

Netflix's secret path to the top: Analyzing the triad innovation – technology – performance

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Abstract

The term triad represents a complex concept widespread in various fields of scientific research or general knowledge, defining conceptual constructs based on a set of three interrelated elements. The authors suggest that triad of innovation–technology–performance, together with capital movements, represent factors that decisively contribute to economic growth. Starting from the triadic conceptual model of innovation–technology–performance, the current study aims to pursue the analysis of each component of the model within Netflix, a leading company with a high business performance in the entertainment industry, and to validate within it the hypothesis according to which investments in research and development (R&D) significantly contribute to a high profitability. To verify the implicit link between R&D investment and profitability measured by profit margin, the correlation coefficient will be calculated. Netflix is a global leader of the entertainment industry, a disruptor of the consumer's way of enjoying free time while being a business and a technological innovator. It counts a high number of subscribers spread in almost 200 countries, which have the possibility to enjoy anytime and anywhere, on a diverse number of devices, a high-quality digital content by the means of a wide number of entertainment products like TV series, documentaries and movies transmitted through the streaming technology. The company that is publicly traded, has surpassed all the industry's competitors and the present paper focuses on studying the Netflix's model of success, based on the interconnection between intensive innovation, latest technologies and a high performance, elements which have ensured an organic evolution and the top position by counting the number of subscribers, in a highly competitive and ever-changing market, the investments in innovation and state-of-the-art technology being reflected in company's superior performance. Encouraging results and conclusions open possible investigation paths to other companies and industries.

Keywords:

Triad of innovation-technology-performance, capital movements, business profitability, streaming technologies, research and development (R&D)

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INTRODUCTION

In this article, we examine the triad of innovation – technology - performance, which constitutes the foundation of a successful business. Using Netflix as an example, the paper examines how strategic investments in research and development drive innovation and technology to produce exceptional business results. As a result of this analysis, we can gain a deeper understanding of Netflix's prowess in a dynamic and competitive market.

Starting from the conceptual definition of the triad [1], [2], the present article aims to analyze the model in discussion within Netflix and to highlight the fact that the implementation of this triad will conduct to high achievements and superior business performance. This model is also characterized by synergy, offering more possibilities and a much higher value than the potential of individual elements or in dual pairs, becoming a valuable research tool for the theorists and an important decision support for the managers, entrepreneurs and legislators [3]. To cover these areas, the article will debut with a brief description of the company, followed by a presentation of each element of the triad and a comparison analysis with two other market competitors. Afterwards the hypothesis will be stated together with the correlation analysis approach, followed by the presentation of the performance achieved and the correlation calculations. In the end, the results will be discussed, and the conclusions will be presented.

Netflix is a global entertainment company founded in 1997 that currently enjoys the position of international leader with approximately 222 million paying subscribers and a reach of over 190 countries. The company's main strategy is to steadily grow its paid subscription business globally, managing to stay within its profit margin target parameters. The company is constantly improving the customer experience [4] aiming to increase their satisfaction, by broadening and diversifying the content offered, focusing on programming an extensive content that manages to delight existing customers and attract new ones. In addition to all this, the content delivery interface is constantly being improved and online streaming entertainment delivery services are offered to an increasing number of users [5].

THE FIRST ELEMENT OF TRIAD: INNOVATION PROCESS AT NETFLIX

In recent years, the company has seen significant growth in the number of registered subscribers, but the pace of growth varies depending on the country in which it does business. The biggest change in the number of subscribers can be seen in areas where the company is pioneering and represents an innovation in those countries, followed by areas where a low presence is enhanced by the addition of more complex services. When monitoring innovation, a wide variety of KPIs could be used, including here the number of the titles included in the streaming offering, the number of patents files, the amount of R&D investments or the frequency of the new releases (Table 1).

Table 1: Innovation KPIs at Netflix;

Performance and Innovation KPI	Value		
	Netflix	Competitor A - Amazon	Competitor B - Disney
Highest number of titles offered via streaming	17.500	26.000	2.700
R&D investments (% from revenues) • used for:	7 – 8% • developing new products • improving existing ones • advancing technological capabilities.	11-12%	7,3-7,5%
Number of patents • the area of :	912 • technology • business processes, • marketing and content distributed to subscribers	21.137	528
New releases frequency (weeks)	1 • launching new content weekly	1	1

Adaptation from: Netflix (2022), Amazon (2022), Disney (2022)

The company is strengthening its business globally, developing its online entertainment streaming service and default features to successfully handle anticipated membership growth, while also focusing on the potential to schedule and introduce a new original content, adding online games to the range of products offered. The company can offer the opportunity to its customers to access more than 17.000 titles through streaming technology [6]. From this perspective, Netflix is situated in the top of the industry, immediately behind Amazon and far in advance from Disney. As the international offer expands, the business is managed to respond to market needs with an adapted offer of technology and content, especially in the segments of online streaming entertainment or e-commerce, as well as the legal regulations in force or newly appeared [9]. Also, to cover the needs of international customers, the company transmits entertainment materials in international languages or dubs locally produced content in English [10].

Research and development (R&D) investments are critical for the long-term success and sustainability of companies across industries. These investments are typically made with the goal of developing new products, improving existing ones, and advancing technological capabilities. These investments represented between 7 - 9% of the company's revenue, similar with the ones from Disney [7] while Amazon, one of the most innovative companies of the world allocates to R&D between 11-12% from its revenues [8].

Patents, copyrights, trademarks or other intellectual property rights are important to companies in the online streaming entertainment industry. Innovation within Netflix was concluded with over 900 patents in the area of technology, business processes, marketing, or content distributed to subscribers. Considered for a long time, the most innovative company, Amazon totals a little over 21.000 patents while Disney, the next competitor has 528 patents and trademarks. In recent years, Netflix has focused heavily on the diversification of the products and services offered to its subscribers, so the company aims to develop and release new content at a rapid pace, with a goal of releasing new movies and TV shows every week, in order to keep up with the top industry standards where innovation is a daily activity, Amazon and Disney also delivering new content almost weekly. The company has also been investing in technology to improve their platform and user experience, which can also impact their time to market for new features and enhancements.

THE SECOND ELEMENT OF TRIAD: TECHNOLOGICAL DEVELOPMENTS AT NETFLIX

The reputation of the company and its ability to provide its services, attract new members or maintain the existing ones is closely related to a superior performance and increased safety of the technological systems used [11]. Computers and computer systems, both those of Netflix and those of its partners, are protected from cyber security threats, which may include cyber-attacks as well as physical, electronic destruction or other potential disruptions. These systems are checked and updated periodically, trying to avoid attacks that can cause interruptions or delays in the services provided or daily activities, expectations regarding the absence of delays being high [12].

The technology used is a very important element of the business and the results obtained, therefore it is constantly updated [13]. Thus, in order to benefit from the latest achievements in the field, the company has developed technologies to recommend content to members, to market it, and to deliver it quickly and efficiently to various consumers or members' various display devices [14]. The main KPIs used for monitoring technology at Netflix are VMAF which is measuring the quality of the video with values ranging in the 0 -100 interval, the number of devices on which the streamed content could be viewed simultaneously, the quality of experience assessed by the customers with values between 1-5 in relation with the time to play, buffering time or number of interruptions and the audio quality bitrate which quantifies the accuracy, the fidelity and the intelligibility of a video material (Table 2).

Table 2: Technology KPIs at Netflix;

Technological Performance - KPI	Value		
	Netflix	Competitor A - Amazon	Competitor B - Disney
Amazon Web Services (AWS)	yes <ul style="list-style-type: none"> data processing 	yes	yes

	<ul style="list-style-type: none"> • data and information storage • content delivery • continuous delivery • test the infrastructure resilience 		
VMAF	92 - 93	87	83
Number of devices viewed simultaneously	1-4	3	3
Quality of experience	4.3	4	3.6
Audio quality bitrate (kbps)	256 - 640	192 - 640	128-768

Adapting from: Winkelman (2022) [15]

A key element is the existence of heterogeneity among the network components and their availability, including technologies for transmitting radio waves, the state of access points or user [16], the clear reception of images and sounds by users and a high quality of their experience, being the results of a performant network [17], especially in the case of a heavy internet traffic [18]. The company permits the customers view the content on up to 4 devices simultaneously and to offer to them high quality videos with VMAF between 92 and 93 from 100. For comparison, the other two top competitors Amazon and Disney can stream simultaneously on maximum 3 devices and can offer a VMAF between 83 and 87. Company's ability to deliver online streaming entertainment content is greatly improved with frequently, such innovations being mirrored in the customers quality of experience which scored a result of 4,3 out of 5 and in the company's performance represented by the growing number of paying subscribers and the financial results. The other two main competitors, Amazon and Disney, have obtained customer rating of 4, respectively 3,6 out of 5, their market share being also reduced.

Netflix offers a stable audio quality, for most content, using Dolby Digital Plus with a bitrate of up to 640 kbps for 5.1 surround sound, and up to 256 kbps for stereo sound, while the bitrate of Amazon starts from 192 kbps and the one of Disney from 128kbps. However, some content may use other audio formats and bitrates depending on licensing agreements and other factors. The company uses adaptive bitrate streaming technology to adjust the video and audio quality based on the internet speed and other factors to ensure smooth playback.

THE THIRD ELEMENT OF TRIAD: PERFORMANCE ANALYSIS AT NETFLIX

Within Netflix, performance measurement can be divided into two categories: financial performance evaluations and non-financial performance evaluations. In order to evaluate the company's performance and make an assessment about its position, the income and the profit margin will be taken into account as financial performance measurements while for the non-financial performance, the market share and the number of subscribers will be reviewed (Table 3).

Table 3: Performance KPIs at Netflix;

Financial and marketing Performance KPI	Value		
	Netflix	Competitor A - Amazon	Competitor B - Disney
Income (billion USD)	25-31,7	35,3	19,7
Profit margin (% from income)	18 - 21%	7%	15,7%
Market share	> 30%	22%	16,5%
Subscribers (millions)	150 - 221	200	179

Adaptation from: Netflix (2022), Amazon (2022), Disney (2022)

Netflix is a publicly traded company on the NASDAQ Regulated Capital Market. From Fig. 1 it can be observed that the share price has registered an upward trend in the last five years, the earnings offered to investors being

higher than in the case of the other listed companies, as well as higher than the earnings offered by other companies in the same field. Considered by Bloomberg as the most profitable company in the streaming service industry [19], the company posted earnings per share of \$4.3 in 2019, \$6.3 in 2020 and \$11.5 in 2021, which means an increase of 270% in the period 2019-2021 (Table 4).

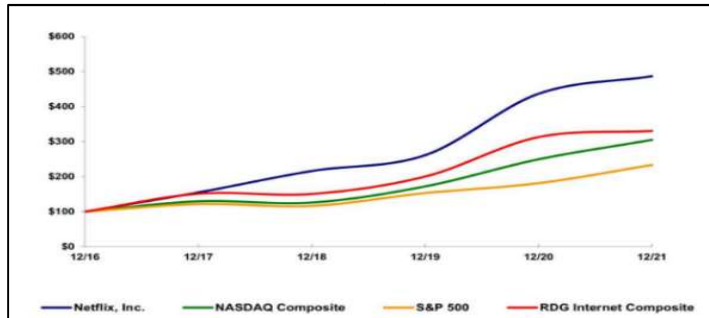


Fig. 1: Netflix shares' performance
Source: Netflix (2022)

	2019	2020	2021
Earnings per share (USD)	4.26	6.26	11.55

Table 4: Netflix EPS between 2019 – 2021
Adaptation from: Netflix (2022)

Investments in innovation and state-of-the-art technology are also reflected in the results recorded in the company's annual financial reports (Table 5). Thus, the company's turnover increased from 24,9 billion dollars in 2020 to 29,6 billion dollars in 2021 and to almost 32 billion dollars in 2022, registering a percentage increase of 27% in the period between 2020 - 2022.

Financial KPI	2022	2021	2020
Streaming revenue (billion USD)	31.7	29.6	24.9
Profit (billion USD)	5.7	6.19	4,5

Table 5: Netflix's financials between 2020 – 2022
Adaptation from: Netflix (2022)

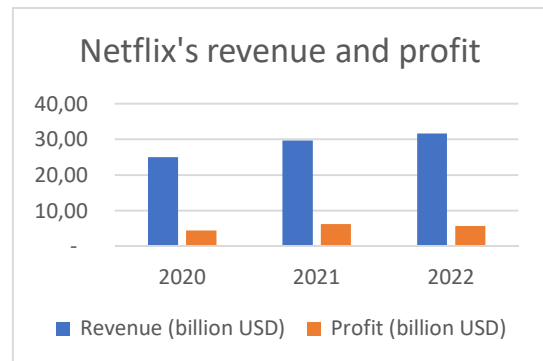


Fig. 2: Netflix's revenue between 2020-2022

An upward trend can be also observed in the case of the recorded profits (Fig. 2). Their value increased from an absolute value of USD 4,5 billion in 2020 to USD 6,2 billion in 2021, reaching an absolute value of USD 5,7 billion in 2022. During this period, Netflix's profit margin has also been on the top of the industry with values up to 18% of streaming revenues in 2020 and 2022 and reaching a value of 21% of streaming revenues in 2021, all of which indicate the high profitability of Netflix between 2020-2022.

Netflix also pays attention to non-financial performance measurement indicators [20]. In addition to the financial results recorded in the last years, the company managed to increase the number of subscribers from 153 million users in 2019 to 189 million users in 2021, reaching a total of 221 million users in 2021, thus achieving a 44 percent increase in the number of subscribers in the period 2019-2021 and a market share of 32%. By comparison, Amazon increased its number of subscribers from 100 million subscribers in 2019 to around 200 million subscribers in 2021 while Disney which started its streaming business in November 2019 achieved a number of 179 million subscribers in 2021.

From the methodology perspective, the article investigates the relationship between innovation, technology, and business performance at Netflix. The study examines key indicators such as R&D investments, profit margins, market share, and subscriber numbers. In order to confirm their hypothesis, the authors calculated correlation coefficients between R&D investments and profitability. Using empirical analysis and competitor comparisons, the study highlights the importance of innovation and technology for achieving high performance.

FINANCIAL AND CORRELATION ANALYSES

To achieve above-market financial results, Netflix has invested heavily in research and development in a constant manner over time, with investments totaling approximately \$2.7 billion in the last year alone. As can be seen in Table 6 and Fig. 3, they were allocated progressively, starting with USD 1.2 billion invested in R&D in 2018, followed by an investment of USD 1.55 billion in 2019, USD 1.83 billion in 2020 and USD 2.3 billion invested in R&D in 2021 and ending with an allocated investment in technology innovation of approximately \$2.7 billion in 2022.

	2022	2021	2020	2019	2018
R&D (billion USD)	2,7	2,3	1,8	1,5	1,2
% from revenues	9%	8%	7%	8%	8%

Table 6: Netflix technology expenditures between 2018 – 2022 between 2018-2022; Adaptation from: Netflix (2022)

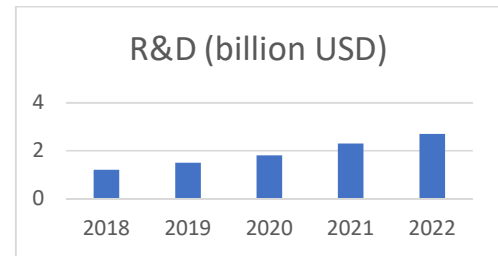


Fig. 3: Netflix R&D expenditures

The authors suggest that Triad Innovation, technology, performance, together with capital movements, represent factors that decisively contribute to economic growth. To verify this hypothesis and the implicit link between R&D investment and profitability measured by profit margin, the correlation coefficient will be calculated within Netflix.

The correlation coefficient measures the strength and direction of the linear relationship between two variables, ranging from -1 to 1. A positive correlation coefficient indicates a positive relationship between the two variables, meaning that as innovation increases, so does performance. A negative correlation coefficient indicates a negative relationship, meaning that as innovation increases, performance decreases. A correlation coefficient of zero indicates no relationship between the two variables. So we have:

H1: The investments in research and development positively correlate to profitability.

The correlation coefficient will be calculated according to the formula:

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n\sum x^2 - (\sum x)^2][n\sum y^2 - (\sum y)^2]}} \quad (1)$$

where r = Pearson correlation coefficient; n = number of observations; x = Netflix R&D investments; y = Netflix profit margin;

To calculate the intensity of the linear relationship between the amounts allocated to research and development and the high profitability recorded, the coefficient of determination will be calculated using the formula:

$$d = r^2 \quad (2)$$

where d = coefficient of determination; r = Pearson correlation coefficient

Also known as R-squared, the coefficient of determination is a statistical measure that represents the proportion of the variance in the dependent variable (in this case, high profitability) that is explained by the independent variable (the amount allocated to R&D). It ranges from 0 to 1, with higher values indicating a stronger relationship between the two variables.

Criterion of significance

In order to test the relationship between the innovation investments and the profitability obtained, R&D investments and the profit margin of Netflix will be considered. According to Table 7, Netflix's research and development investments recorded increasing values during the period 2016-2022, with amounts varying between USD 0.8 billion and USD 2.7 billion, with the profit margin reaching values of 21%.

Table 7: R&D investments and profit margin at Netflix;

Netflix	2022	2021	2020	2019	2018	2017	2016
R&D investments (billion \$)	2,7	2,3	1,8	1,5	1,2	1	0,8
Profit margin (%)	18	21	18	13	10	7	4

Adaptation from: Netflix (2022)

To verify the hypothesis, the correlation coefficient will be calculated according to formula (1). Within Netflix, $r = 0.912$ is thus obtained, a value that indicates a strong positive correlation and a confirmation of the hypothesis according to which investments in research and development significantly contribute to a high profitability. With the funds allocated for the research and development area not only being maintained but even supplemented, the result of the financial year will be an encouraging one for all parties involved, the profitability of the activities carried out being an increasing one.

To check the intensity of the liner relationship between the two elements, formula (2) will be used. After proceeding with the calculation, $d = 0.832$ is obtained, which indicates that within Netflix, the increased profitability is supported by the high and continuously growing investments in the area of research and development. A constant flow of innovation is a key element in achieving success [21] and a high amount allocated to the development of new technologies, motivating a qualified staff or supporting different ideas, tests and projects will increase the profit margin and implicitly the rentability of the company.

CONCLUSIONS

The present research sought to verify the hypothesis according to which investments in research and development significantly contribute to a high profitability obtaining a positive correlation and a systemic link between the two of them, within Netflix. Thus, organizational innovation attracts superior performance both from the perspective of high returns offered to the parties involved, as well as a general development of business performance, and the incorporation of technology into processes and products, brings an accelerated improvement of results. Companies that adapt to changes or even create them, that have an internal culture based on promoting innovation, that develop and use the most modern and best performing technologies, will enjoy a high level of success and high performance.

Following the analysis of the innovation – technology – performance triad within Netflix, the connection between the elements of the triad was highlighted, the businesses evolving in an alert manner and being focused on innovation to be able to overcome the continuous close competition in the market, including here both the innovations of business or new technological developments. Constant technology innovations through which new or improved technologies are launched, including but not limited to various devices, search engines, web systems and IT infrastructure, platforms and digital content, give Netflix a high competitiveness. The Internet itself significantly facilitates the fast and efficient distribution of innovation to customers, which enables frequent releases of innovations that have a rapid impact on customer satisfaction and implicitly on company performance. As a result of innovation and the competitive advantage it gives, Netflix, products and offerings achieve a high success rate and high performance, winning new customers, a high financial performance and the possibility of business expansion.

The analysis of the triad innovation - technology - performance within the company Netflix reveals the systemic connection between the elements of the triad, innovation and technology being the basis of a superior performance and the position of market leader of the company.

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