

## NEGOTIATIONS 4.0 – REVIEW OF RESEARCH AREAS

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**Purpose:** to present original concept of the description of the determinants of negotiations stemming from industrial revolution 4.0.

**Design/methodology/approach:** the paper is based on the author's own concept of negotiations description supported by the comparative analysis of selected works by other authors.

**Findings:** the determinants and features of negotiations 4.0.

**Practical implications:** suggestions and recommendations how to conduct negotiations 4.0 processes in managerial practice.

**Social implications:** the paper help to be aware of specific features of negotiations 4.0 and to develop proper attitudes to them, substantially reflecting those features.

**Originality/value:** the paper contains original author's concept which contributes to the performance of managers and other people responsible for conducting negotiations 4.0.

**Keywords:** industrial revolution 4.0, socio-economic negotiations, negotiations 4.0.

**Category of the paper:** viewpoint.

### 1. Introduction

The so-called (industrial) industrial revolution 4.0 significantly and rapidly changes the nature, scope and course of all kinds of projects carried out in virtually all spheres of our lives. This also applies to socio-economic negotiation processes, which on the one hand are becoming easier to implement, and on the other - more and more complex and unpredictable. The need to consider the requirements and challenges of the 4.0 revolution significantly modifies these processes and determines their effectiveness.

As for the state of research on the issue of impact of industrial revolution 4.0 on negotiation processes, in recent years there have been very few publications dealing with this issue in a complex way. Only one short monograph is worth mentioning (Novotny, 2017), however containing a different approach to the discussed issue than the one presented in this paper. The other publications on the discussed issue are of selective character.

Several works, e.g. (Hofmann, 2020; Masłoń-Oracz, Pietrzak, 2022; Shonk, 2020) are focused on very important aspect of negotiations 4.0, namely their virtual character. Other papers deal with the issue of negotiations 4.0 indirectly, e.g. in the context of developing vocational skills (Spöttl, Windelband, 2021) or international trade relations (Rymarczyk, 2021).

More often the problem of the influence of big data on conducting negotiations - which is in the area under consideration - is discussed, e.g. in the following works (Al-Sakran, 2014; Cooke, 2020; Georgdiadou, Angelopoulos, Drakes, 2019; Kozina, 2020; Why Big Data..., 2020).

Another important issue linked with the considered are negotiation support systems (NSS) and electronic negotiation (Kersten, 2007; Fernandes, 2016), which provide modern information technology, supporting negotiation processes, mainly via Internet.

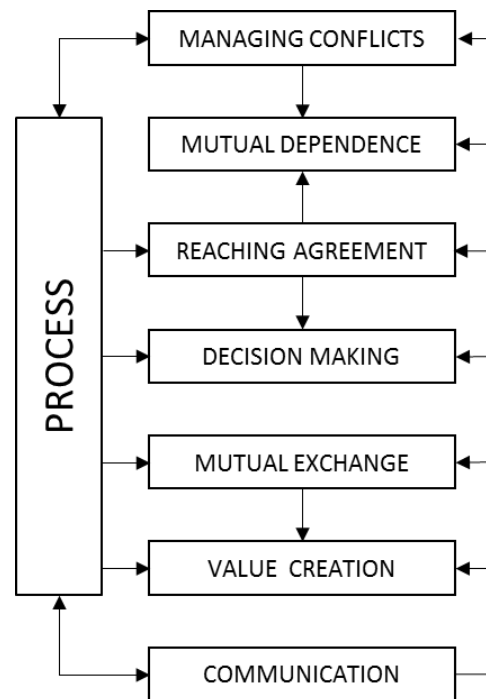
Taking into account the above statements, the objective of the paper is to present the author's concept of describing the conditions of the socio-economic negotiation processes resulting from the occurrence of industrial revolution 4.0, both within these processes and in their context, and these conditions are divided into two groups:

- 1) supporting, i.e. facilitating the implementation of these processes, creating opportunities and extending the possibilities of action and neutralizing limitations,
- 2) disturbing, i.e. hindering the conduct of these processes, causing threats and narrowing the possibilities of operation and strengthening the limitations.

It can be argued that conditions of the first type are of greater importance, because generally industrial revolution 4.0 has a positive impact on socio-economic processes.

In order to describe those both groups of conditions in the following sections of the paper - after presenting the idea of industrial revolution 4.0 - an original concept of negotiation interpretation was adopted as a methodological framework (Kozina, 2018, pp. 13-17). It was developed because of a comparative analysis of selected works on negotiations, e.g. (Jung, Krebs, 2019; Lewicki, Barry, Saunders 2018; Rockmann, Langfred, Cronin, 2020; Thompson, 2013). Within this concept, the following key aspects of the description of negotiations were distinguished, i.e. as a process, methods of conflict management and reaching an agreement, mutual dependence of the parties and processes of: decision making, communication, mutual exchange and value creation. Those aspect and interactions between them are presented in Figure 1. They reflect the areas of research on negotiations 4.0.

Based on the characteristics of the considered conditions of negotiations 4.0 processes, the summary lists the fundamental changes that must be made in these processes due to the occurrence of industrial revolution 4.0. Moreover, the closing section of the paper indicates the directions of research enriching the presented concept. Thus, the paper is of theoretical and methodological character.



**Figure 1.** The Aspects of the Interpretation of Negotiations

## 2. The Idea of Industrial revolution 4.0

Considering that it is unnecessary to describe the discussed phenomenon in greater detail, only its synthetic interpretation will be presented below, highlighting its main features. In general, the term "Industrial revolution 4.0" refers to a series of very dynamic and complex changes taking place in the world since the beginning of this century. It mainly concerns technology in the field of production, i.e. the design and operation of production systems. It covers digitization, automation and robotization through the implementation of more and more advanced IT systems, the Internet of Things, artificial intelligence and many other detailed solutions. Their extensive description is included in the extended literature on the subject, e.g. (Furmanek, 2018; Johnson, Markey-Towler, 2020; Schwab, 2018; Skinner, 2018; Sobieraj, 2018; Wieczorek, 2018).

Industrial revolution 4.0 significantly changes the way modern institutions are organized and operated in order to adapt to the solutions applied within it. In addition, it entails wider social changes, adequate to the technological transformation, regarding the improvement of employees' competences, e.g. in the field of conducting negotiations, putting them more and more challenges and requirements.

From the point of view of negotiations, the important aspect of industrial revolution 4.0 is the rapid development of information technology, the necessity of analyzing big data sets, which are too large or complex to be dealt with by traditional data-processing application

software. Big data require the application of innovative communication technologies and information management tools in order to extract from data resources new and useful knowledge for their users. Big data sets are characterized by the following specific features: volume, variety, velocity, veracity, variability, and value. Those features arise from both the properties of the data itself and its usefulness for its recipients. In addition, big data sets describe features such as relevance to the needs of users, usefulness in terms of making immediate decisions, the ability to visualize a given set of data and verify the disposable information (Co to jest big data..., 2020; Mayer-Schonberger, Cukier, 2014; Stephenson, 2020; Tabakow, Korczak, Franczyk, 2014).

### **3. The Process of Negotiations 4.0**

This is the most general and common way of defining negotiations, applicable to most of their cases in socio-economic life. Negotiations are complex activity spread over time, comprising number of subprocesses, phases (stages) and detailed actions, accomplished in a sequence, parallel and/or periodically as well as a series of events and interactions between parties. They support the basic processes and projects carried out by their parties.

Due to their complexity and volatility, the negotiation processes in general, and those considered here in particular, are not easily structured. They can be disordered, unpredictable or even random. Many activities are carried out intuitively, spontaneously and even instinctively. They are difficult to program into procedures. Remote negotiations seem to be easier to conduct, but they generate more unknowns, including technological ones, and are generally easier to break (Masłoń-Oracz, Pietrzak, 2022). This makes it impossible and, at the same time, unnecessary to seek their formalization. Their models are created, but usually they significantly simplify and are quickly outdated. On the other hand, a large amount of data facilitates the implementation of these processes, especially the identification and analysis of the negotiating situation.

Moreover, industrial revolution 4.0 multiplied the number of negotiation processes and changed their form. The virtualization of contacts causes that their implementation is usually faster, and it is often necessary to consider many different issues and many different goals, both common and contradictory. Conducting 4.0 negotiations requires high flexibility of operation and efficient, direct and multi-directional coordination of activities carried out in networks of numerous interactions. There is an increasing need to negotiate with multiple partners at the same time. Undertaking multiparty negotiations is, however, difficult due to the limited possibilities of analyzing their context, selecting strategies, arranging talks and conducting them.

#### **4. Negotiations 4.0 as a Method of Managing Conflicts**

It is a competitive dimension of negotiations as their participants strive to achieve their own goals and obtain the best possible results. They have divergent intentions and different views on the issues under consideration. Therefore, in the negotiation process, it is necessary to look for solutions to these issues, i.e. to resolve (resolve) emerging conflicts. The contradictions also concern the values, principles, expectations, perceptions, etc., which creates the emotional context of the negotiations, significantly influencing the substantive issues.

On the one hand due to the large amount of data with virtually unlimited availability and a wide exchange of information, the number of potential conflicts between the parties to negotiations 4.0 may be large, as a result of many different interactions between them. There are very violent and sharp disputes over fundamental, mainly material, issues. There may also be unnecessary data conflicts, very often occurring in practice and sometimes difficult to recognize, but here they do not result from their lack (as is usually the case) but from their excess and mutual lack of understanding, which also causes unnecessary disputes. As a result, the parties to negotiations 4.0 are then not able to properly identify and assess the causes, effects and the course of such conflicts, as well as the negotiating situation.

The available data may be unreliable, erroneous, selective, incorrectly compiled, etc., or differently interpreted by negotiators. Unnecessary data conflicts can cause other serious misunderstandings, mostly about values and relationships, and even stimulate real conflicts of interest. Therefore, it becomes necessary to provide a reliable and comprehensive explanation of the situation by confronting the possessed information and organizing it based on commonly agreed standards for its presentation and evaluation. This may allow for a relatively quick and cheap solution of the discussed conflicts, which will prevent their escalation.

On the other hand, the increasing speed of action and the multiplicity and virtualization of relations, and sometimes the anonymity of the partners to negotiations 4.0 mean that possible conflicts are mostly short-lived, unnoticeable, they cannot fully reveal themselves, let alone develop. Moreover, due to possible anonymity of partners or incomplete knowledge about them, it is much more difficult to use competitive negotiation techniques, use the effect of surprise or asymmetry of information, strengthen bargaining power, threaten and promise, bluff, etc., because the parties are "well-informed". It is much easier to explain the nature of short-term conflicts, their causes and effects. They are and must be dealt with on an ongoing basis, when and where they appear, directly through their website. You can make better use of their positive functions, especially stimulating changes that improve performance.

## **5. Negotiations 4.0 as a Method of Reaching Agreement**

This aspect concerns their intended result, beneficial to all their participants, i.e. meeting their needs. They also have common goals, so they are interested in the results of negotiations, which constitute important values for them (tangible and intangible). The cooperation of the parties is therefore necessary to achieve the desired level of effectiveness. This, in turn, requires concluding a number of contracts (implicit and explicit), specifying the terms of the agreement between them. Such an interpretation is rarely adopted without emphasizing other attributes of the negotiation. It is therefore their cooperative dimension. It does not fully reflect their nature, but it is a necessary "logical complement" to another aspect that determines their taking up.

In the reality of industrial revolution 4.0, the possibilities of identifying new, potential 4.0 negotiating partners are large, provided that there is access to data on their reliability, credibility, etc. The choice of partners, usually made from among many alternatives, is hypothetically easier, because a relatively good recognition of the negotiation environment increases the probability of interacting with relevant partners, establishing and maintaining positive and beneficial relationships based on mutual trust, which reduces the risk for the course and the effects of negotiations. To achieve this, a reliable analysis of the partners' credibility is required.

In addition, in the current reality, sometimes limited, short-term or even virtual contracts are established (Hofmann, 2020), which on the one hand frees us from permanent obligations, but on the other hand increases the risk of losses due to the partners failing to meet contractual arrangements or concluding incomplete contracts. It should be noted, however, that with broad, virtually unlimited access to data, signals about disloyal or unreliable partners are easily available in the negotiating environment. In general, negotiators are more inclined to establish and consolidate positive relationships and to use cooperative-oriented negotiating techniques.

It is therefore advisable to rely on proven partners, especially those one trusts. Therefore, the scope of cooperation with them should be expanded. Agreements resulting from negotiations 4.0 are usually less complex, simpler in form and for shorter periods of time, which reduces the risk of failure by negotiating partners to meet their obligations (Hofmann, 2020).

## **6. Negotiations 4.0 as a Mutual Dependence between Their Parties**

There is an interaction of the dimensions of cooperation (collaboration) and competition (rivalry), i.e. the coexistence of contradictory and convergent goals of the participants in negotiations 4.0. It expresses the efforts of the parties to achieve a favorable result, conditioned by the necessity to resolve the conflict between them. Neither party can achieve its goals on its

own, and at the same time each of them can achieve their goals by others. If the partners saw alternative and more effective ways of achieving their goals, they would not negotiate. Thus, such a relationship expresses a close relationship between the two previously discussed aspects.

In the era of industrial revolution 4.0. the parties are rarely "doomed to each other", much more often negotiating by choice than by force. On the one hand, a large amount of information available expands the group of potential partners for cooperation, but on the other hand, it makes it difficult to search for and select the right partners and analyze them in the context of negotiations, and competition intensifies and conflicts may arise. There is much more interaction between the parties to the negotiation. Mutual relations are varied, usually stronger, symmetrical or asymmetrical, although sometimes short-lived or momentary, creating complex networks of connections.

It is easier to build and maintain lasting positive relationships, especially partnerships. You are more likely than usual to establish and maintain positive and beneficial relationships with negotiators based on mutual trust. The aim is to shape and maintain them in order to ensure effective cooperation, beneficial to all, but it is not always possible and/or necessary.

With broad access to data, despite the virtualization of contacts (Hofmann, 2020), signals about disloyal or unreliable partners are easily available in the negotiating environment. Moreover, generally "well-informed" negotiating parties are more likely to establish and maintain positive relationships, and to use cooperative-oriented negotiation techniques. Cooperation and competition coexist in the form of a cooperation strategy.

On the other hand, establishing and developing partnerships is usually time-consuming and generally costly, and sometimes unprofitable or risky. Anonymous functioning in a negotiating environment may turn out to be more beneficial and even safer.

## **7. Negotiations 4.0 as a Decision-Making Process**

It is the most important interpretation of negotiations as it expresses direct finding solutions to the negotiated issues by the parties involved. In the preparatory phase, this process is carried out by them independently of each other, i.e. each of them analyzes the negotiating situation from the point of view of their goals and interests. On this basis, they determine initial solutions to negotiated problems based on their own criteria for selecting solutions. Then they iteratively make the necessary arrangements of possible alternatives, determining the scope of negotiations, i.e. a set of acceptable solutions to negotiated problems, based on the analysis of the community and divergence of interests. By adopting common selection criteria and rules, they find a solution acceptable to everyone.

In negotiations 4.0, all typical activities within the process of interactive decision-making by negotiators, i.e. identifying problems, collecting and analyzing information, generating alternative solutions, selecting criteria for their evaluation, making choices and the necessary implementation works, are facilitated due to both the wide access to data and strong relations of the parties, as well as difficult and complex due to the specificity of the negotiation process itself and the redundancy of information.

Therefore, the information needs of negotiators as decision makers are, in principle, satisfied to the required degree, so their choices should be accurate, adequate to the problems, made on time, adequately detailed, etc. That substantially increases the quality of decisions. Moreover, it significantly reduces the uncertainty of their performance and the effects of negotiations. In this case, the difficulty may be the excessive amount of data, requiring their careful analysis and selection.

The disadvantages of the decision-making process in negotiations 4.0 include the need to act quickly, forcing the parties to decide, the presence of an excess of information and the need for careful selection, expanding analyzes, and making choices too quick and hasty. As a result, decision-making processes can be more time-consuming, although burdened with lower risk.

Taking this into account, the most significant positive effects of the decision-making process in 4.0 negotiations are better and faster decisions, more settlements in real time, data availability for innovation and lower costs. On the other hand, the main negative effects are threat to privacy, loss of responsibility (anonymity of algorithm owners), lack of trust and disputes over the principles of creating algorithms (Schwab, 2018, p. 175).

## **8. Negotiations 4.0 as a Communication Process**

This aspect concerns the mutual exchange of information, "penetrating" all activities of the parties in the negotiation process, from the initial presentation of positions, through: shaping relations, formulating and exchanging offers, persuading, asking questions and answering, listening, clarifying doubts, etc., to final arrangements and drafting the contract.

On the one hand, as a result of the impact of industrial revolution 4.0, the exchange of information in negotiations is significantly enriched. The parties to the negotiations have practically unlimited access to all necessary data in real time, although, for obvious reasons, not all information necessary for action is public, presented to everyone on the forum. High availability of information and transparency of communication allow negotiators to properly determine how to better achieve goals. It increases the efficiency of analytical and diagnostic activities. It significantly enriches the tools for conducting negotiations, i.e. increases the number and quality of offers and the accuracy of arguments, improves the effectiveness of questions, facilitates clarification of doubts and the effective selection of negotiation techniques



(Novotny, 2017). In addition, remote negotiations create greater opportunities for the negotiating team to communicate during the negotiations, allowing for establishing a common position, even when the other party speaks (Masłoń-Oracz, Pietrzak, 2022).

On the other hand, negotiators are not favored by a kind of artificiality of communication during online meetings, a kind of "narrow field of view" (Hofmann, 2020), and especially by limiting non-verbal communication. It is much more difficult to interpret and analyze the meaning of non-verbal messages of other negotiation participants and their emotional behavior. It is easier to hide some inconvenient facts due to the lack of necessity to disclose some data, which may be a condition for cooperation with negotiation partners. There are fewer opportunities to care for data protection and security, and limited awareness of potential threats in this area.

In general, a wide exchange of information and efficient communication allow to better meet the information needs of the participants in 4.0 negotiations. They improve the throughput of omni-directional communication channels. They increase the usefulness of information in terms of its detailed parameters, i.e. reliability, authenticity, proper form, appropriate detail, etc. Moreover, the tools enabling effective use of big data are negotiation support systems and electronic negotiation (Kersten, 2007; Fernandes, 2016).

## **9. Negotiations 4.0 as a Process of Mutual Exchange**

The exchange in negotiations must take place on terms jointly agreed by the parties, through mutual agreements and concessions. It is favored by the differences in the hierarchy of negotiators' goals, i.e. it seeks to obtain significant resources and values, giving back less important but important for other parties in return. It concerns not only tangible resources, as well as intangible ones, i.e. ideas, ideas, concepts of solutions.

On the one hand, the beneficial impact of industrial revolution 4.0 on negotiation processes in this aspect is mainly expressed by supporting the determination of the scope and conditions of a possible exchange due to the wide range of interactions and cooperation between the negotiating parties and the appropriate scope of communication between them. It is much easier to obtain and transmit full and reliable information about the needs of the parties and to gather the necessary data on mutual requirements and expectations already in the initial phase of the negotiations, as they are widely available. In other words, it is not difficult to define and confront the preferences of the participants in 4.0 negotiations, as their expectations are not undisclosed or unclear.

Potential exchange offers are precise and well-thought-out, oriented not only towards material values. There are favorable conditions for the creativity of the parties in the search for opportunities to exchange immeasurable assets. It is easier for negotiators to create wider possibilities of meeting their needs mutually. They rarely show a tendency to formulate non-equivalent exchange proposals only for the purpose of achieving quick and immediate benefits, especially tangible ones. Negotiations based on interests dominate, not simple haggling. There are many options for selecting potential exchange partners and their offers. It is easier to obtain and communicate complete and reliable information about the needs of the parties and to limit focus on immediate needs at the expense of long-term effects.

On the other hand, the significant acceleration and increase in the complexity of the 4.0 negotiation processes may cause them to appear too quick and simpler exchange proposals with a higher "weight", entailing greater risk. Undoubtedly, greater precision is required when formulating exchange offers. In addition, there may be opportunities to surprise other negotiating participants when they are not prepared to accept certain proposals.

## **10. Negotiations 4.0 as a Process of Creating Values**

The interdependence of the parties and the process of mutual exchange in the negotiations allow the parties to the negotiations to achieve mutual benefits by creating additional value, which would not be possible without negotiation. These common values are a synergistic effect of the cooperation of the parties. Creating them is also possible when one party has something to offer that is not worth much for itself but is of great value to other participants in the negotiation - and vice versa. By exchanging these values, each side loses little, but gains a lot.

Negotiations 4.0 are characterized by the ease of their parties agreeing on common values that are to be the subject and effect of cooperation. Orientation not only on the immediate effects of negotiations, the strength and durability of relationships, their positive nature, mutual trust of the parties, wide exchange of information about the values themselves and the possibility of achieving them make their co-creation much easier. At most, the prospect of quick and measurable benefits as an effect of the temporary cooperation of the parties may induce them to try to obtain these benefits.

There may, of course, be the danger of unjustified appropriation of resources, and as a result, reliable partners must be relied upon in the search for common values. In addition, cases of such unethical activities are exposed online and widely stigmatized. Differences in the assessment of the values represented by their participants, i.e. different priorities, create the potential for reaching agreement through the exchange of values that are beneficial to them (Hofmann, 2020). On an ad hoc basis, these values may be of little importance to the parties to the negotiations but bring them benefits deferred in time. Moreover, potential conflicts of values

can and should be resolved by explaining their causes and by convincing each other about the positive impact of different values on the negotiation process.

## 11. Summary

To sum up, it can be said that the impact of industrial revolution 4.0 on contemporary socio-economic negotiation processes requires the use of different methods of proceeding in the implementation of these processes. Considering both the supportive and disruptive impact of Industrial revolution 4.0 on these processes, the following changes in their course, necessary to be introduced due to this impact, can be indicated:

- 1) substantial acceleration of the conduct of these processes, especially pre-negotiation analysis,
- 2) significant increase of the scope of such analysis in a wider negotiating environment,
- 3) searching for trusted negotiation partners and shaping and maintaining positive relations with them,
- 4) on the other hand, exercising caution when establishing relationships, i.e. applying the principle of limited trust,
- 5) adopting a broader perspective when looking for possible alternative solutions,
- 6) generally greater creativity while looking for them,
- 7) increased flexibility of performance, especially when searching for options for solutions,
- 8) seeking for new strategies and negotiation techniques aimed at finding a balance between cooperation and competition,
- 9) enriching the tools of multiparty negotiation, more and more dominant in contemporary socio-economic life,
- 10) full acceptance of the multicultural nature of the negotiating environment and its creative use,
- 11) paying much more attention to information security,
- 12) using modern systems of supporting negotiations via the Internet.

The concept of the description of negotiations 4.0 presented in the paper is a preliminary, largely hypothetical approach to the issues under consideration, since they are relatively new, not fully recognized in theory and research, as well as in socio-economic practice. Therefore, the author will strive to enrich and broaden his concept, mainly by searching for more precise characteristics of the considered relationships between the 4.0 revolution and the course of negotiation processes. It is also planned to conduct comparative empirical research in order to verify the usefulness of this concept.

In addition, it is planned to expand the context of considerations, i.e. to create a broader concept of negotiation 4.0 conditions in the current socio-economic reality by proposing the principles of their conduct, and thus creating a specific normative model of 4.0 negotiations. The second, promising direction of research will be considering the more general issue of managing relations with partners in the conditions of industrial revolution 4.0, and not only the negotiations with them.

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