

# Re-Engineering Digital Marketing Strategy of Dairy Industries

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**How to cite this paper:** Malisianou, E. M., Giannakopoulos, N. T., Sakas, D. P., Toudas, K. S., & Kanellos, N. (2024). Re-Engineering Digital Marketing Strategy of Dairy Industries. *Modern Economy*, 15, 163-191. <https://doi.org/10.4236/me.2024.152009>

**Received:** November 22, 2023

**Accepted:** February 26, 2024

**Published:** February 29, 2024

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## Abstract

With the goal of all businesses, including those in the dairy industry, to climb their website rank in the world web, it is particularly important to implement well-planned promotions and actions in the appropriate communication channels. These channels are now being used as business tools, and therefore, planning, monitoring, and constant updating of the corresponding strategy. This paper examines the effect of big data, collected from the websites of 5 well-known dairy firms, based on their financial and ESG results, by performing statistical analysis (correlation) and Fuzzy Cognitive Mapping (FCM) scenarios, on the global ranking of these dairy businesses. Throughout this study, it is discerned that a significant number of dairy firms' website data, such as social traffic, unique visitors, backlinks, referring domains, referral traffic, paid traffic, direct traffic, search traffic, organic keywords, organic traffic, mobile traffic, and desktop traffic, should be utilized by their marketers and receive further improvement, through investment, due to their ability to enhance the ranking of dairy firms' website in search engine results.

## Keywords

Dairy Industry, Digital Marketing, SEO, Web Analytics, Strategy, Re-Engineering, Financial and ESG Performance, Fuzzy Cognitive Maps (FCM), Decision Support Systems (DSS)

## 1. Introduction

### 1.1. Dairy Industry Sector

The dairy sector is a significant global market (Shahbandeh, 2023), with special

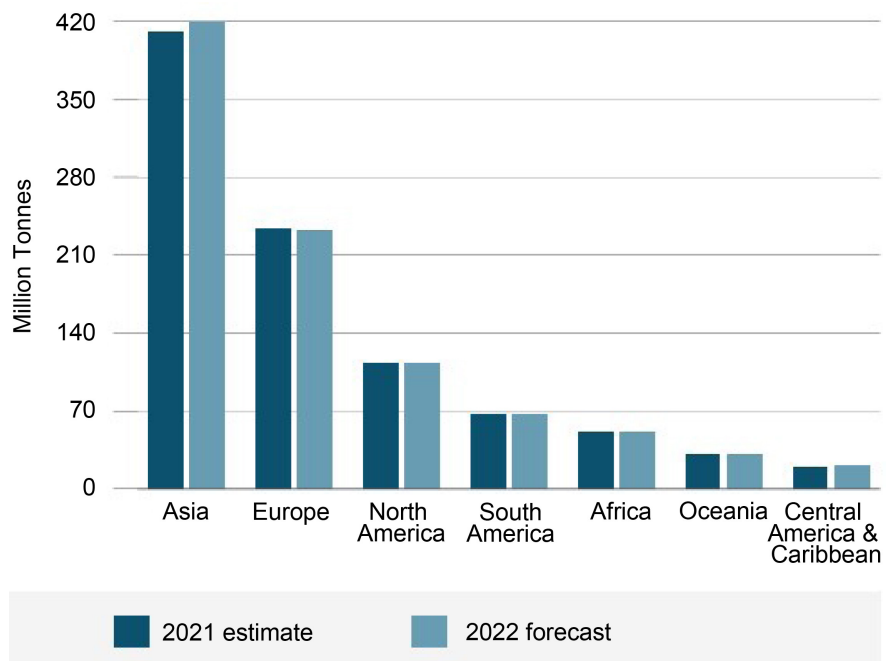
attention on milk, as it is an essential agricultural product that is very delicate and, despite its usage as such, serves as the foundation for a plethora of other goods.

Technology is a crucial aspect for the sustainability of modern dairy e-businesses, both for manufacturing and protection, and for surveillance, advancement, and delivery of manufactured goods (Bhat *et al.*, 2022). The achievement of this worldwide sector is especially important to the advancement of the sector, which, among others, is tackling the strategic issue of globalization head-on.

According to the latest FAO (2022) information (Figure 1), Asia is projected to be the globe's biggest milk-producing area, subsequently followed by Europe, North, and South America, culminating in Africa, Oceania, and Central America and the Caribbean, with an overall calculated milk output of 930 million tons.

In terms of global dairy commerce, the FAO (2022) calculation for 2022 demonstrates a decrease that is the first in almost twenty years (projected at 85 million tonnes in milk substitutes, down 3.4% from 2021), primarily because of decreased imports in China, with additional decreases in Nigeria, Vietnam, and Russia probable to compensate somewhat by greater transactions from the Philippines, Indonesia, the United Kingdom, and the European Union.

With global commerce decreasing, major exporters such as New Zealand, the EU, Belarus, and Turkey will likely experience fewer exports, whereas certain nations such as Mexico, Argentina, and the United States may have higher shipments owing to raised accessible imports of dairy products, particularly butter, and milk powder.



**Figure 1.** Milk Production by Region, 2022. Source: [https://www.fao.org/markets-and-trade/publications/en/?news\\_files=113040](https://www.fao.org/markets-and-trade/publications/en/?news_files=113040).

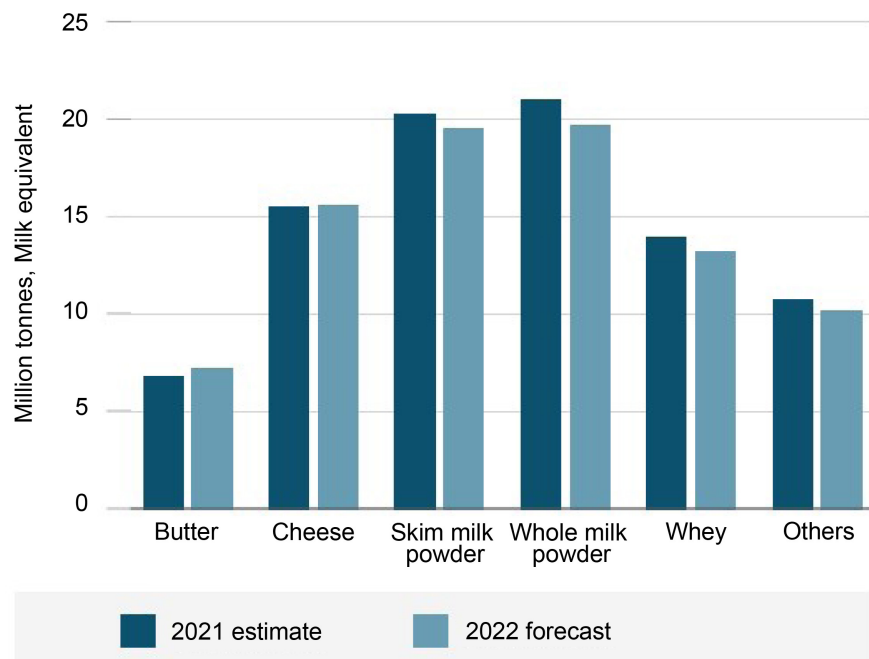
Notwithstanding the predicted decline in worldwide exports (**Figure 2**), some items, like butter and cheese, are said to have plenty of room for development.

## 1.2. Dairy Industry and Digitization

The Internet was invented at the end of the 1970s, and commercial usage started at the beginning of the 1990s (Chaffey & Patron, 2012), with the number of customers with the ability to use it growing all the time. Particularly in the past twenty years, the World Wide Web has thoroughly entered individuals' daily lives, while social networking has emerged as a prominent digital arena for the sharing of thoughts and a beneficial means of interaction for the marketing sector (Porter, 2001).

The widespread availability of ICT (information and communication technologies) to the ordinary population, together, and the inexpensive nature of the required supplies and connection on the other, have rendered internet communication important in the twenty-first century (Saura et al., 2017). Following the internet's change in interaction and knowledge acquiring arrived digital transformation, which is the method of employing technological advances to develop novel or adjust current company lifestyle, procedures, and interactions with consumers to fulfill the market's altering demands and requirements.

Considering the digital revolution, every firm should adjust to evolving patterns, seize available possibilities, yet also scent and react to technological advancements in real-time (Martínez-Peláez et al., 2023). Marketing is one of the initial industries to recognize and react to shifts in social norms and routines. The creation and use of digital marketing solutions is also influenced by digital



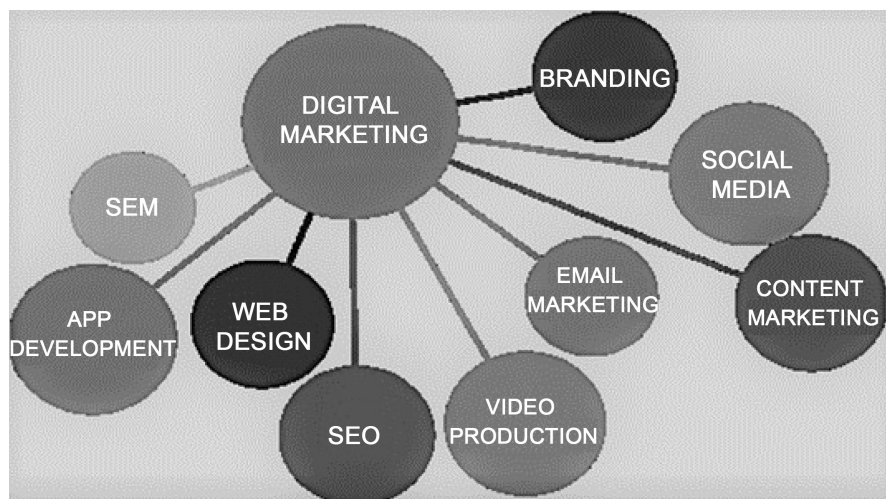
**Figure 2.** Composition of world dairy exports 2022. Source: [https://www.fao.org/markets-and-trade/publications/en/?news\\_files=113040](https://www.fao.org/markets-and-trade/publications/en/?news_files=113040).

transformation (Kotane *et al.*, 2019).

Digital marketing evolved, develops, and develops in tandem with advances in digital technology (Dsouza & Panakaje, 2023). Therefore, digital marketing—a wide word for any sort of internet advertising—is the use of online mediums to advertise or market products/services to the purchasing open to everyone, and it employs a variety of tactics to draw in the demographic being targeted (Jayakumar & Ranjitha, 2018), a few of these are seen in **Figure 3**.

The following are brief explanations of the aforesaid procedures:

- SEM: Search Engine Marketing: “SEM is a method of marketing an organization to increase presence in search engine results, via paid advertising (PPC) or organic traffic via SEO”.
- SEO (Search Engine Optimization): SEO (Search Engine Optimization) is the method of improving a web page so that it ranks at the top of the SERPs of search engines and is more visible to prospective customers (Papagiannis, 2020). Keyword study and efficiency, content development and optimization, building links, technical SEO, and optimizing for mobile are some strategies utilized in SEO. SEO is a vital component of digital marketing since its purpose is to attract organic traffic to a site through search engines. According to the research (Semrush, 2024), the main variables that result in ascending the search engines include getting suggestions from other internet sites (links, backlinks), the safety of the website, the breadth and caliber of its content, its traffic (including in general but primarily direct traffic, because of the recognition of the company), visitor behavior (visit duration, bounce rate, orienting sections per session, etc.), and the material on the website (attractiveness, friendliness, etc.). It should be emphasized that the primary goal of SEO specialists is organic traffic, which includes traffic from search engines but excludes sponsored outcomes on these or additional channels, such as social media. Search engines prioritize sponsored results above organic results, implying that purchased traffic contributes only momentarily (while a campaign



**Figure 3.** Digital marketing actions. Source: Jayakumar & Ranjitha (2018).

is active) rather than forever, as organic traffic does.

- Video creation: One of the main tendencies in digital marketing is video creation, to attract visitors and turn them into consumers via the delivery of engaging and appealing material (We are Social, 2023). A unique film that displays the principles of an organization or its goods, in particular, is far more likely to captivate the purchasing public than words, which, regardless of how helpful does not maintain the visitor's interest and is on the decline. Email marketing is a marketing activity whereby non-messages are delivered to a set of individuals by e-mail to turn the receiver into a client. It is used to advertise commercials, develop trusting connections, and enhance reputation. This type of activity focuses on previous or existing clients by urging them to invest right away (Jayakumar & Ranjitha, 2018).
- Content Marketing: According to Jayakumar and Ranjitha (2018), content advertising is a marketing strategy centered on developing and delivering value, important, and relevant information that draws in and keeps viewers.
- Social Media Marketing: the use of social media to drive traffic to a website. Social media advertising is the technique of driving visitors to a web page using social media. It emphasizes attention-grabbing material and invites visitors to pass on it across these channels (Jayakumar & Ranjitha, 2018). As may have been observed from the examples previously, digital marketing is distinct from conventional advertising in its utilization of media platforms and techniques that enable a company to evaluate the advertising initiatives it executes to determine what works as well as what does not—typically, in actual time (<http://lab.elessons.gr/>).

The primary goal of digital marketing is to draw in clients via the methods used, and the advantages that the firm obtains from them are numerous, indicating that are the following (Veleva & Tsvetanova, 2020):

- High engagement and connection between the firm and the client,
- Geographically unrestricted visibility,
- The ability to respond quickly and adapt to the demands and desires of the client,
- High degree of measurable marketing outcomes,
- Enabling segmentation of customers and aiming for,
- Strong level of customization of advertising communications,
- Increased satisfaction among consumers,
- Making it easier to reach a broader readership via social media,
- Increased traffic to corporate websites,
- Enable competitive review and evaluation,
- Increase the level of oversight and execution of rectification measures throughout the planning and actual execution of marketing actions,
- The capacity to reduce effort on marketing study,
- Reduced marketing expenditures,
- Creating opportunities for new strategy growth, etc.

Furthermore, the value of digital marketing is crucial for the buyer himself, because the quick technology innovations that guide it have transformed how consumers make purchases (Afrina *et al.*, 2015):

- Ongoing updates on goods or services,
- Higher “engagement” to the company,
- Simple to understand details about products or services,
- Simple contrast to rivals,
- The possibility of right away buying,
- The capacity to distribute content concerning products or services,
- Accurate pricing.

Most businesses pursue techniques that are “suitable” with several tactics, and typically one supports the other. The worldwide dairy sector cannot but embrace the power of IT and marketing in this contemporary business environment, whilst every part of digital marketing, as it appears from pertinent studies (Afrina *et al.*, 2015), has a favorable influence on selling conditions in addition.

As a result, digital marketing for contemporary organizations is on the rise, since it offers significant benefits (Guce *et al.*, 2020):

- Simple access to consumers,
- Direct advertising,
- Continuous advertising,
- Cost-effective ways.

Furthermore, it is mentioned that the traffic of the food and drink sector’s web pages accumulated in April 2023, around 4.1 billion guests, with the pattern of the past months represented in the next figure (Figure 4), nevertheless, indicating a 26% reduction in traffic during the last 12 months, opposed to the previous year. During the same time, the top 100 websites in this group get the majority of their traffic from direct views (Direct) and search engine views (Search).

Over the past few years, the dairy sector has worked to broaden its product offering through the addition of new substitute goods, as well as typically adhering to market trends to meet current customer demand and requirements (Mordor Intelligence, 2022). In this environment, dairy farmers must keep up with the industry’s digital revolution (Hassoun *et al.*, 2023).

Market Traffic Dynamics

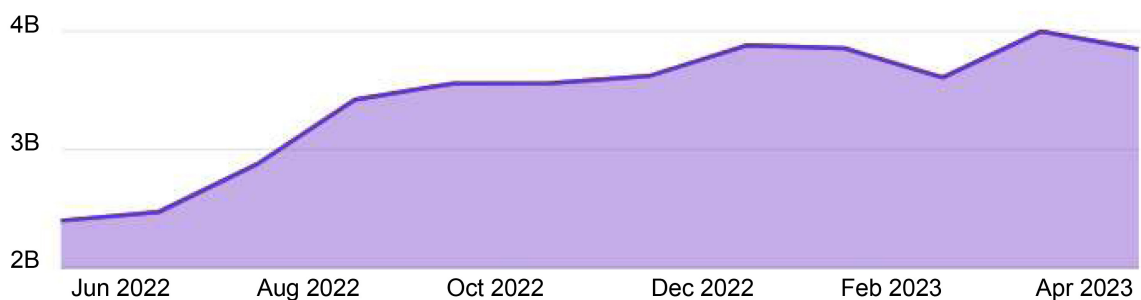


Figure 4. Food and beverage industry website traffic. Source: <https://www.semrush.com/>.

### 1.3. Consumer Behavior through Web Analytics

Customer behavior in any sector offers an abundance of helpful data for an organization, particularly in deciding what to do to draw in prospective clients—as well as assessing the method currently in place—and it is certainly important to the relevant section of the company as well as to the company in its entirety (Giannakopoulos *et al.*, 2023).

Because the adoption of modern computer technology has radically transformed marketing, and traditional approaches are not more adequate to meet the aims of companies and advertisers, the significance of internet marketing for this reason become more crucial. Frequently, the marketing team is also the department that takes an economic strike if the company's finances aren't strong enough to support the development of current marketing methods.

Furthermore, customers are rapidly linking with companies via digital avenues (Jung & Shegai, 2023), and as a consequence, marketers have grown conscious of the necessity to “track” and assess the efficacy of these encounters.

In this setting, the application of “web analytics,” described as “the evaluation, gathering, examination, and dissemination of online information for comprehending and improving web usage” (Web Analytics Association, 2008), is especially significant. It is an instrument that was first used in the 1990s (Chaffey & Patron, 2012), that gathers and documents information that helps analyze and improve a site with the goal of its greatest efficiency and gathers data regarding the origins of a website's traffic (e.g., e-mail, commercials, hyperlinks, search engines, etc.), routing avenues, as well as other aspects of the site's visitor's actions (e.g., browsing duration, etc.).

This technique is frequently used to explore and analyze an organization's marketing tactics or specific marketing initiatives, as well as to assess the customer's “response” to a commercial action. Since it is restricted to the digital world, it is a significant “step” into quantifiable marketing, resulting in the fulfillment of advertising actions documented by this instrument.

The data points that the web analytics group “includes” are diverse, and one straightforward method for an organization to get web analytics is a digital tool that constantly gathers all of the required data that are transformed into particular metrics for every business web page, that gathers data centered on the guests' behavior on it.

Web analytics is a subset of big data, which is defined as a significant quantity of data that's complicated and quantity makes it nearly difficult to capture, store, and interpret using standard techniques (Hassoun *et al.*, 2023). In essence, their size stems from their broad variety, which relates to the multiplicity of data kinds produced by fresh platforms and innovations. A company can get this data from either internal or external sources, and it is frequently discovered in three formats: unstructured, semi-structured, and organized (Mohapatra & Mohanty, 2020), based on the “structure” and analysis simplicity of the data.

Big data, irrespective of size, may assist companies in many ways (Iqbal *et al.*,



2018). These benefits include increased openness because big data can decipher information that is qualitative as well as quantitative is essential for the generation and retention of digital data from transactions, the ability to provide optimally modified goods and services, and the ability to make better decisions, reduce risks, and find significant data through developed analytics.

Big data-driven marketing ideas are bound to assist the company with a variety of issues, including determining which clients are most likely to react to an advertisement, creating dynamic indicators and visualizations for leaders, and social media positioning of the brand. These solutions naturally require a broader digitization of enterprises. Consequently, Big Data solutions can be viewed as the cornerstones of “helpful structures” that efficiently assist marketing professionals (Sakas *et al.*, 2023a). In the decades to come, it is anticipated that these options will present a chance for the study and creation of marketing remedies that broaden the scope of the information they can supply.

For this reason, as businesses lack the expertise to comprehend how big data operates and how it might benefit an organization (Coleman *et al.*, 2016), the particular instruments it offers become especially valuable in the marketplace and act as a catalyst for growth (Sakas *et al.*, 2023c) to sustain the company’s standing in the current and upcoming competition.

Consequently, every business now has the opportunity to use big data to collect, analyze, and investigate the trajectory of customer behavior to find possibilities to emulate effective procedures, assess the efficacy of its behaviors, research the competition, and ultimately implement the digital organization required to meet its objectives.

#### **1.4. Advantages of Re-Engineering the Digital Presence of Dairy Companies**

It is a known reality that contemporary consumers are concerned with the social, matters, and environmental aspects of the manufacturing process in addition to its overall quality. They are additionally ready to shell out more for healthier food and have worries about how animals are treated (Mordor Intelligence, 2022).

Companies have to start using technological advances to compete and adapt to both internal and external modifications in the company’s surroundings (Hadzhiev, 2010). Meanwhile, sectors frequently employ the “re-organization” (re-engineering) tactics, which calls for the meticulous organizing of actions within specific objectives and a vision for the future, while undoubtedly considering potential risks.

According to Talwar (1993), the primary goal of reorganization is to generate wealth for both shareholders and customers by strategically identifying possibilities that may be taken advantage of at the level of the company. The strategy has two elements: either worldwide company reorganization or restructuring of specific procedures (the latter being the most common; examples include developing new products, changing the way that processes are costed, utilizing competi-



tive advantages in distinct ways, utilizing contemporary channels for interaction and advancement, raising the standard of service to customers, etc.).

Any such procedure's final objective is basically to substitute or enhance procedures to increase every company unit's operational efficiency. According to [Dachyar and Christy \(2014\)](#), there are at least four primary justifications for putting company reorganization methods into practice: improving and restoring client service; cutting time to market by eliminating non-value-added operations; lowering manufacturing expenses or/and services; and raising the caliber of those products.

The procedure can be completed using a variety of established approaches, strategies, and instruments, in addition to particular phases, with the proper usage of electronic media and computer networks ([Giakomidou et al., 2022](#)).

Ultimately, this kind of restructuring can minimize "losses" and unusual expenditures, systematize particular corporate methods and procedures, and provide more oversight in the event of a necessity.

## 2. Materials and Methods

The problem of this work is defined as whether the top five (5) dairy companies worldwide can inspire the domestic industry to utilize effective digital marketing strategies, based on the statistical study.

The ultimate goal of each of the businesses on the market is undoubtedly the optimization of its brand name and, by extension, its ranking in internet search engines. Achieving inclusion on the "first page of Google" is essentially the main goal of every business, since this climb brings multiple benefits such as new visitors, new customers, greater popularity, more revenue, etc.

Taking into account the factors that lead to this climb, the trends emerging from the statistical data of the websites being studied, but also the data resulting from the observation of their digital presence, as well as the above bibliographic research, the aim is to—conclude the need for digital reorganization, through taking the appropriate measures and carrying out the required actions.

### 2.1. Research Methodology

To achieve the objective of the present, as described above, the recording of basic Web Analytics metrics was chosen for the web pages of the examined companies in the dairy industry.

In particular, the data of the behavior of the users of five (5) different websites of the following established dairy firms: Lactalis Group (<https://www.lactalis.fr/>), Nestle (<https://www.nestle.com/>), Danone (<https://www.danone.com>), DFA Milk (<https://www.dfamilk.com/>), and Yili Group (<https://www.yili.com/>), were analyzed through recognized quantitative metrics analysis tools. The referred firms were selected based on their financial results (high total revenue and gross profit) and ESG performance (high water, resources, and energy sustainability, etc.) in 2022. In particular, the data studied were obtained from [SimilarWeb](#)

(2024) and Semrush (2024) platforms.

Through the possibilities they offer, they contribute to the evaluation of a website's traffic, but also of the consumer's behavior while navigating it and important elements of the competition. They are provided free for a limited trial, while paid ones have numerous options with varied and in-depth analysis and data. The measurements taken concern the period 01/12/2022 to 30/04/2023 for each of the companies of interest.

The following were set as limitations in the context of this: 1) use of two web analytics programs, 2) limited number of measurements, and 3) limited period of measurements. To evaluate the elements that affect the ranking (Global Rank) of the studied web pages of the industry, it is crucial to examine the basic elements that determine it.

Given the importance of digitization for improving business strategy, but also the limited findings regarding the impact of COVID-19 on the dairy industry, and the need for digital reorganization to adapt to the new data, it is considered appropriate to explore those elements that are critical factors for a successful and modern digital strategy in the dairy industry.

In this context, through Web Analytics tools, important metrics are identified, and selected from them—due to their importance for a company's strategy—which are the following presented in **Table 1** (SimilarWeb, 2024; Semrush, 2024).

## 2.2. Research Hypotheses

The problem of this work is defined as whether the top five (5) dairy companies worldwide can inspire the domestic industry to utilize effective digital marketing strategies, based on the statistical study.

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The studied hypotheses, formulated before the beginning of the measurements, have as their object the examination of whether the applied practices of the leading companies in the sector are effective for their digital presence and the improvement of their ranking on the World Wide Web, and as a purpose examining any need to reorganize the relevant business activities.

In particular, taking into account the trends in digital marketing, but also in the industry, as captured in the previous chapters, the following hypotheses were

**Table 1.** Basic web analytics metrics.

Metric	Explanation
Visits	Estimated number of total visits to the website.
Unique Visitors	Estimation of unique website visitors.
Pages/Visit	An estimate of the average number of subpages a visitor navigates to during a visit to the website.
Average Visit Duration	Estimation of the average length of time of a website visit.
Bounce Rate	Estimate the percentage of website visitors who leave after visiting a single page. It is essentially the percentage of one-page sessions on the website that then leads to abandonment.
% of Branded Traffic	The percentage of website traffic that comes from visitors who type in keywords that include any mention of the company brand.
% of Non-Branded Traffic	The percentage of website traffic that does not come from visitors typing in keywords that include any mention of the company brand.
Direct Traffic	Website traffic by directly typing its address into the browser's search bar or via saved bookmarks or links outside the browser such as PDF files or Word documents.
Referral Traffic	Website traffic from hyperlinks appearing on another website, as long as they are not social media pages.
Search Traffic	Website traffic that comes from searches through Google and other search engines.
Social Traffic	Website traffic from social media sites such as Facebook, Twitter, Reddit, Pinterest, YouTube, etc. This source includes both organic and paid social media traffic.
Paid Traffic (Google Ads)	Website traffic from paid Google Ads. This source includes PPC ads in search results as well as product ads (Google Shopping).
Backlinks	Total number of links from other websites, pointing to the selected webpage, also known as inbound or external links. Search engines like Google see backlinks as votes of confidence.
Referring Domains	Total number of other websites that link to the selected website.
Organic (Search) Traffic	Traffic to a website as a result of unpaid search results (not caused by paid advertising).
Organic Keywords	Keywords used in SEO to attract organic traffic for free.
Desktop Traffic Distribution	The percentage of website traffic that comes from a desktop computer.
Mobile Traffic Distribution	The percentage of website traffic that comes from mobile devices.
Global Rank	The ranking that a web page can receive in the entire World Wide Web, i.e., in the totality of all web pages that exist.

Source: <https://www.semrush.com/>, <https://www.similarweb.com/>.

formulated, in which it is essentially examined whether the selected variables have a significant correlation between them:

**H1.** The time spent by website visitors on how many subpages they visit affects the website's ranking in search engines (average visit time—pages/visit—

global rank).

**H2.** The traffic of the website through social networks depending on the unique visitors generated every month, affects its ascent in the search engines (social traffic—unique visitors—global rank).

**H3.** The number of links of the website to other websites the number of these websites and the traffic they offer to the company contribute to its climb in the search engines (backlinks—referring domains—referral traffic—global rank).

**H4.** The traffic of a website through promotional actions, the direct traffic (direct typing) of the website address, and the traffic through search engines affect its climb in the global ranking (paid traffic—direct traffic—search traffic—global rank).

**H5.** Keywords used to attract free organic traffic based on estimated website traffic as a result of non-paid search results (not caused by paid advertising) contribute to its climb in search engines (organic keywords—organic traffic)—global rank).

**H6.** The traffic coming from social media, depending on the percentage of visitors coming from mobile or fixed devices, contributes to its climb in the search engines (social traffic—mobile traffic—desktop traffic—global rank).

Regarding the nature of the variables, it is noted that independent variables are defined as those whose behavior is examined as to whether it affects or explains the changes in the dependent variables. Therefore, those for which change is assumed through the change of the independent variables are called dependent (Hair *et al.*, 2014).

For the examination of the above cases, the analysis of the collected data was carried out, using the appropriate tools.

### 2.3. Tools for Data Analysis

For the analysis of the collected data, according to the methodology described herein, a statistical processing package was used, where they were entered and analyzed based on descriptive and inductive statistics.

Descriptive statistics help to observe the trends indicated by the data, while inductive statistics can lead to the drawing of conclusions about the population based on the sample, allowing the testing of selected hypotheses. In the latter, due to the nature of the examined variables, the non-parametric Spearman test was used, after the results of the test for the distribution following the data, whose correlation is examined.

The results of these checks for all the studied websites are presented in the following chapter.

Additionally, to predict the results and analyze the studied cases, a descriptive model was created based on the Fuzzy Cognitive Mapping (FCM) standard, through the website platform of *Mental Modeler* (2024), which identifies the relationships between the individual Web Analytics metrics of the cases examined, so that to be more easily understood.

Finally, to conclude and formulate proposals, quantitative and qualitative elements from the observation of the digital presence of the studied companies were evaluated (e.g., navigation experience, presence on social networks, content of posts, frequency of posts, etc.).

### 3. Results

#### 3.1. Statistical Analysis

Starting with listing the results based on the data recorded above, the results based on descriptive statistics are first presented. In particular, the following table (**Table 2**) shows the basic statistics (mean, median, standard deviation, variance, asymmetry, kurtosis, minimum value, maximum value) of all the variables that were recorded in the context of this.

As can be seen from the above recording, the variables Total Visits, Unique Visitors, Average Visit Duration, Non-Branded Traffic, Direct Traffic, Referral Traffic, Search Traffic, Social Traffic, Paid Traffic, Backlinks, Referring Domains, Organic Traffic, Organic Keywords, Mobile Traffic and Global Rank

**Table 2.** Descriptive statistics.

Variables	Observations	Mean	Minimum	Maximum	Std Deviation
Total Visits	150	504360.00	1200.00	2500000.00	792218.82
Unique Visitors	150	330693.60	1200.00	1500000.00	515694.54
Pages/Visit	150	2.04	1.00	2.99	0.45
Average Visit Duration (min.)	150	8.53	0.00	26.03	7.59
Bounce Rate (%)	150	58.58%	0.00%	100.00%	20.95%
Branded Traffic (%)	150	57.60%	0.00%	95.00%	27.48%
Non-Branded Traffic (%)	150	42.40%	5.00%	100.00%	27.48%
Direct Traffic	150	263329.24	0.00	1500000.00	440164.94
Referral Traffic	150	87713.28	0.00	590200.00	156977.03
Search Traffic	150	120304.80	666.00	496500.00	161482.41
Social Traffic	150	33704.80	0.00	175200.00	53970.98
Paid Traffic	150	837.32	0.00	14300.00	2929.87
Backlinks	150	1932045.84	16596.00	5077336.00	1967229.92
Referring Domains	150	13935.40	2007.00	41493.00	14898.94
Organic Traffic	150	282638.56	9825.00	1170939.00	426330.37
Organic Keywords	150	67938.44	824.00	271713.00	95097.98
Desktop Traffic	150	53.85%	33.80%	77.63%	12.74%
Mobile Traffic	150	46.14%	22.37%	66.20%	12.74%
Global Rank	150	501517.72	29443.00	2367728.00	748304.85

N = 150 days of data collection for the 5 dairy companies. Source: <https://www.similarweb.com/>.

show positive (right) asymmetry (the mean of the observations is greater than the median which in turn is greater than the peak), while the variables Pages/Visit, Bounce Rate, Branded Traffic and Desktop Traffic exhibit negative (left) skewness (the mean is less than the median which is less than the peak). Also, the distribution of the variables except for Backlinks, referring domains, Mobile Traffic, and Desktop Traffic is thin-curved as the values of the curvature coefficient are positive.

Regarding the normality of the distribution followed by the above variables, based on the Shapiro-Wilk test, it follows that the variables Total Visits, Unique Visitors, Average Visit Duration, Bounce Rate, Branded Traffic, Non-Branded Traffic, Direct Traffic, Referral Traffic, Search Traffic, Social Traffic, Paid Traffic, Back-links, Referring Domains, Organic Traffic, Organic Keywords, and Global Rank do not follow a normal distribution, while the variables Pages/visit, Desktop Traffic, and Mobile Traffic follow a normal distribution, at a statistical significance level of 5%.

Examining now the hypotheses formulated above, with the contribution of inductive statistics through the statistical processing package and use of the appropriate control, the existence or non-linear correlation between the variables results, leading to the detection of some statistically significant correlations between the variables that were selected for further investigation, based on the value of **Pearson's (1895)** correlation coefficient.

The checks of the above cases follow as follows:

**H1 test:** the time spent by website visitors on how many subpages they visit affects the website's ranking in search engines (average visit time—pages/visit—global rank).

In the specific control, the examination of the function of the time spent by a visitor to the website during his visit to it, and the place of consumption (on the home page or browsing sub-pages), about its position in the global ranking, since one of the important factors of climbing in the search engines is the satisfaction of the visitor, which is reflected, among others, by the time during which he navigates on a website, and by the degree to which he “deepens” in it, indicating the attractiveness of the website to the user.

The statistical test (**Table 3**) shows that the correlation of the Average Visit Duration in the function of Pages/Visit in terms of the Global Rank of a website

**Table 3.** Correlation analysis for H1 (Pearson's coefficient).

Variables	Average Visit Duration	Pages/Visit	Global Rank
Average Visit Duration	1.000	0.178	0.134
Pages/Visit	0.178	1.000	-0.037
Global Rank	0.134	-0.037	1.000

Source: created by the authors.

is not statistically significant at the level examined to draw generalized conclusions about the behavior of the users of the industry's websites.

**H2 test:** the traffic of the website through social networks about the unique visitors that are created every month, affects its climb in the search engines (social traffic—unique visitors—global rank).

This is checked to examine whether it is reasonable for companies in the sector (with a B2B orientation—since they sell to intermediaries and not directly to the consumer, who essentially has access to social media) to maintain social media, ensuring new website visitors to their website, contributing to its ranking on the world wide web.

The statistical test shows (**Table 4**) that the correlation of Social Traffic about Unique Visitors to the Global Rank of a website is statistically significant at the level under consideration.

In particular, the relationship between the variables social traffic and Unique visitors is evident on the one hand, and on the other hand the statistically significant relationship between social traffic and Global rank (strong negative,  $r_s = -0.720$ ,  $p < 0.01$ ) and between Unique visitors and Global rank (moderate negative,  $r_s = -0.609$ ,  $p < 0.01$ ).

**H3 test:** the number of links of the website to other websites about the number of these websites and the traffic they bring to the website, contribute to its climb in the search engines (backlinks—referring domains—referral traffic—global rank).

The purpose of this review is to investigate the effectiveness of referrals from other websites about the number of these websites and the traffic coming from them, to lead the website to a higher position in the search engines.

The statistical test (**Table 5**) shows that the correlation between Backlinks, Referring Domains, and Referral Traffic concerning the Global Rank of a website is statistically significant at the level under consideration.

In particular, the relationship between the variables Backlinks, Referring Domains, and Referral Traffic is visible on the one hand, and on the other hand the statistically significant relationship between Backlinks and Global rank (strong negative,  $r_s = -0.888$ ,  $p < 0.01$ ), after referring domains and Global rank (strong negative  $r_s = -0.871$ ,  $p < 0.01$ ) and between Referral traffic and Global rank (strong negative,  $r_s = -0.722$ ,  $p < 0.01$ ).

**H4 test:** the traffic of a website through promotional actions, the direct traffic

**Table 4.** Correlation analysis for H2 (Pearson's coefficient).

Variables	Social Traffic	Unique Visitors	Global Rank
Social Traffic	1.000	0.936**	-0.720**
Unique Visitors	0.936**	1.000	-0.609**
Global Rank	-0.720**	-0.609**	1.000

\*\*indicate statistical significance at the 99% level. Source: created by the authors.



**Table 5.** Correlation analysis for H3 (Pearson's coefficient).

Variables	Backlinks	Referring Domains	Referral Traffic	Global Rank
Backlinks	1.000	0.840**	0.511**	-0.888**
Referring Domains	0.840**	1.000	0.705**	-0.871**
Referral Traffic	0.511**	0.705**	1.000	-0.722**
Global Rank	-0.888**	-0.871**	-0.722**	1.000

\*\*indicate statistical significance at the 99% level. Source: created by the authors.

(direct typing) of the website address, and the traffic through search engines, influence its climb in the global ranking (paid traffic—direct traffic—search traffic—global rank).

The purpose is to examine whether the traffic generated through advertising campaigns (Google Ads), generates repeat traffic to the website (directly going to the website or searching through search engines), leading to its climbing on the World Wide Web.

The statistical test (**Table 6**) shows that the correlation between Paid Traffic, Direct Traffic, and Search Traffic in terms of the Global Rank of a website is statistically significant at the level under consideration.

In particular, the relationship between the variables Paid traffic, Direct traffic, and Search traffic is visible on the one hand and the other hand the statistically significant relationship between Paid traffic and Global rank (moderately negative,  $r_s = -0.632$ ,  $p < 0.01$ ), between Direct traffic and Global rank (negative moderate,  $r_s = -0.551$ ,  $p < 0.01$ ) and between Search traffic and Global rank (negative moderate,  $r_s = -0.590$ ,  $p < 0.01$ ).

**H5 test:** Keywords used to attract organic free traffic based on estimated website traffic as a result of non-paid search results (not caused by paid advertising), contribute to its climb in search engines (organic keywords—organic traffic—global rank).

The purpose is to examine whether the organic keywords are effectively used to increase the organic traffic of the website and by extension its ranking in the search engines.

The statistical test (**Table 7**) shows that the correlation between Organic Keywords and Organic Traffic in terms of the Global Rank of a website is statistically significant at the level under consideration.

In particular, the relationship between the variables Organic keywords and Organic traffic is evident on the one hand, and on the other hand, the statistically significant relationship between Organic keywords and Global rank (moderately negative,  $r_s = -0.608$ ,  $p < 0.01$ ) and between Organic traffic and Global rank (negative moderate,  $r_s = -0.576$ ,  $p < 0.05$ ).

**H6 test:** The traffic coming from social media, depending on the percentage of visitors coming from mobile or fixed devices, contributes to its climb in the

**Table 6.** Correlation analysis for H4 (Pearson's coefficient).

Variables	Paid Traffic	Direct Traffic	Search Traffic	Global Rank
Paid Traffic	1.000	0.691**	0.659**	-0.632**
Direct Traffic	0.691**	1.000	0.923**	-0.551**
Search Traffic	0.659**	0.923**	1.000	-0.590**
Global Rank	-0.632**	-0.551**	-0.590**	1.000

\*\*indicate statistical significance at the 99% level. Source: created by the authors.

**Table 7.** Correlation analysis for H5 (Pearson's coefficient).

Variables	Organic Keywords	Organic Traffic	Global Rank
Organic Keywords	1.000	0.968**	-0.608**
Organic Traffic	0.968**	1.000	-0.576**
Global Rank	-0.608**	-0.576**	1.000

\*\*indicate statistical significance at the 99% level. Source: created by the authors.

search engines (social traffic—mobile traffic—desktop traffic—global rank).

The purpose is to examine whether traffic originating from social networking platforms is affected by the tendency of the navigation source (mobile or fixed device) to climb the World Wide Web.

The statistical test (**Table 8**) shows that the correlation between Social Traffic, Mobile Traffic, and Desktop Traffic in terms of the Global Rank of a website is statistically significant at the level under consideration.

In particular, the relationship between the Social Traffic, Mobile Traffic, and Desktop Traffic variables is visible on the one hand, and on the other hand the statistically significant relationship between social traffic and Global rank (strong negative,  $r_s = -0.720$ ,  $p < 0.01$ ), between Mobile traffic and Global rank (negative moderate,  $r_s = -0.552$ ,  $p < 0.01$ ) and between Desktop traffic and Global rank (positive moderate,  $r_s = 0.552$ ,  $p < 0.01$ ).

Therefore, hypotheses H2, H3, H4, H5, and H6 are accepted, leading to the conclusions listed in the final chapter.

### 3.2. Fuzzy Cognitive Model

Subsequently, the statistically significant correlations that emerged from the testing of the above hypotheses are depicted below based on the Fuzzy Cognitive Mapping (FCM) standard, through the *Mental Modeler* (2024) software. This software aims, on the one hand, to provide knowledge regarding the relationships developed by the variables that are examined statistically, and regarding the perspectives that appear through scenario analysis. It is an effective inference tool for easy modeling of complex situational relationships, both qualitatively and quantitatively, which has been proven particularly useful through the literature for modeling and analyzing complex dynamic systems (Papageorgiou & Salmeron, 2012).

**Table 8.** Correlation analysis for H6 (Pearson's coefficient).

Variables	Social Traffic	Mobile Traffic (%)	Desktop Traffic (%)	Global Rank
Social Traffic	1.000	0.827**	-0.827**	-0.720**
Mobile Traffic (%)	0.827**	1.000	1.000	-0.552**
Desktop Traffic (%)	0.827**	1.000	1.000	-0.552**
Global Rank	-0.720**	-0.552**	-0.552**	1.000

\*\*indicate statistical significance at the 99% level. Source: created by the authors.

It was essentially created to support decision-making (Felix *et al.*, 2017), allowing users to examine various hypotheses about an issue, in real time, and it has also been applied as a useful tool in the social sciences to measure models that they often form the basis of decision-making (Krimpas *et al.*, 2023; Avgeris & Groumpos, 2022; Athanasoula *et al.*, 2022; Groumpos & Apostolopoulos, 2021).

In this particular case, the ultimate goal of all websites is to climb the search engines (Global Rank). Therefore, taking into account the individual relationships that were evaluated as reasonable for investigation and yielded statistically significant findings, the software was used for their graphical display and the overview of alternative scenarios (Migkos *et al.*, 2022). The purpose of this feature is to capture the reaction of a system of related factors under specific conditions. To explore various scenarios, the above effects were recorded cumulatively below (Figure 5).

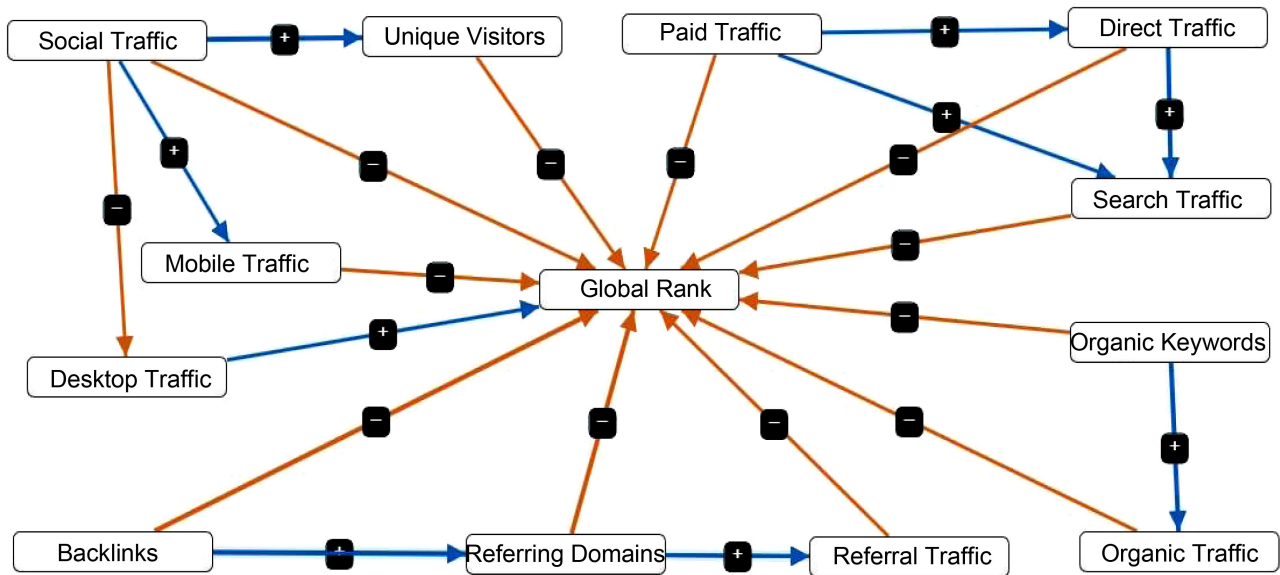
Various scenarios were then examined to confirm the “intensity” at which it is appropriate to boost specific variables to un-climb the website in the global rankings. In particular, the scenarios investigated and captured subsequently, aim to investigate the effect of strengthening the main variables of the hypotheses confirmed above, on the ranking in the World Wide Web. Through the Mental Modeler software and the possibility, it provides for scenario control, the results of these are then captured, in three different levels of reinforcement (small, medium, large) (Figures 6-9).

To improve the ranking of industry websites on the World Wide Web, the findings have been taken into account in formulating the conclusions and suggestions that follow.

## 4. Discussion and Conclusion

### 4.1. Data Analysis Conclusions

Following the statistical control of the above cases, the following conclusions are drawn. The time spent by website visitors on how many subpages they visit does not appear to be a statistically significant factor in the ranking of dairy companies on the World Wide Web. Essentially, based on the sample examined, no conclusions can be drawn based on this relationship.



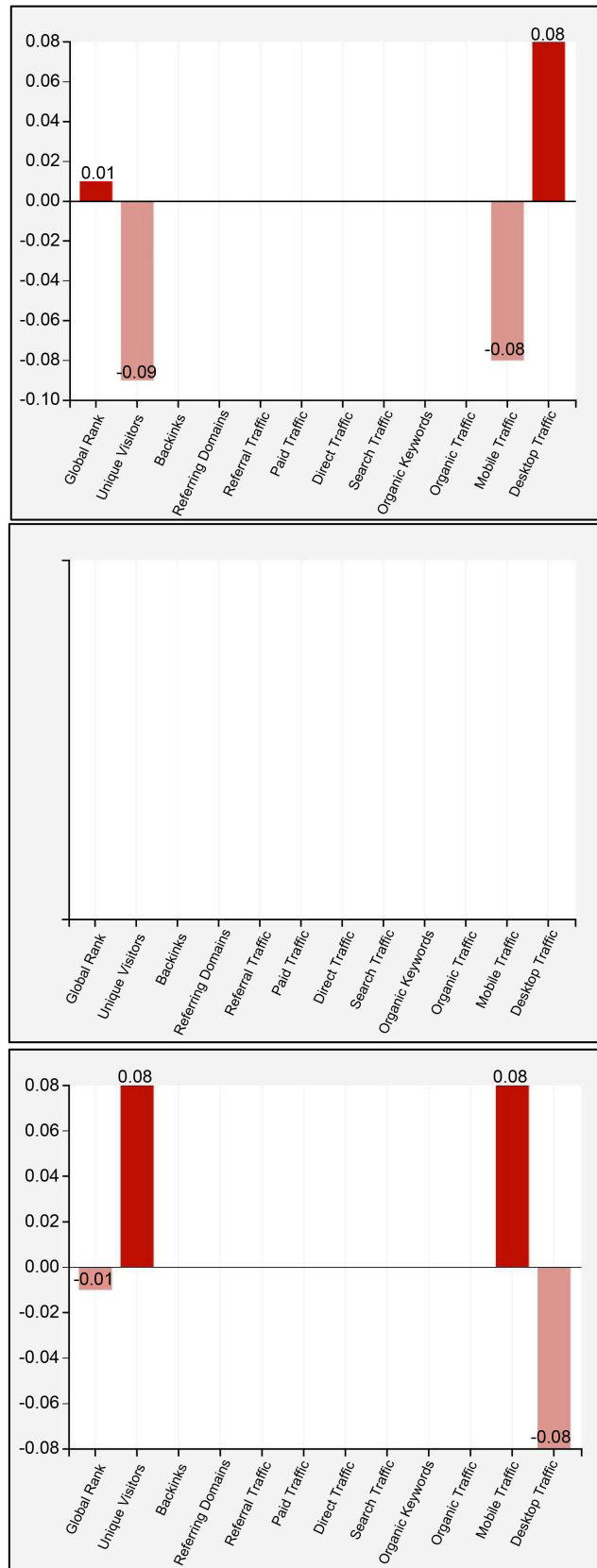
**Figure 5.** Fuzzy cognitive mapping model of dairy companies websites.

Website traffic through social networks is highly correlated with generating new visitors for the website, thereby leading to its climb in the search engines. Although dairy industries are businesses that do not primarily sell directly to the consumer, rather than to other businesses (Sakas et al., 2023b), it is advisable to have social media, which they feed with similar content to attract visitors to their corporate website, then turning them into potential consumers.

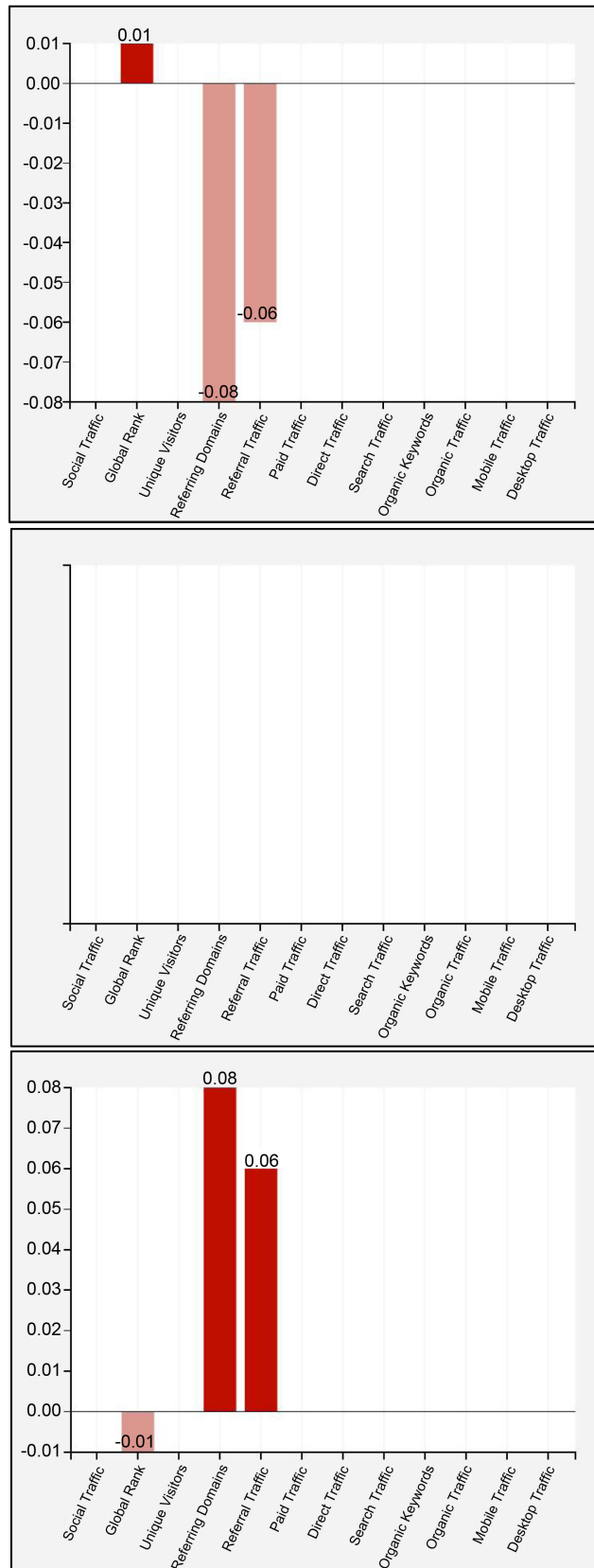
The number of links of the website to other websites the number of these websites and the traffic they bring to the business, contribute significantly to its climb in the ranking engines. As a result, referrals from other websites are especially important for ranking higher in search engines. Among the most important SEO factors, it appears particularly strong for the dairy industry, as a result of which companies in the sector need to be “referred” to other websites by satisfied customers on the one hand, and by satisfied partners on the other.

The traffic generated through advertising campaigns (Google Ads), can generate repeated traffic to the website through direct typing of its address, but also through searching in the search bar, leading to the strengthening of the brand’s reputation and the climbing of the website in the search engines. Although the primary goal of SEO experts is to generate organic traffic for a website, paid campaigns through Google seem to be able to pay off by creating a “memory” in the consumer, so that they then visit it directly leading to paid—and not just temporary paid—attention.

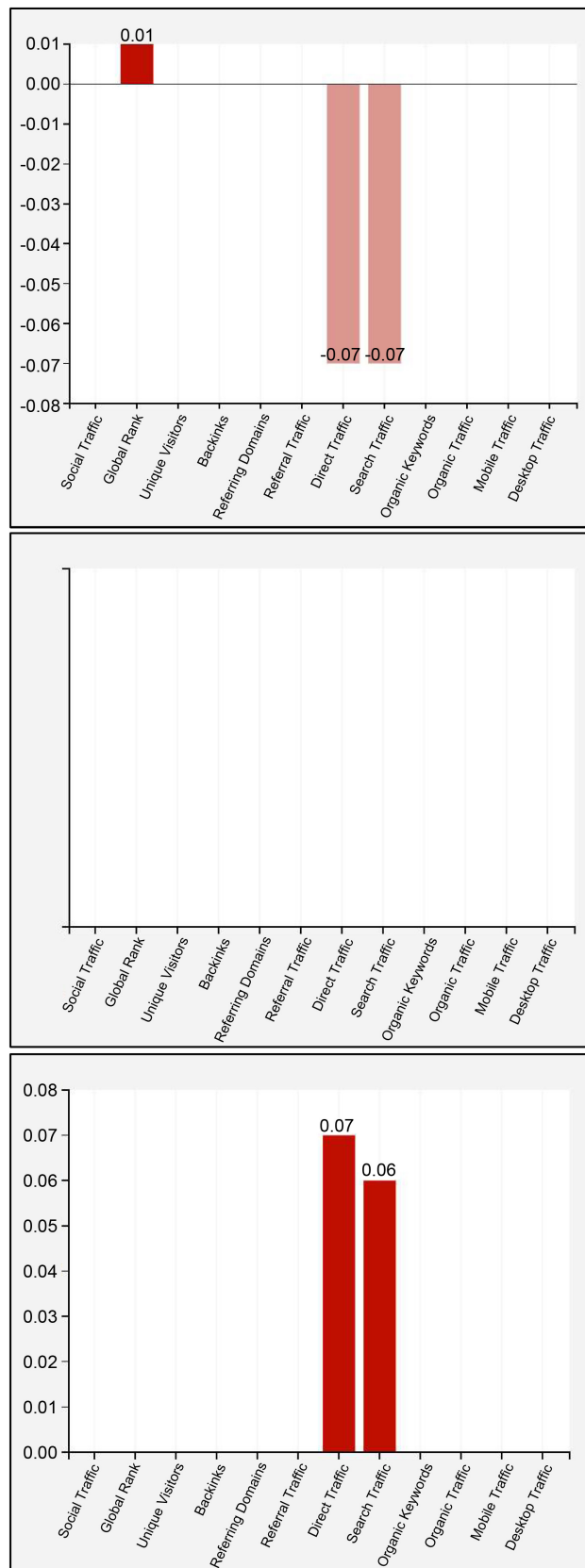
The keywords used to attract organic traffic for free as a function of the website’s traffic as a result of unpaid search results based on the placement of the keywords contribute to its climb in the search engines. Although the importance of keywords has been overstated in achieving higher search engine rankings, their use seems to continue to be an integral part of this optimization for the industry.



**Figure 6.** FCM Scenario 1: Reinforcement effect (small, medium, large) of the Social Traffic variable on website ranking.

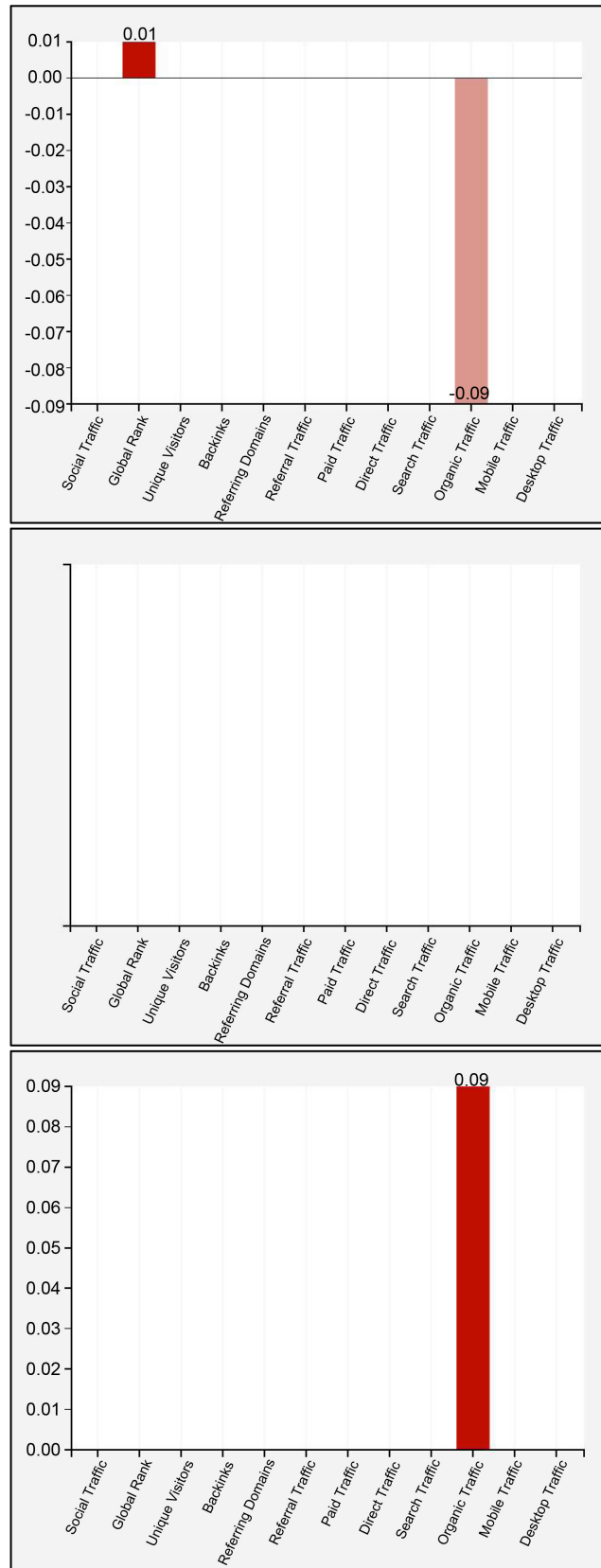


**Figure 7.** FCM Scenario 2: Reinforcement effect (small, medium, large) of the Backlinks variable on website ranking.



**Figure 8.** FCM Scenario 3: Reinforcement effect (small, medium, large) of the Paid Traffic variable on website ranking.





**Figure 9.** FCM Scenario 4: Reinforcement effect (small, medium, large) of the Organic Keywords variable on website ranking.

A website’s traffic from social media, as a function of the percentage of visitors coming from mobile devices, contributes to its climb in the search engines, leading to the realization of the importance of the design and navigation quality of websites via mobile devices but and the appropriate selection of the target audience of marketing actions (Figure 10).

Additionally, from the observation of the digital media of the examined websites and the data provided by the companies themselves, the following emerges:

- Websites are provided in different languages, as the case may be.
- The main digital marketing priorities of businesses include the utilization of social media. A variety of media (Facebook, Twitter, LinkedIn, Instagram, YouTube, Weibo) are used to a great extent and gather frequently renewed content (audio-visual and informational material, products, actions, news, jobs, possibility of interaction/direct conversation between consumers and business, competitions, advice, etc.).
- For the planning of promotional actions, an important element is the utilization of consumer trends such as healthy and alternative food (e.g., plant products, substitutes, etc.) but also the “return” of habits due to COVID-19, such as cooking at home (resulting in e.g., displaying recipes, etc.), while also implementing responsible marketing practices.
- Digital actions, as well as the tendency to strengthen them, are an important factor in the successful course of companies, which, however, seek to implement personalized marketing with the aim of greater consumer satisfaction.
- Investment increases in digital marketing are targeted, with the aim, among other things, of increasing e-commerce in the short term, specifically for firms with high ESG performance and enhanced financial results.

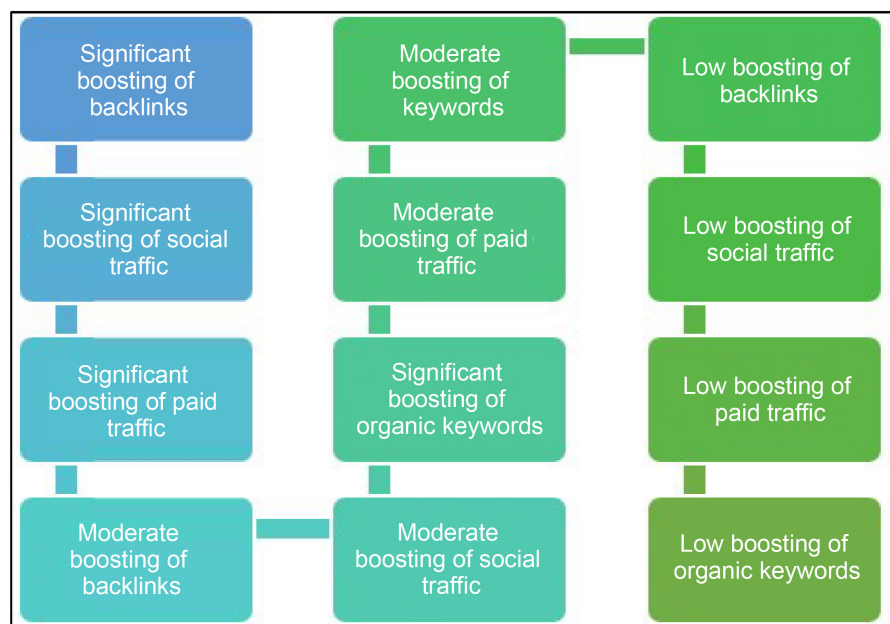


Figure 10. Ranking of examined scenarios’ actions, based on contribution to rank climbing.

- Significant sums are spent on digital campaigns in appropriate media to attract consumers, inform and educate, but also promoting the companies' initiatives and actions.
- Specialized staff and marketing partners are used, to better utilize the available digital channels.
- An emerging trend is the development of core competencies, among which digital design, the development of new sales channels and other digital functions, around a more general digital transformation, utilization of technology and product innovation, seeking the maximum competence—poetry of the consumer and the transformation of the operating model.
- Flexibility in marketing practices is required in terms of leveraging modern strategies to adapt to the modern market, with the ultimate goal of global consolidation.
- A variety of digital marketing strategies are identified for the promotion of products, practices, policies, actions, and in general of the companies themselves, with the following dominant ones: Social Media Marketing, Digital Content Marketing, and Green Marketing, while some of them include Video Marketing actions, E-mail Marketing, and to a lesser extent the practice of Influencing Marketing.

#### **4.2. Digital Re-Organization Suggestions**

Taking into account the results of statistical analysis, website observation, trends in the dairy industry and digital marketing, search engine climbing factors, and the data analyzed above, the following business reorganization proposals are formulated dairy industry in the domestic market:

- Focus on Off-Page Optimization, with backlinks as a key factor in optimizing page ranking, which brings significant traffic flow but also significant “trust” of search engines, resulting in the climbing of the website on the world wide web. Encourage collaboration and interaction with other sites to get as many references to other sources as possible, e.g., through the promotion of experiences, social actions, environmental actions, new products, events, writing articles, etc.
- Utilization of social media, especially the most preferred and emerging ones by the general public, to increase website traffic through them, as new visitors to the website are created, resulting in climbing the world wide web. Examination of collaborations with clients—partners for the realization of competitive actions through social networks. Exploiting the possibilities that technology now provides such as direct communication—artificial intelligence, audiovisual material for interesting e-news—encouraging interaction, etc.
- Realization of targeted periodical promotional actions (Google Ads), since visits to the website through them, can lead to an increase in traffic directly, but also through search engines, resulting in climbing the world wide web.
- Utilization of appropriate keywords within the website, to increase its free

traffic, which results in climbing the world wide web.

- Ensuring quality and mobile-friendly navigation and targeting an increase in the share of visitors from mobile devices, through personalized actions and targeting a target audience that utilizes them, to achieve climbing the world wide web.

Given the special importance of the digital presence of every business, especially in the modern market, it is considered appropriate to be constantly informed, to choose suitable partners (Sakas *et al.*, 2023b), to formulate an appropriate strategy, to take advantage of modern tools (Kontogiorgou *et al.*, 2023), platforms and scientific data, and above all to regularly monitor of the company's course of action. All of the above is important to be regularly evaluated by the company about the goals it has set, but also about the competition, so that it is possible to anticipate any new conditions in time and to immediately adapt to them, through the corresponding actions to organize or reorganize its digital presence.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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