

Triadic Models as a Complex Model: *Technology-Entrepreneurship-Art of Film*

Adrian ZĂVOIANU

Doctoral School of Entrepreneurship, Business Engineering & Management
National University of Science and Technology Politehnica Bucharest, Romania
ctmedia.zavoianu@gmail.com

Cezar SCARLAT

Doctoral School of Entrepreneurship, Business Engineering & Management
National University of Science and Technology Politehnica Bucharest, Romania
cezarscarlat@yahoo.com

Abstract: *The triadic models share interesting features as well as deeper investigation potential. The relationships between triad's elements are not only conceptual but operational as well. Three examples are given, as the fourth case is further analysed in depth.*

The paper aims to reveal the research potential of triadic models by examining the triad Technology-Entrepreneurship-Art of Film at the conceptual level. The analysis potential of triadic models is emphasized, by systematic investigation of the two-by-two inter-relationships, in a triple S holistic approach (synthetic, systemic, and synergic).

This paper focus is on the last triad case (technology-entrepreneurship-art of film) – which is both a novel approach and new integrative analysis. Trying to bridge the literature gap, the authors propose a discussion exploring the possible inter-links between the three elements of the triad.

Trying to bridge the literature gap, the authors propose a discussion exploring the possible inter-links between the three elements of the triad. The results of this endeavour are twofold encouraging: (i) by underlying the investigation potential of triadic models, in general, and (in particular) the potential of the triadic model technology-entrepreneurship-art of film; and (ii) by implications for business managers, in general, and (in this particular case), for company managers while making strategic decisions, considering criteria linked to different business sectors and resources.

Opening a discussion on triad-type models is worthy – as the above examples (selected from diverse business areas) demonstrate a solid research potential, bringing up new notions (as technopreneurship, technowledgepreneurship, triple S holistic approach) or deepening the study of existing concepts.

This study of the triad of technology – entrepreneurship – art of film, as an explorative essay, has its inherent limitations. The most serious one is the integrated approach of the triad's elements – which is also opening further research paths.

Keywords: *Triadic models, Triple S holistic approach, Technology, Art of film, Technopreneurship.*

Introduction

Originated in the mid-16th century from the French *triade* – via late Latin from Greek *trias* (three) – the noun *triad*, as defined by the Oxford dictionary, defines a group or set of three related things or people, considered as a unit (as a chord of three musical notes – a given note plus the third and fifth above it; and even a secret society, originally Chinese – typically known for being involved in organized crime).

Triad is a large denominator, met in various areas of general knowledge and science as well. Let's revisit just a few of them: triadic color scheme; political triumvirate (the first, in ancient

Republican Rome: Caesar, Pompey and Crassus); triad literary form met in medieval Welsh and Irish literature; triads in chemistry, as the earliest atomic-weight classification of the elements (Döbereiner's Law of Triads, 1817). The "triple helix" model of university-industry-government as presented by Etzkowitz (Etzkowitz, 2003), (Etzkowitz, 2008), launched as early as 1993, is a triad too.

Triadic models are conceptual constructs of three inter-related elements as triads; however, they are not simple sets of three elements. Triad-type models are *systemic* (as the three elements of the triad are parts of the same system) and they have to be *synthetic*, emphasising what is essential in each element as well as relevant inter-connections among them. A triadic model should also be *synergic*, displaying more features and potential of the investigated triad's elements, emphasising higher value than the sum of features and potential of the three isolated elements, or even considered as three separate pairs of two-by-two. This is why the triadic models, by this *triple S holistic approach* – as defined by Scarlat (Scarlat, 2017) – have more investigative power. Consequently, they prove to be both finer research tool for theorist scholars and decision making support for practical managers, entrepreneurs and policy makers.

Yet interesting and idea generating, it is beyond the purpose of this essay to analyse which set of three elements is, and what is not a triad. It offers several illustrative examples from economy, project management, entrepreneurship, and marketing. Consequently, more specifically, this paper aims at presenting three example-cases of triadic models used to investigate and analyse basic concepts and elements in the above mentioned areas: stakeholders' triad; project management triad – as schematized by the Project Management Institute (PMI, 2008); and *technopreneurship* triad – as introduced by Scarlat (Scarlat, 2014). To note that triad analysis is aiming at better understanding a more complex concept, defined by three lead-concepts, by two-by-two finer analysis (usually characterised by better-known relationships, ideally quantitative, cause-effect types). Some general objectives that might be relevant to article - exploring the intersection of technology and entrepreneurship, analysing the impact of the film on entrepreneurship, understanding the role of Art in Technology and Entrepreneurship and promoting cross-disciplinary collaboration.

Triadic Models: Triad-Based Models

The mutual influence and interdependence between technology and entrepreneurship were studied by many scholars as Cuero Acosta, Nabi and Dornberger (Cuero Acosta et al., 2014) and Alderete (Alderete, 2014)– so that technology-based entrepreneurship (or technology entrepreneurship) starts to be known as Techno-entrepreneurship.

It is obvious that scholars agree on the intimate interdependence between entrepreneurship, innovation, and technology. As result, corresponding studies are carried out and specialized journals publish them, more or less successfully. However, it is noteworthy that several journals are focused on interdisciplinary areas, two by two (entrepreneurship and innovation; innovation and technology; technology and entrepreneurship), which demonstrates the high level of interest among theorists and practitioners.

Following the trend, the virtues of the triple S holistic approach were exploited by Scarlat (Scarlat, 2014) in case of the triad entrepreneurship-innovation-technology; simultaneously, the common zone of inter-disciplinarity between all three areas of interest was called *technopreneurship*. Nowadays an important part of new businesses are knowledge-based.

Accepting that *technowledge* is an appropriate term for technology knowledge, then managing this particular type of knowledge as well as knowledge-based [new] technology

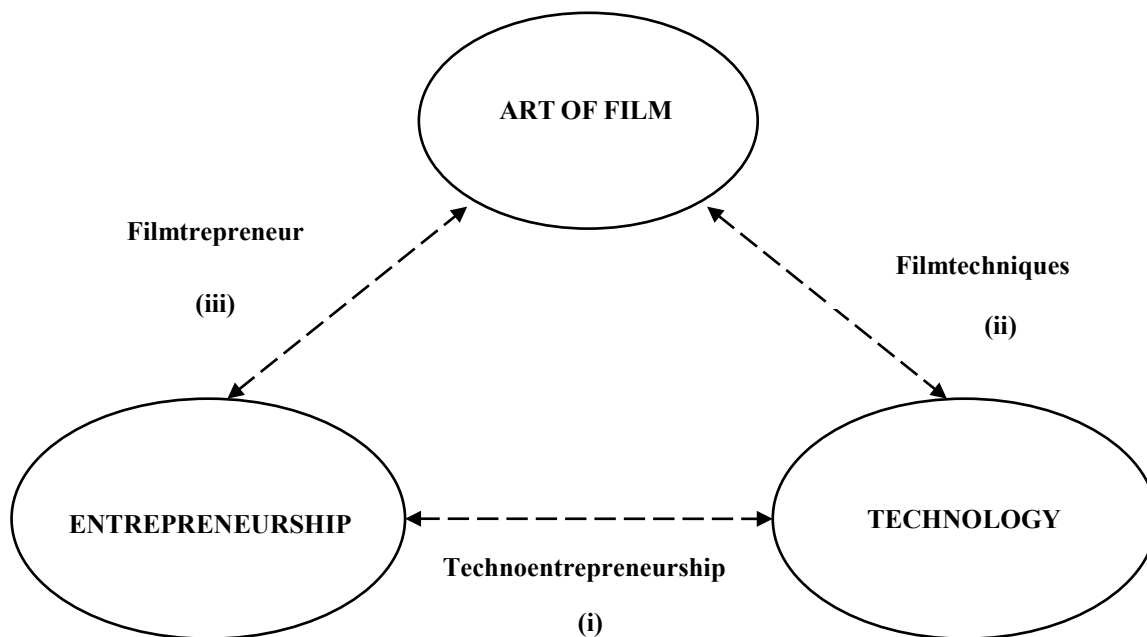
businesses is a particular type of management – *technowledge management*. Therefore, *technowledgepreneurship* might be a suitable term for *technowledge entrepreneurship*.

The Triad of Technology-Entrepreneurship-Art of Film

The paper focus is on the *Technology – Entrepreneurship – Art of film* triad, which emphasizes the analysis potential of the triadic models, by systematic investigation of the two-by-two inter-relationships, in a triple S holistic approach (*Synthetic, Systemic, and Synergic*).

The triad of Technology, Entrepreneurship, Film, and Art combines elements from various domains, highlighting the intersection of creativity, innovation, and business. The intersection of these concepts can result in innovative projects and opportunities, such as tech startups focused on creating digital art, entrepreneurship in the film industry, or the use of technology to enhance artistic expression. This triad highlights the dynamic relationship between technology, entrepreneurship, film, and art in our modern, interconnected world.

This brings in discussion triad: *Technology – Entrepreneurship – Art (Art of film, specifically)* – as schematised in *Figure 1*. The analysis is conducted at conceptual level, by each two components, followed by discussion about possible integrated study. As the relationship Technology-Entrepreneurship (*Figure 1, i*) was discussed already, the following sections are dedicated to the other two.



**Figure 1. Technology, entrepreneurship, art of film and their two-by-two relationships:
A base for a conceptual model.**

Relationship Technology – Art of Film

(ii) Filmtechniques - the relationship between technique and film (Figure 1)

George Sadoul enthusiastically begins his book *The History of World Cinema*: “*An art was born before our eyes*” (Sadoul, 1961). But the *seventh art* was born neither quickly nor easily. It took many technical improvements and discoveries starting with: Faraday's wheel, Daguerre's and Niépce's patents, Muybridge's experiment (which demonstrated that a running horse is at one point with all its legs in the air), Jansen's astronomer's revolver, Marey's photographic rifle, Reynaud's

praxinoscope, Horner's improvement of the zoetrope and last but not least Edison's films and inventions. They were all in the race to make the first film show with an audience.

Ricciotto Canudo was the first to introduce cinema into the arts system, with "*La naissance d'un sixième art. Essai sur le cinématographe*" (*The Birth of a Sixth Art. Essays on the Cinema*), in 1911 (Canudo, 1980). He then returned, in 1919, with "*Manifeste des sept art*" (*Manifesto of the Seventh Art*). The renowned film critic, defines the place of cinema as "*the art of total synthesis, the astonishing child of feeling, the total art towards which the rest have always tended - the absolute pure fusion of the arts... we have engaged science and art*" (JMW, 1975).

The role played by technology in the art of film, and especially in its evolution, is noted by French authors Gérard Lyon-Caen and Pierre Lavigne (Lyon-Caen et al., 1957), who first stated that cinematography is simultaneously "a technique, an art, and an industry". A technique that involves the photographic recording of a scene, capturing sounds and words, in order to project images and sounds onto a screen (Pricop, 2004).

Due to new technologies, new possibilities for interaction in watching films are being sought and explored in the most captivating and intuitive manner, giving the film spectator the role of editing the story in real time (António et al., 2017).

Bares and Lester's theory about technological development has materialized today through digital cinematography, which utilizes images and sounds from the binary storage of a computer. This evolution has brought an end to something nostalgic (film shot on celluloid) for some and a new opportunity for others (digital filmmaking). Cinema and television benefit from modern, digital techniques and rapid progress in the field of graphic technologies, which have paved the way for the emergence of systems capable of automatically generating 3D animations (Bares & Lester, 1997).

Today, it is possible for an actor to be entirely digitally recreated. The development of the concept of "emblem of digital effects", promoted by Kristen Whissel. An "emblem of effects" is a visually spectacular computer-generated effect that provides a stunning vision of the film (Whissel, 2014).

Cinema has established itself as the seventh art, but in certain situations, it has become an art of the elites, which, as described by Adorno (Adorno et al., 1941), is not easily accessible in some cases. High art presents subjects for reflection and challenges societal conventions. As a result, "products of high art are not economically efficient".

"The art and auteur film is that elite cinema, full of meaning and significance where the value of the dramaturgical concept is combined with the poetics of the great filmmakers", believes director Laurențiu Damian. It is the cinema of genius auteurs such as Michelangelo Antonioni, Federico Fellini, Akira Kurosawa, Kim Ki Duk, Lars von Trier, Hou Hsiao Hsien, Ingmar Bergman, Andrei Tarkovski, Orson Welles, Margarethe von Trotta, it is "a cinema that you think about, a cinema with sequences that obsess you for a long time", "Art and auteur film means not only filmmakers who have long since entered world cinema culture, but also young filmmakers who experiment, propose postmodern formulas, resize the art of filmmaking and conquer the major international festivals: Philip Kaufman, Zhagke Jia, Jacques Audiard, Vincent Paronnaud and Marjane Satrapi, Sylvian Chomet and Romanians Cristian Mungiu, Cristi Puiu, Corneliu Porumboiu and Călin Netzer", concluded Laurențiu Damian (Damian, 2000).

Relationship Entrepreneurship – Art of Film

(iii) Filmtrepreneur - the relationship between entrepreneur and film (Figure 1)

Of all the arts, film is the one that has an obvious double valence: that of art and industry. Cinema, in turn, encompasses many of the other arts. On the other hand, its strong technical character has conditioned its historical development since its very beginnings. Translating ideas from the initial phase of a film project requires managerial attention. The financing and budgeting of a film can be compared to the creation of a *puzzle*.

First of all, the film's „atypical” character should be underlined. „Is film a cultural good or a product? Do we relate to film as a commodity with which we trade? Does it become a commodity when we trade with it and trade it? Is it a service that we offer to the film-goer, in the cinema, to the ticket-paying audience of the film show?” (Şandor, 2023). The sale of the film is to a very broad audience, atomised in terms of demand. This is why film productions also have a very high social impact. Because of the extraordinarily large number of consumers, they have an enormous involvement in cultural life. It is the film industry that records artistic creation and distributes it.

Another feature of the film's specificity is related to the high production and even distribution costs. It is also technically specific and conditional compared to other „commodities”, including even other performing arts products. Hence the need for a rational economic approach to the making of feature films, especially in Romania, the knowledge and skillful and skilful interweaving of marketing policies, the adaptation to not only governmental but also unconventional financing methods.

The success and failure of a cinematic work are not „accidents” of fate.

The first film was called “*Workers Leaving the Lumière Factory in Lyon*” (*La Sortie des Usines Lumière à Lyon*) and, as the title implies, showed the factory employees, mostly women, leaving the building on the outskirts of Lyon after a day's work.

The Lumière factory, the Lumière brothers, do you think it was a coincidence? No way, thanks to the business acumen passed down by their father (industrialist Antoine Lumière), we are witnessing the first promotional, PR action made with the help of film. With the “*cinematograph*” - the camera that was called a “*cinematograph*” - a device that followed other daring attempts to capture movement on film, which for the first time, by adding a light source, could also be used as a projector.

The success of projection and the cinematograph apparatus led the two brothers to expand their activity, hiring people and training them as operators, thus making possible the appearance of newsreels, documentaries, video reports and the first film montages.

A new art, the art of cinema, and a new industry, the film industry, were born. And it all started with the Lumiere brothers' first film.

At its beginnings, the cinematic spectacle was described as a fairground amusement. An amusement that had a global business figure of 76 billion dollars in 2022, according to estimates in the article "Global Movie Production & Distribution Industry – Market Research Report" (*ibisworld.com*, f.a.).

The mutual influence and interdependence between entrepreneurship and the art of film became a subject of study for theorists and practitioners when two authors, Mark McCormack (McCormack Mark, 1984) and Miguel Parga (Parga, 2019), pointed out what school doesn't teach you. This turned the field of study interdisciplinary, and the film author began to be known as a “filmtrepreneur”.

Corresponding to Ferrari's vision, future filmmakers are producer-director entrepreneurs or "Filmtrepreneurs" (Ferrari, 2019), meant to generate revenue and transform their films into profitable businesses. The status of being a Filmtrepreneur becomes an extremely risky adventure, particularly in a small European country like Romania, in comparison to the massive film industry in the USA.

In the specialized literature, the relationship between entrepreneurship and filmmaking is discussed by Charles Haine (Haine, 2019) and Louise Levison (Levison, 2013), covering aspects such as creating a business model, managing taxation and financing, finding distribution markets, teaching creative (artistic) aspects of the industry, and promoting the product known as a film.

When starting a film project, it's wise to find a compelling story, as recommended by Soila-Wadman (Soila-Wadman, 2007), considering Callon's ideas (Callon & Surendran, 1996) about the uncertainty of success in transforming ideas into films, given the awareness filmmakers have regarding the challenges of realizing a new film project.

Consequently, considering the previously mentioned points, we will define the film entrepreneurs (Filmtrepreneur) triangle, formed by the producer-writer-director, drawing a parallel to triadic models – the stakeholder triad as presented by Scarlat (Scarlat, 2017).

Analyzing project management literature, a film can be conceptualized in various chronological stages: initiation, planning, production/execution, post-production, release, distribution, and promotional campaigns, as outlined by Soila-Wadman's study (Soila-Wadman, 2009).

French authors Gérard Lyon-Caen and Pierre Lavigne emphasize the role of the director as the author: "The film is first and foremost the creation of the director, the expression of their own personality. The director is the one who completes the creative act: "transforming the written text into images"; "the director's contribution cannot be individualized as the entire film is their work"; "it is evident that, in the end, the director will be recognized as the sole author of the work" (Lyon-Caen et al., 1957).

Entrepreneurship by Film Technology

In this article, we've initiated a discussion about the role of the Technology – Entrepreneurship – Art of Film triad in the film production process. An interesting challenge would be to analyze, briefly, to what extent the triad of "*Technology – Entrepreneurship – Art of Film*" fits into the pattern of the entrepreneurial triad model?

When *technology* refers to technological innovations or the development and use of advanced technologies in film production, then it is easy to argue that this element falls within the entrepreneurial context. Film entrepreneurs can use technology to improve film production, distribution and promotion processes.

Entrepreneurship is essential for film development, financing and distribution. Entrepreneurial skills are needed to find sources of finance, build strategic partnerships, develop marketing strategies and manage resources effectively. This also includes the production planning and budget management aspects of film projects.

The *Art of Film* component adds a creative and artistic aspect to the triad. Film art refers to the aesthetic, narrative and emotional elements involved in the creation of a film. Directors, writers, actors and creative team members bring value by artistically expressing ideas and messages through film. In an entrepreneurial context, the ability to combine the art of filmmaking with market demands and audience desires can play a crucial role in the success of a film project.

Overall, the “*Technology - Entrepreneurship - Art of Film*” triad can fit into the pattern of the entrepreneurial triad model as it involves all three aspects: technology, entrepreneurial skills and artistic creation. This combination can enable effective development and management of film projects, bringing together technological innovation, sound entrepreneurial strategies and artistic value to attract audiences.

In developing and refining the triadic model integrating TECHNOLOGY, ENTREPRENEURSHIP and FILM ART, we have used a comprehensive and multi-faceted approach. The methodology encompassed literature study, qualitative research and quantitative research to ensure a robust and nuanced understanding of the interplay between these three distinct elements.

Qualitative research has played a crucial role in capturing the nuanced and subjective aspects of the triadic relationship. Interviews-dialogues were conducted with experts and practitioners in the fields of technology, entrepreneurship and cinematic art. Open-ended questions were designed to gain insights into the synergies, challenges and potential opportunities arising from the convergence of these fields.

Quantitative research was used to collect numerical data and identify patterns within the triadic model. Surveys and questionnaires were distributed to a diverse sample, including professionals, academics and enthusiasts in technology, entrepreneurship and film. Statistical methods were applied to analyse the quantitative data, providing a quantitative basis for understanding the prevalence and significance of different factors within the triadic relationship.

Insights from the literature review and qualitative and quantitative research were synthesised to form the initial framework of the triadic model. This involved identifying key links, dependencies and feedback loops between technology, entrepreneurship and film art.

This comprehensive approach sought to provide a holistic and in-depth understanding of the complex relationships between technology, entrepreneurship and film art.

Technology continues to play a transformative role in the art of filmmaking, expanding the possibilities for storytelling, visual creativity, distribution, and audience engagement. While consensus might not be expected when discussing art, it should be sought when discussing technology and entrepreneurship.

The entrepreneurship brought about by film technology can open up a wide area of interdisciplinary study among the three domains: *Technology – Entrepreneurship – Art (Art of film, specifically)*.

Conclusions and Managerial Implications

The study of the triad of technology – entrepreneurship – art of film is an explorative study, essay-type, which has its inherent limitations. The most serious one is the integrated approach of the triad’s elements – which is also the main further research path.

Opening a discussion on triad-type models is worthy – as the above examples (selected from diverse business areas) demonstrate a solid research potential, bringing up new notions (as technopreneurship, technowledgepreneurship, triple S holistic approach) or deepening the study of relationships between existing concepts.

The study of triadic models should be associated with the triple S holistic approach – either in a top-down methodology (as in case of project management triadic model) or bottom-up (cases of stakeholders’ triad, technopreneurship triad).

The triadic models may have different natures but they share several noticeable characteristics:

- The three components are well defined elements (concepts, in general), suitable to be examined separately;
- Yet there are inter-relations between triad's elements, which can be considered in three two-by-two pairs, each investigation bringing up new sides and attributes;
- There could be various types of inter-relations (inclusion, overlapping; cause-effect; correlation), not dealing with the type and nature of each inter-relation certainly being a limitation of this essay, and, consequently, a further investigation avenue;
- The assembly of the triad's elements is a different, new construct (like a tripod with three legs or a temple with three pillars); hence, the need for *the Triple S holistic approach (synergy included)*.

The examples of this paper were picked from different areas of business studies (theory of firm, project management, and entrepreneurship, art business) but the triple S approach is applicable for triadic models at large.

Trying to bridge the literature gap, the authors propose a discussion exploring the possible inter-links between the three elements of the triad.

The results of this endeavour are twofold encouraging: (i) by underlying the investigation potential of the triadic models, in general, and triadic model technology – entrepreneurship – art of film, in particular; and (ii) by implications for business managers, in general, and particularly for the art business managers and entrepreneurs – in assessing their start-up options, designing their strategies and making decisions considering criteria from their specific area of activity.

Reference

- Adorno, T. W., Simpson, G., & Horkheimer, M. (1941). *Studies in Philosophy and Social Science*. Alderete, M. V. (2014). ICT incidence on the entrepreneurial activity at country level. *International Journal of Entrepreneurship and Small Business* 47, 21(2), 183–201.
- António, R., da Silva, B. M., Rodrigues, J. M., & Tavares, M. N. (2017). Experimenting on film: Technology meets arts. *International Journal of Creative Interfaces and Computer Graphics (IJCICG)*, 8(1), 54–66.
- Bares, W. H., & Lester, J. C. (1997). *Realtime generation of customized 3D animated explanations for knowledge-based learning environments*. 347–354.
- Callon, J., & Surendran, K. (1996). Competitive Advantage Through Information Technology. *Journal of Strategic Information Systems*, 5(4), 335.
- Canudo, R. (1980). The birth of the sixth art (1911). *Framework: The Journal of Cinema and Media*, 13, 3–7.
- Cuero Acosta, Y. A., Nabi, N. U., & Dornberger, U. (2014). Entrepreneurial orientation and its impact on the improvement of technological capability in Colombia. *International Journal of Entrepreneurship and Small Business*, 21(2), 231–245.
- Damian, L. (2000). *FILMUL DE ARTĂ* [Interviu]. http://tvr2.tvr.ro/emisiuni/filmul-de-arta_5286.html
- Etzkowitz, H. (2003). Innovation in innovation: The triple helix of university-industry-government relations. *Social science information*, 42(3), 293–337.
- Etzkowitz, H. (2008). *The Triple Helix: University-Industry-Government Innovation in Action*. Routledge. <https://doi.org/10.4324/9780203929605>

- Ferrari, A. (2019). *Rise of the Filmtrepreneur: How to Turn Your Independent Film into a Profitable Business*. IFH Books.
- Haine, C. (2019). *Business and entrepreneurship for filmmakers: Making a living as a creative artist in the film industry*. Routledge.
- Ibisworld.com. (f.a.). Global Mouvie Production & Distribution Industry – Market Research Report. Preluat în 14 august 2023, din <https://www.ibisworld.com/global/market-research-reports/global-movie-production-distribution-industry>
- JMW. (1975). Documents of Film Theory: Ricciotto Canudo's" Manifesto of the Seven Arts". *Literature/Film Quarterly*, 252–254.
- Levison, L. (2013). *Filmmakers and financing: Business plans for independents*. CRC Press.
- Lyon-Caen, G., Lavigne, P., & Desbois, H. (1957). *Traité théorique et pratique de droit du cinéma français et comparé. (No Title)*.
- McCormack Mark, H. (1984). What They Don't Teach You at Harvard Business School. *Glasgow: William Collins Sons & Co. Ltd*, 249.
- Parga, M. (2019). *What They Didn't Teach You in Film School*. Hachette UK.
- PMI. (2008). *A guide to the project management body of knowledge (PMBOK® Guide)* (Fourth Edition). Project Management Institute, Inc.
- Pricop, L. (2004). *Management în cinematografie*. Ed. Tritonic.
- Sadoul, G. (1961). *Istoria cinematografului mondial: De la origini până în zilele noastre* (D. I. Suchianu, Trad.). Editura Științifică.
- Scarlat, C. (2014). Technopreneurship-An emerging concept. *FAIMA Business & Management Journal*, 2(3), 5.
- Scarlat, C. (2017). Triadic models: Triple S holistic approach for inter-relational analysis in business management, entrepreneurship and marketing. *Research Journal of Social Sciences*, 10(1), 1–5.
- Soila-Wadman, M. (2007). Film producer, Entrepreneurhsip, and the Experience Economy. *Entrepreneurship & the Experience Economy*, 318.
- Soila-Wadman, M. (2009). *Entrepreneurship and film making: Translation of ideas in the initial phase of a film project needs attention*. 1-15.
- Șandor, C. (2023). *Filmul independent între politici culturale și politici de marketing*. Akakia.
- Whissel, K. (2014). *Spectacular digital effects: CGI and contemporary cinema*. Duke University Press.