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THE CONTENT AND EXECUTION OF A MAINTENANCE CONTRACT: A CHALLENGE FOR INDUSTRIAL COMPANIES

BY

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Abstract. Maintenance is defined as a set of activities or tasks used to maintain or restore a system to a state in which it can perform its designated functions. Because the success of all industrial companies is related to their production systems, maintenance plays a crucial role in guaranteeing availability and reliability of production facilities. Outsource maintenance is performed by service providers considering specific knowledge, staff, competencies and technological capabilities. When outsourcing maintenance, the most important part is designing the service contract that establishes the relationship between the beneficiary and the service provider. Based on a literature review, the aim of this paper is to identify and analyse the key aspects that must be specified in the maintenance service contract and the issues regarding the execution of the contract. The contractual relationship must be clearly determined from the beginning as a valid contract concluded represents the law of the parties.

Keywords: maintenance, outsource, contract, rights and obligations.

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1. Introduction

Maintenance is a set of technical activities designed to maintain a system in a specified state of operation. It includes corrective and preventive activities necessary for the proper functioning of a system. For an equipment / system / machine to function properly, its activity must be between the maximum value and the minimum value of certain parameters. But even the phrase “good operation” of equipment can be subjective and interpretable in relation to the desired quality and maintenance costs (Verzea, 2015; Hongfu *et al.*, 2021): for example, the same machine that is classified as defective in a company with high quality standards can be classified as suitable in another with lower standards or the machine can operate in normal settings but with high maintenance costs situation in which it is more advantageous financially to change it. Because the success of all industrial companies is related to their production systems, which are strongly linked to features like flexibility, productivity and quality, maintenance plays a crucial role in guaranteeing availability and reliability of production facilities (Yan *et al.*, 2022). Also, nowadays industry and production systems have a very significant impact on resource consumption, both at the environmental and societal level so in recent years it is often being used the concept of sustainable development or “green maintenance” (Pascal *et al.*, 2020) which involves 100% recyclable products in which the production process has no impact on the environment. With this in mind, maintenance policies are a major lever for sustainable production as they provide companies with the ability to maintain efficient production systems and high-quality products.

The maintenance service can be performed either within the company, by an internal structure or by a third party entity that specializes in this field, the advantages of outsourcing being closely related to practical aspects like: staff, knowledge and skills, technological capabilities or technologies. When outsourced maintenance is used, the beneficiary company will look for and choose a service provider that will be able to carry out the maintenance process, the relationship between them being established through a service contract.

Given the need to use a contract for maintenance services by industrial companies but also the fact that this type of contract does not have a specific regulation to guide the managers so that the contracts that are being used ensure the expected performance in the company, the aim of the project will be to identify and analyze the most important aspects involving the content and execution of a maintenance contract.

2. Methodology

In this research an in-depth study of the literature is carried out to identify the current stage of knowledge regarding the maintenance activity and

its externalization in order to better understand the theoretical framework in which this type of contract appears.

Subsequently, the paper will focus on showing and explaining the most important aspects to be negotiated and inserted in a maintenance contract, respectively: duration the contract, the price of the contract, the full and complete description of the services covered by the contract (object of the contract), the parties rights and obligations, sanctions for culpable breach of contract.

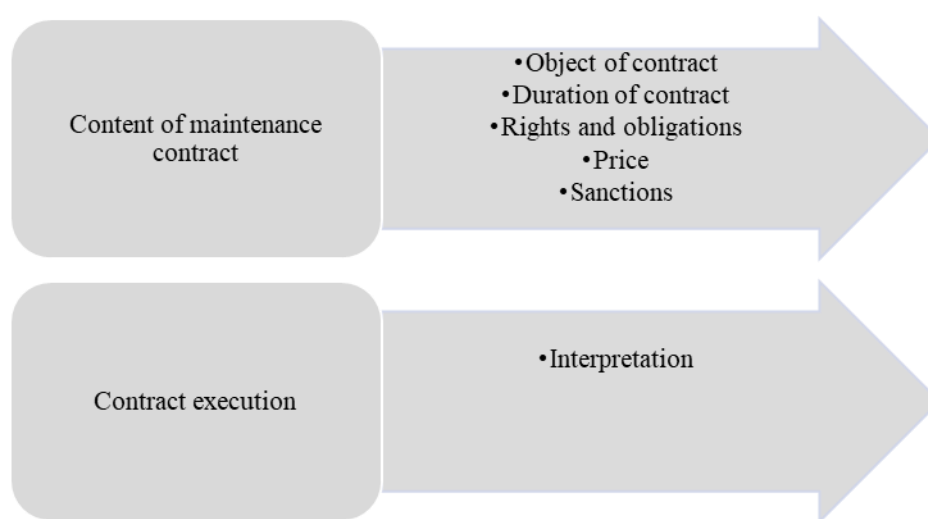


Fig. 1 – Outsourcing maintenance regarding content and execution of maintenance contract.

3. Theoretical perspective

a) *Maintenance* – All production companies define their business strategies and competitive priorities taking into consideration a number of factors related to their production systems such as flexibility, productivity and quality. As a consequence, there have been developed and used some maintenance policies based on failure, wear, conditioning, design and detection, but in order to be successful, a maintenance policy must be thought and designed regarding the following: identifying the most important system, identifying critical components, collecting data, estimating reliability, estimating maintenance costs, economic evaluation of maintenance policy (Faccio *et al.*, 2012). Thus, the process of designing an efficient maintenance plan is a complex one and requires a high level of specialization on the part of maintenance engineers, in order to reach the result wanted in the company.

The maintenance activity is essential for the industrial equipment/ system/ machine as it helps to prolong its life while assuring the quality needed for production. As found out (Gwo-Liang, 2011), maintenance can come in many forms, namely: preventive, corrective, risk-based, conditioning-based, opportunistic maintenance. The maintenance activity can also be provided: as warranty or as a type of insurance which the provider sells to the beneficiary (Sukha *et al.*, 2015).

When maintenance is outsourced, it is performed by a third-party entity that specializes in that field, the advantages of outsourcing being closely related to: staff, knowledge and skills, technological capabilities or technologies. In such case, the relationship between the beneficiary and the service provider is being established through a service contract.

b) *Maintenance contract* – it is an agreement between the maintenance provider and the owner of the equipment to be repaired or for which preventive maintenance will be carried out (Sukha *et al.*, 2015). Applying the general criteria for classifying contracts (Stătescu and Bîrsan, 2008), the maintenance contract is a consensual contract, negotiated, bilateral, onerous, commutative, with successive execution or with immediate execution.

As regard for the types of maintenance contracts, they can be work package contracts, performance contracts or facilitator contracts (Martin, 1997). In the case of a performance-based contract (Adel *et al.*, 2014) only the result to be achieved by the provider is foreseen, the latter having the freedom to proceed as he wishes as long as he reaches that result. Panesar and Markeset (2008) define the contractual relationship as discrete or relational.

Prior to the conclusion of the contract, an extremely important stage is the negotiations, with the parties having the freedom to initiate, conduct or even terminate the negotiations without being liable for any failure. During the negotiations, the parties shall discuss any matter which they consider to be relevant and determine the content of the contract (Adel *et al.*, 2014). In practice, the parties often go beyond this stage, using pre-formulated contracts which can lead to:

Table 1
Consequences of lack of negotiations

Lack of negotiations	Inappropriate contracts	With large gaps in the application specifications and difficulties in the execution of the contract.
	Abusive clauses	Unfair terms that have not been previously negotiated by the parties and that create a significant imbalance between their rights and obligations (Legea nr. 193/2000; Legea nr. 287/2009).

As shown in Table 1, the lack of negotiations can lead to inappropriate contracts and abusive clauses that cause unfair terms, large gaps in the application specifications and difficulties in the execution of the contract.

4. The content of a maintenance contract

Determining the content of the maintenance contract is a challenge for the managers of the industrial companies that use this service in order to obtain the expected result in the company. Also, in order to be validly concluded and to benefit from the effects of the law, the contract must meet a number of essential conditions such as: the ability to contract, the consent to be free and untainted, to have a specific object and lawful, to be a moral and lawful cause. These essential conditions relating to the substance of the contract may be transposed into well-defined contractual clauses to enable them to be verified and established. In relation to the specialized literature consulted, the most important aspects to be included in the contract that reflect the conditions of validity are: a) contracting parties; b) object of contract; c) duration of contract; d) rights and obligations; e) price; f) sanctions.

a) The maintenance contract parties are:

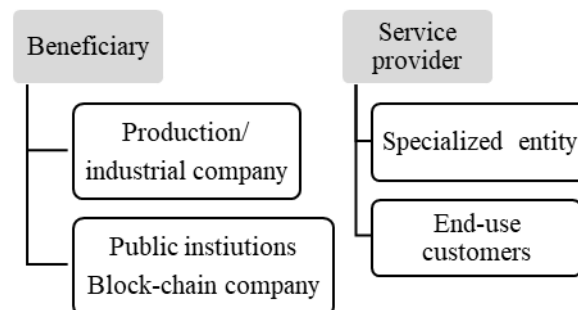


Fig. 2 – The parties to a maintenance contract.

As shown in Fig. 2, in outsourced maintenance, the parties are the beneficiary and the provider (Hong *et al.*, 2015; Webin, 2009; Tarakci *et al.*, 2007). The beneficiary can be a production company that needs the maintenance of production systems or it can be the owner of a machine, a good (in the medical field, aviation), an institution that manages a service of interest. (railways, national roads, highways) or even a blockchain company when maintenance is done in order to maintain the integrity and security of the data (Aparecido, 2020). In the field of outsourcing services, a special category is outsourcing to end-use customers (Varadarajan, 2008).

b) The object of the contract is the maintenance operation on which the parties have reached a consensus (Webin, 2009). While designing this part of contract, the industrial company should consider: full establishment of maintenance activities, the quality of service expected and the resources needed.

Table 2
Aspects regarding the object of a maintenance contract

Object of maintenance contract		
Maintenance activities	Quality of service	Resources
<ul style="list-style-type: none"> – Case 1: the provider performs inspections, repairs, corrective repairs; – Case 2: beneficiary carries inspections and repairs and the provider performs corrective repairs; – Case 3: beneficiary performs corrective repairs and the provider performs inspections and minor defects. 	<ul style="list-style-type: none"> – Technical characteristic of the system/ equipment/ machine/ good; – Expectation of the beneficiary. 	<ul style="list-style-type: none"> – Equipment/ spare parts needed; – The party responsible for procuring them.

c) The duration of contract - implies the period of time for which the parties have agreed to cooperate and provide the maintenance service. From this perspective, there can be: long term contracts and short-term contracts. It is recommended to stipulate a longer term, because of the *learning* (Tarakci *et al.*, 2007) phenomenon, the service provider will get to know the system / machine / equipment, acquire specific knowledge about it and familiarize with the organizational culture of the beneficiary (Panesar *et al.*, 2008).

d) The rights and obligations of the parties are the most important part of a maintenance contract, which is a challenge for industrial companies.

Table 3
Rights and obligation of the maintenance contract parties

Rights	↔	Obligations
↓	Reciprocal	↓
The right of the beneficiary for performing maintenance activities.		The obligation of the provider for performing maintenance activities.
The right of the provider for receiving the price.		The obligation of beneficiary to pay the price.
The right of the beneficiary to have quality services.		The obligation of the provider for ensure safety of operations, use staff that is qualified, assure quality of services (Dzulkifli <i>et al.</i> , 2012).

As shown in Table 3, the rights and obligation are reciprocal and interdependent and given this synallagmatic nature of the contract, one party may invoke the non-performance of the other party to refuse to perform its own obligation.

e) The contract price is the consideration to which the beneficiary is obliged. There can be: fixed price that includes a fixed amount for the work done and materials used; price for level of performance in the case of performance-based contracts, service providers are paid for a level of performance, and the actual amount of material delivered (Lai *et al.*, 2014); price by the hour. In the contract, the parties must insert the amount of the price, the method of payment, the terms of payment, if changes in the price are accepted and under what conditions.

f) Sanctions for non-culpable performance or late performance of contractual obligations should be included in the content of a maintenance contract to ensure that difficulties in performing maintenance are avoided. It provides an additional guarantee of compliance with the obligations assumed but also a way to be held liable in the event of such situations. Sanctions may include: penalties for late performance of the obligations normally set for each day of delay, damages if fault or defect in the maintenance system / equipment / facilities subject to maintenance is the sole fault of the provider, to the extent that non-performance may attract the unilateral termination of the contract with a notice period.

5. The execution of a maintenance contract

The management of the maintenance contract intervenes not only in the stage of negotiation and conclusion but also in the stage of the execution by supervising the fulfillment of the assumed obligations. During the execution stage of the maintenance contract, problems may arise related to the interpretation (Lai *et al.*, 2004) of the contract or related to the non-execution of the assumed obligations.

a) The interpretation of the contract is that operation which is used when there are disagreements between the parties regarding the performance of the contract. According to the law (Art. 1266 Cod Civil), the contract will be interpreted according to the concordant will of the parties and not according to the literary meaning of the terms used and to establish the concordant will of the parties will take into account the purpose of the contract, negotiations, established practices between the parties and their behavior. If the terms have different meanings, they shall be interpreted in a manner which best suits the nature and purpose of the contract. In the alternative, the clauses will be interpreted in favor of the obligor.

b) Non-execution of contractual obligations - the parties have the right to the full, accurate and timely fulfillment of the obligation given the main effect of the valid contract concluded, that of the force of law between the contracting parties (Stătescu and Bîrsan, 2008).

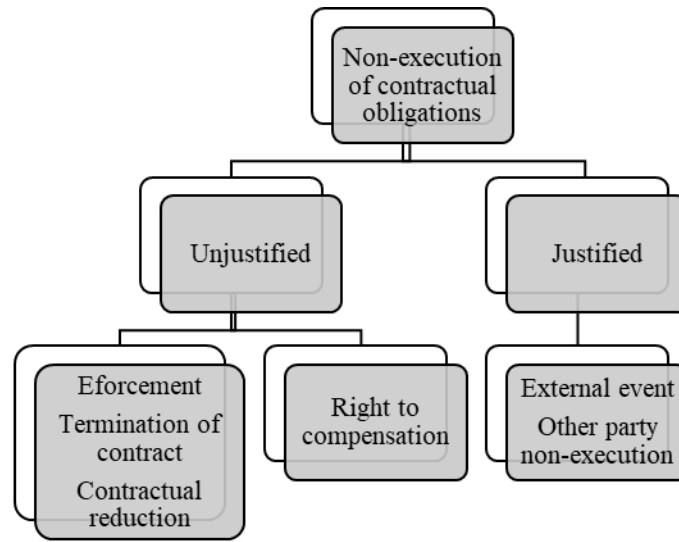


Fig. 3 – Types of non-execution and its consequences.

As shown in Fig. 3, unjustified non-performance of one of the parties entitles the other party to obtain enforcement, termination of the contract or even reduction of its obligation without losing, in any of the listed options, the right to compensation.

Non-execution is not always unjustified because it can be based on a just cause meaning that we are in the presence of a justified non-execution. The justified causes of non-performance are: when one of the parties does not fulfill its own obligation, the other party may refuse, to an appropriate extent, to perform its own obligation (except in the case mentioned above, when the non-performance is minor) or when it occurs an external event, which could not have been foreseen or prevented, which makes the execution of the contract impossible.

6. Conclusions

The importance of maintenance in a company in relation to the lack of specific legal benchmarks that companies should take into account when concluding a maintenance contract make determining the content of a maintenance contract and knowing the execution issues a challenge to industrial companies.

The paper identifies the most important issues to be taken into consideration when concluding a maintenance contract, that have to be negotiated first in order to ensure obtaining the desired result in an industrial company.

The aim of this paper is to provide a model of maintenance contract that can help the industrial companies that externalize maintenance in regard of the desired results.

The limitations of this research are determined by the fact that the conclusions are based only on bibliographic research and not a case study conducted in industrial companies but the research will continue in that direction, the future objectives being to conduct a case study to identify the practical issues that appear within the Romanian industrial companies regarding the content and execution of a maintenance contract.

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CONȚINUTUL ȘI EXECUTAREA CONTRACTULUI DE MENTENANȚĂ: O PROVOCARE PENTRU COMPANIILE INDUSTRIALE

(Rezumat)

Mentenanța este definită ca un set de activități sau sarcini utilizate pentru a menține sau a restabili un sistem într-o stare în care acesta își poate îndeplini funcțiile desemnate. Deoarece succesul tuturor companiilor industriale este legat de sistemele lor de producție, întreținerea joacă un rol crucial în garantarea disponibilității și fiabilității instalațiilor de producție. Mentenanța externalizată este efectuată de furnizorii de servicii luând în considerare cunoștințele, personalul, competențele și capacitățile tehnologice specifice. La externalizarea mentenanței, cea mai importantă parte este

proiectarea contractului de servicii care stabilește relația dintre beneficiarul și furnizorul de servicii. Pe baza unei analize a literaturii de specialitate, scopul acestei lucrări este de a identifica și analiza aspectele cheie care trebuie specificate în contractul de servicii de mentenanță și aspectele referitoare la executarea contractului. Raportul contractual trebuie să fie clar determinat de la început întrucât un contract valabil încheiat reprezintă legea părților.

