THE IMPORTANCE OF STRATEGIC MANAGEMENT IN RAILWAY TRANSPORT IN CRISIS CONDITIONS – CASE STUDY MANAGEMENT OF THE ROMANIAN RAILWAYS IN THE FIRST WORLD WAR

Cătălin-Laurențiu BULGARIU [a], Aurel Mihail ȚÎȚU [b*], Gheorghe NEAMȚU [c]

[a, c] University Politehnica of Bucharest, Faculty of Industrial Engineering and Robotics, Romania
[b] Lucian Blaga University of Sibiu, Romania

ABSTRACT
The scientific paper presents a concrete research based on a case study on management adopted by the leaders of the Romanian Railways (C. F.R.) during the first World War in 1916. Regarding the methodology and the research perspective, the overall scientific approach has combined the theoretical perspective with the practical perspective, analyzing with interest the technical-managerial action adopted in a difficult period with many limitations. In this respect, if the measure taken is validated, a new research horizon opens up to a new, unconventional method of increasing the circulation capacity in the railway sector, which is related to strategic management and crisis. This action, identified by the author, although it was adopted more than 100 years ago, can still be considered topical and can be integrated into the strategic management and resilience capacity of the rail system in crisis conditions. Studying and understanding the past can show us our place on the evolutionary scale and what we can improve in the future.

KEYWORDS: *crisis, management, railway transport, resilience, strategic management.*

DOI: 10.24818/IMC/2022/01.02

1. INTRODUCTION

In this paper is presented and subjected to validation, in a practical way, a method of increasing the traffic capacity that they applied during a period of hard trials, namely during the first World War, the leaders of the Romanian Railways. This information identified in the "Romanian Railway Epopeea" (Botez, Urma, & Saizu, 1977), was considered exciting and, further, is exposed the situation of the Romanian Railways in 1916 and the technical – managerial action adopted by their management. It is to be admitted that at first sight, whenever there was talk of a double path, it would have automatically formed in the mind that they would be able to run twice as many trains as by simple route. This is not the case, because the passage of a simple road, to traffic only in one direction, generally only allows the numerical circulation of the same number of trains which also run in both directions. However, this study shows that this method adopted during World War I, to organize the movement only in one direction, the infrastructure being the same, plain line track, has nevertheless obtained an increase in capacity. What is worth noting in this work is the way of managing the limited situation in which the railway transport was found and the way of management by the leaders of the Romanian Railways through an unconventional method, which even in our times can be applied and developed in situations of the crisis, taking into account that

* Corresponding author. E-mail address: *mihail.titu@ulbsibiu.ro.*

the circulation capacity is a current and debated topic, as well as the methods of increasing this capacity. This unconventional measure, identified by the author, represents a method of increasing the circulation capacity, which can certainly be found in strategic management and from which new directions of research can be learned. Taking into account the current needs, and the level at which the railways are found, the importance of studying and debating the methods of increasing the circulation capacity, can bring a significant contribution to the management of this sector of activity and certainly, by studying and understanding the past we can build and understand the future. After more than 100 years, some methods applied in crisis situations can still be adapted and applied nowadays, which shows us the level we are at and what we can improve. Taking into account that every organization can find itself at a given moment in a crisis situation, management (strategic management, crisis management), requires development both in the practical and in the scientific or research sphere. Strategic management is based on strategies (activities different from the usual ones or the conventional way of working or doing things) which we can also identify in the technical-managerial action applied to the Romanian Railways during the crisis period of the First World War. This paper aims to be a starting point in the development of interest regarding strategic management in the field of railway transport and the adoption of truly applicable measures in crisis and resilience situations. Resilience, which has also recently gained more and more interest in the management of organizations, defined as the ability to face unfavorable situations (or changes) or the way of managing these crises.

2. THE SITUATION OF THE C.F.R IN THE PERIOD 1916-1918 – METHODOLOGICAL APPROACHES

With the establishment of a state of war in August 1916, the C.F.R. organization ceased to be a stand-alone institution. In this context it becomes entirely an auxiliary service of the army, working with the Transport Office and being subject to military laws, all personnel being mobilized on the spot. The role of the economic-industrial factor of the railways ceases, being replaced by that of a helper of the army's operations, as was necessary.

With the withdrawal, in November-December 1916, of the government and the army, about 2700 km of the 3800 km railway network of Romania remain under enemy occupation, along with everything that could not be evacuated.

In order to prevent or hinder the advance of the troops of The Central Powers, it was necessary to destroy lines, railway nodes, installations and bridges.

Even Anghel Saligny's main bridge was taken out of operation (without destruction), while the secondary bridge over Borcea's arm was blown up.

Thus, the railway network in the south of the country was completely disarticulated at the end of 1916, the one in Moldova, overcrowded, almost blocked by vehicles, while at the same time carrying all the burden of war operations.

The railways in Romania were in a situation of dramatic drama in early 1917, such as had never been known anywhere else in the world.

The situation of the railways in the south of the country, the 2700 km network occupied by the Germans, had been mostly abandoned by Romanian personnel in middle and higher positions. Instead, there were workers from workshops, stations, depots, etc., as well as other agents and small clerks.

The rail traffic was carried out only for military needs and only on lines that interested the enemy army. The other lines, and especially the secondary lines, had been completely abandoned, and gradually they fell into ruin, with all that was beside them.

The situation of the Moldovan railways was quite different in the way things were carried out in the free territory, where the disaster had other aspects and other implications. Here the disaster was a dynamic one, while in the south it was static.
The general Directorate managed a network of about 1100 km, without double lines, generally insufficiently equipped, much worn out and especially suffocated by rolling stock evacuated from the south of the country.
The working conditions in the near front area were also particularly harsh and following the daily bombing of trains, which cost many lives and great material damage, a real railway battle front was formed, working in constant danger.
Having an important and special role in the fight for the prompt support of the front, the "railway army" gave brilliant examples of sacrifice.
There are numerous records which prove that the expression established by the "second army of the country" was not a mere play on words.
The historical reality also confirmed that in the most difficult moments, proving a recognized discipline, in order to support the armies on the front that defended with the sacrifice of life any foot of ground, the *Ceferists* themselves were in the immediate vicinity of the battle lines.
In Galați, the repair work of locomotives was carried out many times under the artillery fire of the armies.
But even in these conditions, totally lacking the safety of work, as well as acute shortages of spare parts, extremely precious works have been made that have greatly helped rail transport.
Despite these immense hardships, military transports (people, weapons, subsistence material, etc.) had to be carried out according to plans. On this depended to a decisive extent the survival of the country, its heart, concentrated between Prut and the Carpathians (Botez, Urma, & Saizu, 1977).

„ […] A number of unusual measures have been taken to this end.[1] . One of these was the organization according to a special method of circulation on the long line Tecuci-Iași-Pașcani-Adjud. How useful it would then have been a transverse line that would have joined the nodes railway Adjud and Tecuci (or at least Bârlad), thus closing a highly efficient central rail ring! (Closing line existing, Adjud-Mărășești-Tecuci, was partially, from a time, in the heat of the fire or even on the moving front of the armies fighter). From January 1917 until the summer, when possible run on the line Adjud-Marasesti-Tecuci, and therefore when the big ring central cited was closed, Alex. Perieţeanu organized the circulation one way (Iasi-Tecuci-Adjud etc.) as in a huge carousel of the size of an entire country. In this way the obstacle was overcome no. 1 which hindered the circulation - train crossings, for which not there were enough lines that caused frequent and long blockages trains but had to accept a longer journey for a series of destinations. For example, a train guided from Adjud to Tecuci he had to go on the Pașcani-Iași route, etc., much more longer than normal. Only one train („The Courier'') could circulate directly from Tecuci to Iași.[2][...]"

Figure 1. The method of increasing the circulation capacity adopted in The First World War, identified in the book "Romanian Railway Epopeea"

Source: Botez, Urma, & Saizu (1977)

In figure no. 1 is presented the technical-managerial measure adopted by the management of the railways in Romania during the first world war and the way to manage a crisis situation imposed by the limitations of the war.
The role of management (strategic management, resilience) can be noted in the case presented and from which the calculations will be made to validate this action.

3. RESEARCH METHOD

3.1 Calculation of circulation capacity for situations in the First World War

The remaining railway ring, which fully represented the Romanian railway, is shown in figure no 2.

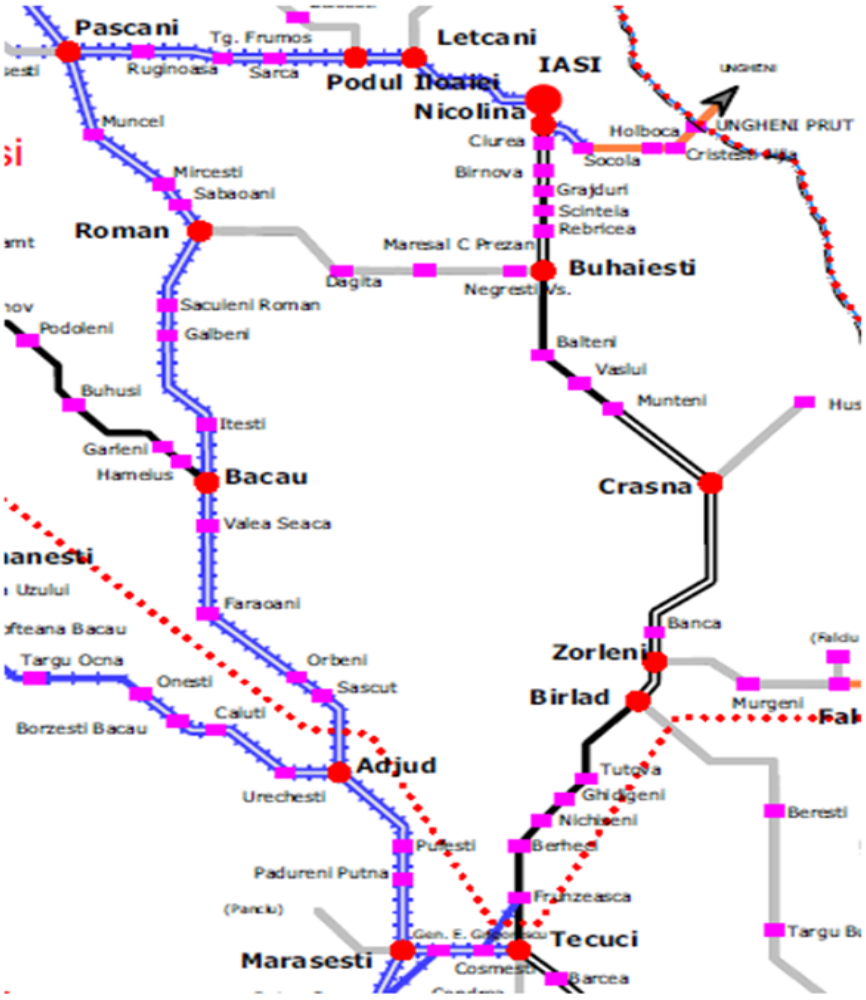

Figure 2. Rail ring Adjud-Pașcani-Iași-Tecuci-Adjud

Source: adapted from Compania Națională de Căi Ferate "CFR" – SA (2022)

It was further shown that the direction chosen to carry out the circulation was well chosen, namely:
Adjud →Pașcani→Iași→Tecuci→Adjud

Table 1. The distances between the stations on the rail ring

Nr. crt.	Stations-halts and other stopping points	The distance between stations (km)
1	**ADJUD**	-
2	Sascut	14
3	Orbeni	9
4	Faraoani	15
5	Valea Seacă	9
6	BACĂU	11
7	Iteşti	12
8	Gălbeni	9
9	Săcuieni	11
10	ROMAN	12
11	Săbăoani	8
12	Mircești	7
13	Muncel	14
14	**PAȘCANI**	9
15	Ruginoasa	15
16	Târgu Frumos	16
17	Sârca	12
18	Podul Iloaiei	10
19	Leţcani	9
20	**IAȘI**	14
21	Nicolina	2
22	Ciurea	6
23	Bârnova	10
24	Grajduri	5
25	Scânteia	6
26	Rebricea	6
27	Buhăieşti	9
28	Bălteni	7
29	VASLUI	10
30	Munteni	5
31	Crasna	11
32	Banca	20
33	Zorleni	10
34	BÂRLAD	7
35	Tutova	15

36	Ghidigeni	7
37	Nichiseni	4
38	Berheci	8
39	Frunzeasca	8
40	**TECUCI**	8
41	Cosmești	7
42	Gen. E. Grigorescu	5
43	MĂRĂȘEȘTI	7
44	Pădureni Putna	6
45	Pufești	8
46	**ADJUD**	11

Source: adapted from Compania Naţională de Căi Ferate "CFR" – SA (2022)

From table no. 3, the following results:
- the distance traveled in loaded mode – 784 km;
- the distance traveled in empty mode – 912 km.

The driving distances traveled in laden-empty mode have been taken into account, calculating for each direction, hourly or counterclockwise, the traffic distances between the stations on the existing rail ring, thus resulting in shorter working distances in a clockwise direction, which means that the transportation of military effects took place in a shorter time. In conclusion, according to the results obtained from the calculations, the direction of movement was chosen correctly.
The calculation of the traffic capacity will continue, if the traffic would have been carried out on a plain railway line track in both directions and if the traffic would have been carried out in one direction, also on a plain line track.

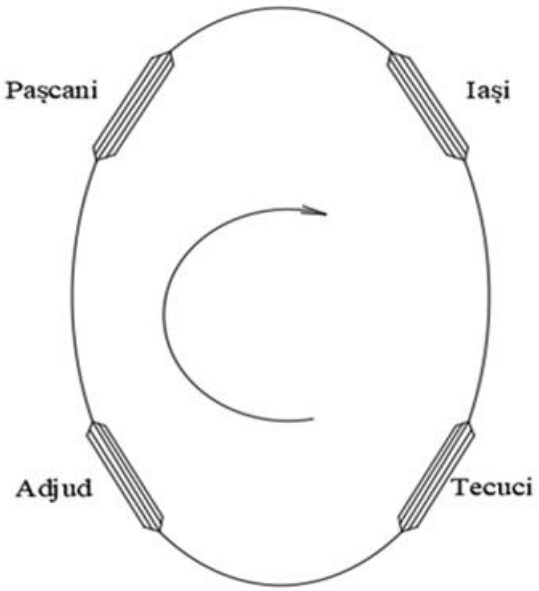

Figure 3. The direction of traffic chosen by the management Romanian railways in the First World War (clockwise)
Source: original contribution

Table 2. Kilometer distances clockwise

	Tecuci	**Adjud**	**Pașcani**	**Iași**
Tecuci	-	44	184	260
Adjud	380	-	140	216
Pașcani	240	284	-	76
Iași	164	208	348	-

Source: original contribution

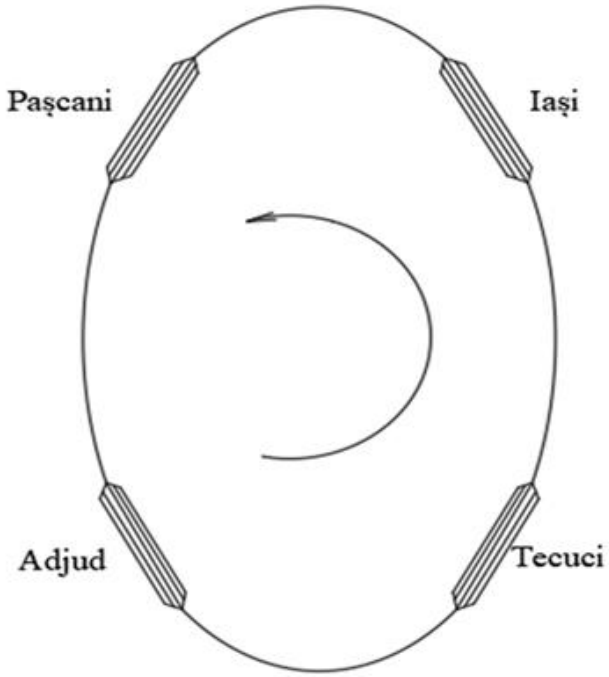

Figure 4. Anti-clockwise direction of circulation
Source: original contribution

Table 3. The mileage distances in the anti-clockwise direction

	Tecuci	**Adjud**	**Pașcani**	**Iași**
Tecuci	-	380	240	164
Adjud	44	-	284	208
Pașcani	184	140	-	348
Iași	260	216	76	-

Source: original contribution

Table no. 4 shows the travel times between stations on the existing rail ring necessary for the calculation of the traffic capacities and the validation of the results.

Table 4. Distances traveled loaded-empty

Route	Distance traveled (loaded)	Distance traveled (empty)
Iași-Pașcani	348	76
Iași-Adjud	208	216
Tecuci-Pașcani	184	240
Tecuci-Adjud	44	380

Source: original contribution

The value marked in yellow in table no. 5 represents the value of the travel time of the limiting distance on the respective section necessary to perform the calculations.

Table 5. Travel times between stations in the railway ring

Nr.crt.	Stations-Halts and other stopping points	Travel times between stations (min.)
1	**ADJUD**	-
2	Sascut	19
3	Orbeni	9
4	Faraoani	15
5	Valea Seacă	11
6	BACĂU	14
7	Iteşti	17
8	Gălbeni	9
9	Săcuieni	12
10	ROMAN	13
11	Săbăoani	10
12	Mircești	7
13	Muncel	13
14	**PAȘCANI**	13
15	Ruginoasa	24
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23	Bârnova	29
24	Grajduri	12
25	Scânteia	10

26	Rebricea	8
27	Buhăiești	10
28	Bălteni	10
29	**VASLUI**	12
30	Munteni	7
31	Crasna	13
32	Banca	23
33	Zorleni	11
34	**BÂRLAD**	12
35	Tutova	20
36	Ghidigeni	9
37	Nichiseni	4
38	Berheci	10
39	Frunzeasca	10
40	**TECUCI**	7
41	Cosmești	10
42	Gen. E. Grigorescu	8
43	MĂRĂȘEȘTI	8
44	Pădureni Putna	9
45	Pufești	10
46	**ADJUD**	12

Source: adapted from Compania Naţională de Căi Ferate "CFR" – SA (2022)

3.2 Calculation of the circulation capacity for the simple path situation

On simple track lines, train traffic is usually done according to the normal chart in which train speeds and categories are different. The most commonly used chart types within the normal graph are the paired graph and the unpaired graph. In our case, the graph is pair.

The characteristic of this type of graph is that in a graph period there is a pair of trains, that is, one in one direction and the other in the opposite direction (Tanasuica, 2003). We have the situation when a train passes and one stops at each railway station (Ministerul Transporturilor - Autoritatea Feroviara Romana).

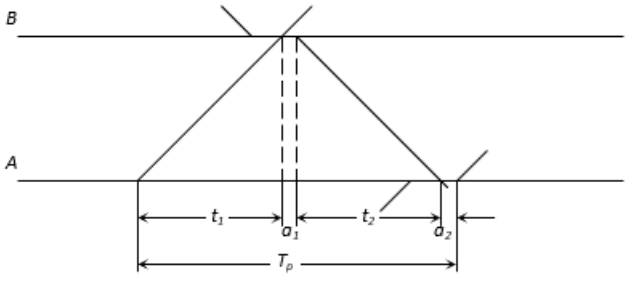

Figure 5. The situation where a train passes and one stops at each station
Source: adapted from Popa

In this case, the graph period shall be calculated with the formula:

$$T_p = t_1 + t_2 + a_1 + a_2, \quad (1)$$

Choose t_1, t_2 from table no. 5, the value on the limiting distance, namely 29 min.

$$T_p = 31 + 31 + 3 + 3 = 68\,\text{min} \quad (2),$$

where:
t_{sd}- additional start-up time (2min).
t_1, t_2 - train travel times, which include start-up times;
a_1, a_2- cross intervals in both stations (3 min).

Whereas when it comes to the circulation capacity of a railway section, we mean the trains that run through it completely, from one end to the other, and how the time a train occupies the portion of the line between two consecutive sectioning points is variable according to a number of objective factors (distance between these points, the inclination of the ground, frequency of curves), it follows that the size of the traffic capacity of the section may be at most equal to the maximum number of trains that can move daily on the most difficult part (distance) of traffic situated between two consecutive cut-off points on that section (Popa) (Tanasuica, 2003).
This is why such a portion of the line is called the limiting distance (Gherasim, 2007). The above finding leads us to the conclusion that, in fact, the traffic capacity of a railway section is equal to the traffic capacity corresponding to the limiting distance (Popa) (Gherasim, 2007).
This results in the capacity of this ring equal to:

$$C_s = \frac{1440}{T_p}, \quad (3)$$

$$C_s = \frac{1440}{68} = 21 \text{ pairs of trains} \quad (4).$$

3.3 Calculation of the capacity for the situation of the circulation organization only in one sense

On double-track railway line, trains are followed at station, block or current line movement station intervals. In our case, trains are followed at station intervals. Calculation of traffic capacity on dual-track lines for the case when trains are followed at station interval (fig. 6) (Popa) (T.anasuica, 2003).

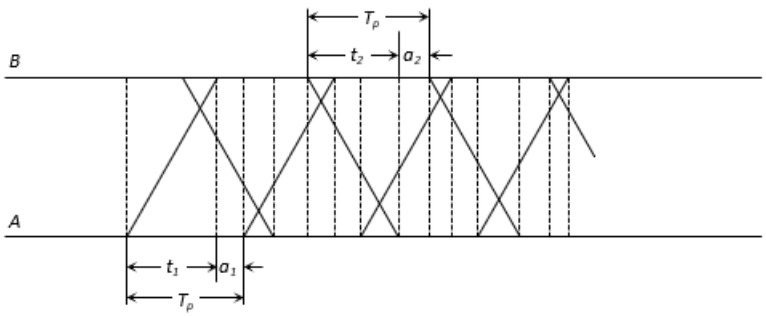

Figure 6. Circulation graph for the case when trains are tracked at the station interval in a double-track railway line
Source: adapted from Popa

The period of the graph is calculated with the formula:

$$T_p = t_1 + a_1; \quad (5)$$

$$Tp = 29 + 3 = 32\text{min}; \quad (6)$$

$$t_1 = 29min; a_1 = 3min. \quad (7)$$

where:
t_1- travel time, in the direction A-B;
a_1- the reapproval time.
One-way circulation capacity:

$$C_d = \frac{1.440}{T_p}, \quad (8)$$

$$C_d = \frac{1.440}{32} = 45 \text{ trains/one-way/day.} \quad (9)$$

In the case of organizing one-way traffic in double-track railway, an increase in capacity of 3 trains was obtained, which means that this method adopted is a correct one, the management playing an important role in organizing the activity and making decisions.

4. LITERATURE REVIEW

4.1 History and role of management in railway transport

Since the early 20th century, in response to the needs of social-economic practice, management has emerged as a science, although it has much older and deeper roots in practicability (Buciuman, 2022).
French author Jean Chavalier argues in his work ,,*Organization''* that the term ,,management'' derives from the French word ,,menage" meaning ,,the organization and management of a house" (Chevalier, 1957). The semantic correspondent in Romanian of ,,management" is ,,leadership", but due to the growing adoption of neologisms and a wider acquired knowledge, the term ,,management" is used.
If we look back, in his work *,,The Prince''* (Machiavelli, 2017), Niccolo Machiavelli lays the foundation for management rules and theories, which are as current as they were more than 500 years ago. The transposition of these principles finds its place in contemporary management, which can make us affirm that the past itself can change and improve the future. It is worth noting that management is not new at all, its foundations being defined and described in other forms thousands of years ago. As examples, references to management can be found since *The Old Testament*, and these are not the only ones.
Management, as defined in several research and specialized writings, can be summarized as the wise use of means to achieve a goal (Stroh, Northcraft, & Neale, 2002) (Uzuegbu & Nnadozie, 2015), which can be reflected in the actions undertaken in World War I by the leadership of the Romanian Railways. Over time, several researchers, writers and scientists have made their mark and formulated various theories and philosophies in connection with this notion of management, among the most relevant being Henri Fayol's ,,*14 principles of Management"* (Rodrigues, 2001) de Henri Fayol (Witzel, 2003) (Wren, Bedeian, & Breeze, 2002), which re found in operational management.
Prior to this, the theoretical foundations of management development were laid by the one who is considered the father or founder of scientific management in the early 1900, namely Frederick Taylor, with this the word management being widely spread (Cugueró-Escofet & Rosanas, 2020).

According to F. Taylor management is the art of knowing the right things and knowing the right time to do the right things (Taylor, 1911).
Also, several technical-managerial strategies and actions were used during both World Wars, and engineers, mathematicians and statisticians contributed substantially to the development of the notion of management (Ferraro, 2016).
Before Taylor, decisions were based on basic, traditional rules using precise principles and procedures backed by evidence.
Taylor's principles of scientific management are based on command and control theories due to his experience in engineering (Kidwell & Scherer, 2001) (Kamal, 2020). The major problem in management was that people had very limited management knowledge.
Managers were not trained to supervise their workers in a real way, which led to poor work results and thus the productivity goals could not be achieved. Taylor's principle of ,,choosing the right person for the right place'' helped solve the above (Rahman, 2012).
In conclusion we can say that management is important in every field of activity. It is very important to study the history of management, so that we could avoid making the same mistakes or we could bring to rebirth some actions that could place us at a higher level of knowledge and beneficial in achieving the objectives.

5. CONCLUSIONS AND INTERPRETATION OF RESULTS

In conclusion, the calculations made found that due to the decisions and managerial measures taken by the leadership of the C.F.R during the First World War, an increase in the traffic capacity was achieved by 3 trains, which may seem a negligible value, but this should not be underestimated, since the war effort could be increased by ca. 4800 tons daily, which is 4.800.000 kg of military effects/day, which should not be overlooked.
This managerial measure identified in the book ,,Romanian Railway Epopeea" exposes an unconventional method of performing railway traffic in a time of crisis and the role that management can play in organizing the activity of an institution or even the state. Increasing circulation capacity even today is a topic discussed and studied in the literature, as well as studying and understanding the past can improve the future.
A critical analysis of what has been done must start from the finding that all the calculations made have as central idea the section and its transit of direct freight trains, which in principle do not stop on the section for commercial reasons (loads/downloads). If they stop, however, the stops occur for technical reasons, especially in a plain line track way to allow for crossovers.
In the absence of concrete data it seems that the way of carrying out the traffic and supply of the army that was on the left side of the ellipse that still represented the Romanian Railway was carried out according to this type of graph, cross-crossing stops are extended until a train approaches the pre-emergent one.
Calculations for the capacity of such a graph confirmed the same capacity increase, 3 trains (which is even more relevant to the audacity of the railway leaders since then, as they managed to increase capacity by also exchanging military effects).

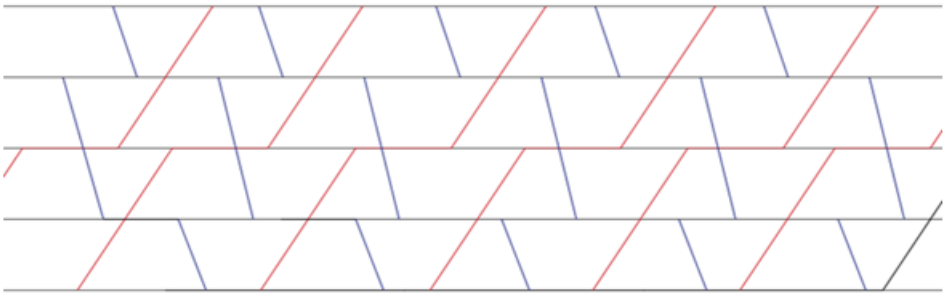

Figure 7. Type of graph with technical stops
Source: original contribution

Figure no. 7 shows the type of traffic chart with simple technical stops to allow train crossings.

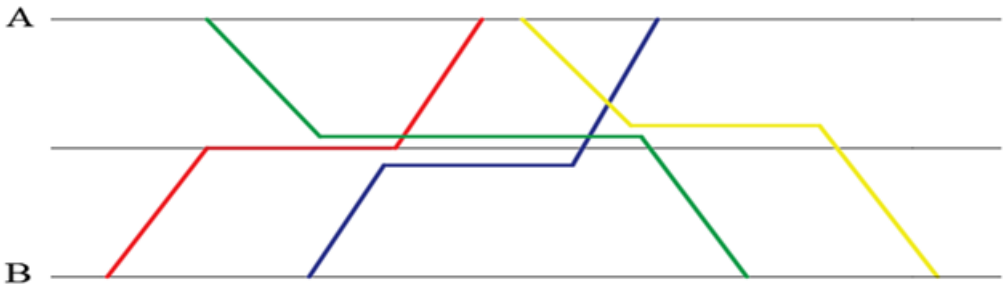

Figure 8. Type of graph with prolonged cross-crossing stops (organization mode used during the War).
Source: original contribution

In conclusions Figure no.8 shows the type of chart by which the train movement was organized following the measures adopted by the railway management in the First Modial War, to allow for the exchange of military effects and the increase in capacity.
Following the research carried out and the results of the calculations, it is possible to highlight the importance of the strategic management of organizations in periods of great trial (such as wars, pandemics, calamities, etc.) and how to manage the unforeseen situations that must be overcome in order to get out of the crisis. The subject addressed in this study is topical and still requires major attention in the scientific approach, taking into account the difficult period we are in and how history can repeat itself. In any case, every organization should pay great attention to strategic management and crisis management in order to face the future difficulties they may face.
Research in the field of transport and the management of the railway transport system is a well-founded one, since this transport system is considered a critical infrastructure, which requires a serious approach and an adequate management based on knowledge and research.

REFERENCES

Botez, C., Urma, D. & Saizu, I. (1977). *Epopeea feroviara romaneasca.* Bucuresti: SPORT-TURISM Publishing.
Buciuman, I. (2022). *Elemente manageriale în sistemul de transport feroviar*. Cluj Napoca, România: Studia Publishing.
Chevalier, J. (1957). *Organisation – Administration de l'entreprise* (Vol. I).

Compania Națională de Căi Ferate "CFR" – S.A. (2022). Livret cu mersul trenurilor de Marfă pe Regionala de Căi Ferate Iași.

Compania Națională de Căi Ferate "CFR" – S.A. (2022). *Rețeaua Feroviară – CFR SA*. Retrieved on 2022, from CFR SA: http://www.cfr.ro/index.php/ct-menu-item-81/29-articles/5528-article-116.

Cugueró-Escofet, N. & Rosanas, J. M. (2020). Practical Wisdom for Sustainable Management and Knowledge Sharing. *Sustainability, 12*(10), 1-17. https://doi.org/10.3390/su12104173.

Ferraro, S. (2016). Frederick Taylor's other Principles. *International Journal of Business and Social Science, 7*(11), 24-27.

Gherasim, T. (2007). *Sisteme de transport: transporturi feroviare.* Bacău: Universității „G. Bacovia" Publishing.

Kamal, S. (2020). Importance of Scientific Management in the Modern Management. *Black Sea Journal of Management and Marketing, 1*(2). http://doi.10.47299/bsjmm.v1i2.60.

Kidwell , R. E. & Scherer, P. M. (2001). Layoffs and their ethical implications under scientific management, quality management and open-book management. *Journal of Business Ethics, 29*(1-2), 113-124. doi:10.1023/A:1006455228312.

Machiavelli, N. (2017). *Principele.* București, România: Humanitas Publishing.

Ministerul Transporturilor – Autoritatea Feroviară Română. (fără an). Instrucțiuni pentru calculul capacității stațiilor și secțiilor de circulație. *(115).*

Popa, M. (fără an). Trafic în Rețele cu Acces Reglementat. *Note de curs*. București.

Rahman, H. (2012). Henry Fayol and Frederick Winslow Taylor's Contribution to Management Thought: An Overview. *ABC Journal of Advanced Research, 1*(2), 94-103. https://doi.org/10.18034/abcjar.v1i2.10.

Rodrigues, C. A. (2001). Fayol's 14 principles of management then and now: A framework for managing today's organisations effectively. *Management Decision, 39*(10), 880-889. https://doi.org/10.1108/EUM0000000006527.

Stroh, L. K., Northcraft, G. B. & Neale, M. A. (2002). *Organizational Behavior: A Management Challenge* (3 ed.). Lawrence Erlbaum Associates, Inc.

Tanasuica, I. (2003). *TEHNOLOGIA ACTIVITATII STATIILOR DE CALE FERATA* (Vol. II). Feroviara Publishing.

Taylor, F. (1911). *The principles of scientific management.* New York.

Uzuegbu, C. P. & Nnadozie, C. O. (2015). Henry Fayol's 14 Principles of Management: Implications for Libraries and Information Centres. *Journal of Information Science Theory and Practice, 3*(2), 58-72. https://doi.org/10.1633/JISTAP.2015.3.2.5.

Witzel, M. (2003). *Fifty key figures in Management.* USA: Routledge.

Wren, D. A., Bedeian, A. G. & Breeze, J. D. (2002). The foundations of Henri Fayol's administrative theory. *Management Decision, 40*(9), 906-918. https://doi.org/10.1108/00251740210441108.