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ASSESSING MARKETPLACE AND E-COMMERCE WEBSITE QUALITY WITH SEO SCORE

Karol KRÓL[1], Dariusz ZDONEK[2*], Wojciech SROKA[3]

[1] University of Agriculture in Krakow, Faculty of Environmental Engineering and Land Surveying; k.krol@onet.com.pl, ORCID: 0000-0003-0534-8471
[2] Silesian University of Technology in Gliwice, Faculty of Organization and Management; dariusz.zdonek@polsl.pl, ORCID: 0000-0002-6190-9643
[3] University of Agriculture in Krakow, Faculty of Agriculture and Economics; wojciech.sroka@urk.edu.pl, ORCID: 0000-0002-4255-3741
* Correspondence author

Purpose: Search Engine Optimisation (SEO) covers processes aimed at improving website quality. SEO audits can be used to conduct comparative and competitive analyses to identify good practices employed by other online platforms. The article scores selected marketplace and e-commerce websites in terms of search engine optimisation.
Design/methodology/approach: We analyse the quality of selected marketplace and e-commerce websites with synthetic aggregate metrics, so-called SEO Score. The first stage involved exploratory quality tests, whereby the home page source code was analysed for every website. The second stage was algorithmic tests using selected online tools.
Findings: The websites scored 2,126 out of 3,000 points in total. It is 71% of the maximum score. This means that, according to the test applications, not many attributes require SEO effort under the employed research design. Four out of the five tested websites had their names (brands) in the meta description tag. All the portals had the title tag. However, only one site had the meta keywords tag.
Originality/value: The research apparatus employed is sufficient to identify basic design flaws, which makes it useful for competitive analysis. Our algorithmic analysis pinpointed differences in the quality of leading marketplace and e-commerce websites in Poland. The exploratory research revealed certain good practices regarding meta information on marketplace and e-commerce websites, which may affect SEO.
Keywords: quality assessment, quality metrics, competitive analysis, SEO audit, e-commerce websites.
Category of the paper: research paper.

1. Introduction

Search Engine Optimisation (SEO) involves diverse processes aimed at improving a website's visibility among organic (natural, free) search results. SEO works by reorganising the website to encourage longer browsing, increase user engagement, generate multiple browsing sessions, and invite the user deeper into the site (Berman, Katona, 2013). Lastly, SEO also covers efforts to adapt the website to user expectations, changing design standards, and requirements of search engines (Yalçın, Köse, 2010). Therefore, SEO combines user experience (UX) and machine experience (web crawlers) (Król, 2018). It affects the site itself (on-site SEO) and its environment (off-site SEO) regarding three primary domains: content (including texts, graphics, and multimedia), technical aspects (technical SEO), and hyperlinks. Optimalisation bears fruit after some time and its benefits are not set in stone (Król, Zdonek, 2020). The ultimate goal of SEO is to improve the amount and quality of traffic from organic results and boost the website's ranking by enhancing its general quality.

Search engine optimisation is connected to two other notions: search experience optimisation (SXO)—which combines SEO and UX—and SEO audit. The SEO audit aims to identify critical points of the website that can significantly boost its SERP ranking if improved. If done correctly, an audit of technical factors can offer valuable insight into various problems and opportunities present on a website (Edgar, 2023). The SEO audit is a complex expert service shaped by the auditor's individual skillset and experience. It is usually the auditor who decides the scope of the audit and the extent of the final report. They employ various techniques and automatic testing applications. The test results are expressed as scores (so-called SEO Score), sometimes letters or graphics (Król, Zdonek, 2020). The report contains audit specifications, results (measurements, validations, etc.), and a list of recommendations.

A final SEO report with recommendations is particularly relevant for website editors and administrators, both at the front-end, where the layout, content, and usability are decided and at the back-end, responsible for such aspects as ‘running the application’, deploying new functions, scripts, data processing, database management, and execution of the primary functions of the application In-depth audit results help make technical improvements, streamline editorial work on content, and implement new content management policies, including SEO-friendly principles. This is why SEO audits are usually comprehensive, multidimensional, in-depth technical analyses. As they employ source code exploration and available SEO tools, such audits can investigate any website and identify the good practices it follows. Hence, it is possible to conduct a general, scored SEO quality assessment of any website. It usually follows the scheme of competitive analysis and/or comparative analysis and shows the website's place in the global online ecosystem.

The article scores selected marketplace and e-commerce websites in terms of search engine optimisation. We analyse selected websites' quality using synthetic aggregate metrics, the so-called SEO Score (Król and Zdonek 2020). The article investigates the following research questions:

- Q1: are there any differences in the quality of the leading marketplace and e-commerce websites in Poland measured with the SEO Score metrics under the employed research design?
- Q2: what are the website quality assessment capabilities of free SEO auditing tools?

The tangible contribution of the article is: 1) the results of the comparative quality analysis of selected marketplace and e-commerce websites in Poland and 2) design recommendations and good practices for the content of website meta information.

The article is organised into several sections. Section two provides a research background, including characteristics of the marketplace and e-commerce websites, focusing on the attributes that affect their quality the most. It also presents search engine optimisation as a collection of activities critical for improving website quality as perceived by users, leading to better ranking and conversion rate. Section three sets out the methodology, including the subject matter and research techniques. Section four presents and discusses the results. The final section covers a summary, practical implications, and further research.

2. Background

2.1. Quality of marketplace and e-commerce websites

Online selling platforms are software, applications, or websites for selling products and services online. They come in two basic types: marketplace platforms (such as Allegro or Amazon), and e-commerce platforms for online stores (such as WooCommerce, Shopify, or PrestaShop) (Kim, 2022). Online marketplaces act as intermediaries between sellers and buyers. They provide the infrastructure, payment methods, scoring and review systems, and other commerce facilities (Singh et al., 2023). E-commerce platforms are tools for establishing and running online stores. Both approaches are popular and often employed in parallel (Etro, 2023).

The quality of marketplace and e-commerce websites hinges on a multitude of factors. It is often described in general terms, but below such undetailed characteristics lie the underpinnings of specific attributes of the development technique, content editing methods, design attributes, configurations of servers or databases, and many other specific technical activities (Shafiq et al., 2022). Such factors as easy navigation, clarity, responsiveness, and general interface usability contribute to the high quality of marketplace and e-commerce

websites. In practical terms, this means the development of the structure and colour theme of the menu (and other website components) using usability tests with checklists and controlled experiments, such as A/B tests (split testing) (Alexander et al., 2021). Text readability can be tested with readability testing tools, and text accessibility to people with disabilities can be verified with tools like the WAVE Web Accessibility Evaluation Tools (Ismail, Kuppusamy, 2022). The quality of marketplace and e-commerce websites also depends on the security of sensitive data, financial transactions, and general abuse and fraud security. This means that proper security measures must be in place, such as secure socket layer (SSL) certificates (Dastres, Soori, 2020). Another factor in the quality of marketplace and e-commerce websites is the quality of products and services they offer and their ranking, which is controlled by SEO, positioning, and marketing efforts, including search engine marketing (SEM). Customer service, including help and technical assistance availability and trustworthiness of reviews and scores awarded by other users, are also important (Nyagadza, 2022). A simple path to purchase and clear pricing and commission policy are not insignificant. Therefore, marketplace and e-commerce websites follow applicable regulations, including data protection, consumer rights, and e-commerce laws (Chawla, Kumar, 2022). If all these attributes radiate high quality, the website can be ranked high on the SERP because they determine the degree of search engine optimisation.

2.2. Search engine optimisation

SEO encompasses the vision, strategy, and a broad palette of actions taken to make the website attractive to search engines. The efforts focus mainly on website content, structure, and code adjustments to improve its visibility among organic results. Other efforts are building the link profile, improving link structure, optimising metatags, enhancing performance, and many more (Daly, Ryan, 2024). The utmost goal of SEO is to improve the user-perceived quality of the website, which will boost its popularity and traffic statistics, leading to better SERP ranking positions (Roumeliotis et al., 2022a).

The pursuit of high quality of websites based on high-quality content and technical aspects (including usability, functionality, performance, and responsiveness) opened new markets for SEO and positioning experts. SEO helps marketplace and e-commerce websites compete effectively by improving their organic visibility among search results. Good SEO practices usually have long-term, but by no means immediate, benefits. Their results are more durable and help maintain high traffic volumes for longer (Roumeliotis, Tselikas, 2022b).

Until recently, valuable content had to compete with mass-produced content from content factories. Useful texts were usually inundated in overflowing, properly concocted junk proposals. What is more, content farms could be ranked higher than respected websites or even (local) government websites. These spamming websites were set only to reach the best possible rank or number of views, often using content, techniques, and tools that offered no value to the

user or were even illegal or unethical (Levy, 2011). The time of shallow and low-quality content ended when search engine algorithms were amended (McGee, 2011).

Search engine content optimisation helps reach better SERP ranks. For this reason, marketplace and e-commerce websites started offering guides, reviews, product comparisons, or user tests in addition to their product offers after such algorithms as Google Panda and Penguin (Patil et al., 2021) were changed (Müller, Christandl, 2019). All this new content is there for a reason; it is a response to technology changes and a new content publishing and rank building philosophy: Content is King. 'Content is where I expect much of the real money will be made on the Internet' (Gates, 1996). The changes in the search engine algorithms shifted the focal point to quality content with the right number of key phrases optimised for search engines, which should also conform to user (audience, readership) expectations.

Before the Google algorithms were amended, in the Web 1.0 era (Król, 2020) and early Web 2.0 era, copywriters and SEO specialists were packing texts full of keywords (keyword stuffing), which yielded high-ranking positions in most cases. An 'artificial Internet' emerged dedicated to web crawlers and SERPs. At that time, 'high quality' of a website meant 'high SERP rank no matter the cost' regardless of user expectations. The new search engine algorithms put user interests first and made high quality perceived by users the model for evaluation by crawlers. As a result, SEO in terms of content, development technique (technical SEO) and search experience (SXO) grew more important. New tools were designed to conduct SEO audits, including comparative and competitive analyses.

2.3. Competitive analysis

Competitive analysis investigates the activities, strategies, strengths, weaknesses, and achievements of businesses in the same industry or offering similar products and services. Its purpose is to understand how competitors operate in the market, what they do right and wrong, and use the information to build a business strategy (Wijaya et al., 2021).

An analysis of actions and components that improve visibility in SERPs and user engagement gives a sneak peek of good practices used on other websites. It can be done by browsing and exploratory research. A look at competition websites, focusing on their structure, headings, article length, and topics, can provide valuable hints. Another recommended step is an analysis of competitive efforts in social media, such as content, frequency of publications, and user responses. It can inspire new content that will gain more attention and increase user engagement.

Other ways to find good practices are an exploration of the website, including menu layouts, HTML tags (such as headings H1, H2) and the use of such tools as Open PageRank, which shows the website's SERP rank. Other tools, such as SimilarWeb offer approximate website usage statistics. For example, one can also test competitive website performance with Google PageSpeed Insights or GTmetrix. Such keyword planners as Google Keyword Planner or Ahrefs can identify the main keyword phrases used on competitive websites. Tools for

analysing backlinks, such as Moz Link Explorer or Majestic, can find out what links lead to competitive websites and how many of them there are. There are also tools for automatic SEO auditing that can be used to conduct a comprehensive website quality assessment.

3. Materials and methods

The article investigates selected leading marketplace and e-commerce websites in Poland (Table 1). These websites are constantly improved and can be considered models and benchmarks in e-commerce website quality tests.

Table 1.
Audited marketplace and e-commerce websites

Acronym	Name	Characteristics
WS1	Allegro	An online marketplace present in Central and Eastern Europe owned by Allegro Sp. z o.o. in Poznań, Poland.
WS2	Empik	A seller of books, music, and other products operating in Poland. It has both brick-and-mortar stores and an e-commerce platform.
WS3	OLX	An online classified ads platform owned by OLX sp. z o.o. in Poznań.
WS4	Morele.net	An online store selling consumer electronics.
WS5	ceneo.pl	A price comparison website, e-commerce site registered in Wrocław, Poland.

The study followed two stages. The first one involved qualitative exploratory research. We analysed source codes of the home pages of each website, focusing on meta information, i.e. the structure of meta tags, which affects search engine optimisation (Table 2). The second stage involved quantitative algorithmic tests using selected automatic tools.

Table 2.
Tested HTML meta tag attributes

Item	HTML meta tag attributes	Function
1	Meta description 130 characters	The <meta name="description"> element provides a summary of a page's content that search engines include in search results. A high-quality, unique meta description makes the webpage appear more relevant and can increase search traffic.
2	Title	A succinct description of the page in the header section <title>#</title>. The title tag is displayed in the web browser tab label and on search engine results page.
3	Keywords	Keywords relevant to the page enclosed in <meta name="keywords" content="#">

For the quantitative part of the research, we employed tools that can conduct algorithmic SEO audits and present the results as an aggregate synthetic score (Król, Zdonek, 2020). The SEO audit followed the cross-validation scheme; the SEO quality of each website was verified with several test tools, which increased the reliability of the score (Table 3).

Table 3.
SEO audit tools

Item	Test tool	SEO quality metric	Metric scale	Metric unit
1	WeNet audit SEO	SEO Score	0–100	%
2	Pixaura Free SEO Audit Tool	On-Page SEO	A+ / F-	unitless
3	SEOmator Free SEO Audit Tool	SEO	0–100	%
4	AIOSEO SEO Analyzer	Overall Site Score	0–100	unitless
5	RankMath SEO Analyzer	SEO Score	0–100	unitless
6	Seobility SEO Checker	SEO Score	0–100	%
7	SEO Tester Online	SEO Score	0–100	unitless

1) https://audytseo.wenet.pl/; 2) https://www.pixaura.com/free-seo-audit/; 3) https://seomator.com/free-seo-audit-tool; 4) https://aioseo.com/seo-analyzer/; 5) https://rankmath.com/tools/seo-analyzer/;
6) https://www.seobility.net/en/seocheck/; 7) https://suite.seotesteronline.com/seo-checker/; 6.04.2024.

4. SEO-centred design recommendations

The descriptions obtained at the first stage were verified against design recommendations. Descriptions included in meta information should follow certain conventional guidelines and recommendations that are considered good practices. The most common are recommendations for title length (the meta title HTML tag) and page description (the meta description HTML tag).

According to Screaming Frog SEO Spider Tool (a desktop tool), the website title should be from 30 to 65 characters long, equivalent to 200 to 571 px. According to Zadroweb SEO Auditor, the title should not exceed 55 characters so that all search engines can display it correctly. SEO Checker Tool limits the title length to 66 characters. But it should not be shorter than 55 characters.

Similar guidelines apply to the length of the meta description tag. Editors of a SEO portal pozycjonowanie.pl recommend that the description should be around 160 characters long and contain a call to action. According to Screaming Frog, the website description should be 70 to 156 characters long, equivalent to 400 to 930 px. Zadroweb SEO Auditor sets the perfect description length at 150-160 characters. SEO Checker Tool limits the description length to 270 characters.

SEO experts also offer recommendations. Łukasz Żytko, the SEO leader at Whites believes that the website title should be 55 to 65 characters long because ‘the length of the results is limited to 512 pixels. Otherwise, it can be snapped in a really surprising place’ (Żytko, 2015, p. 18). The meta description tag, which summarises page content, should not exceed 160 characters (Żytko, 2015, p. 21). In summary, the literature suggests that the page title should range from 10 to 70 characters, and its description should not exceed 320 characters. It is noteworthy that Google does not officially restrict the length of the meta description tag, but the example description in its recommendations has 130 characters (Chrome for Developers, 2024).

5. Results

Results of the SEO attribute measurements using all the test applications are on a scale from 0 to 100 units except for Pixaura Free SEO Audit Tool. This application presents the result with letters. Following the aggregation of the results (except for Pixaura Free SEO Audit Tool) and imputation of data as the arithmetic mean, websites WS4 and WS1 reached the highest scores (under the employed research design). WS5 had the lowest result. The least discerning application was SEOmator Free SEO Audit Tool, which awarded the largest number of points, while WeNet audit SEO was the most parsimonious (Table 4).

Table 4.
SEO audit findings expressed with aggregate metrics

Item	Test tool	Measurement result					
		WS1	**WS2**	**WS3**	**WS4**	**WS5**	**Total**
1	WeNet audit SEO	72	66	57	77	43*	315
2	Pixaura Free SEO Audit Tool	N/D	A	B+	A	F*	0
3	SEOmator Free SEO Audit Tool	100	83	83	92	75	433
4	AIOSEO SEO Analyzer	71	79	67	75	75	367
5	RankMath SEO Analyzer	65	77	60	78	65	345
6	Seobility SEO Checker	76	53	63	77	N/D	336
7	SEO Tester Online	69	58	54	83	66	330
Total		453	416	384	482	391	2126

* test restricted with a captcha; T/O – Server Error (timeout), N/D – domain unavailable. The test could not be completed. WS1: https://allegro.pl/; WS2: https://www.empik.com/; WS3: https://www.olx.pl/; WS4: https://www.morele.net/; WS5: https://www.ceneo.pl/, 9.04.2024.

The maximum SEO score per website was 600 points (Pixaura Free SEO Audit Tool is excluded). The websites scored 2126 out of 3000 maximum points in total. It is approximately 71% of the maximum score under the employed research design. This result shows that not many quality attributes need search engine optimisation according to the test applications, especially considering that most of the design flaws are minor.

All the investigated websites have the title tag in the meta section (Table 5). These titles describe the primary attributes of the portals (selected by the editors), such as ‘attractive prices’ or the websites' functions, for example, ‘online shopping’ or ‘compare prices’. All the titles include the brand (website) names as the keyword and a short, concise description. The website name (brand) is the first keyword in four out of five cases. Four titles are structured the same way: ‘Website name (brand) – motto, succinct characteristic’. Therefore, this title structure can be considered a good practice.

Table 5.
Page title in the header section of meta information

Acronym	Name	Title*
WS1	Allegro	Allegro – atrakcyjne ceny – Strona Główna (Allegro – attractive prices – Home Page)
WS2	Empik	Empik.com | 5 000 000 produktów i pomysłów na prezent | Dostawa za 0 zł z Empik Premium (Empik.com | 5,000,000 products and gift ideas | Free delivery with Empik Premium
WS3	OLX	Ogłoszenia – Sprzedam, kupię na OLX.pl (Classified Ads – Sell, buy at OLX.pl)
WS4	Morele.net	Morele – zakupy online to pestka (Morele – online shopping is a piece of cake)
WS5	ceneo.pl	Ceneo – porównanie cen, sklepy, perfumy, agd, rtv, komputery (Ceneo – compare prices, stores, perfumes, household appliances, consumer electronics, computers)

*Website title as specified in the source code in HTML tag (<title></title>), 9.04.2024.

Four of the five tested websites had their names (brands) in the meta description tag. The brand occurred three times in the title of WS3. There is no brand name in the meta description tag of WS4 (Table 6). Therefore, it seems that placing the website name (brand) in the meta description tag is a good practice, also corroborated by Google Developers guidelines.

Table 6.
Descriptions of the websites used in the meta description tag

Acronym	Name	Meta description*
WS1	Allegro	Allegro – Najlepsze ceny oraz gwarancja bezpiecznych zakupów! (Allegro – The best prices and guaranteed safe shopping!)
WS2	Empik	Ponad 5 000 000 pomysłów na prezent w kategoriach Książka, Muzyka, Film, Zdrowie i uroda, Zabawki, Dom i ogród, Elektronika, AGD, Sport. Z Empik Premium taniej. (More than 5,000,000 gift ideas. Books, Music, Movies, Health and Beauty, Toys, Home and Garden, Electronics, Household Appliances Sports. Pay less with Emplik Premium.)
WS3	OLX	OLX.pl to darmowe ogłoszenia lokalne w kategoriach: Praca, Dom i Ogród, Elektronika, Moda, Rolnictwo, Zwierzęta. Dla Dzieci, Sport i Hobby, Muzyka i Edukacja, Usługi i Firmy. Szybko znajdziesz tu ciekawe ogłoszenia i łatwo skontaktujesz się z ogłoszeniodawcą. Na OLX.pl czeka na Ciebie m.in. praca biurowa, mieszkania, pokoje, samochody. Jeśli chcesz coś sprzedać – w prosty sposób dodasz ogłoszenia. Chcesz coś kupić – tutaj znajdziesz ciekawe okazje, taniej niż w sklepie. A wszystkie te ogłoszenia bez konieczności zakładania konta. Sprzedawaj po sąsiedzku na OLX.pl (OLX.pl offers free local classified ads in the following categories: Work, Home and Garden, Electronics, Fashion, Farm, Animals, For Children, Sports and Hobby, Music and Education, and Services and Business. You will quickly find interesting classified ads and contact the advertiser. OLX.pl has office jobs, apartments, rooms, and cars for you. It's easy to add a selling ad and find interesting buying opportunities that are cheaper than in stores. No registration required to use the ads. Sell in your neighbourhood)

Cont. table 6.

WS4	Morele.net	Szybka i darmowa dostawa, niskie ceny, najlepsze promocje, łatwe reklamacje i zwroty, szeroka oferta bestsellerów. Nasi eksperci doradzą, co wybrać z szerokiej oferty bestsellerów z różnych kategorii. (Quick and free delivery, low prices, the best deals, easy complaint system and returns, variety of bestsellers. Our experts will help you choose from our broad range of bestsellers from various categories.)
WS5	ceneo.pl	Porównywarka cen Ceneo.pl – znajdź produkt oraz sprawdź i porównaj jego cenę w sklepach internetowych. Perfumy, AGD, RTV, komputery, laptopy, fotografia (Ceneo.pl price comparison platform – find a product and check and compare its prices across online stores. Perfumes, household appliances, consumer electronics, computers, laptops, photography)

* Website description as specified in the source code in HTML (meta name="description") WS1: https://allegro.pl/; WS2: https://www.empik.com/; WS3: https://www.olx.pl/; WS4: https://www.morele.net/; WS5: https://www.ceneo.pl/, 9.04.2024.

All the websites except for WS2 have the correct length of the title tag according to RankMath SEO Analyzer (Table 2). A manual verification of SXO confirmed it. The title of WS2 is truncated on the Google SERP, which means it is too long. The titles of the other websites do not exceed the recommended 75 characters and are displayed complete. The tests seem to confirm the good practice of not exceeding 60 characters for page titles.

The algorithmic tests revealed meta descriptions that were too long on two websites. One of them exceeds the recommended 160 characters several times over (Table 7). A manual verification of SXO confirmed it. A meta description that is too long will not be displayed complete on the Google SERP. Therefore, the tests seem to confirm the good practice of not exceeding 160 characters for page descriptions.

Table 7.
Measured lengths of titles and descriptions

Website	SEO title (number of characters)	Pass	SEO meta description (number of characters)	Pass
WS1	41	1	61	1
WS2	87	0*	160	1
WS3	38	1	569	0*
WS4	32	1	200	0*
WS5	60	1	152	1

* According to RankMath SEO Analyzer, most search engines truncate meta titles to 75 characters and meta description to 160 characters.

Source: RankMath SEO Analyzer.

Title and meta description lengths can also be expressed in pixels. Seobility SEO Checker recommends titles not exceeding 580 pixels and meta descriptions not longer than 1000 pixels. When applied together, these two approaches yield varying results for meta description (Table 8). Note, however, that the use of a character as the unit of description length is much more practical.

Table 8.
Measured lengths of meta title and description tags

Website	Title	Pass	Meta description	Pass
allegro.pl	369 / 580 pixels 369 pixels out of 580 pixels max.	1	401 / 1000 pixels 401 pixels out of 1000 pixels max.	1
empik.com	826 / 580 pixels The page title should be shorter than 580 pixels. It is 836 pixels long.	0	1036 / 1000 pixels The meta description is too long: 1036 pixels out of 1000 pixels max.	0
olx.pl	366 / 580 pixels 366 pixels out of 580 pixels max.	1	3600 / 1000 pixels The meta description is too long: 3600 pixels out of 1000 pixels max.	0
morele.net	293 / 580 pixels 293 pixels out of 580 pixels max.	1	1244 / 1000 pixels The meta description is too long: 1244 pixels out of 1000 pixels max.	0
ceneo.pl*	N/A			

Test results: 1 – pass; 0 – optimisation needed; * N/A – Page unavailable. This site could not be crawled by the Seobility bot (robots.txt blocks access). No URLs can be crawled that deny access to the user agent Seobility.

Source: Seobility SEO Checker.

However, only one site had the meta keywords tag (Table 9). It is consistent with general design recommendations. The omission of this tag can be considered a good practice.

Table 9.
Occurrence and content of the meta keywords tag

Acronym	Name	Keywords*
WS1	Allegro	No keywords, no meta keywords HTML tag.
WS2	Empik	No keywords, no meta keywords HTML tag.
WS3	OLX	No keywords, no meta keywords HTML tag.
WS4	Morele.net	No keywords, no meta keywords HTML tag.
WS5	ceneo.pl	Porównywarka cen, Ceneo, sklepy internetowe, Biuro i firma, Budowa i remont, Dla dziecka, Dom i wnętrze, Fotografia, Gry, Hobby i zwierzęta, Komputery, Moda, Motoryzacja, Ogród, Sport i rekreacja. (Price comparison website, Ceneo, online stores, Office and home, Construction and repair, For children, Home and interior, Photography, Games, Hobby and animals, Computers, Fashion, Automotive, Garden, Sports and recreation.)

* Keywords specified in the (meta name="keywords") HTML tag of the source code.

6. Discussion

6.1. Observations

The audit process for WS5 needs to be clarified. Many websites, including WS5, are configured to restrict access to their source code for web crawlers. It may be because crawlers use up server resources, which can reduce performance. The robots.txt file can be configured to disable testing. In addition, if a CAPTCHA is used, the test involves only the CAPTCHA box, not the website. This makes the results of algorithmic SEO audits less reliable. It was the case with WS5.

The exploratory research demonstrated that editors of leading Polish marketplace and e-commerce websites do not use the meta keywords tag, although it can inform the browser about the topics of the website. In-depth research provides arguments for this approach. In fact, Google does not use the keywords meta tag in web ranking: 'Our web search Google.com disregards keywords meta tag completely. They simply don't have any effect in our search ranking at present.' (Google Developers, 2009). What is more, Yahoo and Bing search engines also ignore meta keywords: 'Today, it's pretty clear the meta keyword tag is dead in terms of SEO value. Sure, it might have value for contextual ad systems or serve as a signal to bots plying the web looking for topics to target, but as far as search goes, that tag flat lined years ago as a booster' (Forrester, 2014). The primary reason for this is that the keyword meta tag was used for fraudulent SEO (Black Hat SEO) (Malaga, 2010).

Test tool editors use various lengths and recommendations for the meta description and title tags as references. A quality (correctness) assessment of this attribute based on length in pixels is less practical than a character-based assessment. The latter is more rational in terms of content optimisation: it is easier to count characters in a text editor than to measure length in pixels. Moreover, it is much easier to count the characters in examples of meta description tags on the Google Developers (2024) website and follow their lead, which is not to exceed 170 characters.

The results of the algorithmic tests should be scrutinised and considered critically. Websites often partially or completely restrict their availability for crawlers through various mechanisms. Some websites use CAPTCHA to verify whether an activity was initiated by an actual user or a crawler. This may distort the results of an algorithmic test because it is not the target website that is audited but a CAPTCHA box or another intermediary. Crawlers can also be banned from a website with a special configuration of the robots.txt file and/or the website's source code with the meta robots tag. Crawlers are most often blocked for privacy reasons to limit access to sensitive data that are not to be indexed or to optimise indexing by blocking irrelevant or recurring sections. Still, the primary purpose of the robots.txt file is to manage server traffic by limiting the number of requests, which may be necessary for large websites or when server resources are limited. As a consequence, it may be impossible to conduct an SEO audit with an online tool (Li et al., 2019).

6.2. Website quality scoring

Most website quality research focuses on specific types of sites. According to Morales-Valgas et al. (2023), the most popular test object is education sector websites, including university, public library, and museum sites. Health care (hospital and clinic) (Król, Zdonek, 2021) and healthy lifestyle website quality is evaluated just as often. Another common focus is public institutions, including local and central governments, and commercial organisations, such as online stores and hospitality businesses, hotels and guesthouses. Most studies of website quality offer a ranking list of the investigated websites according to the value of the indicator employed for the specific research design (Van Huy, Thai Thinh, 2024).

The tools for automated quality testing are most often selected subjectively to serve the purpose of the research design. According to Aladwani and Palvia (2002) and Morales-Valgas et al. (2020), website quality is its ability to meet the expectations of users and editors defined by quantifiable attributes. Consequently, website quality is determined by the subjective assessment of such attributes as functionality and usability performed by users rather than by an expert auditor. Morales-Vargas et al. (2023) proposed an all-inclusive framework for developing new tools for website quality assessment, focusing on strategic, functional, and experimental aspects of use. Rashida et al. (2021) came up with a model for assessing university websites based on two main criteria: content and performance. Confetto and Covucci (2021) analysed the quality of a website in terms of SEO and proposed a new algorithm concept: Sustainability-content SEO. In their research, Kaur et al. (2016) employed selected automatic testing tools, such as Pingdom, GTMetrix, Website Grader, and Site Speed Checker. Mladenović et al. (2023) investigated factors affecting website SERP visibility improvement. Giannakoulopoulos et al. (2019) verified the quality of websites using HTML and CSS validators, WAVE, Google PageSpeed Insights, and Google Lighthouse. The literature analysis revealed that website quality evaluation often involves web applications that can automatically test specific quality areas.

Website quality assessment involves many specialist IT tools and guidelines, such as the W3C or WCAG specifications useful for evaluating accessibility to people with disabilities, for example (Dueppen et al., 2019). Website quality research relatively often employs tools for validating code syntax, including W3C HTML and CSS validators, and such tools as Majestic SEO to analyse hyperlink quality, Pingdom to monitor website performance, mobileOK to verify mobile friendliness (responsiveness), WAVE to evaluate website accessibility, or Xenu's Link Sleuth to verify hyperlink quality (Cajita et al., 2017; Ismailova, Inal, 2017). These tools follow various operational principles. Some need to be installed on the auditing device; others are web applications run in a browser.

7. Summary

The article presents differences among leading marketplace and e-commerce websites in Poland identified with selected test tools under the employed research design (Q1). The study assumed the perspective of a third-party auditor, following black-box testing principles. The focal point was selected design attributes and development techniques rather than the brand, business model, or path to purchase. When aggregated, the results can be ordered by the aggregate SEO Score into a ranking list of the websites. Although the evaluation is general, it still supports the conclusion that the websites are of high quality. Even though the websites exhibit high quality, as measured by the SEO Score, some attributes, such as meta information,

could be optimised. We have noticed that minute design details and imperfections that affect SEO may go unnoticed for large websites with specialised editors and extensive back-end facilities. Their optimisation may be ignored as irrelevant to the website team's content management policy.

Results from free tools are approximate. The tools offer limited recommendations for improvements (Q2). Nevertheless, they are sufficient for identifying basic design flaws. Therefore, they may be useful for competitive analysis and slightly less for search engine optimisation.

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