world since sixteenth and seventeenth century. Of course, geographic discoveries started well before than Renaissance and Reform. Throughout Renaissance, a reformation period was initiated on the basis of art, literature, and science as a whole. Thousands of masterpieces and books of prominent scholars of East were translated into Latin and Greek languages, which sparked the transfer of modern science to the West. More than anything else, Renaissance rendered the world comprehend that human is the main axis of the globe, thus each system is to be settled for his/her own benefits. This scientific and human oriented approach opened a new page, established an original culture upon the power of knowledge, logic, rationale, and science (for

further information on Renaissance, see also Ferguson, 1948; Copenhaver, 1992; Levine, 2018: 21-36; Haar, 2006: 20-37; Quinn, 1992: 352-359).

Religious Reformation: Also, Reform played a common ground for the formation of liberal thought which is a “must” for innovation. With the leadership of Martin Luther in the sixteenth century, the dogmas and the manipulation of church became upside down and it was perceived that church degenerated and it used policy for its own purposes, not for the goods of everyone. Therefore, the need for religious transformation and eradication of church’s hegemonic power was quite apparent. It was entailed that the church was to be grounded on logic and ration based framework. All these progresses ended with the appearance of new sects like Protestantism, Catholicism and Calvinism (on Reform, see also Rex, 2017: 211-230; Karaçağıl & Kiriş, 2012: 19-34; Dieter, 2017: 55-74).

Geographical Discoveries, Colonialism, Discovery of World and Developing a Global Vision: Geographical discoveries paved the way for opening the universal eyes of the West. New locations and continents were explored through transatlantic journeys. These places can be chronologically sequenced with their explorers in this manner: (e.g. Cape of Good Hope (Dias), 1487; America (Christophe Colombo), 1492; Africa and Indian Coasts (Vasco de Gama), 1497-1499; Brazil (Cabal), 1500; Mexico (Cordoba), 1518; Philippines (Magellan), 1521; Canada (Cartier), 1534; Chile (Almagro), 1535; Australia (Mendes), 1605; New Zealand

(Tasman), 1642). These worldwide journeys enabled the West to develop and explore what was happening all around the world. The underground assets like mine, gold, and the other valuable goods were transferred to West and this development caused the accumulation of capital, which would be a base for industrial revolution as a whole (Eğilmez, 2018: 81, 82; Güran, 2017: 160).

The Derivatives of Industrialization

Industry 1.0 (The Strength of Machines and Coal)

Industry 1.0 is the first sphere of industrialization process. It is the first and foremost initiation of this developmental inclination, which means that it is a sort of mechanization and fabrication. Actually, it starts with the discovery of “steam power” and its implementation in factories to produce goods in a massive way. According to Scott (2019), it is “the most fundamental reordering of human existence since the beginning of agriculture” (Scott, 2019: 1-2). Allen (2017) claims that industrial revolution “refers to the far reaching transformation of British society that occurred between the mid-18th and the mid-19th centuries” (Allen, 2017, 2). Mokry (1985) came to the conclusion that “the industrial revolution in Britain constituted a new point of departure in human history, an event of such moment to daily life that it compares to the advent of monotheism or the development of language” (Mokyr, 1985: 1). Deane (1979) states that industrial revolution reflects series of changes economically, politically, and

sociologically in a radical manner. These following statements include those kinds of changes in a detailed way and they are quoted directly from Deane's (1979) book named "The First Industrial Revolution". So these modifications are: "(1)widespread and systematic application of modern science and empirical knowledge to the process of production for the market; (2) specialization of economic activity directed towards production for national and international markets rather than for family and parochial use; (3) movement of population from rural to urban communities; (4) enlargement and depersonalization of the typical unit of production so that it comes to be based less on the family or the tribe or more on the corporate or public enterprise; (5) movement of labor activities concerned with the production of primary products to the production of manufactured goods and services; (6) intensive and extensive use of capital resources as a substitute for and complement to human effort; (7) emergence of new social and occupational classes determined by ownership of or relationship to the means of production other than land, namely capital" (Deane, 1979: 1, 2). From all these statements, it can be demonstrated that industrialization or let's say industry 1.0 came with inventions of new machines in parallel to the discovery of steam; however, the indirect effects are not restricted to just machines or fabrications, contrarily, it left a great impact on everything from class formation, ownership, markets, labor mobilization and qualification to economic activities as a whole, which confirms that it is a real 'revolution'.

Industry 2.0 (Power of Electricity)

Industry 2.0, which is argued as the second “wave” (Toffler, 2008) of industrialization, encompasses the period between 1870s when oil was found by Edwin Drake in Titusville, USA and 1989s on which Soviet Union or let’s say Eastern Block dispersed. Drake’s discovery of petroleum replaced coal, the energy source of industry 1.0 (Görçün, 2016: 51-54). Inadequacy of coal to meet the needs of industry, higher costs of its transfer to factories, and environmental pollution that it caused mandated that new forms of energy sources were to be found as an alternative to coal. Hence, petroleum came to the fore at the end of the nineteenth century (Görçün, 2016: 52, 53).

After the exploration of petroleum, a German inventor and a mechanical engineer called Rudolph Diesel invented the first diesel engine. He was actually educated in Munich Polytechnic and graduated as a refrigeration engineer in 1879. His works on refrigeration inspired him to invent a particular engine that could be activated through diesel and that would be more efficient than steam engine. Also, some sociological barriers of small scale artisans who could not afford large steam engines, which were the gifts of Industry 1.0, triggered Diesel’s work, and so he designed different sets of engines including “solar powered air engine.” At the end, he achieved to develop a unique “diesel internal combustion engine” in

1897 and he patented it in 1898. Due to the fact that the diesel engine was much more efficient and productive than the steam engine, Diesel became a millionaire all of a sudden. He, as a matter of fact, invented this unique device on some local fuels derived from oils of vegetables. Higher cost of diesel during economic crisis and its rising price as well as environmental concerns led to particular developments in biodiesel, which was the original form on Diesel's mind at the beginning (Smith & Taylor, 2008: 161, 162).

In his laboratory in Menlo Park, New Jersey in 1879, Edison signed a great success and he transformed electricity into light and the electric light was turned into a unique innovation at the end of nineteenth century. In 1881, a great many people gathered in the salon of Palace of Industry in Paris, which was the first International Exposition of Electricity. The crowd lined up to experience railcar and telephone all of which worked through electricity. The others witnessed the prototype of future Parisian apartment where each room was lighted with electricity. The kitchen became a spot for "electric waffles"; living room was warmed by an electric fire along with the music of electrical piano, the bedroom was a place of technology where electric hairbrushes were available. Also there were electrical telegraphs, dolls, gongs, and etc. which signalled everybody that electricity would become a common good and figment along with diesel machines and cars (Freeberg, 2013: 1, 5).

What's more, the petroleum brought about the inventions of cars and Henry Ford with his Ford Motor Company established in 1903 and with his invention of assembly line, became prominent and his way of production in a massive way was started to be debated on economic and industrial level. That's why, new phenomena called "Fordism" occurred. The Fordist philosophy developed the standards of work in a meticulous way so as to enhance the production and Ford contemplated that there were always two options for everyone: leisure (i) and work (ii). Regarding the fact that the economy is always centered upon preferences, everyone was to bear alternative costs of their choices, which was the common thought of Ford as well. In his book named "My Life and Work", Ford believed in the fact that "leisure and work bring different results." and one "cannot have both leisure and the results of work." If one prefers leisure to work, then he/she has to tolerate its results, which is the case for vice versa. Therefore, Ford reorganized the factories on a productive aspect by means of 'assembly line' and via his application of Taylorist principles to workplaces. And he came to the point that the success depends on hard work, there is one thing that hindered business: finance and the money is OK but leisure comes first. Thus, rather than money or capital, the entrepreneurs ought to focus on the nature of work (Ford, 2007: 46).

In this age, the development of petro chemistry industry enabled the invention of plastic insulated cables which resulted in the breakthrough of semiconductors. Semiconductors also capacitated the transfer of data from one location to another, which accelerated the innovation of computers as well. At the end of 1930s, Howard Hathaway Aiken invented the first, an automatic and a digital computer named *Mark-I*. This computer, which was as big as a room, had the capability to solve logarithmic and trigonometric functions. When it comes to the 1950s, the computers called as *ENIAC* was started to be used (Görçün, 2016: 87, 63, 93).

Industry 3.0 (The Magic of Technology)

Since 1980s, the culture for innovation has gone on in a progressive ways. In 1989, Berlin Wall was destroyed and Soviet Union was dispersed in 1991 and so, communism, which was a threat for capitalism and free market economy, failed. Globalization and neoliberalism transformed the economies in a revolutionary way and market economies again came to fore, which made technological magic gain a big momentum. Therefore, Frank, Roehrig and Pring (2019) referred this term (1980-2000) as the period of “*invention boom*”. The internet and personal computers are the leading inventory outputs of this time, which paved the way that these two elements became the center and sinequanons of daily life (Görçün, 2016: 95-98; Frank, Roehrig & Pring, 2019: 34). Additionally, Industry 3.0 introduced computer aided/assisted

machines and automation, which are the cornerstones of this revolution (Mohanta, Nanda & Patnaik, 2020: 3).

Industry 4.0 (Artificial Intelligence, Digital Transformation, and Big Data)

Right now, the world is heatedly discussing Fourth Industrial Revolution. In spite of the fact that this is a new technology, the leading economies are eager to adapt themselves to this promising transition. Germany was the first country to develop a national industrial strategy for Industry 4.0 in 2012 and that was followed by UK, which has regarded Industry 4.0 as the main growth area and spectrum for the future. The United States assessed Industry 4.0 as a vision for innovational development while France has constructed industrial reform program on the basis of Industry 4.0. On the other hand, Japan has regarded it as a means for technological refreshment, so it is an area of high top priority. The initiatives of China through implementations of technologies of Industry 4.0 and its trend to use it in digital economy illustrate that China desires to be on the front and on this issue (Sergi, et al. 2019: 1).

The main target of Industry 4.0 is to create a “transformation in industry value chains, associated models of business, and value chains of production by combining embedded production system with intelligent systems of production” (Kumar, Zindani & Davim, 2019: 1).

In view of the fact that Industry 4.0 is related to manufacturing systems or enterprises, there are

some key points to reveal basic nature of this new but promising industrial framework. The first element of this process is artificial intelligence (AI) which possesses two visions: “one capable of manipulating symbols and creating knowledge, and the other aimed at approaching what is understood about the operation of the human brain by connecting a network of agents, inspired by the neural network system” (Andre, 2019: 14). Second, internet of things (IoT) is used to refer to communication or interaction among smart manufacturing objects, which authorize the uses of resources in an efficient way and on demand orientation, and which give rise to the free circulation of goods from one stakeholder to another (Kumar, Zindani & Davim, 2019: 3). Cloud Manufacturing Systems (CMS) are the other factor to be considered while explaining Industrial 4.0. It is a platform or advanced and complicated information systems that exchange data in a flawless way by means of digital services (Hoffman, 2019: 5). Big data is the other key characteristics of Industry. 4.0 through which oversized and wide varieties of data can be processed and analyzed in an efficient and effective manner. According to Mohanta et al. (2020) big data has five dimensions called “Volume” (i), “Variety” (2), “Velocity” (iii), “Veracity” (iv), and “Value” (v). “Volume” (1) refers to the huge amount of data processed and produced. “Variety” (2) is used for different sets of data either “structured” or “unstructured” from a huge amount of sources while “velocity” (3) gives the idea on “the rate at which the data are generated and analyzed for further processing.” “Veracity” (4) lays an emphasis on the

originality of the data. At last, “Value” (5) is the era of generated data in order to reveal the accuracy of the information obtained via convenient analysis methods (Mohanta, Nanda & Patnaik, 2020: 5).

The Purpose of the Study

The ultimate objective of the study is to qualitatively analyze four movies for four stages of Industrial Revolution so that the short history of industrialization can be comprehended in a sophisticated way. It is a reality that the movies can be used for educational purposes (about movies used for educational concerns, see also Dale, 1947: 65-71; Judd, 1923: 173-178; Cantor, 2007: 39-69; Barak & Dori, 2011: 608-620; Weisenjeld, 2001: 131-140; Leitch, 2017: 66-78; Fienup-Riordan, 2015: 59-71) and so, another goal of the paper is to unveil the significance of movies for education. With these concerns and as stated well in advance, four movies were determined for four stages and for different peculiarities of these turning points. Industry 1.0 was oriented upon *Oliver Twist* (2005). Industry 2.0 was related to *Modern Times* (1936), as for Industry 3.0, it was based upon *A Beautiful Mind* (2001) while Industry 4.0 was overviewed with *Replicas* (2018). This qualitative initiative depending upon movies will enable the readers to perceive the short history of industrialization in a concrete way and to deduce

something from the past and to walk through the future with the lights of science, democracy, liberal thought, innovation, and hard work.

Research Method

As for the methodology of the research, it can be referenced that two methods named “content” and “discourse” analysis were used to analyze the film scripts and the framework of the samples in a qualitative manner. Content analysis, as one of the most important research techniques, regards “data as representations not of physical events but of texts, images, and expressions that are created to be seen, read, interpreted, and acted on for their meanings, and must therefore be analyzed with such uses in mind.” Content analysis “makes sense of what is mediated between people-textual matter, symbols, messages, information, mass-media content, and technology supported social interactions without perturbing or affecting those who handle that textual matter” (Krippendorff, 2004: xiii). Schreier (2012) views content analysis as a qualitative technique and it is “a method for describing the meaning of qualitative material in a systematic way” (Schreier, 2012: 1). Concerning discourse analysis, on the other hand, it is a research method that clarifies “how meaning can be created via the arrangement of chunks of information across a series of sentences or via the details of how a conversationalist takes up and responds to what has just been said.” Also discourse analysis approves “how speakers indicate their semantic intentions and how hearers interpret what they hear, and on the

cognitive abilities that underlie human symbol use” (Johnstone, 2018: 5). According to Taylor (2013), discourse analysis focuses on various forms of languages and their representations along with the pictures and the movies, and the historical materials as well as communications or interactions among people by moving from the fact that the language as a whole and the context are the evidences of social events and they reflect the forms of particular societies. In discourse analysis, the way of speaking, the social and cultural contexts, the time, the state, the style of the word choice demonstrate more than what was stated. Therefore, “discourse analysis is the close study of language and language use as evidence of aspects of society and social life” (Taylor, 2013: 3, 4).

Film Selection Parameters and Final Listing

While selecting the movies that fit each grades of industrialization, an extensive research was carried out through google engine, IMDB, scripts.com, youtube.com, and so forth. For films that symbolize Industry 1.0, the criteria of the paper was to focus on working conditions in the early stages of industrialized countries, mainly in England. As for industry 2.0, the fundamental concern of the research was to lay an emphasis on Fordism and its novelty originating from assembly line as well as mechanic work. The arguments for Industry 3.0 were oriented upon Cold War and its technological upbringings. At last, Industry 4.0 movies were chosen on the

basis of AI, IoT, and CMS. All these criteria are in line with the literature review of the research.

Findings

The findings of the study will be concentrated on the four different headlines due to the fact that there are actually four cases like “Oliver Twist” (Case 1), “Modern Times” (Case 2), “A Beautiful Mind” (Case 3), and “Replicas” (Case 4). At first, short info will be given on these movies and their foremost characters and later on, their connections with the spheres of industrialization will be acknowledged in line with the literature review of the study. It is too challenging to find a specific movie which reflects all the features of each era, so the basic concern of the paper is to center on some prominent peculiarities of these progressive stages. As an example, in Case 1 selected to depict Industry 1.0, “Oliver Twist” (2005) was given priority since the super synopsis for child labor in the early stages of industrialization is portrayed. In Case 2, that’s to say, in “Modern Times” (1936), which is a good sample for Industry 2.0, the way that the mass production and the assembly line of Henry Ford altered the working conditions were laid an emphasis. In Case 3, to put in another way, in “A Beautiful Mind” (2001), the mode of technology evolved in parallel to Cold War skepticism was mentioned. In “A Beautiful Mind” (2001), the way that the technological boom was created was focused, which is the principal concern of industry 3.0. The sinequanons of Industry 4.0

such as Big Data, Algorithms, IoTs and AI might be witnessed through in Case 4 or let's say "Replicas" (2018). The verbal content of the scripts of these movies named "Oliver Twist" (Case 1), "Modern Times" (Case 2), and "A Beautiful Mind" (Case 3) were accessed through scripts.com, however, "Replicas" (Case 4) were deciphered through the ventures of author. Furthermore, the visual figures were transferred from youtube.com.

Case 1) "Oliver Twist has asked for more. For more? Compose yourself, Mr. Bumble, and answer me distinctly. Do I understand that he asked for more after he had eaten his supper? He did, sir. That boy will be hanged." (Oliver Twist, 2005)

Oliver Twist, one of the extraordinary novels of Charles Dickens concerning its portrayal of 18th century England as well as its industrialized revolutionary perspective, is adapted to cinema in 2005 by Roman Polanski. The film is crucial in regards to its expressionism on economic, social, and political conditions of England in the very early years of Industrial Revolution. In the casting, Barney Clark (as Oliver Twist), Jeremy Swift (as Mr. Bumble), Ian McNeice (as Mr. Limbkins), Richard Durden (as Unkind Board Member), Timothy Bateson (as Parson), Andy de la Tour (as Workhouse Master), Filip Hes (as Workhouse Boy), Andreas Papadopoulos (Workhouse Boy), Laurie Athey (as Workhouse Boy), Joseph Tremain (as Hungry Boy), Peter Copley (as Dining Hall Master), Andy Linden (as Mr. Gamfield-the

Chimney Sweeper), John Nettleton (as 1st Magistrate), Tony Noble (as 2nd Magistrate), Michael Heath (as Mr. Sowerberry) are present (<https://www.imdb.com/title/tt0380599/> (Retrieved: 25.03.2020)).

The movie meets with its fans with Oliver's transfer to workhouse,¹ which is a unique shelter for those who need a care. Here, Oliver finds a home to accommodate, but the kids residing here are maltreated by officers. Although the board members are full and almost all of them are corpulent, regrettably, kids are given inadequate amount of meal, and in a way, they are converted into forced labor. The children are enforced to unpick the oakum as an employment activity, which is legitimated by officers as "serving the country and the Majesty." All the kids are hungry and because of that, they cannot go to sleep. One night, Oliver wakes up and sees a boy in the dorm going back and forth. This guy, as the others, is in starvation and he is frightened. The others ask for the reason and he says that "I am so hungry, I'm frightened. I might eat the lad that sleeps next to me" (Oliver Twist, Movie Script, 2005, available at https://www.scripts.com/script/oliver_twist_15164 (Retrieved: 26.03.2020)). The kids are actually in a gorgeous starvation and they decide to eat the parts of the rope since there is no other alternative. Next day, the kids gather in dining hall for meal and conclusively, Oliver is still in starvation and he yearns for more nourishment by alleging that "Please, sir. I want some more" (Oliver Twist, Movie Script, 2005). His statement is approached as an 'uprising' by

dining hall master and the board of the workhouse and they come to a resolution that Oliver is to be sold to someone as an apprentice or as a henchman. His price is just five pounds (Oliver Twist, Movie Script, 2005, available at https://www.scripts.com/script/oliver_twist_15164 (Retrieved: 26.03.2020); <https://www.youtube.com> (Retrieved: 26.03.2020).

Principally, a chimney sweeper comes to workhouse to purchase him and the board members are outraged viewing that it is filthy and jeopardous for a child. However, chimney sweeper does his best to merchandise this guy as he is too dime and proper to be abused (Oliver Twist, Movie Script, 2005 available at https://www.scripts.com/script/oliver_twist_15164(Retrieved: 26.03.2020):

“That's because they damp the straw afore they light it in the chimney.....to make them come out again. Damp straw makes smoke. Smoke sends a boy to sleep, and that's what he wants. Boys is very lazy, gentlemen. But there's nothing like a good hot blaze to make them come out in a run. It's humane too. Yes. Because even if they've stuck in the chimney... ..roasting their feet makes them struggle to extricate theirselves. Yes.”

Oliver begs for the first magistrate not to give him to this direful man and thanks God, they do not. The horrible statements of chimney sweeper above concerning his treatment to a boy and Oliver's unwilling actions make a prevailing role for magistrates' decidedness. The magistrate reprimands Mr. Limbkins, a cruel man, and advises him to treat Oliver graciously. Later on,

instead of a chimney sweeper, the board members consent to sell out Oliver to a coffin maker, who is a moderate man (<https://www.youtube.com> (Retrieved: 26.03.2020)).

Problems follow up Oliver and he argues with Noah, another apprentice of coffin maker and Mr. Sowerberry punishes him with a stick. Then he evacuates to London very early in the morning and he is abused by Fagin, a pickpocket man there. He forces Oliver to steal over and over. Once at a time, Oliver attempts to steal the handkerchief of Mr. Brownlow and coincidentally, Oliver is not charged with burglary, and so Mr. Brownlow takes him to his house. But again, Fagin burglarizes Oliver. At last, Fagin is hung because of his crimes and Mr. Brownlow adopts Oliver and he embraces the life that he misses so much (<https://www.imdb.com/title/tt0380599/> (Retrieved: 26.03.2020)).

The movie, adapted from novel, is so magnificent that it displays the hard working and socio-economic circumstances in 18th century England with an unexampled professionalism. At that time, industrialization, that is to say, Industry 1.0 takes place and as a result, wealth has enhanced, but new barriers of English society such as child labor, maltreatment of labor, long hours of work, corruption, poverty, inequality, and so on has emerged. Hence, new discussion has occurred on the basis of questioning the functions of Industry 1.0 and on its positivity or negativity. To me, it is still a matter of chicken and egg.

Case 2 “Don’t Stop for Lunch. Be Ahead of Your Competitor.” (Modern Times, 1936)

Modern Times, a silent movie in which the leading role belongs to Charles Chaplin, who is a factory worker, is one of the popular movies of 1930s. The casting of the movie contains Charles Chaplin (as Charlie Chaplin), Paulette Goddard (as A Gamin), Henry Bergman (as Cafe Proprietor), Tiny Sandford (as Big Bill), Chester Conklin (as Mechanic), Hank Mann (as Burglar), Stanley Blystone (as Gamin’s Father), Al Ernest Garcia (as President of the Electro Steel Corporation), Richard Alexander (as Prison Cellmate), Cecil Reynolds (as Minister), Mira McKinney (as Minister’s Wife), Murdock MacQuarrie (as J. Widdecombe Billows), Wilfred Lucas (as Juvenile Officer), Edward LeSaint (as Sheriff Couler), and Fred Malatesta (as Café Head Waiter) (<https://www.imdb.com/title/tt0027977/> (Retrieved: 18.03.2020)).

In this movie, Chaplin pictures how Fordism, the gift of Industry 2.0, leaves a great impact on the routines of an employee. It is seen that Fordism makes employees the parts of machines, the monotonous agents of labor markets. The very first scene of the movie is the clock, which symbolizes the ‘punctuality’ and the significance of ‘time’ in modern industrialized economies.

In these economic systems, everything is time demanding, so its management is of great importance. Chaplin, as a director, frankly shares a brief info about the movie and its content at the beginning and he says that the movie is “a story of industry, of individual enterprise-a

humanity crusading in the pursuit of happiness.” And when the clock shows 6 a.m. in the morning, Chaplin portrays running sheep herd and the humans coming out of subway. It is the morning rush hour. Chaplin gives the message that industrial economy converts human into herds and they rush to arrive in their smoked industries. Therefore, the employees have the problem of time but that is not the case for employer (president). The well-dressed president is quite relaxed, deals with puzzles and reads his newspaper, controls each parts of factory through cameras and gives commands to enhance the speed of production. Through assembly line, the employees always carry out routine works including Chaplin and they have no alternative to do; otherwise they will be fired (<https://www.youtube.com> (Retrieved: 18.03.2020)). On the one hand, the employer does his best to maximize production or profit and to eliminate free time on the other hand. One day, the innovators of an automatic feeding machine come to the factory and advertise their products and their emphasis is on the eradication of leisure time and rise on productivity, which can be realized in the following lines (Modern Times, Movie Script, 1936 available at https://www.scripts.com/script/modern_times_13917 (Retrieved: 18.03.2020):

“Good morning my friends. This record comes to you through the Sales Talk Transcription Co. Inc. Your speaker, the mechanical salesman. May I introduce Mr. J. Willacomb Bellows, inventor of the Bellows Feeding Machine, a practical device which automatically feeds your men at work. Don't stop for lunch. Be ahead of your competitor. The Bellows feeding machine will eliminate the lunch

hour, increase your production and decrease your overhead. Allow us to point out some of the features of this wonderful machine. It's beautiful aerodynamic streamlined body, its smoothness of action made silent by electroporous metal ball bearings. Let us acquaint you with our automaton soup plate, its compressed air blower, no breath necessary, no energy required to cool the soup. Notice the revolving plate with the automatic food pusher. Observe our countershaft double-knee action corn feeder, with its synchronized transmission, which enables you to shift gears by the mere tip of the tongue. Then there is the hydro compressed sterilized mouth wiper. Its factors of control insure against spots on the shirt front. These are but a few of the delightful features of the Bellows Feeding Machine. Let us demonstrate with a worker. Actions speak louder than words. Remember, to keep ahead of your competitor, you cannot ignore the importance of the Bellows Feeding Machine.”

However, there are some particular problems of feeding machines and it does not work properly. In the factory, the routines go on without any interruption and Chaplin becomes a “mechanic” due to these ceaseless works and he goes mad and is taken to hospital. Following treatment, he finds a red flag on the street and this connotes a socialist message, which is fostered by the crowds, who desires liberty at work. The only way to escape from these hard working conditions is to unite for liberty, that is to say, to be the member of a trade union. Their attempts for unionization are inhibited by policeman and Chaplin is contemplated as the communist leader of the meeting as he has red flag in his hands and so, he is arrested. Chaplin, additionally, captures the attention of the audience to the chronic troubles of capitalism, which gives rise to unemployment in a direct way. Due to the barrier of unemployment, people must

live in poverty as there is no living wage. With three girls figure illustrated in the film, Chaplin gives the message that capitalism is a system with its drawbacks. Because of poverty, the eldest sister steals banana to feed her sisters and they gather woods on the seashore to cook something. Meanwhile, the fathers' of these ladies are died in a meeting and the little sisters are sent to orphanage (<https://www.youtube.com> (Retrieved: 19.03.2020)).

Actually, the film criticizes capitalist system, its hegemonic ideology, and mass production of Industry 2.0. As capitalism just focuses on production and profit, it mandates people to lose their humanity as well as emotions for the sake of productivity and profitability of employers. Everything is time oriented and there is no place for employees to be unionized in this system. The state, which is one of the most significant components of industrial relations mechanism, stands and backs the employer and prevents the unionization process. This also creates inequality. To the viewpoint of Chaplin, the ideal solution for this problem is to hold red flag, or let's say, to support socialism as a counter system to capitalism, which aims at organizing employees under the roof of socialist ideals. However, I am not sure that socialism can be functional in this journey as the state is more glorified and attributed a meaning than it should be. In this system, the state controls everything from soup to nuts and the unions are something like the ideological apparatuses of the state itself. Hence, the unions are not available to truly guard employees' rights, yet still they are to be present so as to control and manipulate the

masses. It seems improbable to settle a free and impartial unionist perspective. In capitalism, they are dominated by capital owners while they are rebuked by omnipotent state in socialism.

Case 3 “Genius Sees the Answer before the Question.” (A Beautiful Mind, 2001)

A Beautiful Mind, filmed in 2001, tells the story of a popular mathematician, John Nash and his skeptical behaviours during Cold War years. As Industry 3.0 goes in line with the Cold War period and involves magic technological innovations, A Beautiful Mind is good choice for qualitative analysis. In the film, there are popular actors and actresses such as Russell Crowe (as John Nash), Ed Harris (as Parcher), Jennifer Connelly (as Alicia Nash), Christopher Plummer (as Dr. Rosen), Paul Bettany (as Charles), Adam Goldberg (as Sol), Josh Lucas (as Hansen), Anthony Rapp (as Bender), Jason Gray-Standford (as Ainsley), Judd Hirsch (as Helinger), Austin Pendleton (as Thomas King), Vivien Cardone (as Marcee), and so forth. A Beautiful Mind is the story of a mysterious John Forbes Nash, who only tackles with numbers and formulas on surface; but in detail, it whispers how competition between two states called United States of America and Soviet Union contributes to innovation in one sense and agnosticism in other aspect (<https://www.imdb.com/title/tt0268978/> (Retrieved: 19.03.2020)).

John is a genius but asocial man and he consciously keeps away from sociality by thinking and ascertaining that “The truth is that I don't like people much. And they don't much like me” (A

Beautiful Mind, Movie Script, 2001 available at

https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 20.03.2020).

This statement unveils his principle towards life and people as a whole. He also confirms his science dedication character but his inadequacy of clubbiness while he is communicating with his supernatural or ghost character Charles, on his PhD dissertation topic and studies in the dorm. Nash unwraps his life story to Charles and displays that “My first grade teacher, she told me... that I was born with two helpings of brain, but only half a helping of heart” (A Beautiful

Mind, Movie Script, 2001 available at

https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 20.03.2020).

This shows again the mechanic and science devoted character of John as well. Just as stated well in advance, John is a man of science and he gets a Carnegie scholarship to complete his PhD in mathematics in Princeton University. In spite of the fact that real Nash does reject that the movie does not reflect his life story as a whole, to me, it includes a great many realities of the period. More than anything else, the movie starts with the speech of Helinger and he gives utmost care to the technological developments, which are the unique tools for America to be on the front and to preserve liberty and democracy and which are the main signals of Industry 3.0.

In the following lines, Helinger points that wars on the battle field terminate, but now

technological wars are initiated (A Beautiful Mind, Movie Script, 2001 available at https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 20.03.2020):

“Mathematicians won the war. Mathematicians broke the Japanese codes and built the A-bomb. Mathematicians... like you. The stated goal of the Soviets is global Communism. In medicine or economics, in technology or space, battle lines are being drawn. To triumph, we need results publishable, applicable results. Now who among you will be the next Morse? The next Einstein? Who among you will be the vanguard... of democracy, freedom, and discovery? Today, we bequeath America's future... into your able hands. Welcome to Princeton, gentlemen.”

These lines verify the fact that technology and innovation are the key concepts of Industry 3.0.

Despite some ups and downs, Nash spends his life with hard work, science, and academic studies. However, these are not as easy as expected. So John pays an unprecedented cost and he starts to see hallucinations while he is focusing on his PhD. But, he is not aware of the situation. He terminates his PhD with a great success and he develops a new and an original theory called as “Nash equilibrium”² which is still used by a great many disciplines including economy, labor relations, military agreements, mathematics, social welfare policies, and social sciences and which is acceded as the part of game theory right now. Later on, he is appointed to Wheeler Lab established as the new military think tank at Massachusetts Institute of Technology (A Beautiful Mind, Movie Script, 2001 available at https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 20.03.2020).

to struggle against the communist activities of Soviet Russia, and as a result of great pressure and a hard work, novel hallucinations emerge like Parcher (a CIA agent) and Marcee (niece of Charles) in John's life. John goes to Pentagon over and over to untangle the cryptography of Russia and while doing so, he observes camera and his hallucinations gets bigger and bigger and Parcher convinces John to be an agent and he consents. Parcher takes John to a specific and a precise place near to Wheeler Lab, which is utilized by USA as a technological base to handle the adverse effects of socialism and to fight with its leader, Moscow (<https://www.youtube.com> (Retrieved: 20.03.2020)).

In this military and top secret base, Nash gets acquainted with intelligence on the one hand and he is familiar with unexampled innovative tools on the other hand. To illustrate, Nash sees remote controlled TV, unrivalled intelligence machines at first just as Parcher is endeavoring to explicate the Nazis and their intentions in USA with these statements (A Beautiful Mind,

Movie Script, 2001 available at

https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 23.03.2020):

“This factory is in Berlin. We seized it at the end of the war. Nazi engineers were attempting...to build a portable atomic bomb. The Soviets reached this facility before we did, and we lost the damn thing. [...] The Soviets aren't as unified as people believe. A faction of the Red Army calling itself Novaya Svobga, "the New Freedom," has control of the bomb... and intends to detonate it on U.S. soil. Their plan is to incur maximum civilian casualties. Man is capable of as much atrocity as he has imagination. New Freedom has sleeper agents here in the U.S. McCarthy is an idiot, but unfortunately that doesn't make

him wrong. New Freedom communicates to its agents... through codes imbedded in newspapers and magazines, and that's where you come in.”

In the movie, it's quite clear that the US intelligence services go hand in hand with technology fostered by electricity, telecommunication, and space operations like satellites. These are the very basic of Industry 3.0 resulted in/from catastrophic rivalry between USA and USSR during Cold War period. Unfortunately, this war paranoia does not suggest positivity but at times, it causes fatalities and strong psychological disorders. John suffers them both. Anyhow, he keeps on his career and marries Alicia; nevertheless, his psychological problems get bigger and bigger and at the end, he is taken to a clinic. The audience witnesses how medicine is progressed and how it is professional in US during treatment owing to the fact that new methods and technological devices are on the fore in the movie (<https://www.youtube.com> (Retrieved: 23.03.2020)).

Finally, Nash goes out of hospital, yet still his problems carry on. To get of the delusions, Alicia, his wife, and he resolves to be social and involves in social life activities and so, Nash returns to Princeton again with his beloved family to go on his academic career. He arranges a meeting with Martin, John's former friend from Princeton and also a mathematics professor. He communicates with Martin that “Alicia and I think that-that fitting in, being part of a

community, might do me some good. That a certain level of attachment, familiar places, familiar people, might help me... elbow out these-these certain delusions that I have” (A Beautiful Mind, Movie Script, 2001 available at https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 23.03.2020).

Nash gets permission from Martin to study in the library. He studies for many years there and grapples with this ailment. Meanwhile, the audience becomes face to face with the technological and technical innovations such as Alicia’s and Parcher’s modern automobiles, the radios of John (see Figure 7), which are quite popular at that time and which are the components of Industry 3.0 as well. At the end, Nash learns how to deal with the problem and his scientific works are so super that he wins Nobel Prize in 1994 (<https://www.youtube.com> (Retrieved: 23.03.2020). In his speech, he confesses that he has made the unique discovery of his life (A Beautiful Mind, Movie Script, 2001 available at https://www.scripts.com/script.php?id=a_beautiful_mind_3766&p=2 (Retrieved: 23.03.2020):

“I’ve always believed in numbers. In the equations and logics... that lead to reason. But after a lifetime of such pursuits, I ask, what truly is logic? Who decides reason? My quest has taken me through the physical, the metaphysical, the delusional...and back. And I have made the most important discovery of my career. The most important discovery of my life. It is only in the mysterious equations of love that any logical reasons can be found. I’m only here tonight because of you. You are the reason I am. You are all my reasons. Thank you.”

Case 4 “This man is death. It’s neurological data still accessible. We’re going to take his biological brain imprint into that synthetic one replicating human mind.” (Replicas, 2018)

Replicas, reflected on the scene in 2018, was selected to analyze Industry 4.0 in a qualitative style. It is one of the most renowned science fiction movies in the world and it classifies the chronicle of a scientist called William and his family, who all lose their life in a tragic traffic accident. In the casting, there are Keanu Reeves (as William Foster), Alice Eve (as Mona Foster), Thomas Middleditch (as Ed Whittle), John Ortiz (as Jones), Emjay Anthony (Matt Foster), Emily Alyn Lind (as Sophie Foster), Aria Lyric Leabu (as Zoe Foster), Nyasha Hatendi (as Scott), Amber Rivera (as Margaret), Jonathan Dwayne (as Security Guard), Luis Gonzaga (as Officer Perez), Andres Ramos (as officer Rodriguez), Jeffrey Holsman (as Blue Eyes), Sunshine Logrono (as Hector), and Angela Alvarado (as Ms. Barnes). It’s a new movie, but its message and theories concerning the future world are far promising and enlightening (<https://www.imdb.com/title/tt4154916/> (Retrieved: 23.03.2020)).

William, who is a an extraordinary scientist in Bionyne Industries (Experimental Research Facility) in Puerto Rico, USA where memory transfer operations and cloning procedures are conducted aided with AI technologies as well IoTs, finds himself in an extraordinary journey in

the aftermath of his families death in a traffic accident while they are heading for a vacation (<https://www.youtube.com> (Retrieved: 23.03.2020)).

Due to heavy rain, William loses the control of his car and they all go down into the depths of a lake and all his family members pass away. He becomes shocked and calls Ed, one of his friends from work, who is a cloning scientist. William desires to clone his family both physically and mentally and thus he is in need of Ed's help, who is an expert on cloning. To put in another way, memory or let's say neural cloning is carried out by William whereas physical one is fulfilled by Ed. However, a serious predicament is available, that is, only three cloning machines are present, so William must select three of them. Primarily, he does not desire to take this responsibility and forces Ed to choose but Ed says that "You wanted this and you picked." William contemplates a lot and chooses three of them (e.g. Mona, Sophie, and Matt) in a random way and Zoe, his daughter, is not selected (<https://www.youtube.com> (Retrieved: 23.03.2020)). Even though Ed, a cloning specialist, has plenty of hesitations on cloning and transferring their minds because of some failures in the past with these utterances like "If this works, their brains are gonna come out like infants." and "What if something horrible goes wrong?", he fails to convince William and William says that "Something already has" (<https://www.youtube.com> (Retrieved: 24.03.2020)). That means Ed becomes unsuccessful to persuade William on the detrimental effects of their operations. And then they initialize the

process by taking their precautions to keep this attempt confidential. So, William asserts to Ed that “Nobody can know what happen.” They wait for seventeen days and miraculously, they accomplish and with a great amazement, Ed states that “Oh, shit, I did, we did it. She’s perfect now.” and “Hey, we make clones today, you can add to your resume” (<https://www.youtube.com> (Retrieved: 24.03.2020)). This means that William practices his unique invention to revive his family, I mean he practices it on his family at first, which is too risky yet no alternative options are existent and he, with Ed, win.

Following Mona, Sophie, and Matt’s cloning, William transposes their memories via memory transformer, his unprecedented innovation, by removing some of the sorrowful recollections via using AI, and it seems that everything works well as different from the project 345 on which the mind of sergeant Kelly was imprinted. In other words, the family members behave normally and more than that, they are healthier than before because of the fact that William imprints their minds into their own bodies and mind and body fit each other, which gives an accurate solution. However, William’s stupid boss learns the situation and aspires to misuse this specific case. He threatens William to explain the case and also forces him to terminate the project on the grounds that time is up (<https://www.youtube.com> (Retrieved: 24.03.2020)):

“William: I thought I can do it. Sorry! What?

Boss: Bill, have you been avoiding my call? Bill. Bill.

William: What?

Boss: Do you realize how much money has been invested in this project? People are counting on you. I am counting on you.

William: Shit.

Boss: And we're almost got out of time.

William: Shit.

Boss: What did you say? You hear me? Bill, you still there?"

William loads his memory to memory transformer device and wants to test it on 345, that's to say, AI assisted bio. He is so determined as well as ambitious to create an algorithm that adjusts to the 345 and in so doing, he can control the synthetic body himself and in way, the bio will be William itself and it will accede his mind as the matter is body and mind adjustment.

When he comes back to his home, he learns from his wife that his girl has a little fever and Sophie wakes up with scream. She whispers the accident and William, as a father, makes her calm down and takes her body to the basement and rewrites the pathways and some particular associations that remind her accident. Meanwhile, Mona comes from upstairs and asks William "what's going on?", "What have you done to Sophie?" and requests him to tell the truth. Later on, William says that "There was a crash. You and the kids died. I brought you back. You're replicas." Mona is shocked (<https://www.youtube.com> (Retrieved: 24.03.2020)). By the way, Jones goes on his threats to give William the algorithm and he abducts his family. At the end, William shares the algorithm by transferring his mind to the bio and he makes another William on the synthetic body of 345. Thanks to defacto William, Jones and bio William earns a lot of

money from cloning and memory transferring projects. Real William also brings Zoe back and they live together blissfully (<https://www.youtube.com> (Retrieved: 24.03.2020)).

As seen from the content and the visuals, it can be demonstrated that the movie is a real symbol of Industry 4.0 concerning the technology it offered to the real world. In addition, it gives concrete hints about the future projection of the universe itself. The question is: Are all these things liable to be achieved? Considering what happened for the last three centuries, I can say that it is a big “Yes”. Maybe, they are all done and the innovators are just preparing the humankind to these enigmas depending upon movies. Who knows? Frankly, we cannot know, maybe we can just predict, yet it is quite certain that there is someone who knows all these processes. We will see.

Concluding Remarks

Today, multidisciplinary works are on the rise and so, I always believe in the allurements of this scenario despite its several minuses. As a labor economist and social policy expert, I have got the idea that scientific authorities can get benefit from the magical world of movies while educating or teaching. This is also the case for researching as well. Movies have the potentiality to whisper something fresh to pupils’ minds so that they can grasp the social issues like economy, technology, poverty, inequality, history, and etc. in a proficient manner, which is

certified by the fact that they learn visually. Therefore, movies or let's say cinema are essential apparatuses for education.

Moving from here, the main goal of the survey is to analyze the industrial stairs in a qualitative framework and on the basis of concrete movies selected such as *Oliver Twist* (2005) for Industry 1.0, *Modern Times* (1936) for Industry 2.0, *A Beautiful Mind* (2001) for Industry 3.0, and *Replicas* (2018) as a symbol for Industry 4.0. Naturally, there are innumerable films that center on these issues but they are to be restricted. *Oliver Twist* (2005) is favored for its depiction of child labor in the early years of Industry 1.0 whereas *Modern Times* (1936) is a peerless sample for Fordism, which is a sinequanon of Industry 2.0. Industry 3.0, which is configured through Cold War period, is symbolized with *A Beautiful Mind* (2001). As for *Replicas* (2018), it reflects the characteristics of Industry 4.0 and it is newsworthy too. Content and discourse analysis, which are quite popular for these qualitative studies, are utilized all over the course of the study. Content analysis is preferred to explore the content of the movie while discourse is used so as to ground the critical aspect of movie scripts.

As a result, it is proved that disciplines are interrelated and they are not isolated from one another (i). Also movies are convenient prototypes for education and for their portrayals of societal realities, which will likely augment the students' learning adeptness on social, economic, political, and cultural affairs (ii). What's more, disparate academic realms can learn

much from each other and they should cooperate (iii). Last but not least, emerging economies are to figure out those industrial countries as role models and they are expected to give their attention to their innovative cultures, which has been established for the last three centuries with various challenges. Otherwise, many of these economies will miss industry 4.0 train as they did for the former stages of industrialization (iv). I fear from history's repeating itself again.

Strengths and the Limitations of the Research

The article can be assessed as a unique paper in view of the fact that it scrutinizes the spheres of industrialization ranging from Industry 1.0 to Industry 4.0 under the illumination of four different international movies. There is no hesitation to say that this perspective suggests a holistic viewpoint to the readers while focusing on the story of industrialization, which is so super in terms of reflecting the strength of the paper. Of course, there are several limitations of the research as it has a qualitative nature. At first, depending on “content” and “discourse” analysis methods, four movies (e.g. *Oliver Twist*, *Modern Times*, *A Beautiful Mind*, *Replicas*) were picked up for scrutiny. This initiative may be both an advantage and disadvantage. It can be a utility stemming from the fact that four stages of industrialization can be leaked to the audience, which will possibly suggest a holistic framework and which will render them grasp

the theory in a better way. Thinking the other side of the coin, it can be a down as it is unfeasible to go into the details of each case. Therefore, as a researcher, you must delve into only some prominent situations of these cases. Besides, the study is centered upon a qualitative model and no software programs are used like Atlas, Nvivo, Maxqda, which are undoubtedly popular for qualitative researches, and so this is a restriction as well.

Insights for Future Researchers

Two recommendations can be given for the researchers who will concentrate on the adjacent issues in the upcoming future. The initial one is that they can use qualitative computed aided software programs for content and discourse analysis and focus a list of films as sample instead of several ones, which empowers the originality of the papers. Otherwise, they can follow the strategy to choose just a movie and analyze it in a thorough way. Another advice is sent to the labor studies professionals and cinema experts that they are to be much more tolerated to multidisciplinary studies for the world has been reconstructed on the basis of this phenomenon.

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FIGURES

Figure 1: The Stages of Industrial Revolution

Industry 1.0

- Machines
- Factories
- Mechanical Production
- New Energy Sources (Coal, Water)
- New Machines (Spinning Jenny, Power Loom)
- The Railway System, The Locomotive
- James Watt and Thomas Newcomen
- Iron, Coal, Textile, Steam Industries
- Division of Labor and Specialization

Industry 2.0

- Electrical Energy, Steam Power
- Petroleum
- Iron and Steel Production
- Telephones, Telgraphs, Motion Pictures
- Automobiles, Diesel Engines, Airplanes, Bicycles
- Fertilizers, Rubber
- Widespread Machinery in Manufacturing
- Different and New Forms of Business Organization

Industry 3.0

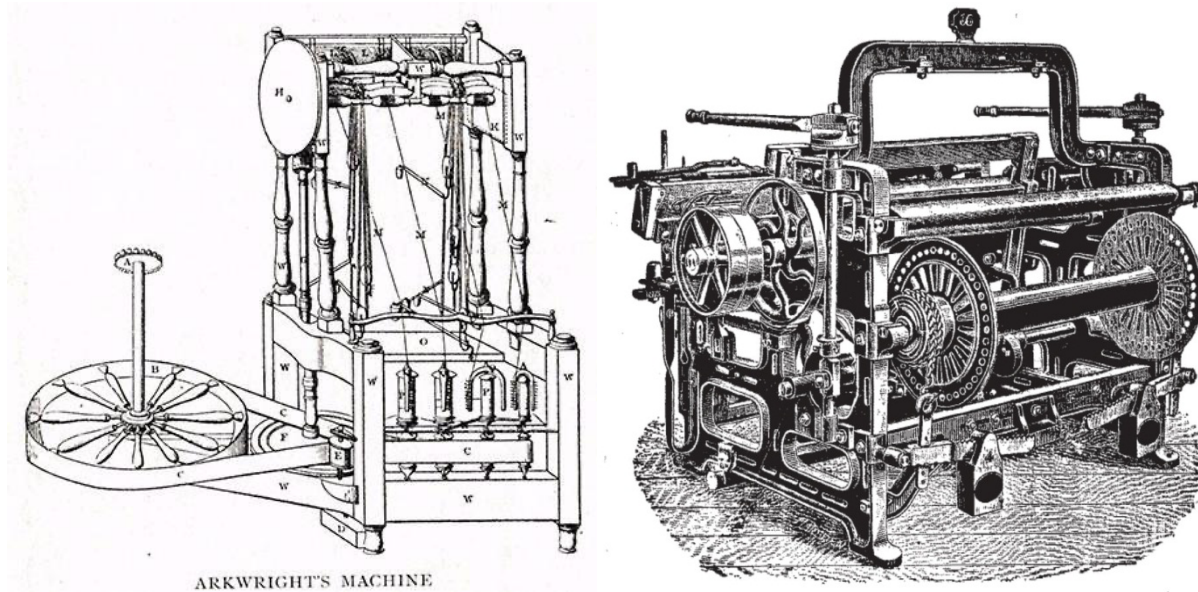
- Automation
- Information Technology
- Telecommunication Systems
- Computer and Electronic Industries
- Business Computers and Computer Software
- Internet and World Wide Web (WWW)

Industry 4.0

- Smart Manufacturing Systems
- Artificial Intelligence (AI)
- Internet of Things (IoT)
- Cloud Manufacturing Systems
- Big Data
- Machine Learning
- Robots

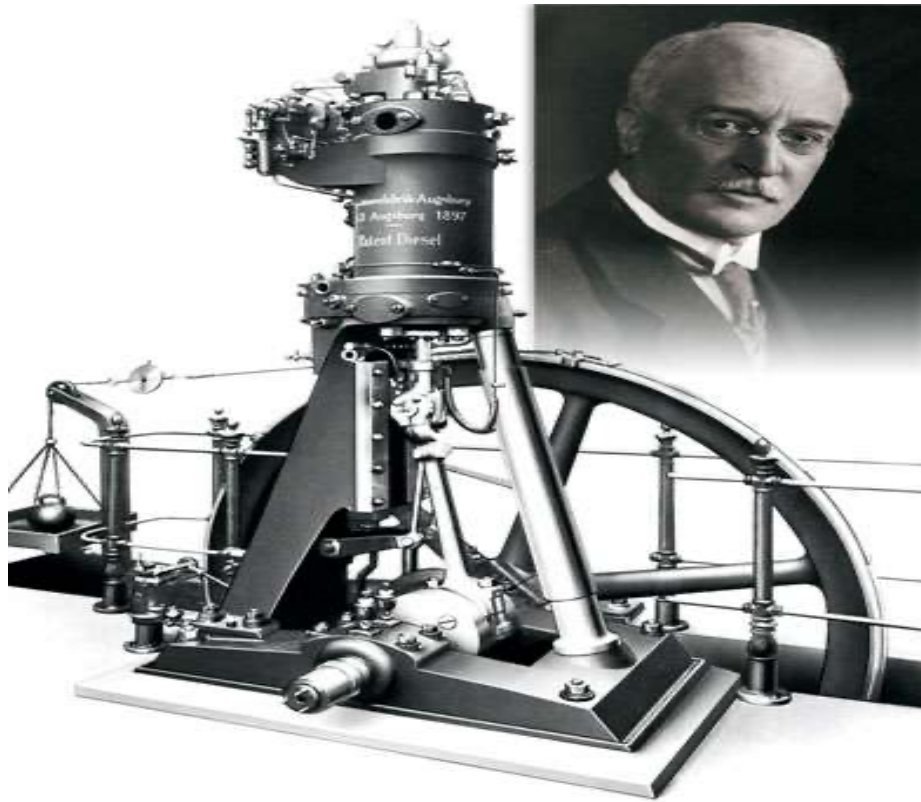
Source: Kumar, & Nayyar, 2020: 3.

**Figure 2: Industry 1.0, Innovation Age: Arkwright's Spinning Jenny (left)
and Cartwright's Power Loom (right)**



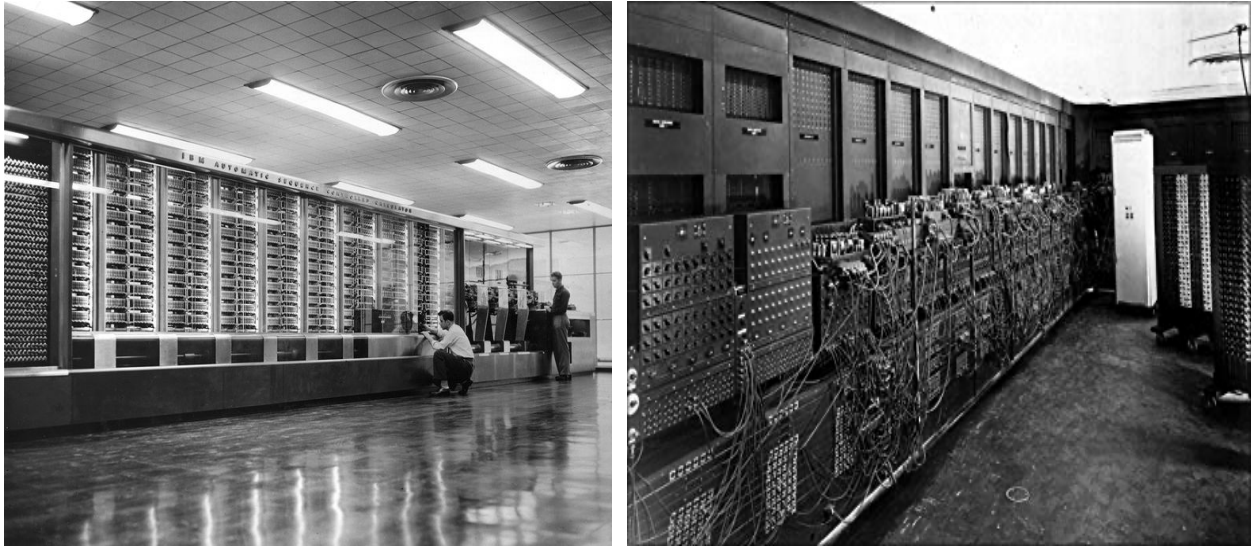
Source:<https://www.sutori.com/item/1769-the-water-frame-richard-arkwright-and-john-kay-what-did-it-do-the-wat> (Retrieved: 24.10.2019);
<https://www.historycrunch.com/power-loom-invention-in-the-industrial-revolution.html>
(Retrieved: 24.10.2019).

Figure 3: Rudolph Diesel and His “Diesel” Engine



Source: <http://dartonrefuel.com/biodiesel.php> (Retrieved: 24.10.2019).

Figure 4: Mark-I (left) and ENIAC (right)



Source: <https://www.thoughtco.com/howard-aiken-and-grace-hopper-4078389> (Retrieved: 25.10.2019);<https://www.amazon.com/20x30-Poster-Eniac-Computer-Installed/dp/B06Y35H34X> (Retrieved: 25.10.2019).

**Figure 5: Class Conflict, Case of the Privileged Minority, but Miserable Majorities
in Oliver Twist (2005)**



**-Miserable majorities, attempting
to eat rope to be full-**



-Privileged minorities, living in luxuries-

Source: <https://www.youtube.com> (Retrieved: 26.03.2020).

Figure 6: Delineation of Industrial England in 18th Century



-18thEngland-



-Workhouse-



-Child Labor in Workhouse-



-Children Unpicking the Oakum-



-The Dorms of the Children-



-Kids with Little Food-

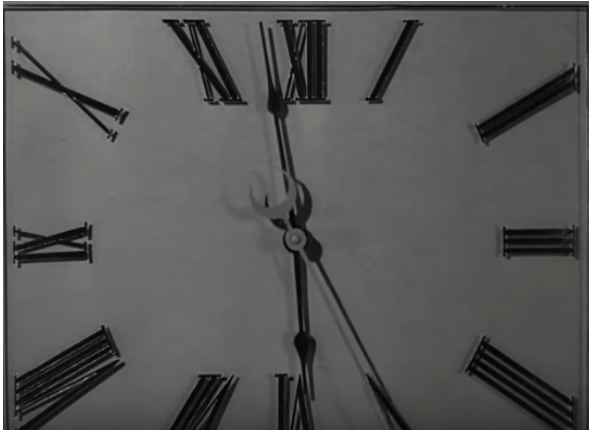
Source: <https://www.youtube.com> (Retrieved: 26.03.2020).

Figure 7: A Boy for Sale in Industrial England in 18th Century



Source: <https://www.youtube.com> (Retrieved: 26.03.2020).

Figure 8: Industry 2.0 and Its Reflections in Modern Times (1936)



-Time and Punctuality-



-Running Shepherds-



-Morning Rush Hour at Subway-



-Smoked Industries-



-Automatic Feeding Machine-



-Union of Workers under Socialism-

Source: <https://www.youtube.com> (Retrieved: 19.03.2020).

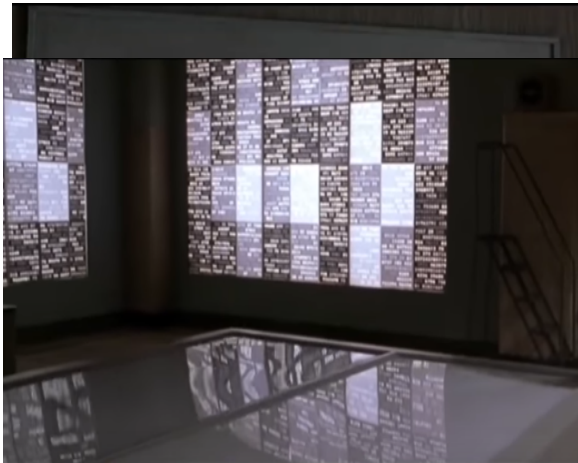
Figure 9: Industry 3.0 and Its Projections in A Beautiful Mind (2001)



-Computer and Electronic Magic-



-Agent Machine-



**-Remote Controlled Television-
-Pentagon with Technology in 1953-**



**-Nash Examines Remote Control-
-New Type of Camera-**

Source: <https://www.youtube.com> (Retrieved: 20.03.2020).

Figure 10: Other Evidences of Industry 3.0 in A Beautiful Mind (2001)



-Alicia's Modern Car, a) -



-Technology in Medicine-



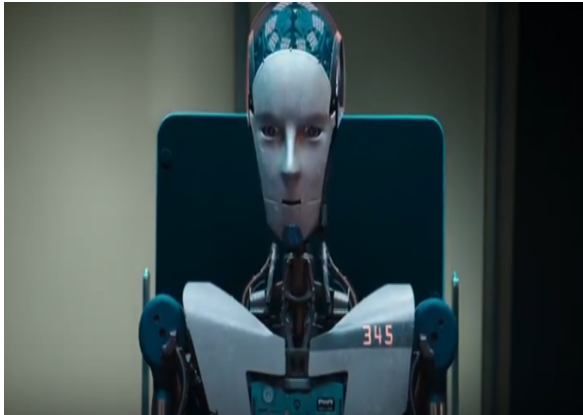
-Alicia's Modern Car, b) -



-John's Radio on the Table-

Source: <https://www.youtube.com> (Retrieved: 23.03.2020).

Figure 11: Industry 4.0 in Association with Replicas (2018)



-AI Assisted Robot / Bio-



-Memory Transformer-



-Human Subject for Memory Transformation-



-Transferring Neural Data from Death Man-



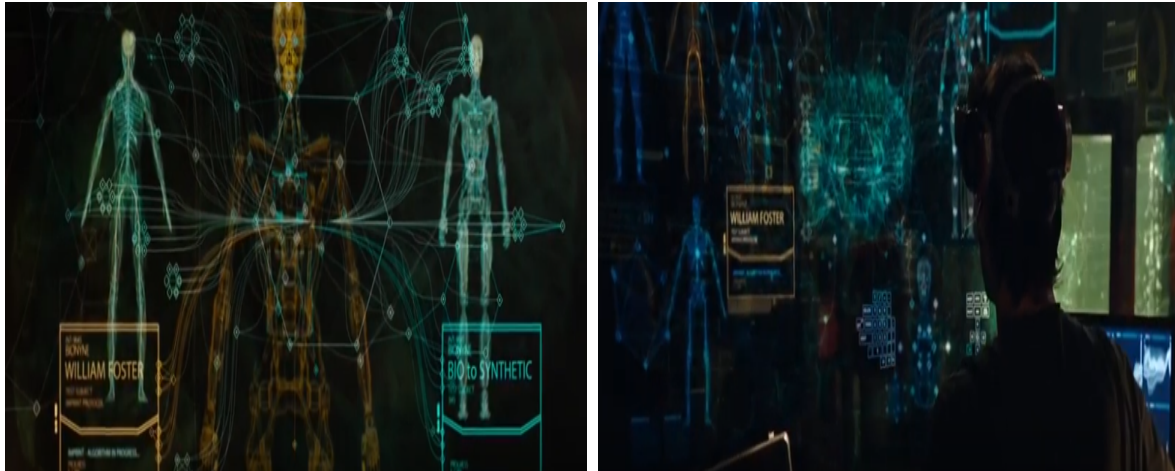
-Neural Mapping Procedure-



-Human Cloning-

Source: <https://www.youtube.com> (Retrieved: 23.03.2020).

Figure 12: Algorithms and AI in Replicas (2018) as Part of Industry 4.0.



Source: <https://www.youtube.com> (Retrieved: 24.03.2020).

ENDNOTES

¹ In the literature, there are actually two views concerning the functions of workhouses: one recalls positivity while the other is vice versa. In 19th century England, workhouses are used as places for shelters where “unmarried mothers, prostitutes, and vagrants all resorted to [...] on a regular basis.” owing to the prevalence of poverty and poor law regulations (Crossman, 2013: 168. To the views of Newman (2014), workhouses were created as a result of the poor law of 1834 passed in England so as to alleviate impoverishment. These buildings, which have remained active for virtually 100 years, reflect the confusion of English treatment towards poor as they were constructed for elimination of pauperism, yet still, their architecture contradict with this ideology (Newman, 2014: 122). According to Siena (2013), who possesses positive perspective, workhouses have various functions. First and foremost, they are the places, which devote themselves to work that is their nominal target. Additionally, they always provide sanctuary for those who are in need of a state care like elderly, disabled, mad, orphans and so forth. In these social service-oriented institutions, the state also suggests feeding, nursery, and hospital treatment. These are also the spots that act like an employment agency and through which young guys are placed to particular jobs and apprenticeships (Siena, 2013: 19).

² Nash equilibrium, is “a strategy profile at which no player, acting alone, can make a change that improves his outcome” (Schechter & Gintis, 2016: 61). Holt, Roth, and Vernon (2004) defines Nash equilibrium as “a set

of strategies, one for each of the n players of a game, that has the Property that each player's Choice is his best response to the choices of the n-1 other players." (Holt, Roth, & Vernon, 2004: 3999). In a way, Nash's theory brings "optimality" to the fore and one is to select the optimal social alternatives over the others and to consider the others while making his preferences in real life activities (Maskin, 1999: 23). So, people are to do their best not only for themselves but also for the others as a whole to get an optimal satisfaction, which is also approved by Nash with these statements in the movie: "*Because the best result will come from everyone in the group doing what's best for himself and the group.*" Nash is on the point of view that Adam Smith, the pioneer of the modern economy, is to be modified. (*A Beautiful Mind*, Movie Script, 2001).