

THE CONCEPT OF ZERO MARGINAL COST IN THE STREAMING INDUSTRY

Joško Lozić¹
Katerina Fotova Čiković
Ivana Martinčević

Abstract

The digital transformation of production systems has precipitated a profound shift in the conceptualisation and structure of production costs. Traditional cost accounting frameworks, developed within the context of linear, industrial production processes, have become increasingly inadequate for capturing the economic realities of digitalized production systems. The objective of this paper is to critically examine the emerging paradigms of cost accounting within digitalized industries—namely, those that have transitioned from conventional linear value chains to digitally integrated models, characterized by a shift from the production of tangible goods to the generation and dissemination of digital content. This transformation necessitates a re-evaluation of variable cost structures, culminating in the formulation of the zero marginal cost model. The zero marginal cost paradigm initially manifested within the media sector but has since proliferated across various industries that operate under platform-based business models. In such contexts, the marginal cost of reproducing and distributing digital content asymptotically approaches zero, thereby undercutting even the minimal marginal costs associated with traditional economies of scale. This phenomenon not only challenges the foundational assumptions of classical cost accounting but also compels a reconceptualization of economic value creation and distribution in the digital era.

Keywords: digital transformation, disruption, platform economy, scalability, zero marginal cost.

JEL classification: D24; L86; M41

INTRODUCTION

The digitalization of production systems at the beginning of the century radically changed the environment of old industries and forced them to make deep and fundamental changes in the models of production, distribution and monetization of goods and services. Digitalization first affected the media industry, and as a result, completely new media industries developed within the already existing, or old, media industry. The digitalization of media content production enabled the convergence of systems, and all of this directly influenced a complete change in the paradigm of consumption of media industry products. Digitalization enabled the development of new technologies, and digital transformation enabled the development of new forms of process management. New media industries are associated with the development of the platform economy (Parker et.al., 2016; Moazed, Johnson, 2016), or with what would

¹ Joško Lozić, Ph.D.; Katerina Fotova Čiković, Ph.D.; Ivana Martinčević, Ph.D., University North, Croatia, Republic of Croatia.

later be called “platformization”. The development of the platform economy model, i.e. the new model of media content production and distribution, was created due to the digital transformation of production processes (Lozić&FotovaČiković, 2024). Instead of selling physical products in brick-and-mortar stores, media content is distributed and consumed on media platforms. The distribution of multiple copies of the same content from the platform, with the existing fixed cost unchanged, is the basis of a theory Rifkin (2015) calls zero marginal cost economics or near-zero marginal cost.

YouTube is an open-access platform that enables the consumption of content with the help of streaming technology. Spotify is the largest global music streaming platform in the subscription model. Netflix is the largest streaming platform for video content in the subscription model. The platforms Disney+, Apple Music and Amazon Prime are already positioned in the streaming industry. Unlike the aforementioned platforms, which were founded as digital infrastructure, the New York Times, as part of the "old" media industry, digitally transformed production systems and switched to a subscription model on the platform. Aircraft engine manufacturers have transformed product systems into 3d printing models and platforms for monitoring and collecting data on the behaviour of engine components (Srnicek, 2017). All of the above is part of the platform economy and partly uses the effects of the zero marginal cost economy. The paper analyses the change in the structure of costs that appeared as a result of the new way of production and distribution of media content based on digital transformation and the economy of platforms.

1. COST STRUCTURE OF THE "OLD" AND "NEW" MEDIA INDUSTRY

The development of new media industries has significantly changed the classic allocation of costs according to their source and type of origin. Costs were still divided according to the same principle, but their actual impact on the final result and the distribution of total costs was greatly changed. The research and analysis of the cost structure associated with the “zero marginal cost” model is a continuation of existing research conducted based on the analysis of newspaper publishers’ costs (Lozić, 2019). The new research includes an analysis of the media industry as a digitally transformed industry.

1.1. Defining the costs of the "old" media industry

Classical media industries were based on a business model known as "pipeline" (Parker et.al., 2016). On one side, resources entered, and on the other side of the chain, finished products came out. Manufacturers controlled the value chain in all segments of product production and distribution. The cost structure was on par with all other industries from the end of the 20th century industrial capitalism. The cost structure of the old media industry, as with other industries of production capitalism, is divided into fixed and variable costs. The approach to cost theory is based on the analysis of production systems, and it is impossible to separate the theory and analysis of the cost structure from the theory and analysis of production systems (Pavić et.al., 2006). Cable television was the largest single media industry by revenue, and represents the transition from the "old" model to the "new" media industry. Broadcasting introduces

innovations in production, distribution and monetization of products that did not exist in classic media industries.

Fixed costs are all those costs that do not change with a change in the volume of production. A change in a fixed cost or its elimination can only happen with the complete elimination of the production process (Pindyck, Rubinfeld, 2005; Sexton, 2016). The organisation has fixed costs even when the production process is at a standstill, so these costs are also called "overhead" or "general" costs. This means that they must be paid even when production is equal to zero (Samuelson, Nordhaus, 2010). Fixed costs remain unchanged regardless of the output trend, that is, they do not increase with an increase in output and do not fall with a decrease in output (Pavić et.al., 2006; Gillespie, 2007, p. 118). Sometimes they can also be found under the name "additional" or "non-refundable" cost because they include costs such as rent, interest on non-debts, salaries of administrative staff, etc. (Samuelson, Nordhaus, 2010). The fixed cost, and thus the total fixed cost, is the largest or dominant part in the cost structure (Sexton, 2016).

Unlike fixed costs, which are invariable, variable costs change with changes in the volume of production (Samuelson, Nordhaus, 1992; Sexton, 2016). Variable costs include materials for the production of goods and services, i.e. that part of the resources that directly depends on the change in the volume of production (Pindyck, Rubinfeld, 2005; Pavić et.al., 2006). Variable costs are directly related to the amount of output, i.e. there is a correlation between the amount of output and variable costs (Gillespie, 2007). In the traditional publishing model in which a subscription is paid for access to a paper or electronic journal, fixed costs mainly relate to the preparation of articles that go into the journal. They remain the same regardless of the total circulation of the journal. Variable costs vary depending on the number of copies of the journal in circulation (House et.al. 2004).

Marginal cost refers to the additional cost of producing an additional unit of a product (Samuelson, Nordhaus, 1992; Pavić et.al., 2006). The change in total cost resulting from a change in the quantity produced per unit is called marginal cost (Pavić et.al. 2006: 308). The marginal cost of a product is the opportunity cost of producing one more unit of it (McTaggart et.al. 2015: 33). Marginal cost is also called incremental cost. Since fixed cost does not change with a change in the level of production, marginal cost is equal to the increase in variable cost or the increase in total cost incurred by producing an additional unit of a product (Pindyck, Rubinfeld 2005: 209). Therefore, marginal cost can be written as follows:

$$\frac{\Delta TC}{\Delta Q} = \frac{\Delta VC}{\Delta Q} = MC$$

Fixed costs are designated as FC, or total fixed costs as TFC. Variable costs will be designated as VC or total variable cost as TVC. The sum of fixed and variable costs makes up the total cost of doing business. We will designate them as TC. Marginal costs are designated as MC. Marginal cost is one of the most important concepts in the entire economy. Marginal cost denotes the "extra" or additional cost of producing a unit of product (Samuelson, Nordhaus, 1992). Marginal cost is defined as the change in total cost (TC) about the change in quantity (Q), or $MC = \Delta TC / \Delta Q$. Technically speaking, it is the first derivative of the total cost function concerning quantity; therefore, MC is

the slope of the TC curve (Hyun& Byun, 2016). In the above costing model, it is necessary to emphasize that it is a study of costs in the relatively short term. In the analysis of long periods, all costs take on the characteristics of variable costs.

1.2. Cost structure of the "old" media industry

The traditional or "old" media industry produced physical products that it sold on the market in stores designed for the media industry. Publishers of media products sold physical carriers of content as the final product of the media industry. The costs of the classic media industry were characterized by what Waldfogel (2018) calls "first copy cost". These are costs that include editorial costs, management system and rights fees for media content, reviews, proofreading, covers, editorial content and all other necessary factors that are not an integral part of the media content in question. These costs also include general costs such as subscription management, licenses, distribution and marketing (House et.al., 2004).

Table 1 shows the distribution of costs in the classic media industry. The model includes production costs up to 100,000 copies. Fixed costs represent a constant amount and are the same for zero production as for the highest production level. Variable costs increase with increasing production. Average fixed costs (AFC), average variable costs (AVC) and average total costs are obtained by dividing individual costs by the volume of production.

Table 1. Classic media industry cost structure

N.C.	FC	VC	TC	AFC	AVC	ATC	MC
0	100.000	0	100.000	-	-	-	-
10.000	100.000	50.000	150.000	10,00	5,00	15,00	5,00
20.000	100.000	85.000	185.000	5,00	4,25	9,25	3,50
30.000	100.000	110.000	210.000	3,33	3,67	7,00	2,50
40.000	100.000	136.000	236.000	2,50	3,40	5,90	2,60
50.000	100.000	168.000	268.000	2,00	3,36	5,36	3,20
60.000	100.000	200.000	300.000	1,67	3,33	5,00	3,20
70.000	100.000	240.000	340.000	1,43	3,43	4,86	4,00
80.000	100.000	286.000	386.000	1,25	3,58	4,83	4,60
90.000	100.000	336.000	436.000	1,11	3,73	4,84	5,00
100.000	100.000	392.000	492.000	1,00	3,92	4,92	5,60

Marginal cost refers to the additional production costs incurred when increasing production per unit of product. In our case, marginal cost refers to the additional production costs incurred when increasing the circulation by 10,000 copies. We calculate marginal cost as follows:

$$MC = \frac{\Delta (TC[n]-TC[n-1])}{\Delta(Q[n]-Q[n-1])}$$

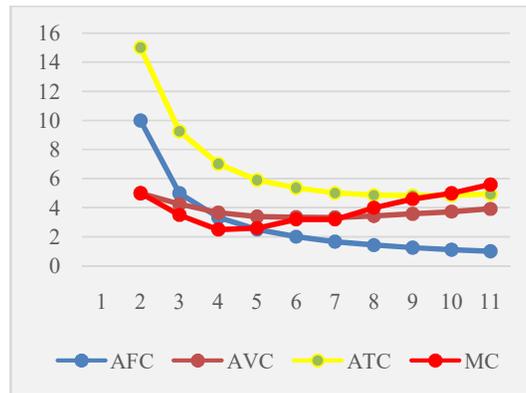


Figure 1. Classic media cost structure

The average fixed cost curve is a curve that slopes steadily toward zero, but never touches it (Sexton, 2016). Marginal cost decreases as output increases to a certain level of output, and then increases. In our example, marginal cost is lowest for a production of 30,000 copies, and is equal to the initial cost for 90,000 copies. Figure 1 shows the graphs of the cost curves. The decline in average fixed cost (AFC) decreases as output increases. The other three curves, average variable cost (AVC), average total cost (ATC), and marginal cost, first decline and then rise. The figure shows that the marginal cost curve touches the total cost curve at a production level between 80,000 and 90,000 copies.

1.3. Defining the costs of the new media industry

The digital transformation of business systems and activities, and especially the development of technology in the streaming segment, have fundamentally changed the paradigm of the cost structure of new media industries. Streaming technology has enabled completely new monetization models, apart from the sale of physical carriers. New media industries developed alongside the Web 2.0 model and social networks. The social media industry has made it possible for users to share different content, which has shaken the fundamentals of advertising. The contents could be shared indefinitely and without additional costs. Once set fixed cost did not change for a long period. The extraordinary success of platforms such as Facebook, Salesforce, Amazon and Instagram offers a preview of this new reality. These were the first examples of the immense power of these new business models that fully enjoy the benefits of zero marginal cost. They are based on the possibility of unlimited scalability, without capital costs, and can be implemented immediately (Allmiral, 2019).

The digital transformation of the system, followed by the convergence of different platforms, enabled the distribution and consumption of digitized content on different platforms. Unlimited distribution and consumption of content on the platform, with an unchanged fixed cost, is called the "zero marginal cost" model. Rifkin (2015) is the first to systematically analyze the term "zero marginal cost", i.e. "marginal cost close to

zero". The term is used to determine the nature of the marginal cost of producing one new unit of digital content. Rifkin (2015) points out that every time we use the term "marginal cost close to zero", we are implicitly pointing to the marginal costs of distributing information, green energy, and goods and services (Rifkin, 2015). Yung et al. (2019) emphasize the role of zero marginal cost when producing electricity from renewable sources and releasing it into the already existing infrastructure, which confirms the theses mentioned by Rifkin about the use of the zero marginal cost effect in energy distribution. Goods and services that are digitized and can be sold online, such as computer software or e-books, still require persistent digital infrastructure and electricity for each new copy, but the marginal cost of each new copy is negligible (Markley, 2024). Albert (2009) points out that the marginal cost of production is not quite equal to zero, because there are costs of maintaining the infrastructure in the organization. The IT infrastructure itself is expensive in itself, and one can talk more about "marginal cost close to zero" in the area of distribution than in the area of production.

At the time of the old media industries, Odlyzko (1975) was the first to mention the "marginal cost of the first copy" problem. Odlyzko analysed the production of printed products, at that time in the physical product model, and concluded that 70% was accounted for by the costs of editorial, processing, printing and the "cost of the first copy". Markley (2024) gives an example of the production of a new can of a drink. The cost of producing a new can is insignificant compared to the costs incurred by the factory in starting the entire production. The cost of producing a new can corresponds to the term "marginal cost close to zero", but the cost of employing the resources needed in the organization of production is not calculated there. "First copy costs" is a term used in journal publishing to describe the costs incurred to bring a copy of a particular article into the condition required for publication in the journal. They consist of the fixed costs of article production listed above: editorial costs involved in selecting and reviewing articles, the manuscript management system, page preparation and illustrations, and copy editing/rewriting (House et.al. 2004). The large input costs of production, in a linear production model, include the costs of printing, distributing, and selling enough copies to cover the fixed costs and take advantage of the marginal cost effect. The market price of a single copy is the issue that defines the need to cover the large input costs, and must be acceptable to the end customer.

1.4. Cost structure of the "new" media industry

The cost structure of the new media industry does not deviate from the already known costs of other old industries, but the costs take on new characteristics and impact on the total costs. The existing division into fixed and variable costs remains the basic division model, but the fixed cost gains additional importance in cost analysis. Buytaert (2014) analyses the costs of the new media industry based on the digital transformation of production and determines the division of costs into two basic categories. Costs are divided into "setting cost" and "marginal cost of production". Fixed costs are the part that includes the "setting cost", while variable costs are the part that is now included in the "marginal cost of production". Buytaert (2014) points out that "setting costs" are the part of the costs that includes the construction of human resources and tools necessary for making the first copy, while "marginal costs of production" are the part of the costs

that refers to the production of an additional unit of production. The classic fixed cost of production now includes all those costs that include the production of the "first copy" and its placement on the digital platform. A variable cost, as a cost that is related to a change in production volume, disappears very quickly because the fixed cost takes over the dominant part of the cost.

Table 2. New media industry cost structure

N.C.	FC	VC	TC	AFC	AVC	ATC	MC
0	100.000	0	100.000	-	-	-	-
10.000	100.000	50.000	150.000	10,00	5,00	15,00	5,00
20.000	100.000	2.500	102.500	5,00	0,13	5,13	-4,75
30.000	100.000	500	100.500	3,33	0,02	3,35	-0,20
40.000	100.000	500	100.500	2,50	0,01	2,51	0,00
50.000	100.000	500	100.500	2,00	0,01	2,01	0,00
60.000	100.000	500	100.500	1,67	0,01	1,68	0,00
70.000	100.000	500	100.500	1,43	0,01	1,44	0,00
80.000	100.000	500	100.500	1,25	0,01	1,26	0,00
90.000	100.000	500	100.500	1,11	0,01	1,12	0,00
100.000	100.000	500	100.500	1,00	0,01	1,01	0,00

The digital transformation of production has directly affected the change in the impact and meaning of classical costs in digitalized production processes. The fundamental change is that the marginal cost of a new product drops to zero. When this change is combined with the ability of consumers to access media products on a wide range of home and portable devices, digitalization enables a new set of sophisticated sales and pricing strategies, which could, at least in theory, bring new financial benefits to producers (Waldfoegel, 2017). The costs of newspaper and book publishers have the same or very similar cost structure associated with the publication of the "first copy". However, if one of them starts using the advantages of digital publishing, it will achieve a competitive advantage based on a significant reduction in the variable cost of production (Kie-Mason&Riveros, 2000). Classical linear production used the "barriers and moats" model around organizations that Porter determined in the Analysis of Industries. Organizations have built a market position based on capacity development and using the effects of economies of scale. Rifkin (2015) emphasizes that such a model based on the effects of economies of scale still has higher marginal production costs than digital content distribution models that use zero marginal cost distribution effects.

Table 2 provides an overview of the production costs of digitally transformed production processes. The analysed costs refer to the production and distribution of products on a scale of 10,000 to 100,000 sold units. The assumption is that the scaling of the production size includes the level of production for which it is not necessary to increase the fixed cost. The fixed cost is at the level of 100,000 for the given level of production. Variable costs are set for the first unit of production, i.e. "first copy", and then the symbolic value of variable costs is added for each new level of production.

Already in the first new frequency, ATC is almost equal to AFC, and the marginal cost drops to zero. Each new change, i.e. the increase in the production of the number of copies, affects the growth of AFC as much as ATC. MC remains unchanged, i.e. zero, which is why they are called "zero marginal cost" or "marginal cost near zero".

Figure 2 graphically shows the trend of total average costs and marginal costs from Table 2. AFC overlaps with ATC and falls towards zero, but never reaches zero. AVC falls steeply towards zero already in the second frequency, but never reaches zero due to the persistence of symbolic variable costs for each change in the production level. MC falls to zero already in the second frequency of change and maintains this value for all further changes in the production level. Their structure is most similar to AVC. Even if the level of fixed costs were to change for a new level of production scaling, with the same variable cost, the trend of AVC and MC would remain the same. This is another reason why the digitalized production model is called "marginal cost near zero".

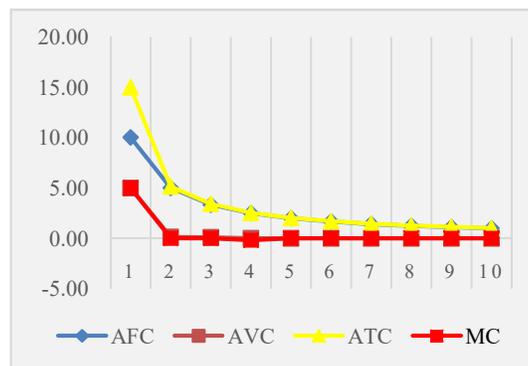


Figure 2. Digital media cost structure

The cost analysis presented in Table 2 and Figure 2 proves the claims of a sharp drop in average total costs after covering the costs of the "first copy". The variable cost of the additional product does not exist because the production costs have already been calculated and met within the fixed cost. In the context of streaming platforms, the contents are placed on the platform and for their production and maintenance of the platform, fixed costs are indispensable. For each further download of content from the platform, as well as the production and distribution of a new product, the variable cost has a symbolic value. Music streaming platforms allow listening to music after the rights have been paid to the content owner. The monetization of the service and the amount of the subscription no longer depend on the number of listens. On the Twitter/X platform, the digital infrastructure enables the exchange of short messages, and the cost of each new message is zero (Lozić, 2023). The same is true for platforms for watching video content and platforms for browsing newspapers and magazines.

Mason (2020) points out that as a result of the development of the zero marginal cost effect, a large number of technological monopolies have been built in the last twenty years, whose ownership structures and stock market capitalization are significantly more powerful than any known monopoly in the history of capitalism. Such monopolies have never existed in banking, steel or oil. They are aimed at

suppressing competition in order to keep prices below the level of reproduction costs. The iTunes platform determined the price for one song regardless of the costs of maintaining the platform. Apple Music has set a subscription price regardless of the number of users, for the entire offered music catalogue. Such monopolies in the media industry, built using the zero marginal cost model, were founded to circumvent antimonopoly laws and neutralizing competition. As Frederic Jameson pointed out, it is easier to imagine the end of the world than for the European Commission to introduce rules for the Facebook platform (Mason, 2020).

2. PLATFORM SCALABILITY

The digital transformation of production enabled different forms of production and data distribution models, which were not possible in the industrial production model, and are based on the use and processing of data and software-managed production processes. Software alone is not enough to make the change complete, but the starting point of change is the management and scaling model in production systems. Disruption of existing systems is visible in all forms of production and the biggest transformation of the system is recognized in the change of the model from a linear to a network business system, that is, from pipeline scale to platform scale (Choudary, 2015). What is special about modern software is that it scales to hundreds of millions of users with almost no additional marginal cost. Amidst all the bad news about technological change and the costs of investing in infrastructure, the good news was the reduction in data processing costs. Digital technologies have reduced the production costs of music, movies, TV shows and books (Waldfoegel, 2018).

The scalability of a business system in the platform economy model can be interpreted as the ability to manage a system with a constant volume of production, and to adapt to increasingly large data sets without compromising the performance of the production system and the final result. With the continuous growth of the amount of data, platforms become increasingly stable, and it is easier to scale production (Krneta, 2024). The ability of a business to scale is determined by its ability to aggregate input data for the business-work and resources and its effective coordination towards the creation and delivery of value (Choudary, 2015). Analysing scalability on the example of a platform, the situation of "scaling up" is most often defined due to the constant growth of data and software load. However, the very possibility of sudden "scaling down", without significantly affecting costs, proves the importance of scaling in platform business (Bridgwater, 2020). Analyzing the effects and results of the use of scalability, it is necessary to emphasize that the use of scaling without appropriate infrastructure is a recipe for disaster (Hamirani, 2024).

The extent and magnitude of the use of scaling depend on various factors. It cannot be applied in the same way in all industries and at all stages of development of the organization. Likewise, the use of scalability changes with the change in market position or within the industry (Emmer, 2023). The example cost structure in Table 2 is created for a hypothetical and relatively short period in which fixed costs remain the same, and software costs are scaled according to the range of digital content sales from the lowest to the highest level. The cost of software is a fixed cost that scales upwards, but remains within the total fixed cost. By increasing the capacity of the platform, the fixed cost would increase, but the cost of software would remain within the new fixed

cost, which means that it would not affect the change in marginal cost. The ability of a technology platform to scale costs within a given capacity, without changing marginal cost, proves its focus on using zero marginal cost effects. Markley (2024) gives the example of a movie theatre that is entered by another viewer. For a given seat capacity, the fixed cost remains the same, and the marginal cost is close to zero.

3. SCALABILITY AND MARGINAL COST

The ability to scale an organization is not just a simple increase in numbers on the output side. The entire system must develop equally in order to maintain growth. The biggest obstacle on this path is resource limitations (Chen, 2024). Analysing scalability as a technological effect, it can be concluded that it is that technological entity can operate at the right size, without a break, and achieve the expected result. In addition, the system must be designed in such a way that there is no need for sudden activities, system reconfigurations or changes to the system architecture, which would cause risks of various forms (Bridgwater, 2020). Scalability allows the organization to generate new revenues and grow without being limited by its structure or lack of various resources. But, most importantly, by increasing sales volume, scalability ensures that the organization increases efficiency instead of stagnation and failure (Johnson, 2024). The scalability of a platform system is also associated with the effect of zero marginal cost at which prices are formed in an auction system where new entities are added to existing systems without increasing the set price. Examples include adding another property on the Airbnb platform, a new vehicle on the UBER platform, or adding a new Facebook account. Determining the prices of these products is insignificant because it is more important to make them known and bring them closer to users (Fraiman, 2021).

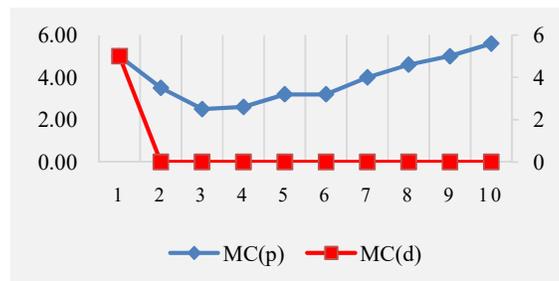


Figure 3. Comparison of marginal cost

In the context of the scalability of the production resource and the determination of the marginal cost trend, the marginal costs of production of physical products of the media industry (MC_p) and the marginal costs of digitized production of digital content (MC_d) were compared. The analysis used data from Table 1 (for physical production) and from Table 2 (for production of digitized content). The marginal cost of physical products MC_p initially decreases and then increases due to the increase in the variable cost of production. The marginal cost of production of digitized content MC_d exists only in the first frequency, that is, it covers the variable costs of the "first copy". After that, it drops to zero, so we talk about a "marginal cost close to zero" or a "zero

marginal cost" form of production and distribution. The results of the analysis are shown in Figure 3.

The research results prove the extremely significant impact of scalability on the cost structure of digitally transformed media organizations, which especially refers to the structure and trend of marginal costs. In the example that was processed, the fixed cost was analysed in the context of a change in ten frequencies of production and sales capacity. The change in frequency, or rather its increase, does not affect the increase in fixed costs because digital transformation provides significant support in the development of scaling production capacities. Once set and installed, the fixed cost of the infrastructure allows for unlimited possibilities of scaling other costs up and down, while the marginal cost remains close to zero, as shown in Figure 3.

Nevertheless, the mention of the term "zero marginal cost" caused the emergence of different opinions and interpretations of the cost calculation model itself. The most common objection, with the most arguments, is based on the analysis of the source of the production cost, regardless of the degree of digitization. Netflix is the largest digital platform for streaming video content, but it spends huge resources to produce that content. It is similar to the New York Times, Disney+ or Amazon Prime. Spotify has to buy broadcasting rights from music content rights holders, which constitutes the basic Cost of revenue. Social media uses the UGC model, but the maintenance of the technological infrastructure is very expensive, which is the basic Cost of revenue. In addition, the analysis of the zero marginal cost effect should be separated from the price formation model based on the marginal value of each subsequent product. According to this model, each subsequent or new product has a lower value for the customer because there is a rate of saturation with the product. Gangwar and Bhargava (2023) point out that when using streaming platform services, users with higher incomes have a higher marginal value or are willing to pay more than students, but free time for listening is a limiting factor for both groups of users.

In this context, Pawlovski (2025) analyses the ability to scale digital platforms. At first glance, the digital world has become a buffet from which millions of copies are distributed without the additional cost of a new unit of product. Scalability is becoming a favourite trick of Silicon Valley, but in the end, there are production costs. The question is justified whether it is still free (Pawlovski, 2025). Rouchry (2021) goes a step further and connects the theory of zero marginal cost with Marxism by referring to Rifkin's (2015) original work, in which he refers to the work of Oscar Lang from 1936. In this paper, Lange warns of the impossibility of developing entrepreneurial projects in branches of industry that have already achieved some form of monopolization, which will be easily proven by analysing industrial capitalism from the second half of the twentieth century, globalization and the migration of capital to the East. Mason (2020) also agrees with Rifkin's thesis on the development of post-capitalism and emphasizes that four new phenomena define the development of such a system, namely: zero marginal cost, automation, network effects and the socialization of knowledge. They not only define it but also erode the existing system and the ability of capitalism to adapt to changes, which forces organizations and states to adapt very quickly to the new model. Regardless of the various objections and challenges to Rifkin's work on the effects of the zero marginal cost model, there still remains a significant area for research into this phenomenon.

CONCLUSION

The digital transformation of production systems directly influenced the change in the cost paradigm that emerged during the late industrial capitalism. The media industry was the first to find itself under pressure from changes in the production structure and models of distribution and monetization of goods and services. The fundamental difference brought about by the digital transformation in the media industry was the gradual disappearance of the production of physical products, which was replaced by the production of digitized content. Such digitized content was no longer a classic commodity sold on the market, but a form of service that organizations monetize in various forms of payment. The disappearance of goods as a physical form of product for the market directly influenced the change in the paradigm of variable costs, and in this context, marginal costs.

The product of the media industry, which is placed on servers and platforms, is no longer a classic physical product in its nature, but becomes a service that can be used while the subscription lasts. The costs of the server, that is, the platform, are fixed costs that take over the largest part of the variable costs of the increase in viewing content. In this context, we talk about zero marginal cost, because after it is installed on the server, the variable costs of the increase in production become negligible, and therefore the marginal cost is close to zero. It is similar to social networks, because each new post posted by users does not increase the fixed cost, i.e. production is scalable for the given fixed cost capacity.

The change in the cost paradigm of digitally transformed organizations has caused different scientific and professional interpretations, and scientists have not yet formed a firm position on what is new and acceptable, and what is a matter of different interpretations of changes in cost calculation. What is certain and common to all forms and types of production and distribution of digitized content is related to the increase in new infrastructure costs and the subsequent decrease in data processing costs due to the use of software intended for this process. Investing in digital infrastructure enables the scalability of the system, and the fixed costs take over a large part of the variable costs of the increase in the production of digitized content. Therefore, it cannot be claimed that the production of content is free, that is, that it uses the effects of zero marginal cost. However, the distribution of a new unit of digital content is almost free and uses all scaling effects for the fixed cost capacity set, and one can speak of zero marginal cost at the level of distribution of each new unit of digitized content.

REFERENCES

- Allmiral, E. (2019) „From Competing On Analytics To Companies As Code“. Forbes, <https://www.forbes.com/sites/esade/2019/01/10/from-competing-on-analytics-to-companies-as-code/#199fb8097af1>. [02.03.2025.]
- Albert, S. (2009). Marginal Cost Is Not Zero: The Economics of Producing Online Content. <http://albertsun.info/2009/07/marginal-cost-is-not-zero>. [22.03.2025.]
- Bridgwater, A. (2020). What is technology scalability? Forbes.com <https://www.forbes.com/sites/adrianbridgwater/2020/02/19/what-is-technology-scalability/>. [12.02.2025.]

- Buytaert, D. (2014). The end of ownership: The zero-marginal-cost economy. <https://thenextweb.com/entrepreneur/2014/09/06/end-ownership-zero-marginal-cost-economy/>. [02.03.2025.]
- Chen, H. (2024). Six start up scaling strategies for navigating rapid growth. Forbes.com. <https://www.forbes.com/councils/forbesbusinesscouncil/2024/09/03/six-startup-strategies-for-navigating-rapid-growth/>. [22.03.2025.]
- Choudary, S. P. (2015). Platform scale: How an Emerging Business Model Helps Startups Build Large Empires with Minimum Investment. Sangeet Paul Choudary.
- Emmer, M. (2023). The seven principles of scalability. Forbes.com. <https://www.forbes.com/councils/forbesbusinesscouncil/2023/12/05/the-seven-principles-of-scalability/>. [08.04.2025.]
- Fraiman, D. (2021). A self-organized criticality participative pricing mechanism for selling zero-marginal cost products. *Chaos Solution & Fractals* 158(8):112028. DOI:10.1016/j.chaos.2022.112028.
- Gangwar, M. and Bhargava, H.K. (2023). Pricing on-demand services: Alternative ways of combining usage and access fees. *Prod.Oper. Manag.* ol 32:11–27. DOI: 10.1111/poms.13835.
- Gillespie, A (2007). *Foundations of Economics*, Oxford University Press
- Hamirani, Q. (2024). Mastering the arts of scaling your business. Forbes.com. <https://www.forbes.com/sites/qhamirani/2024/10/06/mastering-the-art-of-scaling-your-business/>. [18.02.2025.]
- House, E., Park, V. and Histon, C. (2004). Cost and business model in scientific research publishing. SQW Limited, Enterprise House, Vision Park, Histon, Cambridgeshire. https://wellcome.ac.uk/sites/default/files/wtd003184_0.pdf. [25.02.2025.].
- Hyun, C. and Byun, C. (2016). *The Economics of the Popular Music Industry*, Palgrave Macmillian.
- Johnson, J. (2024). Would you make it on shark tank? The importance of scalable business models. Business.com. <https://www.business.com/articles/the-importance-of-scalable-business-models/>. [23.01.2025.]
- Kie-Mason, J.K. and Riveros, J.F. (2000). Economics and Electronic Access to Scholarly Information. (eds.) Kahlin, B.; Varian, H., *Internet Publishing and Beyond: The Economics of Digital Information and Intellectual Property*, The MIT Press, Cambridge, Massachusetts.
- Krmeta, A. (2024). Modern data platforms and scalability. Medium.com. <https://medium.com/symphonyis/modern-data-platforms-and-scalability-6dbc56762359>. [02.02.2025.]
- Lozić, J. and FotovaČiković, K. (2024). Digital transformation: The fundamental concept of transformation of business activities. 107th International Scientific Conference on Economic and Social Development – Economic and Social Survival in Global Changes, Zagreb. Book of Proceedings, pp. 326-337. ISSN 1849-7535.
- Lozić, J. (2019). Industrijadigitaliziranihsadržajstvaranovuparadigmuteorije troškova: nultigraničnitrošak u digitalnomizdanjučasopisa. *Polytechnic & Design*, Svezak 7, br.1, 53.-59.
- Lozić, J. (2023). *Menadžmentdruštvenih mreža*. SveučilišteSjever. Centar za izdavaštvo. ISBN 978-953-7986-62-9.

- Markley, J. (2024). What is zero marginal cost. SmartCapitalMind.com. https://www.smartcapitalmind.com/what-is-zero-marginal-cost.htm?utm_content=cmp-true. [18.03.2025.]
- Mason, P. (2020). The post capitalist transition: Implications for the left. *The Political Quarterly*, Vol. 91, No. 2. DOI:10.1111/1467-923x.12851.
- McTaggart, D., Findlay, C. and Parkin, M. (2015). *Economics*, Seventh Edition, Pearson Australia.
- Moazed, A. and Johnson, N.L. (2016). *Modern Monopolies – What it takes to Dominate the 21st Century Economy*. Applico, LLC. ISBN 9781250091895.
- Odlyzko, M.A. (1995). Tragic loss or good riddance? The impending demise of traditional scholarly journals. *International Journal of Human-Computer Studies*, 42;71.-122.
- Parker, G.G., Van Alstyne, M.W. and Choudary, S.P. (2016). *Platform Revolution: How Networked Markets are Transforming the Economy and How to Make Them Work for You*, W.W. Norton & Company Ltd. ISBN 978-0-393-24913-2.
- Pavić, I., Benić, Đ. and Hashi, I. (2006). *Mikroekonomija, Drugoizdanje*, Sveučilište u Splitu, Ekonomskifakultet Split
- Pawlovski, A.M. (2025). When zero marginal cost isn't free: The hidden cost of digital abundance. Medium.com. <https://medium.com/design-bootcamp/when-zero-marginal-cost-isnt-free-the-hidden-costs-of-digital-abundance-1160474dc8ed>. [02.02.20259.]
- Pindyck, R.S.; Rubinfeld, D.L. (2005). *Mikroekonomija, Petoizdanje.*, MATE
- Rifkin, J. (2015). *The zero marginal cost society: The Internet of things, the collaborative commons, and the eclipse of capitalism*, Palgrave Macmillan, St. Martin's Press LLC. ISBN 978-1-137-28011-4.
- Rouchy, P. (2021). Rifkin's misreadings of the zero-marginal cost of production of information technology. *Mises: Interdisciplinary Journal of Philosophy, Law and Economics*. Vol 9, Special issues. DOI: <https://doi.org/10.30800/mises.2021.v9.142>
- Samuelson, P.A. and Nordhaus, W. D. (1992). *Ekonomija, Četrnaestoizdanje*, MATE
- Samuelson, P.A. and Nordhaus, W. D. (2010). *Ekonomija, Devetnaestoizdanje*, MATE
- Sexton, R.L. (2016). *Exploring Economics*, Seventh Edition, Cengage Learning
- Srnicek, N. (2017). *Platform Capitalism*. Polity Press. ISBN -13: 978-5095-0486-2.
- Waldfoegel, J. (2017). How Digitalization Has Created a Golden Age of Music, Movies, Books, and Television. *Journal of Economic Perspectives*, Vol. 31, No.3, 195.-214.
- Waldfoegel, J. (2018). *Digital Renaissance: What Data and Economics Tell Us about the Future of Popular Culture*, Princeton University Press.
- Yang, J., Zhao, J., Qiu, J. and Wen, F. (2019). A Distribution Market Clearing Mechanism for Renewable Generation Units with Zero Marginal Costs. *IEEE Transactions on Industrial Informatics*, 15 (8) pp. 4775-4787. DOI: 10.1109/TII.2019.2896346.