



İZMİR BAKIRÇAY UNIVERSITY

GRADUATE EDUCATION INSTITUTE  
MANAGEMENT INFORMATION SYSTEMS

**ACCESSIBILITY, USABILITY AND SECURITY ASSESSMENT OF  
CORPORATES' SUSTAINABILITY WEB PAGES: A CASE STUDY ON  
CORPORATES IN THE BORSA ISTANBUL SUSTAINABILITY STOCK INDEX**

MASTER'S THESIS

Sıla Azer YÜKSEL

Supervisor: Assoc. Prof. Dr. Serhat PEKER

July 2024



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**İzmir**

**İzmir Bakırçay University**

**Graduate Education Institute**

**July 2024**

## FINAL APPROVAL FOR THESIS

This thesis titled “Accessibility, Usability and Security Assessment of Corporates’ Sustainability Web Pages: A Case Study on Corporates in the Borsa Istanbul Sustainability Stock Index” has been prepared and submitted by Sıla Azer YÜKSEL in partial fulfilment of the requirements in “İzmir Bakırçay University Directive on Graduate Education and Examination” for the Degree of Master of Science in Management Information Systems Department has been examined and approved on 01/07/2024.

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## ABSTRACT

### ACCESSIBILITY, USABILITY AND SECURITY ASSESSMENT OF CORPORATES' SUSTAINABILITY WEB PAGES: A CASE STUDY ON CORPORATES IN THE BORSA ISTANBUL SUSTAINABILITY STOCK INDEX

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Corporate sustainability web pages reflect strategies to mitigate environmental impact, crucial for long-term business continuity. In this manner, ensuring accessibility, usability, and security in these pages is essential. This thesis evaluates the quality of sustainability web pages of corporates from accessibility, usability, and security perspectives. Our sample consists of 71 Turkish companies and the analysis was conducted on their sustainability web pages using TAW, GTmetrix, SUCURI, Google Mobile-Friendly, and Dead Link Checker automatic online testing tools. Thus, the results show indicate a necessity to enhance the overall quality of sustainability web pages among Turkish corporations. The findings of this thesis also address the major problems and serve as constructive feedback for web administrators and developers, guiding them towards enhancements in accessibility, usability, and security aspects of these web pages. Therefore, this thesis seeks to provide valuable insights into the performance of these web pages, thereby contributing to the advancement of corporate sustainability communication and transparency.

**Keywords:** Human-computer interaction (HCI), web accessibility, web usability, web evaluation tools, corporate web pages

## ÖZET

# ŞİRKETLERİN SÜRDÜRÜBİLİRLİK WEB SAYFALARININ ERİŞEBİLİRLİK, KULLANILABİLİRLİK VE GÜVENLİK DEĞERLENDİRMESİ: BORSA İSTANBUL SÜRDÜRÜBİLİRLİK HİSSE SENEDİ ENDEKSİNDE YER ALAN ŞİRKETLER ÜZERİNE BİR VAKA ÇALIŞMASI

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Kurumsal sürdürülebilirlik web sayfaları, uzun vadeli iş sürekliliği için çok önemli olan çevresel etkiyi azaltma stratejilerini yansıtmaktadır. Bu bağlamda, bu sayfalarda erişilebilirlik, kullanılabilirlik ve güvenlik gibi kriterlerin sağlanması oldukça önemlidir. Bu tez, kurumsal sürdürülebilirlik web sayfalarının kalitesini erişilebilirlik, kullanılabilirlik ve güvenlik perspektiflerinden değerlendirmektedir. Örneklemimiz 71 Türk şirketinden oluşmaktadır ve analiz, TAW, GTmetrix, SUCURI, Google Mobile-Friendly ve Dead Link Checker otomatik çevrimiçi test araçları kullanılarak sürdürülebilirlik web sayfaları üzerinde gerçekleştirilmiştir. Sonuçlar, Türk şirketleri arasında sürdürülebilirlik web sayfalarının genel kalitesinin artırılması gerektiğini göstermektedir. Bu tezin bulguları aynı zamanda temel sorunları ele almakta ve web yöneticileri ve geliştiricileri için yapıcı bir geri bildirim işlevi görerek onları bu web sayfalarının erişilebilirlik, kullanılabilirlik ve güvenlik yönlerinde iyileştirmeler yapmaya yönlendirmektedir. Dolayısıyla bu tez, söz konusu web sayfalarının performansına ilişkin değerli bilgiler sunmayı ve böylece kurumsal sürdürülebilirlik iletişimi ve şeffaflığının ilerlemesine katkıda bulunmayı amaçlamaktadır.

**Anahtar Sözcükler:** İnsan-bilgisayar etkileşimi, web erişilebilirliği, web kullanılabilirliği, web değerlendirme araçları, kurumsal web sayfaları



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Thank you.

**STATEMENT OF COMPLIANCE WITH ETHICAL PRINCIPLES AND  
RULES**

I hereby truthfully declare that this thesis is an original work prepared by me; that I have behaved in accordance with the scientific ethical principles and rules throughout the stages of preparation, data collection, analysis and presentation of my work; that I have cited the sources of all the data and information that could be obtained within the scope of this study, and included these sources in the references section; and that this study has been scanned for plagiarism with Turnitin scientific plagiarism detection program used by İzmir Bakırçay University, and that “it does not have plagiarism” whatsoever. I also declare that, if a case contrary to my declaration is detected in my work at any time, I hereby express my consent to all the ethical and legal consequences that are involved.

**Sıla Azer YÜKSEL**

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## **LIST OF ABBREVIATIONS**

WCAG: Web Content Accessibility Guidelines

W3C: World Wide Web Consortium

TLS: Transport Layer Security

SSL: Secure Sockets Layer

HTTP: Hypertext Transfer Protocol

HTML: Hypertext Mark-up Language

CSS: Cascading Style Sheets

SEO: Search Engine Optimization

BSE: Bombay Stock Exchange

## 1. INTRODUCTION

Companies need to prioritize sustainability since it includes risk management, employee engagement, market advantage, investor interest, regulatory compliance, cost savings, brand reputation, and market advantage. Sustainable business operations lessen their impact on the environment by cutting down on waste, pollution, and resource usage. Financial penalties and legal ramifications can be avoided by adhering to stricter environmental rules. Sustainability reduces operating costs through resource conservation and energy-efficient procedures, which boosts efficiency economically. Furthermore, it improves customer loyalty and company reputation, as people are beginning to favor environmentally responsible businesses. Sustainability sets businesses apart from the competition, drawing in eco-aware customers and creating new business opportunities. Investors that place a high value on environmental, social, and governance factors will also find it appealing. Sustainable methods increase risk management by reducing hazards associated with supply and resource constraint.

Sustainability information refers to the data provided by businesses concerning the wider economic, environmental, social, and ethical impacts of their operations [1]. Corporate sustainability involves various aspects of how businesses interact with society, including corporate citizenship, social responsibility, and sustainable management [2]. It also influences both corporate reputation and financial performance. All these factors have led companies to adopt more proactive approaches to sustainability management and reporting [3], [4]. Companies mostly use their websites as a reporting tool for their sustainability initiatives. Usually, this entails setting aside particular web sites to describe their sustainability goals, actions, and associated data. Thus, companies can improve responsibility, credibility, and transparency in tackling related issues by putting their sustainable policies on display online.

On the other hand, the quality of websites is very important for organizations to enhance their competitive advantage and portray their identity and institutional image. When assessing the quality of websites, automated testing technologies give the evaluator an interface that makes it simple and fast to identify possible issues. Numerous website quality factors can be examined with various software testing tools, allowing for the prompt detection and prevention of issues.

Several factors influence the quality of webpages. Accessibility, usability, and security are essential for web quality because they ensure a safe, intuitive, and inclusive user experience. Together, they protect user data, enhance user satisfaction, and ensure that all individuals, regardless of their abilities, can access and navigate web content effectively. For these important reasons security, usability, and accessibility are commonly considered when evaluating website quality. According to the W3C's Web Content Accessibility Guidelines (WCAG 1.0 and 2.0), web accessibility refers to the ease with which older persons and those with disabilities can access online resources [5]. Usability, particularly for websites meant for public use, is another essential component. This metric measures how quickly and easily visitors can browse the website to find the service they want. User dissatisfaction increases when a website is difficult to navigate or slow, raising the likelihood that users may leave. Usability evaluations generally check for broken links, page size, and load speed of websites [6]. Apart from usability and accessibility, security is also very important for websites. An outdated system and unencrypted communication increase the risk of attacks [7]. In addition to accessibility, usability and security, mobile friendly analysis is very important to analyze the mobile compatibility of a web page. Nowadays, mobile is used more than desktop type, and if a web page is not mobile friendly, it can result in a bad experience for the user. More over these dimensions broken link analysis helps improve the quality of a web page by detecting non-existent or broken hyperlinks on a web page.

This thesis aims to evaluate the quality of sustainability web pages belonging to 71 Turkish companies from the perspectives of accessibility, usability, and security. Using automatic testing tools, these web pages are examined to provide up-to-date insights into their performance. By identifying potential issues and areas for improvement, our thesis seeks to offer valuable suggestions to enhance the effectiveness and reliability of corporate sustainability communication on these web pages.

In the thesis organization section, the general structure of the thesis is emphasized, which studies are carried out in which section.

## **1.1. Research questions**

In order to meet the specified research goals, these research questions were developed:

- How do the sustainability web pages of corporates in Turkey perform in terms of accessibility, usability, and security?
- What accessibility issues exist in the sustainability web pages of Turkish corporates according to the WCAG 2.0 guidelines?
- To what extent do Turkish corporate's sustainability web pages fail to meet accessibility conformance levels?
- What is the usability status of the sustainability web pages of Turkish corporates based on their performance metrics?
- What are the security risks associated with the sustainability web pages of Turkish corporates?

## **1.2. Contributions**

The main contributions of this thesis are summarized as follows:

- Usability, accessibility, and security issues in the sustainability web pages of corporates in Turkey have been identified.
- Actionable information and suggestions were provided to improve web page quality. These suggestions will improve corporate sustainability communication and transparency.
- Automatic online tools that can be used by webmasters for accessibility, usability and security analysis were specified.

### **1.3. Thesis organization**

This thesis is organized into the following six chapters: Chapter 2 provides a comprehensive literature review of studies on the accessibility, usability, and security of websites, including an analysis of corporate sustainability web pages. Chapter 3 explains the data used in the research, the analysis process, and the testing tools employed. Chapter 4 presents the findings from the usability, accessibility, and security analyses of the corporate sustainability web pages in Turkey. Chapters 5 and 6 offer a summary of the thesis, compare the findings with similar studies in the literature, and provide suggestions for developers as well as potential directions for future research.



## **2. LITERATURE REVIEW**

### **2.1. Web quality**

The primary focus of this paper is evaluating the quality of websites and corporate sustainability web pages. This section reviews various previous studies on assessing usability, quality, and accessibility and security. Mansotra and Manhas [8] performed several tests on website usage, assessing factors such as response time, load time, website size, and number of items. They also examined structural elements like code and link validation, as well as content aspects, including link popularity. Huang and Cappel [9] analyzed business websites. They developed a rating system based on user research and applied it to the INC 500 company websites. The findings showed that very few usability recommendations were followed. Researchers analyzed the usability procedures of INC 500 and Fortune 500 organizations in the current study and discovered that Fortune 500 companies often outperformed INC 500 companies in terms of usability standards. Wan Mohd Isa et al. [10] examined the usability and accessibility of Malaysia's e-government websites. Usability was assessed according to the Nielson usability guidelines, focusing on factors such as upload speed, page size of the main page, and the presence of broken links. Past research indicates that website evaluation is contingent upon various factors, such as download delay, page errors, broken links, server response time, etc., all of which can be assessed using web diagnostics [11]. As for this research, it purposed to mainly assess the Turkish Corporate's sustainability web pages E- in term to their usability and accessibility, and security.

## 2.2. Web accessibility

The evaluation of website accessibility aims to confirm equal access to information for all individuals, including those with disabilities Web Accessibility Initiative (WAI | W3C, 2005). The WCAG 2.0 accessibility model is structured around four core principles: perceivable, operable, understandable, and robust (WCAG) 2.0, 2008). Crafted to be adaptable across different web technologies, WCAG can be assessed using a blend of human evaluation methods and automated testing tools [13]. Website accessibility analysis has been the subject of numerous research, most of which used automatic assessment tools like AChecker, TAW, WAVE, and Sort Site to find possible problems [14].

In the research conducted by Ismailova and Inal [15] the authors focused on assessing the accessibility of government websites using the TAW tool. Similarly, Kuzma et al. [16] evaluated the accessibility of health sector websites, also employing the TAW tool for their analysis. Kamal et al. [17] evaluated the accessibility of educational websites using the AChecker tool. Alhadreti [18] also utilized the AChecker tool to assess accessibility in the health sector. Similarly, Barricelli et al. [13] conducted an accessibility evaluation of educational websites, employing the AChecker tool in their research. Gopinath et al. [19], the authors evaluated the accessibility of government websites using the Google PageSpeed Insights tool. Yerlikaya et al. [20] conducted an accessibility assessment of educational websites, employing the SortSite tool. Similarly, Alsaeedi [21] examined the accessibility of educational websites using the WAVE tool.

TAW tool offers comprehensive testing with a user-friendly interface and multilingual support but is region-specific and less internationally known. AChecker is a free, customizable tool but has a less intuitive interface. SortSite provides extensive site-wide testing but can be overwhelming and is primarily a paid tool. WAVE is highly recognized and user-friendly but focuses on individual pages. Google PageSpeed Insights integrates well with other Google tools and is free but focuses more on performance than accessibility. According to this comparison of accessibility tools, in this thesis, the TAW tool was used for accessibility analysis because it is more user-friendly and easier to use than other tools.

### 2.3. Web usability

Usability is a critical aspect of website design, focusing on how effectively users can navigate and access content. Usability analysis uses two primary testing methodologies: assessing every page or giving the home page special attention so that developers can make it accessible [22]. Studies in the domains of information systems (IS) and human-computer interaction (HCI) have emphasized the importance of usability in online activities. Numerous studies conducted in the fields of education, social media, and government have evaluated the usability of websites [23]. These evaluations often utilize automated tools like the WAVE tool, W3C's HTML Validation Service, and others. They investigate elements such as accessibility, content, page analysis, design, mobile readiness, search engine optimization performance, usability, and security. This provides insights into the strengths and weaknesses of websites across different domains [24]. In their 2019 study, Zarish et al. [25] evaluated the usability of educational websites using Qualidator, Website Analyzer, and Website Grader - tools. Wen Jun et al. [26] conducted a usability assessment of social media platforms, employing Pingdom, GTmetrix, and Website tools for their analysis. Akgül [27] conducted a usability evaluation of educational websites, employing the SUCURI Sitecheck tool. Bilal et al. [28] investigated the usability of government websites, using GTmetrix for their analysis.

GTmetrix offers comprehensive performance analysis with detailed metrics and actionable recommendations but has limited free tests and can be expensive for advanced features. Qualidator provides a holistic view of website quality across various metrics but may be overwhelming and less performance-focused. Website Grader is user-friendly and free, offering a general overview suitable for non-technical users but lacks in-depth analysis. Pingdom focuses on performance and uptime monitoring with detailed metrics and historical data but is primarily a paid tool and less comprehensive outside performance areas. GTmetrix tool was used during web usability analysis in this thesis, as Tmetrix offers comprehensive performance analysis with detailed measurements and actionable recommendations.

## 2.4. Web security

In addition to usability and accessibility, security is a crucial aspect in website evaluation. While it may seem slightly distant from the former two, the significance of website security is deemed equally or even more crucial [22]. Ratnasingam [29] underscores the substantial challenge of security, emphasizing the potential for hackers to compromise or destroy applications. Various research in the literature, including security analyses of websites, were investigated to explore this aspect further. Dukes et al. [30] conducted a comparative assessment of manual testing methods and automated tools for vulnerability detection. They found that a combination of expert observation and manual testing is more effective in identifying errors. During the security analysis, researchers investigate the status of approximately 7000 distinct domains concerning malware presence, inclusion on blacklists, and software currency. To identify potentially dubious circumstances McAfee SiteAdvisor, APIs like Sucuri SiteCheck, Google Safe Browsing, and Norton, which are accessible through various reputable web browsers, are employed [7]. Alsmadi et al. [31] conducted a study on the security of government websites using the Rapid7 Security Tool and Penetration Testing Tool. Macakoğlu et al. [7] assessed the security of educational websites employing the Sucuri tool. Similarly, Csontos et al. [22] evaluated the security of government websites using Sucuri.

Sucuri offers comprehensive website security with easy-to-use features but is primarily a paid service focused on websites. McAfee SiteAdvisor provides free safety ratings but lacks in-depth security analysis. SortSite covers a wide range of site checks, including security, but isn't specialized in security. Google Safe Browsing offers free, real-time protection but is limited to harmful website detection. Rapid7 provides robust, enterprise-level security tools that require technical expertise. Penetration Testing Tools offer in-depth assessments but are costly, require skilled professionals, and lack continuous monitoring. Since the Sucuri tool is easy to use and offers a comprehensive analysis, this tool was used for web security analysis in this thesis.

Table 2.1. Provides a general summary of papers that work on Web accessibility, usability and security in different sectors using automatic tools.

**Table 2.1.** Related Work on Web accessibility, usability and security

<b>Paper</b>	<b>Sector</b>	<b>Dimension</b>	<b>Tools&amp; Techniques</b>
[32]	Government	Accessibility	TAW, Site Analyzer
[31]	Government	Security	Rapid7Security Tool, Penetration Testing Tool
[17]	Education	Accessibility	Achecker
[33]	Government	Accessibility, Usability	TAW, AChecker, eXaminator, Total Validator, EvalAccess 2.0, HERA
[34]	Education	Accessibility	Hera, TAW
[19]	Government	Accessibility	GooglePageSpeedinsight, WAVE, GoogleMobile-FriendlyTest, Pingdom tool, and PowerMapper
[35]	Government	Accessibility	Achecker, TAW, WAVE, SortSide
[20], [36]	Education	Accessibility, Usability	EvalAccess2.0, WebPage Analyzer developed by Website Optimization
[20]	Education	Accessibility	SortSide
[15]	Government	Accessibility	TAW
[37]	E-Commerce	Accessibility, Usability	SortSide

[38]	Government	Accessibility, Usability, Security	WAVE, w3clink, sortside, Pingdom, Google speed insigh, Acunetix WebVulnerability Scanner tool
[14]	Health	Accessibility, Usability, Security	TAW, WebPageAnalyzer developed by WebSiteOptimization, Measure Text Readability, built with
[39]	Education	Accessibility	Achecker, Google's Mobile Friendly
[16]	Health	Accessibility	TAW
[40]	Banking	Accessibility, Usability, Security	WebSiteOptimization, Fast Link Checker, Pingdom, PageSpeed Google
[41]	Education	Accessibility	AChecker, WAVE, and aXe
[24]	Government	Accessibility, Usability	Achecker, TAW
[42]	Airline	Accessibility, Usability	TAW, Pingdom, Websitepulse,
[43]	Banking	Accessibility, Usability	WAVE, Achecker
[28]	Government	Accessibility, Usability	Achecker, Gtmetrix, online Google Mobile-friendly tool.
[25]	Education	Usability	Qualidator, Website Grader, Website Analyzer
[44]	Government	Accessibility, Usability, Security	EvalAccess2.0, AChecker online, WebSiteOptimization tool.
[45]	Education	Accessibility	TAW, Google Mobile-friendly test tool

[21]	Education	Accessibility	WAVE
[46]	E-Commerce	Accessibility, Usability	Achecker, TAW
[47]	Banking	Accessibility, Usability	Wave, TAW, Achecker
[48]	Education	Accessibility	Achecker, WAVE ,aXe
[22]	Government	Accessibility, Usability, Security	WAVE, Sucuri, Gtmetrix
[27]	Education	Accessibility, Usability	Achecker, SUCURI Sitecheck
[49]	Government	Accessibility, Usability	TAW, Google Mobile-friendly test tool
[18]	Health	Accessibility	Achecker
[26]	Social Media	Usability	Pingdom, GTmetrix, and Website Grader
[13]	Education	Accessibility	Achecker
[50]	Fintech	Accessibility, Usability	MAUVE++, WAVE, Dead Link Checker
[51]	Banking	Accessibility	WAVE, Achecker
[52]	Health	Accessibility, Usability, Security	TAW, Deadlink Checker online test tool, the Google Mobile-friendly test tool
[7]	Education	Accessibility, Usability, Security	TAW, GTmetrix, Sucuri

## **2.5. Related works on corporate's web pages**

In today's world, websites have become increasingly pervasive, playing a crucial role in the success of a wide array of organizations across various sectors. They are indispensable not only in commerce and industry but also in financial services, government healthcare, administrations, culture, entertainment, and numerous other fields [53]. These websites are commonly referred to as corporate websites, as they share a unified purpose: to support and promote the endeavors of an organization, whether they are economic, cultural, or social in nature [54].

There are studies in the literature for accessibility analysis of corporate websites. Leither et al. [55] used guided interviews with managerial interviews in addition to an automated online tool called Total Validator. Only 12% of public sector websites met web accessibility principles, according to this survey, which found that websites in the private sector had superior accessibility results. Singh and Singh [56] conducted an investigation to examine the corporate information posted on the websites of one hundred well-known Indian firms that are listed on the Bombay Stock Exchange (BSE). Their research also sought to pinpoint the factors influencing the extent of disclosure. The research revealed a positive correlation between company magnitude and listing age with enhanced web accessibility. Additionally, it highlighted those companies with lower market risk exhibit a greater concern for the online accessibility of corporate information. In one of the recent studies, Conte et al. [57] investigated the adherence to principles promoting the social inclusion of disabled users, specifically focusing on the accessibility of corporate websites maintained by sustainable firms. The findings revealed that a significant majority of corporate websites fall short of meeting accessibility guidelines, with variations noted in accordance with sector and geography. Interestingly, the study also highlighted those businesses, irrespective of their industry or geographical origin, exhibit adherence to W3C standards according to the results.

In the literature, there are quality analysis studies as well as accessibility analysis of corporate websites. The four concepts of quality Fogli and Guida [53] aimed to explore are usage quality, internal quality, final quality, and initial quality. This study offers a new quality model for websites, comprising a number of primary elements, supporting features, and structures that define the overall quality of the website. One of the recent quality analysis studies is on the evaluation of airline corporate websites: Agrawalet et al.

[42] assessed the website quality of Indian airlines, focusing on principles like accessibility, usability, and readability through online automation tools. The evaluation of usability included parameters like page size, loading time, and the presence of broken links, among others.

Based on the extensive literature review provided, the focus on sustainability web pages within the corporate sector remains relatively unexplored. This thesis aims to fill this crucial gap by comprehensively assessing the usability, accessibility, and security aspects of sustainability web pages belonging to Turkish companies.



### **3. METHODOLOGY**

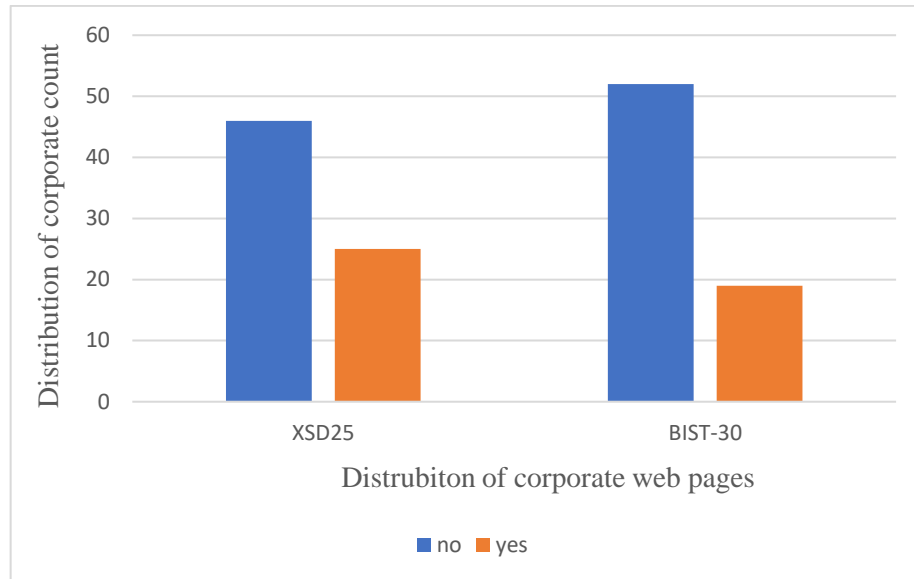
#### **3.1. Selection of web pages**

This section explains the research methodology, including the study's universe and sample, as well as the data collection and analysis processes.

This thesis investigates the sustainability web pages of companies listed in BIST-30 and XSD25, focusing on their accessibility, security, and usability. BIST-30 represents the top 30 companies in terms of trading volume and market value on the Istanbul Stock Exchange, while XSD25 represents companies with high sustainability performance and liquidity also listed on the Istanbul Stock Exchange. Throughout the research, "XSD25 (yes)" refers to companies listed in the XSD25, while "XSD25 (no)" refers to those not listed in it. Similarly, "BIST 30 (yes)" indicates companies listed in the BIST-30, and "BIST 30 (no)" represents those not listed in it. When determining the stocks to be included in the BIST 30 index, the market capitalization and average daily trading volume of the shares in active circulation are ranked in descending order. Stocks ranked at the top of these two rankings are included in the index. Companies to be included in the XSD25 sustainability index must meet the relevant criteria:

- Overall Sustainability Score of 70 or above,
- Each main title score is 60 or above,
- At least 8 of the category scores are 50 or above [58].

Initially 76 companies that meeting these criteria from the XUSRD (Sustainability index) were selected, but five were excluded due to the absence of sustainability web pages. The remaining 71 companies' sustainability web pages were thoroughly evaluated, and the evaluated web pages are listed in the Appendix. Additionally, the distribution of data for XSD25 and BIST-30 companies is presented in Figure 3.1.



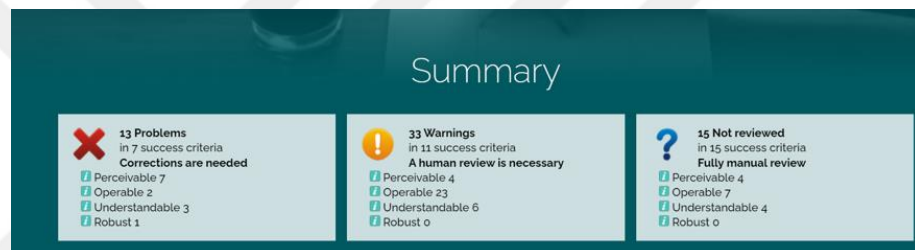
**Figure 3.1.** Distribution of corporates web pages according to the list on XSD25 and BIST 30

### 3.2. Data collection tools and techniques

In this, section automatic online testing tools used to evaluate companies' sustainability web pages in terms of accessibility, usability and security are discussed. Data obtained using automatic tools for accessibility, usability and security analyses were collected in 2023.

The TAW [59] one of the automated testing tools was used to analyze companies' sustainability web pages. The sustainability pages of the corporate selected for the thesis were assessed using the TAW test tool in accordance with WCAG 2.0. WCAG is a set of standards designed to develop the accessibility of web content for people with visual, hearing, cognitive, or motor impairments. The TAW tool provides a summary and detailed report of accessibility guides broken down into operable, understandable, perceivable and robust categories [59]. Using this tool, a website's accessibility can be assessed by entering the web page's URL. Web accessibility issues are classified into three categories: precedence 1 (Level A), priority 2 (Level AA), and priority 3 (Level AAA). Level A sets the minimum level of accessibility, addressing basic functionality issues, while Level AAA represents the highest and most comprehensive level of accessibility, often considered difficult to achieve across an entire site. Level AA, positioned between these, covers more significant barriers without being overly stringent,

making it a practical and impactful choice for most organizations. Level AA is important for accessibility analysis because it strikes a balance between making web content accessible to people with disabilities and being practical to implement, ensuring compliance with legal standards and enhancing usability for a broad audience. . For this thesis Level AA category was selected to meet regulatory requirements, improve user experience, and demonstrate a commitment to inclusivity. The report presents findings from the analysis of companies' sustainability web pages using TAW. The statuses for each success criterion are categorized as follows: 'No problem found,' 'Problem found,' 'Unable to perform automatic review', and "Recommended for human review'. These categories are shown in Figure 3.2. Given the scope of this thesis, only the findings regarding the categories of 'Problem found' and 'No problem found' were discussed and considered in this research.

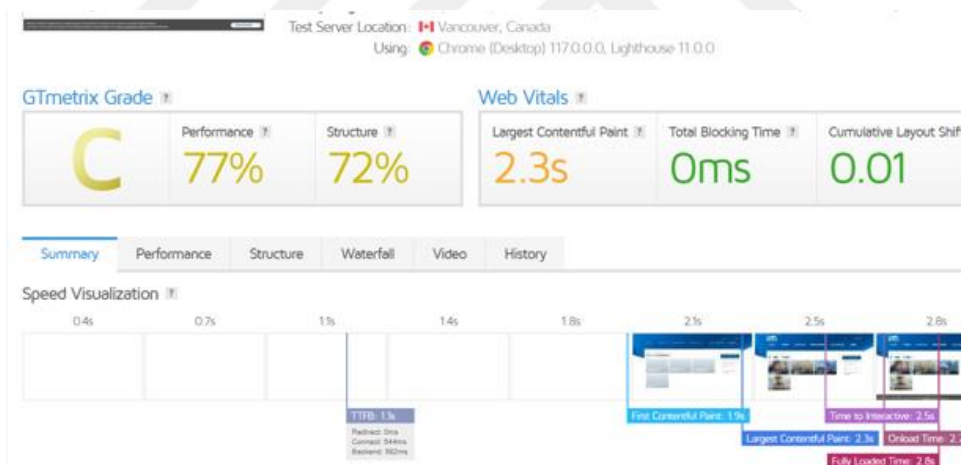


**Figure 3.2.** Summary section of the TAW tool results

The GTmetrix automated testing tool [60] was employed to analyze the usability of the corporate web pages. GTmetrix is a comprehensive tool designed to track web performance and website performance. It offers valuable insights into the functionality and speed of websites by analyzing various metrics, such as the size of the web page, the number of demands required to load it, and the page load time. These metrics are critical for assessing the effectiveness of a website and identifying areas for improvement in user experience. GTmetrix provides a detailed report, enabling users to calculate the web page's comprehensive speed score and rating. Factors such as total page size, loading speed, and the overall number of requests are taken into account. All things considered, GTmetrix is a useful tool for website optimization, giving users the ability to make well-informed choices to improve the functionality and user experience of their websites. GTmetrix displays the Google Lighthouse test performance score and evaluates the website's functionality in various ways. The GTmetrix Grade reflects a web page's speed, determined by its performance score across six critical parameters. These parameters

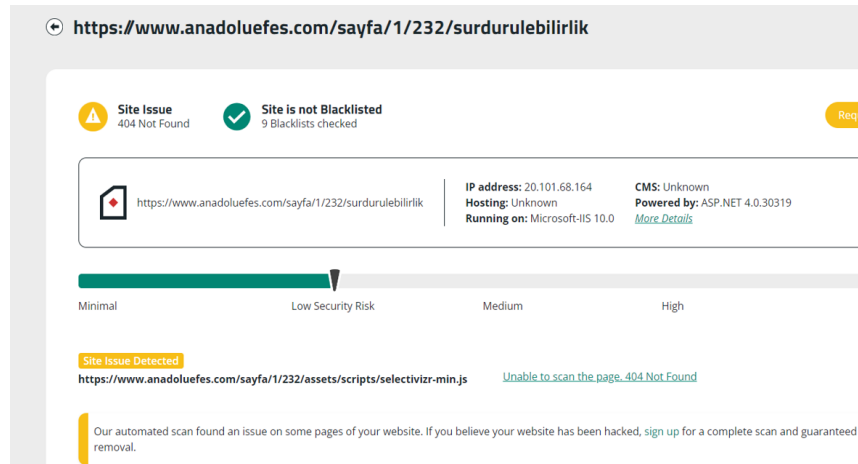
include Cumulative Layout Shift (CLS), Speed Index (SI), First Contentful Paint (FCP), Total Blocking Time (TBT), Time to Interactive (TTI), and Largest Contentful Paint (LCP).

Every parameter is compared to predefined threshold values to get the performance score. We investigated Total Blocking Time, Speed Index, First Contentful Paint, and Fully Loaded Time in our thesis. Fully Loaded Time represents the time it takes for a web page to fully loaded time, including data loading and JavaScript code execution completion [7]. However, it is important to note that it may not be a definitive performance indicator for users. First Contentful Paint (FCP) measures how quickly text, graphics, and other content load and render on a web page. The Speed Index (SI) indicates how rapidly visible content fills up on a web page. SI serves as a useful benchmark for page performance as it correlates with other performance indicators [60]. Total Blocking Time (TBT) quantifies the duration of user delays in interacting with a website. It holds significant weight, comprising 25% of the performance score among all metrics [7]. Figure 3.3 shows the results obtained using the GTMetrix tool.

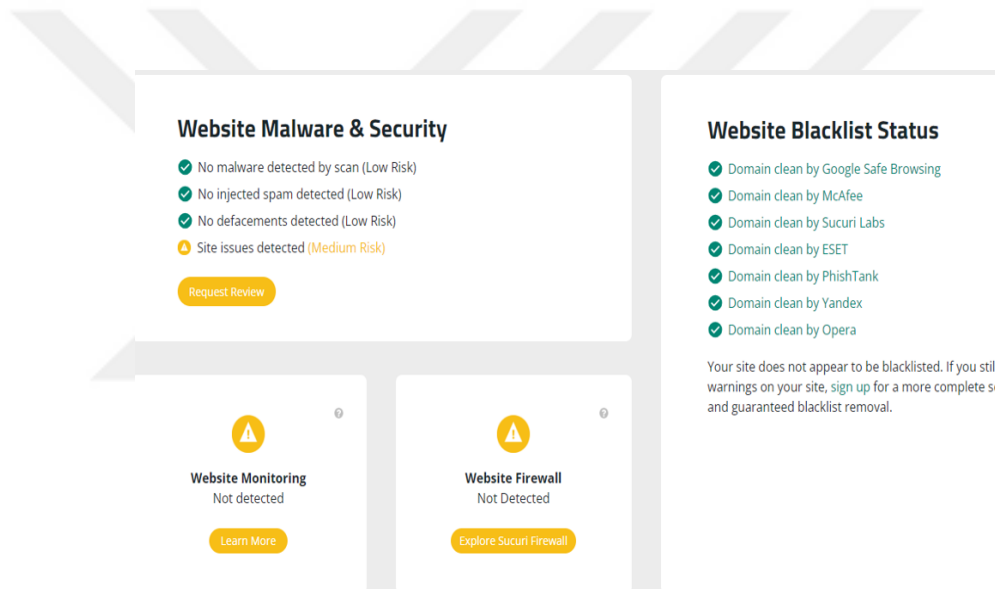


**Figure 3.3.** Summary section of the GT Metrix tool results

The Sucuri automated testing tool [61] was utilized to analyze corporate web pages for security. This tool generates reports containing information such as the website's risk level, server type and version, usage of TLS (SSL), the programming language or engine used for development, and additional relevant details. . Figure 3.4 and Figure 3.5 shows the results obtained using the Sucuri tool.

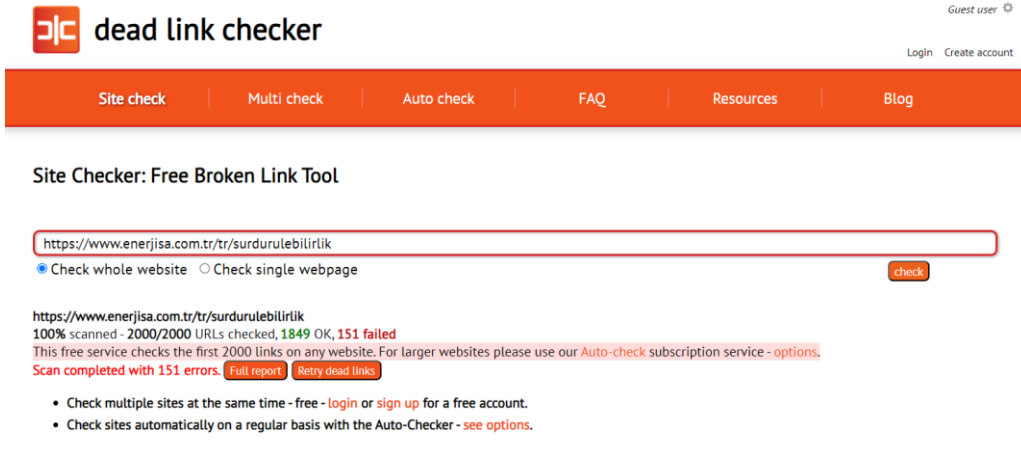


**Figure 3.4.** Summary section of the GT Metrix tool results 1



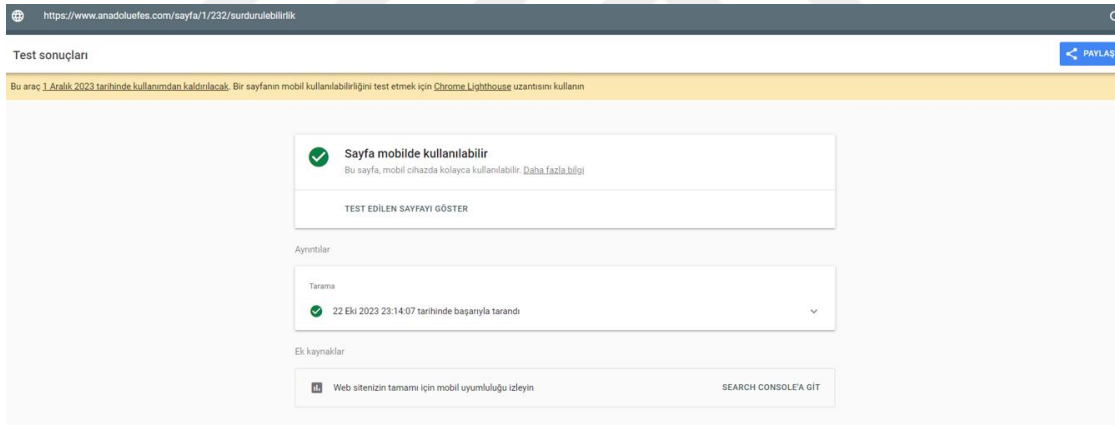
**Figure 3.5.** Summary section of the GT Metrix tool results 2

The Dead Link Checker [62] automated tool was employed to identify broken links that harm user experience and SEO values. Previously, Macakoğlu and Peker [52] used this tool to assess broken links on universities hospital websites. Figure 3.6 shows the results obtained using the Dead Link Checker.



**Figure 3.6.** Summary section of the Dead Link Checker results

Another key factor influencing web accessibility is mobile-friendliness. To assess this the Google Mobile-Friendly testing tool [63] was utilized to evaluate how well websites respond on mobile devices. Al-Sakran and Alsudairi [49] previously used this tool to assess the websites of government websites. Figure 3.7 shows the results obtained using the Mobile-Friendly testing tool.



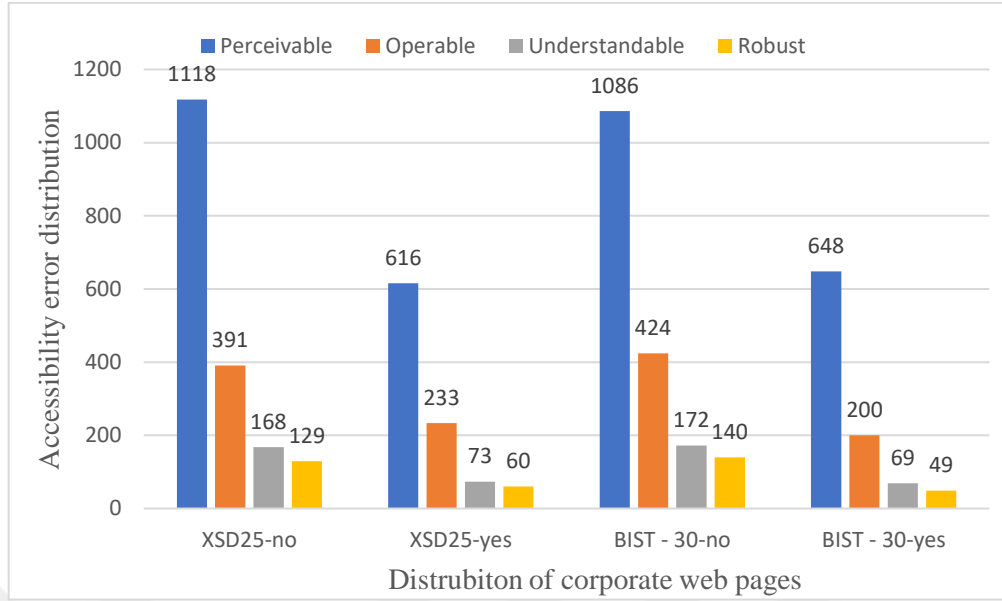
**Figure 3.7.** Summary section of the Google Mobile-Friendly results

## **4. RESULTS**

### **4.1. Web accessibility**

Web accessibility entails ensuring that web pages and web applications are designed and developed to be accessible to individuals with disabilities and all users. In this section, we present the accessibility findings for corporate web pages using the TAW automated testing tool, which focuses on web accessibility and W3C standardization services. Accessibility findings are based on four principles. These principles are perceivable, operable, understandable and robust. Perceivability ensures that all information and user interface components are presented in ways that users can perceive, meaning the content must not be invisible to any of their senses. Operability requires that user interface components and navigation are functional and that the interface does not demand interactions beyond users' capabilities. Understandability mandates that both the information and the operation of the user interface are comprehensible, preventing content or functionality from being too complex for users to grasp. Finally, robustness ensures that content is sufficiently resilient to be reliably interpreted by a wide range of user agents, including assistive technologies, thereby maintaining accessibility as technology evolves. These principles collectively ensure that digital content remains accessible and usable for all users, regardless of their abilities or the technologies they employ [5].

Using the TAW tool, we analyzed 71 websites (seven web pages could not be tested because no results were obtained when using the Taw tool). These evaluations revealed that these websites had unmet accessibility needs at compliance level AA. Upon examining the distribution of errors across all assessed web pages, it was found that the perceivable principle had the highest error rate, accounting for approximately 62.19% of errors, while the robust principle demonstrated the lowest error percentage at 6.77%. Figure 4.1 illustrates the incidence of accessibility issues per web page, categorized according to the four foundational principles: perceivable, operable, understandable, and robust.



**Figure 4.1.** Accessibility error distribution of corporate sustainability web pages according to four fundamental principles

Table 4.1 displays companies with the highest and lowest performance based on the total number of errors (perceivable, operable, understandable, and robust) per web page. Enerjisa Enerji A.Ş., Anadolu Anonim Türk Sigorta Şirketi, and Türkiye İş Bankası A.Ş. exhibited the fewest errors per web page, followed by Mavi Giyim Sanayi ve Ticaret A.Ş. and Türkiye Vakıflar Bankası T.A.O. On the other hand, Arçelik A.Ş., Şekerbank T.A.Ş., Yapı ve Kredi Bankası A.Ş., DO & CO, and Zorlu Enerji Elektrik Üretim A.Ş. had the highest number of accessibility errors per web page.

**Table 4.1.** Top and bottom 5 corporates in the ranking of accessibility errors per web page

Corporate	XSD25	BIST 30	Number of errors per web page
Enerjisa Enerji A.Ş.	yes	no	1
Anadolu Anonim Türk Sigorta Şirketi	no	no	1
Türkiye İş Bankası A.Ş.	yes	yes	1
Mavi Giyim Sanayi ve Ticaret A.Ş.	no	no	2
Türkiye Vakıflar Bankası T.A.O.	no	no	2
...	...	...	...
Zorlu Enerji Elektrik Üretim A.Ş.	no	no	122
DO & CO	no	no	132
Yapı ve Kredi Bankası A.Ş.	yes	yes	146
Şekerbank T.A.Ş.	no	no	171
Arçelik A.Ş.	yes	yes	294

Table 4.2 presents a comprehensive overview of control points specified in the WCAG 2.0 guidelines and their distribution among companies, with a focus on BIST-30 and XSD25 companies. The 'overall' column summarizes the total number of violations for each control point, along with the percentage of companies that violated it.

Within the scope of BIST 30 and XSD25 companies results, the table provides the quantity of accessibility errors per web page within each checkpoint, ensuring an overview of web pages violating designated checkpoints. Notably, the highest number of accessibility errors were observed at compatibility level A. Summarizing the findings, the most commonly breached success criteria included 1.1.1 (Text alternative missing), 1.3.1 (Info and Relationships), and 2.4.4 (Link Purpose in Context), each with violation rates surpassing 85% across web pages. Additionally, 3.3.2 (Labels or instructions) and 4.1.2 (Name, Role, Value) emerged as commonly breached criteria. Conversely, 2.2.1 (Timing Adjustable) was the least frequently violated checkpoint, suggesting the presence of headings that explain the purpose and subject matter of pages intended for corporates sustainability web pages. Notably, more than 64% of web pages demonstrated compliance

with checkpoint 3.1.1 (Language of Page), indicating a default language comprehensible to the program across all pages.

**Table 4.2.** Failure to meet success requirements at adherence level A

Success Criteria	XSD25 & BIST 30									
	Overall		XSD25-yes (n=20)		XSD25-no (n=44)		BIST 30-yes (n=16)		BIST 30-no (n=48)	
	%	Total	%	Avg	%	Avg	%	Avg	%	Avg
1.1.1 - Non-text Content	89.06	951	85	18.82	88.63	15.77	93.75	21.46	87.5	14.97
1.3.1 - Info and Relationships	85.93	855	80	18.43	88.63	14.35	87.5	23.28	85.41	12.9
2.2.1 - Timing Adjustable	1.56	1	0	0	2.27	1	0	0	2.08	1
2.4.2 - Page Titled	3.125	2	5	1	2.27	1	6.25	1	2.08	1
2.4.4 Link Purpose (In Context)	90.62	621	90	13.26	90.9	9.72	93.75	13.26	89.58	9.81
3.1.1 Language of Page	35.93	23	60	1	25	1	43.75	1	33.33	1
3.2.2 - On Input	32.81	29	45	1.33	27.27	1.58	56.25	1.33	25	1.41
3.3.2 Labels or instructions	68.75	188	65	4.54	70.45	4.38	68.75	4.54	68.75	4.18
4.1.2 - Name, Role, Value	64.06	189	70	4.45	61.36	4.77	68.75	4.45	62.5	4.66

The observation reveals that nearly all of the web pages affiliated with listed in the BIST 30 companies violate checkpoints 1.1.1 (Non-Text Content) and 2.4.4 (Link Purpose in Context).

#### 4.2. Web usability

The dimensions and loading durations of 71 potential corporate web pages were investigated using the online assessment tool GTmetrix. Notably, six web pages within the dataset could not undergo testing account of timeout and security concerns. The assessment yielded performance grade results denoted on a scale from A to F, with A denoting the highest performance grade and F signifying the lowest.

Table 4.3 shows the distribution of performance ranks among the evaluated web pages. While 4.61% of the sustainability web pages examined achieved an A performance score, the highest percentage of total sustainability web pages exhibited C, D and E performances.

**Table 4.3.** Distribution of GTmetrix ranks

GTmetrix Grade (A-F)	Number of web pages
A (excellent)	3 (4.61%)
B (good)	7 (10.77%)
C (average)	16 (24.62%)
D (below average)	19 (29.24%)
E (bad)	14 (21.53%)
F (very bad)	6 (9.23%)

Table 4.4 shows the web page grades of companies according to the usability analysis results.

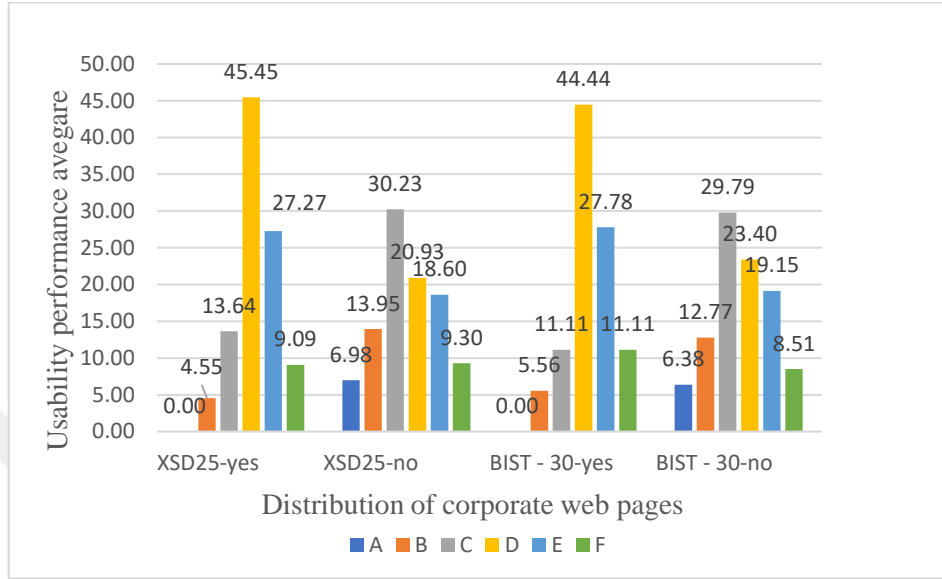
**Table 4.4.** Corporate's web pages grade

Company	Grade
Anadolu Efes Biracılık ve Malt Sanayii A.Ş.	C
AG Anadolu Grubu Holding A.Ş.	No result
Akbank T.A.Ş.	D
Akçansa Çimento Sanayi ve Ticaret A.Ş.	No result
Akenerji Elektrik Üretim A.Ş.	E
Akfen Gayrimenkul Yatırım Ortaklığı A.Ş.	C
Aksigorta A.Ş.	B
Aksa Akrilik Kimya Sanayii A.Ş.	C
Aksa Enerji Üretim A.Ş. -	B
Akiş Gayrimenkul Yatırım Ortaklığı A.Ş.	E
Albaraka Türk Katılım Bankası A.Ş.	F
Anadolu Hayat Emeklilik A.Ş.	C
Anadolu Anonim Türk Sigorta Şirketi	F
Arçelik A.Ş.	D
Aselsan Elektronik Sanayi ve Ticaret A.Ş.	E
Aydem Yenilenebilir Enerji A.Ş.	E
Aygaz A.Ş.	B
Bim Birleşik Mağazalar A.Ş.	B
Bizim Toptan Satış Mağazaları A.Ş.	D
Brisa Bridgestone Sabancı Lastik Sanayi ve Ticaret A.Ş.	D
Coca-Cola İçecek A.Ş.	C
Çimsa Çimento Sanayi ve Ticaret A.Ş.	No result
Doğuş Otomotiv Servis ve Ticaret A.Ş.	D

1. DO & CO	C
Doğan Şirketler Grubu Holding A.Ş.	D
Enerjisa Enerji A.Ş.	E
Enka İnşaat ve Sanayi A.Ş.	F
Ereğli Demir ve Çelik Fabrikaları T.A.Ş.	No result
Esenboğa Elektrik Üretim A.Ş.	C
Ford Otomotiv Sanayi A.Ş.	F
Türkiye Garanti Bankası A.Ş.	E
Global Yatırım Holding A.Ş.	D
Galata Wind Enerji A.Ş.	F
Türkiye Halk Bankası A.Ş.	E
Türkiye İş Bankası A.Ş.	E
İskenderun Demir ve Çelik A.Ş.	C
İş Finansal Kiralama A.Ş.	C
İş Yatırım Menkul Değerler A.Ş.	F
Karsan Otomotiv Sanayii ve Ticaret A.Ş.	E
Koç Holding A.Ş.	D
Kerevitaş Gıda Sanayi ve Ticaret A.Ş.	D
Kordsa Teknik Tekstil A.Ş.	E
Logo Yazılım Sanayi ve Ticaret A.Ş.	D
Mavi Giyim Sanayi ve Ticaret A.Ş.	A
Migros Ticaret A.Ş.	E
Naturel Yenilenebilir Enerji Ticaret A.Ş.	A
Otokar Otomotiv ve Savunma Sanayi A.Ş.	B
Petkim Petrokimya Holding A.Ş.	D
Pegasus Hava Taşımacılığı A.Ş.	C
Pınar Süt Mamülleri Sanayi A.Ş.	E
Polisan Holding A.Ş.	B
QUA Granite Hayal Yapı ve Ürünleri Sanayi Ticaret A.Ş.	B
Hacı Ömer Sabancı Holding A.Ş.	C
Türkiye Şişe ve Cam Fabrikaları A.Ş.	E
Şekerbank T.A.Ş.	D
Sun Tekstil Sanayi ve Ticaret A.Ş.	C
Tat Gıda Sanayi A.Ş.	C
Tav Havalimanları Holding A.Ş.	C
Turkcell İletişim Hizmetleri A.Ş.	D
Türk Hava Yolları A.O.	D
Tekfen Holding A.Ş.	D
Tofaş Türk Otomobil Fabrikası A.Ş.	D
Türkiye Sınai Kalkınma Bankası A.Ş.	D
Türk Telekomünikasyon A.Ş.	No result
Türk Traktör ve Ziraat Makineleri A.Ş.	D
TÜPRAŞ - Türkiye Petrol Rafinerileri A.Ş.	D
Ülker Bisküvi Sanayi A.Ş.	C
Türkiye Vakıflar Bankası T.A.O.	A

Vestel Elektronik Sanayi ve Ticaret A.Ş.  
 Yapı ve Kredi Bankası A.Ş.  
 Zorlu Enerji Elektrik Üretim A.Ş.

No result  
 E  
 C



**Figure 4.2.** Percentage of performance grades (A-F) by corporates

The distribution percentages of companies categorized according to their ownership of XSD25 and BIST 30 companies are shown in Figure 4.2. It is seen that corporate web pages, especially those listed in the XSD25 (XSD25- yes) and BIST 30 (BIST 30-yes), perform below average for “A” performance.

**Table 4.5** Quality performance summary of web pages by corporates

Performance Metrics	XSD25 & BIST 30			
	XSD25-yes (n=22)	XSD25-no (n=43)	BIST 30-yes (n=18)	BIST 30-no (n=47)
<i>Fully Loaded Time (s)</i>				
Min.	2.1	1.4	2.1	1.4
Mean	8.3	5.3	7.8	5.6
Max.	94.8	63.6	17.4	94.8
<i>First Contentful Paint (s)</i>				
Min.	1.1	0.236	1.1	0.236
Mean	2.4	1.03	2.75	2.2
Max.	13.2	12	13.2	12
<i>Speed Index (s)</i>				
Min.	1.4	0.448	1.4	0.448
Mean	3.45	3.2	3.75	2.9
Max.	13.2	14.6	13.2	14.6
<i>Total Blocking Time (ms)</i>				
Min.	0	0	0	0
Mean	0	50	2	0
Max.	407	666	407	666

Table 4.5 provides an overview of the performance quality metrics of web pages based on the XSD25 and BIST-30 companies. The full loading time of a corporate's web page is not listed in the BIST-30 but is listed in the XSD25 exceeded 94 seconds. Additionally, a detailed list of the first five and last five corporates based on the mean full loading time of web pages is presented.

Among the listed companies, Mavi Giyim Sanayi ve Ticaret A.Ş. demonstrated the best performance with a loading time of less than 2 seconds. Conversely, Doğu Otomotiv Servis ve Ticaret A.Ş. had the longest full loading time, followed by Galata Wind Enerji

A.Ş., Logo Yazılım Sanayi ve Ticaret A.Ş., Doğan Şirketler Grubu Holding A.Ş., and Pınar Süt Mamülleri Sanayi A.Ş."

**Table 4.6.** Ranking of corporates by average fully loaded times

Corporate	XSD25	BIST 30	Fully loaded time (s)
Mavi Giyim Sanayi ve Ticaret A.Ş.	no	no	1.4
Türkiye Vakıflar Bankası T.A.O.	no	no	1.6
Bim Birleşik Mağazalar A.Ş.	yes	yes	2.1
Akenerji Elektrik Üretim A.Ş.	no	no	2.2
Polisan Holding A.Ş.	no	no	2.2
...	...	...	...
Pınar Süt Mamülleri Sanayi A.Ş.	no	no	19.8
Doğan Şirketler Grubu Holding A.Ş.	yes	no	26.5
Logo Yazılım Sanayi ve Ticaret A.Ş.	no	no	35.6
Galata Wind Enerji A.Ş.	no	no	63.6
Doğu Otomotiv Servis ve Ticaret A.Ş.	yes	no	94.8

In this research, the general page size of sustainability web pages were also taken into account. Table 4.7 examines general area sizes and determines threshold ranges according to general averages. Notably, on average, 81.75% of businesses had a page weight below 4MB, which is generally considered respectable performance.

In addition, the page widths of the web pages of companies that not listed in the XSD25 (no) and BIST 30 (no) were smaller than those of companies that listed in the BIST-30 (BIST-30 yes) and XSD25 (XSD25 yes). The web pages of companies, not listed in the BIST-30, load faster than other sustainability web pages and have the potential to cause a slowdown in clicks and loading.

**Table 4.7.** Distributions of overall sizes of corporate web pages

Total Page Size (MB)	Number of web pages			
	XSD25-yes (n=22)	XSD25-no (n=43)	BIST 30-yes (n=17)	BIST 30-no (n=47)
0 – 3.59 (very good)	17(%77.27)	37(%86.04)	13(%76.47)	41(%87.23)
4 – 5.9 (good)	2 (%9.09)	2(%4.65)	2(%11.76)	2(%4.25)
6 – 7.9 (average)	0 (%0)	2 (%4.65)	0 (%0)	2(%4.25)
8 – 9.9 (bad)	1 (%4.54)	1 (%2.32)	0 (%0)	2(%4.25)
10 and above (very bad)	2 (%9.09)	1(%2.32)	2 (%11.76)	0(0%)

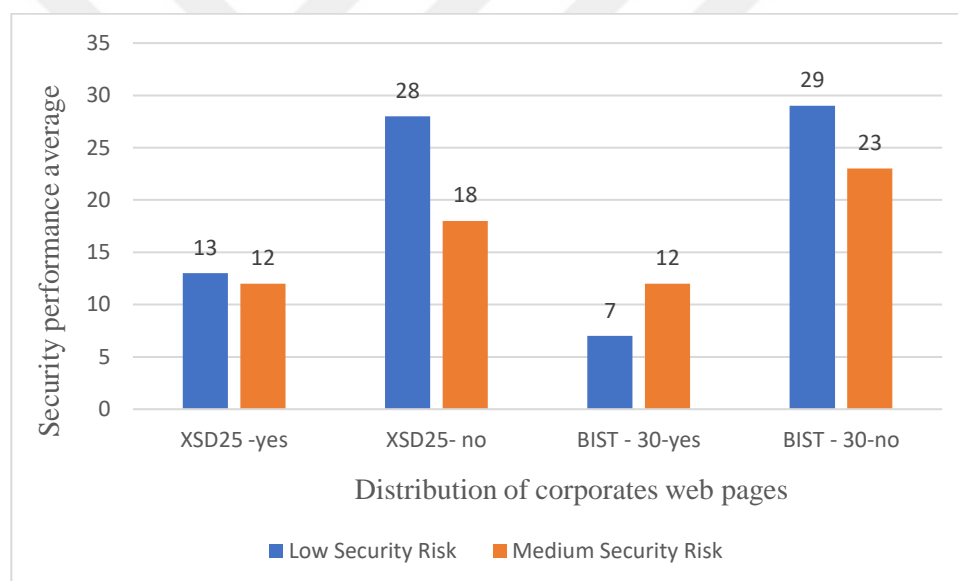
Table 4.8 lists the top five corporate sustainability web pages by number of web pages ranging from 0 – 1.4 MB (very good), 8 – 9.9 (bad) and 10 and above (very bad). In this context, the best web page in loading is Türkiye Vakıflar Bankası T.A.O and worst web page in loading is Arçelik A.Ş.

**Table 4.8.** Ranking of corporates according to total gage size (mb)

Company	XSD25	BIST 30	Total Page Size (MB)
Türkiye Vakıflar Bankası T.A.O.	no	no	0.00399MB
Aksigorta A.Ş.	no	no	0.37MB
Akfen Gayrimenkul Yatırım Ortaklığı A.Ş.	no	no	0.648MB
DO & CO	no	no	0.708MB
Ülker Bisküvi Sanayi A.Ş.	no	no	0.725MB
...		...	...
İş Yatırım Menkul Değerler A.Ş.	no	no	8.62
Doğuş Otomotiv Servis ve Ticaret A.Ş.	yes	no	9.06
Türkiye Şişe ve Cam Fabrikaları A.Ş.	yes	yes	11.9
Esenboğa Elektrik Üretim A.Ş.	no	no	22.9
Arçelik A.Ş.	yes	yes	28.9

### 4.3. Web security

As part of the security investigation, we assessed the risk levels of the corporate sustainability web pages using the SUCURI tool. The tool categorizes risk levels into Minimum, Medium, Low, High, and Critical. These risk levels express the extent to which a web page threatens the user's security. Notably, more than 50% of the analyzed web pages showed a low risk level. However, no web pages were found to have high or critical risk levels. Figure 4.3 illustrates the distribution of risk levels for enterprises based on the XSD25 and BIST-30 companies. The analysis reveals that the majority of risk levels fall within the low and medium categories across both XSD25 and BIST-30 companies. Furthermore, a significant portion of web pages belonging to businesses not listed in the BIST-30 companies was found to have low risk levels.



**Figure 4.3.** Percentage of security risk levels of the web pages of corporates

Table 4.9 provides an overview of the distribution of web servers. Upon examination of the entire distribution, it is evident that the most commonly used web server is Microsoft-IIS 10.0, accounting for approximately 22.26% of usage. Following closely is the Apache web server, with a usage percentage of 5.63%. Consistently, Microsoft-IIS 10.0 emerges as the predominant choice, being the most constantly used web server across almost all corporates, followed by Apache. This trend underscores the widespread adoption of Microsoft-IIS 10.0 in the web server landscape.

**Table 4.9.** Distribution of web servers by web pages

Type of web server	Number of web pages
Microsoft-IIS 10.0	8(%22.26)
Nginx	2(%2.81)
LiteSpeed	1(%1.40)
Pepyaka 1.19.10	1(%1.40)
Microsoft-IIS 8.5	1(%1.40)
Nginx 1.18.0	1(%1.40)
Unknown	52(%73.23)

Table 4.10 shows which web server the companies use according to the security analysis results.

**Table 4.10.** Web server information used by corporates

Company	Server
Anadolu Efes Biracılık ve Malt Sanayii A.Ş.	Microsoft-IIS 10.0
AG Anadolu Grubu Holding A.Ş.	Microsoft-IIS 10.0
Akbank T.A.Ş.	Unknown
Akçansa Çimento Sanayi ve Ticaret A.Ş.	Nginx 1.18.0
Akenerji Elektrik Üretim A.Ş.	Microsoft-IIS 10.0
Akfen Gayrimenkul Yatırım Ortaklığı A.Ş.	Microsoft-IIS 10.0
Aksigorta A.Ş.	Microsoft-IIS 8.5
Aksa Akrilik Kimya Sanayii A.Ş.	Unknown
Aksa Enerji Üretim A.Ş. -	Unknown
Akiş Gayrimenkul Yatırım Ortaklığı A.Ş.	Unknown
Albaraka Türk Katılım Bankası A.Ş.	Unknown
Anadolu Hayat Emeklilik A.Ş.	Kestrel
Anadolu Anonim Türk Sigorta Şirketi	Unknown

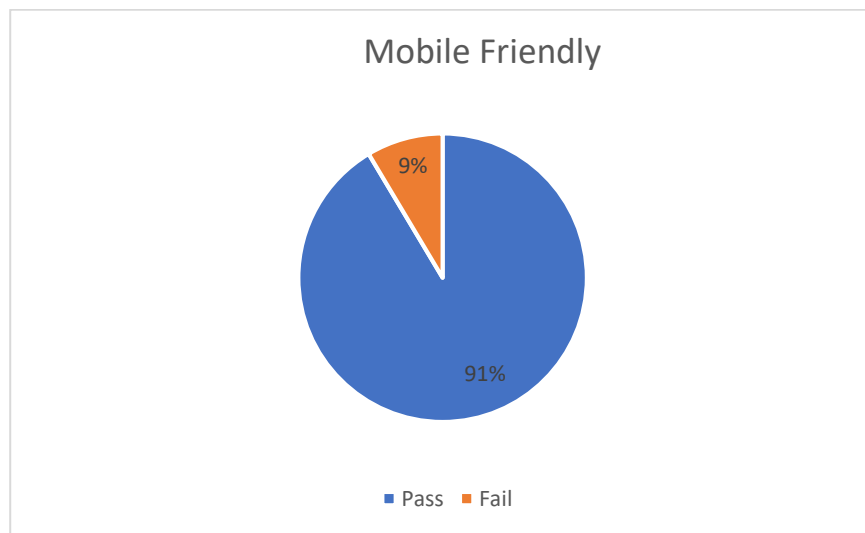
Arçelik A.Ş.	Unknown
Aselsan Elektronik Sanayi ve Ticaret A.Ş.	Unknown
Aydem Yenilenebilir Enerji A.Ş.	Unknown
Aygaz A.Ş.	Microsoft-IIS 10.0
Bim Birleşik Mağazalar A.Ş.	Microsoft-IIS 10.0
Bizim Toptan Satış Mağazaları A.Ş.	Unknown
Brisa Bridgestone Sabancı Lastik Sanayi ve Ticaret A.Ş.	Unknown
Coca-Cola İçecek A.Ş.	Unknown
Çimsa Çimento Sanayi ve Ticaret A.Ş.	Nginx
Doğuş Otomotiv Servis ve Ticaret A.Ş.	Unknown
DO & CO	Apache
Doğan Şirketler Grubu Holding A.Ş.	Unknown
Enerjisa Enerji A.Ş.	Unknown
Enka İnşaat ve Sanayi A.Ş.	Apache
Ereğli Demir ve Çelik Fabrikaları T.A.Ş.	Unknown
Esenboğa Elektrik Üretim A.Ş.	Pepyaka 1.19.10
Ford Otomotiv Sanayi A.Ş.	Unknown
Türkiye Garanti Bankası A.Ş.	Unknown
Global Yatırım Holding A.Ş.	Apache
Galata Wind Enerji A.Ş.	Unknown
Türkiye Halk Bankası A.Ş.	Unknown
Türkiye İş Bankası A.Ş.	Unknown
İskenderun Demir ve Çelik A.Ş.	Unknown
İş Finansal Kiralama A.Ş.	Unknown
İş Yatırım Menkul Değerler A.Ş.	Unknown

Karsan Otomotiv Sanayii ve Ticaret A.Ş.	Unknown
Koç Holding A.Ş.	Unknown
Kerevitaş Gıda Sanayi ve Ticaret A.Ş.	Unknown
Kordsa Teknik Tekstil A.Ş.	Unknown
Logo Yazılım Sanayi ve Ticaret A.Ş.	Unknown
Mavi Giyim Sanayi ve Ticaret A.Ş.	Unknown
Migros Ticaret A.Ş.	Unknown
Naturel Yenilenebilir Enerji Ticaret A.Ş.	Unknown
Otokar Otomotiv ve Savunma Sanayi A.Ş.	Unknown
Petkim Petrokimya Holding A.Ş.	Unknown
Pegasus Hava Taşımacılığı A.Ş.	Unknown
Pınar Süt Mamülleri Sanayi A.Ş.	Apache
Polisan Holding A.Ş.	Microsoft-IIS 10.0
QUA Granite Hayal Yapı ve Ürünleri Sanayi Ticaret A.Ş.	Nginx
Hacı Ömer Sabancı Holding A.Ş.	Unknown
Türkiye Şişe ve Cam Fabrikaları A.Ş.	Unknown
Şekerbank T.A.Ş.	Unknown
Sun Tekstil Sanayi ve Ticaret A.Ş.	LiteSpeed
Tat Gıda Sanayi A.Ş.	Unknown
Tav Havalimanları Holding A.Ş.	Unknown
Turkcell İletişim Hizmetleri A.Ş.	Unknown
Türk Hava Yolları A.O.	Unknown
Tekfen Holding A.Ş.	Unknown

Tofaş Türk Otomobil Fabrikası A.Ş.	Microsoft-IIS 10.0
Türkiye Sınai Kalkınma Bankası A.Ş.	Unknown
Türk Telekomünikasyon A.Ş.	Unknown
Türk Traktör ve Ziraat Makineleri A.Ş.	Unknown
TÜPRAŞ - Türkiye Petrol Rafinerileri A.Ş.	Unknown
Ülker Bisküvi Sanayi A.Ş.	Unknown
Türkiye Vakıflar Bankası T.A.O.	Unknown
Vestel Elektronik Sanayi ve Ticaret A.Ş.	Unknown
Yapı ve Kredi Bankası A.Ş.	Unknown
Zorlu Enerji Elektrik Üretim A.Ş.	Unknown

#### 4.4. Mobile- friendly analysis

The testing was conducted using the Google Mobile-Friendly Testing Tool. Out of the 71 web page contents, 70 underwent testing, while one web page was excluded due to an error indicating that Google could not use its URL. As illustrated in Figure 4.4, the mobile responsiveness of these 70 web pages was assessed. Of the tested web pages, 91 percent (64) successfully passed the mobile compatibility test, while 9 percent (6 web pages) did not meet the criteria for mobile compatibility. It is worth noting that the excluded web page was not evaluated due to an unavailable error from Google.



**Figure 4.4.** Mobile friendly result

#### 4.5. Broken link analysis

The Dead Link Checker an automated testing tool was employed to evaluate the asset of broken links on the web pages of 71 companies. The conclusions of this analysis are outlined in Table 4.11. Out of the total number of company web pages assessed, 376 were found to have broken links. Additionally, only approximately 0.15% of business web pages were free of broken links, indicating that this issue was prevalent across the board. Interestingly, the corporates not listed in the XSD25 and BIST 30 were found to have the highest number of broken links.

**Table 4.11.** Broken links average

	# of URLs checked Average	Broken Links		
		Min	Avg	Max
XSD25-yes	1689.84	1	56.44	297
XSD25-no	1537.66	0	54.41	376
BIST - 30-yes	1702.94	0	45.5	297
BIST - 30-no	1549.9	0	104.16	376

Table 4.12 lists the ranking of companies according to accessibility, usability, and broken link results. Companies that results are no results show that the analysis results show that the tools do not provide any analysis reports for these web pages.

**Table 4.12.** Ranking of companies according to accessibility, usability, and broken link results

Company	Accessibility	Usability	Broken Links
Enerjisa Enerji A.Ş.	1	51	51
Anadolu Anonim Türk Sigorta Şirketi	2	55	53
Türkiye İş Bankası A.Ş.	3	50	30
Mavi Giyim Sanayi ve Ticaret A.Ş.	4	1	4
Türkiye Vakıflar Bankası T.A.O.	5	2	1
Pegasus Hava Taşımacılığı A.Ş.	6	18	1
İş Finansal Kiralama A.Ş.	7	11	31
Naturel Yenilenebilir Enerji Ticaret A.Ş.	8	28	57

Türk Telekomünikasyon A.Ş.	9	No result	45
Çimsa Çimento Sanayi ve Ticaret A.Ş.	10	No result	24
Pınar Süt Mamülleri Sanayi A.Ş.	11	61	10
Türkiye Sınai Kalkınma Bankası A.Ş.	12	35	5
Kerevitaş Gıda Sanayi ve Ticaret A.Ş.	13	20	33
Türk Hava Yolları A.O.	14	52	1
Aksa Enerji Üretim A.Ş. -	15	17	21
Aydem Yenilenebilir Enerji A.Ş.	16	59	35
Anadolu Efes Biracılık ve Malt Sanayii A.Ş.	17	10	23
Akiş Gayrimenkul Yatırım Ortaklığı A.Ş.	18	30	41
İskenderun Demir ve Çelik A.Ş.	19	15	58
Galata Wind Enerji A.Ş.	20	64	38
AG Anadolu Grubu Holding A.Ş.	21	No result	54
Sun Tekstil Sanayi ve Ticaret A.Ş.	22	23	9
QUA Granite Hayal Yapı ve Ürünleri Sanayi Ticaret A.Ş.	23	6	1
Esenboğa Elektrik Üretim A.Ş.	24	34	60
Türkiye Garanti Bankası A.Ş.	25	38	8
Türk Traktör ve Ziraat Makineleri A.Ş.	26	44	26
Vestel Elektronik Sanayi ve Ticaret A.Ş.	27	No result	19
Doğan Şirketler Grubu Holding A.Ş.	28	62	15
Logo Yazılım Sanayi ve Ticaret A.Ş.	29	63	31
Akfen Gayrimenkul Yatırım Ortaklığı A.Ş.	30	16	28
Akçansa Çimento Sanayi ve Ticaret A.Ş.	31	No result	42
Aygaz A.Ş.	32	8	44
Kordsa Teknik Tekstil A.Ş.	33	36	27
Akbank T.A.Ş.	34	46	3
Tav Havalimanları Holding A.Ş.	35	22	12
Turkcell İletişim Hizmetleri A.Ş.	36	42	4
Aselsan Elektronik Sanayi ve Ticaret A.Ş.	37	39	2
Tat Gıda Sanayi A.Ş.	38	33	17
Hacı Ömer Sabancı Holding A.Ş.	39	19	20
Akenerji Elektrik Üretim A.Ş.	40	4	59
Polisan Holding A.Ş.	41	5	34
Enka İnşaat ve Sanayi A.Ş.	42	40	29
Türkiye Halk Bankası A.Ş.	43	29	1
Otokar Otomotiv ve Savunma Sanayi A.Ş.	44	13	47
Petkim Petrokimya Holding A.Ş.	45	14	43
Global Yatırım Holding A.Ş.	46	25	1
Bizim Toptan Satış Mağazaları A.Ş.	47	37	6
TÜPRAŞ - Türkiye Petrol Rafinerileri A.Ş.	48	27	32
İş Yatırım Menkul Değerler A.Ş.	49	43	11
Bim Birleşik Mağazalar A.Ş.	50	3	52
Koç Holding A.Ş.	51	48	40
Aksa Akrilik Kimya Sanayii A.Ş.	52	21	7
Ülker Bisküvi Sanayi A.Ş.	53	12	16

Türkiye Şişe ve Cam Fabrikaları A.Ş.	54	58	61
Karsan Otomotiv Sanayii ve Ticaret A.Ş.	55	49	25
Tekfen Holding A.Ş.	56	31	39
Anadolu Hayat Emeklilik A.Ş.	57	53	14
Albaraka Türk Katılım Bankası A.Ş.	58	54	36
Brisa Bridgestone Sabancı Lastik Sanayi ve Ticaret A.Ş.	59	26	18
Zorlu Enerji Elektrik Üretim A.Ş.	60	47	56
DO & CO	61	7	48
Yapı ve Kredi Bankası A.Ş.	62	45	22
Şekerbank T.A.Ş.	63	56	37
Arçelik A.Ş.	64	57	37
Coca-Cola İçecek A.Ş.	No result	9	13
Doğuş Otomotiv Servis ve Ticaret A.Ş.	No result	65	55
Ereğli Demir ve Çelik Fabrikaları T.A.Ş.	No result	No result	62
Ford Otomotiv Sanayi A.Ş.	No result	60	49
Migros Ticaret A.Ş.	No result	32	27
Tofaş Türk Otomobil Fabrikası A.Ş.	No result	41	46
Aksigorta A.Ş.	No result	24	50

## 5 DISCUSSION

In evaluating the quality of sustainability web pages for companies, three crucial factors stand out: accessibility, usability, and security. This thesis analyzed these aspects for 71 Turkish company sustainability web pages using various online automated testing tools, including TAW, GT Metrix, Sucuri SiteCheck, Google Mobile Friendly Testing, and Dead Link Checker.

The findings revealed significant accessibility shortcomings in these corporate sustainability web pages. The TAW tool, which checks for web accessibility compliance, found no errors at the conformance level AA. However, none of the evaluated web pages met the minimum conformance level A, which is essential for ensuring that web content is accessible to all users, including those with disabilities. This deficiency suggests that these web pages do not meet the necessary standards for effective and satisfactory use by all stakeholders. Upon comparing error occurrences per corporate web page, it was observed that companies not listed in the XSD25 performed better in terms of accessibility, while those listed in the BIST-30 performed poorly. This investigation highlights the most frequently infringed compliance points at level A, specifically:

- 1.1.1 - Non-text Content: According to this rule, all non-text item that the user is shown must have a text alternative that fulfills the same function.
- 2.4.4 - Link Purpose (In Context): This guideline requires that the purpose of each link can be determined from the link text alone or from the link text together with its context.

These findings suggest a need for developers and administrators to adhere more closely to the Web Content Accessibility Guidelines (WCAG) 2.0 when creating web pages, to ensure they are accessible to a wide range of stakeholders.

In assessing usability, the thesis examined the loading times, performance scores, and page sizes of corporate sustainability web pages. The results indicated that 9% of the web pages had performance values below the acceptable threshold. Notably, the best performance was observed in companies that are not listed in both BIST 30 and XSD25, while the worst performance was noted in companies that are listed in both indices. This correlation suggests that the companies with broader visibility and resources might not prioritize web performance as much as less prominent companies.

Longer page load times were linked to higher HTTP request counts and larger page sizes. To address these issues, it is recommended to:

- Optimize image sizes: Reducing the size of images can significantly decrease load times.
- Reduce the number of queries: Minimizing the number of HTTP requests can streamline the loading process.
- Minimize web page size: Using web optimization tools to consolidate or compress CSS, HTML, and JavaScript content can enhance page performance.

By implementing these measures, developers can significantly improve the usability of their web pages, ensuring a faster and more efficient user experience.

In examining the security measures on corporate sustainability web pages, it was observed that companies not listed in both XSD25 and BIST 30 demonstrated the highest level of performance. This suggests that these companies are more proactive in implementing robust security measures. Regarding SSL encryption, the findings revealed that over 95% of the assessed web pages ensure secure communication, which is a positive indicator of the overall security posture. However, 38% of the evaluated web pages publicly disclose version information of their web servers. This practice increases the vulnerability to potential hacking attempts, as it provides attackers with critical information that can be exploited.

To mitigate these risks, it is imperative for companies to:

- Implement robust security measures: Regularly update and patch systems to protect against known vulnerabilities.
- Ensure secure communication channels: Use SSL/TLS encryption to secure data transmission.
- Hide server version information: Configure servers to conceal version information from public view to reduce the risk of exploitation.

By taking these steps, companies can enhance the security of their web pages and protect against cyber-attacks.

Finally, this thesis examined the prevalence of broken links on corporate sustainability web pages in Turkey. The results indicated that nearly all websites had at least one broken link, with only about 0.15% of business web pages being entirely free of broken links. Despite this small percentage, it is recommended that developers and site

administrators regularly inspect all websites for broken links and promptly repair any found. Regular maintenance of web links ensures a seamless user experience and maintains the integrity of the information provided.

Additionally, the thesis assessed the mobile responsiveness of corporate sustainability web pages. The findings showed that 91 percent (64) of the tested web pages met the mobile compatibility criteria, while 9 percent (6 web pages) did not. This suggests that users of corporate sustainability web pages may face accessibility issues when accessing information and services via these sites. Given that mobile devices generate a significant amount of web traffic, addressing this problem is crucial. Ensuring mobile compatibility can greatly enhance the user experience and accessibility of web pages, catering to the increasing number of users accessing the web through mobile devices.

## 6 CONCLUSION

Businesses' capacity to connect with big audiences depends on how well they interact with the outside world. In this outreach, sustainability websites are essential because they provide businesses with vital channels for communication with their target markets. These web pages' security, usability, and accessibility are critical in today's fiercely competitive corporate environment. Websites that are accessible guarantee that users, including those with impairments, can obtain important information. A smooth and simple user experience is offered by usable websites, which promote visitor engagement and retention. Users' confidence is increased and sensitive data is protected on secure websites. With an emphasis on these important dimensions of security, usability, and accessibility, this thesis compares and evaluates how well businesses' sustainability websites function.

We analyzed the sustainability web pages of 71 Turkish companies using various online automated testing tools, including TAW, GT Metrix, Sucuri SiteCheck, Google Mobile-Friendly Testing, and Dead Link Checker. Firstly, we employed the TAW automatic tool for web accessibility testing. The results indicated that companies not listed in the XSD25 index performed better in terms of accessibility, while those listed in the BIST-30 index performed poorly. Therefore, companies in the BIST-30 need to review and correct the accessibility errors identified on their sustainability web pages. For the usability analysis, we used the GT Metrix automatic online tool. Our findings showed that the worst results were obtained for companies listed in both the BIST-30 and XSD25 indices. This highlights the need for these companies to evaluate their sustainability pages concerning loading time, page size, and image size. Improving these factors is crucial to ensuring a good user experience. Finally, we conducted a security analysis using the Sucuri SiteCheck tool. The results revealed that companies listed in both the XSD25 and BIST-30 indices had the poorest performance in terms of security. Consequently, these companies must enhance the reliability and security of their sustainability web pages by addressing the identified vulnerabilities.

This thesis offers guidance for website developers and administrators to enhance existing and new websites, while also promoting social awareness through accessible and user-oriented design. Although the thesis's results advocate for the integration of these tools into regular web development practices to identify and rectify accessibility issues

proactively, it also suggests that comprehensive user testing could provide deeper insights into the real-world accessibility challenges faced by users. By incorporating feedback from diverse user groups, developers can gain a more nuanced understanding of usability barriers and make more informed decisions to create truly inclusive web experiences. Thus, this thesis not only contributes to the academic discourse but also provides actionable recommendations for improving the accessibility of corporate sustainability web pages in Turkey and beyond.

The thesis also has several limitations, including its focus on Turkish companies, which limits the generalizability of its findings to other regions. It relies heavily on automated tools for assessing web accessibility, usability, and security, potentially missing nuances that manual testing could reveal. The analysis is restricted to companies listed in the BIST-30 and XSD25 indices, overlooking smaller firms. Additionally, it primarily uses quantitative data without incorporating qualitative feedback from actual users, especially those with disabilities. The security assessment is also limited to a single tool, which may not identify all vulnerabilities. Finally, the thesis captures only a snapshot in time, not accounting for ongoing website updates and improvements.

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## APPENDICES

Corporate	XSD25	BIST 30	Web Page Link
Aksigorta A.Ş.	no	no	<a href="https://www.aksigorta.com.tr/online-faaliyet-raporu-2021/surdurulebilirlik-politikasi/">https://www.aksigorta.com.tr/online-faaliyet- raporu- 2021/surdurulebilirlik- politikasi/</a>
Enerjisa Enerji A.Ş.	yes	no	<a href="https://www.enerjisa.com.tr/tr/surdurulebilirlik">https://www.enerjisa.com .tr/tr/surdurulebilirlik</a>
Anadolu Anonim Türk Sigorta Şirketi	no	no	<a href="https://www.anadolusigorta.com.tr/surdurulebilirlik">https://www.anadolusigor ta.com.tr/surdurulebilirlik</a>
Türkiye İş Bankası A.Ş.	yes	yes	<a href="https://www.isbank.com.tr/bankamizi-taniyin/surdurulebilirlik">https://www.isbank.com.t r/bankamizi- taniyin/surdurulebilirlik</a>
Mavi Giyim Sanayi ve Ticaret A.Ş.	no	no	<a href="https://www.mavi.com/sustainability/index.html">https://www.mavi.com/su stainability/index.html</a>
Türkiye Vakıflar Bankası T.A.O.	no	no	<a href="https://www.vakifbank.com.tr/yatirimci-iliskileri-surdurulebilirlik--vakifbank.aspx?pageID=1024">https://www.vakifbank.co m.tr/yatirimci-iliskileri- surdurulebilirlik-- vakifbank.aspx?pageID=10 24</a>
Pegasus Hava Taşımacılığı A.Ş.	yes	yes	<a href="https://www.pegasusyaticiliskileri.com/tr/kurumsal-yonetim/surdurulebilirlik">https://www.pegasusyaticir mciliskileri.com/tr/kurum sal- yonetim/surdurulebilirlik</a>
İş Finansal Kiralama A.Ş.	no	no	<a href="https://www.isleasing.com.tr/Sites/1/content/Surdurulebilirlik/2021/tr/m-4-0.html">https://www.isleasing.co m.tr/Sites/1/content/Surd urulebilirlik/2021/tr/m-4- 0.html</a>
Naturel Yenilenebilir Enerji Ticaret A.Ş.	no	no	<a href="https://www.naturelenerji.com.tr/surdurulebilirlik">https://www.naturelenerji .com.tr/surdurulebilirlik</a>
Türk Telekomünikasyon A.Ş.	no	no	<a href="https://www.ttyatirimciiliskileri.com.tr/tr-tr/sosyal-sorumlu-yatirim/sayfalar/surdurulebilirlik">https://www.ttyatirimciilis kileri.com.tr/tr-tr/sosyal- sorumlu- yatirim/sayfalar/surdurule bilirlik</a>
Çimsa Çimento Sanayi ve Ticaret A.Ş.	yes	no	<a href="https://cimsa.com.tr/surdurulebilirlik/">https://cimsa.com.tr/surd urulebilirlik/</a>
Pınar Süt Mamülleri Sanayi A.Ş.	no	no	<a href="https://www.pinar.com.tr/surdurulebilirlik/surdurulebilirlik/Surdurulebilirlik/383/3819/0">https://www.pinar.com.tr /surdurulebilirlik/surdurul ebilirlik/Surdurulebilirlik/3 83/3819/0</a>

Türkiye Sınai Kalkınma Bankası A.Ş.	no	no	<a href="https://www.tskb.com.tr/hizmetler/surdurulebilir-bankacilik">https://www.tskb.com.tr/hizmetler/surdurulebilir-bankacilik</a>
Kerevitaş Gıda Sanayi ve Ticaret A.Ş.	no	no	<a href="https://www.kerevitas.com.tr/tr/yatirimci-iliskileri/surdurulebilirlik">https://www.kerevitas.com.tr/tr/yatirimci-iliskileri/surdurulebilirlik</a>
Türk Hava Yolları A.O.	yes	yes	<a href="https://investor.turkishairlines.com/tr/kurumsal-yonetim/surdurulebilirlik">https://investor.turkishairlines.com/tr/kurumsal-yonetim/surdurulebilirlik</a>
Aksa Enerji Üretim A.Ş. -	no	no	<a href="https://www.aksaenerji.com.tr/tr/surdurulebilirlik/">https://www.aksaenerji.com.tr/tr/surdurulebilirlik/</a>
Aydem Yenilenebilir Enerji A.Ş.	no	no	<a href="https://www.aydemyenilenebilir.com.tr/surdurulebilirlik">https://www.aydemyenilenebilir.com.tr/surdurulebilirlik</a>
Anadolu Efes Biracılık ve Malt Sanayii A.Ş.	no	no	<a href="https://www.anadoluefes.com/sayfa/1/232/surdurulebilirlik">https://www.anadoluefes.com/sayfa/1/232/surdurulebilirlik</a>
Akiş Gayrimenkul Yatırım Ortaklığı A.Ş.	no	no	<a href="https://akisgyo.com/surdurulebilirlik-yaklasimimiz">https://akisgyo.com/surdurulebilirlik-yaklasimimiz</a>
İskenderun Demir ve Çelik A.Ş.	no	no	<a href="https://www.isdemir.com.tr/surdurulebilirlik/yaklasimimiz/">https://www.isdemir.com.tr/surdurulebilirlik/yaklasimimiz/</a>
Galata Wind Enerji A.Ş.	no	no	<a href="https://www.galatawindeenerji.com/surdurulebilirlik/">https://www.galatawindeenerji.com/surdurulebilirlik/</a>
AG Anadolu Grubu Holding A.Ş.	no	no	<a href="https://www.anadolugrubu.com.tr/sayfa/1/379/anadoludan-yarinlara">https://www.anadolugrubu.com.tr/sayfa/1/379/anadoludan-yarinlara</a>
Sun Tekstil Sanayi ve Ticaret A.Ş.	no	no	<a href="https://www.suntekstil.com.tr/surdurulebilirlik-yolculugumuz/">https://www.suntekstil.com.tr/surdurulebilirlik-yolculugumuz/</a>
QUA Granite Hayal Yapı ve Ürünleri Sanayi Ticaret A.Ş.	no	no	<a href="https://surdurulebilirlik.qua.com.tr/">https://surdurulebilirlik.qua.com.tr/</a>
Esenboğa Elektrik Üretim A.Ş.	no	no	<a href="https://www.esenbogaelektrik.com.tr/">https://www.esenbogaelektrik.com.tr/</a>
Türkiye Garanti Bankası A.Ş.	yes	yes	<a href="https://www.garantibbvainvestorrelations.com/tr/entegre-faaliyet-raporu-2021/surdurulebilirlik.aspx">https://www.garantibbvainvestorrelations.com/tr/entegre-faaliyet-raporu-2021/surdurulebilirlik.aspx</a>

Türk Traktör ve Ziraat Makineleri A.Ş.	yes	no	<a href="https://www.turktraktor.com.tr/surdurulebilirlik-yaklasimimiz">https://www.turktraktor.com.tr/surdurulebilirlik-yaklasimimiz</a>
Vestel Elektronik Sanayi ve Ticaret A.Ş.	yes	no	<a href="https://www.vestelyatirimciiliskileri.com/surdurulebilirlik/surdurulebilirlik-stratejisi.aspx">https://www.vestelyatirimciiliskileri.com/surdurulebilirlik/surdurulebilirlik-stratejisi.aspx</a>
Doğan Şirketler Grubu Holding A.Ş.	yes	no	<a href="https://www.doganholding.com.tr/surdurulebilirlik/genel-bakis/">https://www.doganholding.com.tr/surdurulebilirlik/genel-bakis/</a>
Logo Yazılım Sanayi ve Ticaret A.Ş.	no	no	<a href="https://www.logo.com.tr/logo-surdurulebilirlik">https://www.logo.com.tr/logo-surdurulebilirlik</a>
Akfen Gayrimenkul Yatırım Ortaklığı A.Ş.	no	no	<a href="https://www.akfengyo.com.tr/tr/yatirimci-iliskileri/surdurulebilirlik-ve-kurumsal-yonetim">https://www.akfengyo.com.tr/tr/yatirimci-iliskileri/surdurulebilirlik-ve-kurumsal-yonetim</a>
Akçansa Çimento Sanayi ve Ticaret A.Ş.	no	no	<a href="https://www.akcansa.com.tr/surdurulebilirlik/akcansa-ada-surdurulebilirlik/">https://www.akcansa.com.tr/surdurulebilirlik/akcansa-ada-surdurulebilirlik/</a>
Aygaz A.Ş.	no	no	<a href="https://kurumsal.aygaz.com.tr/kurumsal/surdurulebilirlik-yonetimi">https://kurumsal.aygaz.com.tr/kurumsal/surdurulebilirlik-yonetimi</a>
Kordsa Teknik Tekstil A.Ş.	no	no	<a href="https://www.kordsa.com.tr/surdurulebilirlik/default/surdurulebilirlik/273/0/0">https://www.kordsa.com.tr/surdurulebilirlik/default/surdurulebilirlik/273/0/0</a>
Akbank T.A.Ş.	yes	yes	<a href="https://www.akbankinvestorrelations.com/tr/surdurulebilirlik/">https://www.akbankinvestorrelations.com/tr/surdurulebilirlik/</a>
Tav Havalimanları Holding A.Ş.	yes	no	<a href="https://tavhavalimanlari.com.tr/tr-TR/surdurulebilirlik">https://tavhavalimanlari.com.tr/tr-TR/surdurulebilirlik</a>
Turkcell İletişim Hizmetleri A.Ş.	yes	yes	<a href="https://www.turkcell.com.tr/tr/hakkimizda/kurumsal-iletisim/surdurulebilirlik">https://www.turkcell.com.tr/tr/hakkimizda/kurumsal-iletisim/surdurulebilirlik</a>
Aselsan Elektronik Sanayi ve Ticaret A.Ş.	no	yes	<a href="https://www.aselsan.com.tr/surdurulebilirlik">https://www.aselsan.com.tr/surdurulebilirlik</a>
Tat Gıda Sanayi A.Ş.	no	no	<a href="https://www.tatgida.com.tr/tr/surdurulebilirlik-stratejisi/">https://www.tatgida.com.tr/tr/surdurulebilirlik-stratejisi/</a>
Hacı Ömer Sabancı Holding A.Ş.	yes	yes	<a href="https://yatirimciiliskileri.sabanci.com.tr/surdurulebilirlik/default/Kurumsal-Yonetim-ve-Surdurulebilirlik/7/63/0">https://yatirimciiliskileri.sabanci.com.tr/surdurulebilirlik/default/Kurumsal-Yonetim-ve-Surdurulebilirlik/7/63/0</a>

Akenerji Elektrik Üretim A.Ş.	no	no	<a href="https://www.akenerji.com.tr/surdurulebilirlik">https://www.akenerji.com.tr/surdurulebilirlik</a>
Polisan Holding A.Ş.	no	no	<a href="https://polisanholding.com/surdurulebilirlik/surdurulebilirlik_v17">https://polisanholding.com/surdurulebilirlik/surdurulebilirlik_v17</a>
Enka İnşaat ve Sanayi A.Ş.	yes	yes	<a href="https://www.enka.com/sustainability/tr/">https://www.enka.com/sustainability/tr/</a>
Türkiye Halk Bankası A.Ş.	no	no	<a href="https://www.halkbank.com.tr/tr/bankamiz/surdurulebilirlik/surdurulebilirlik-organizasyonu.html">https://www.halkbank.com.tr/tr/bankamiz/surdurulebilirlik/surdurulebilirlik-organizasyonu.html</a>
Otokar Otomotiv ve Savunma Sanayi A.Ş.	no	no	<a href="https://www.otokar.com.tr/surdurulebilirlik/surdurulebilirlik">https://www.otokar.com.tr/surdurulebilirlik/surdurulebilirlik</a>
Petkim Petrokimya Holding A.Ş.	yes	yes	<a href="https://www.petkim.com.tr/surdurulebilirlik">https://www.petkim.com.tr/surdurulebilirlik</a>
Global Yatırım Holding A.Ş.	no	no	<a href="https://globalyatirim.com.tr/tr/77-yatirimci-iliskileri/surdurulebilirlik">https://globalyatirim.com.tr/tr/77-yatirimci-iliskileri/surdurulebilirlik</a>
Bizim Toptan Satış Mağazaları A.Ş.	no	no	<a href="https://www.bizimtoptan.com.tr/s/surdurulebilirlik">https://www.bizimtoptan.com.tr/s/surdurulebilirlik</a>
TÜPRAŞ - Türkiye Petrol Rafinerileri A.Ş.	no	yes	<a href="https://www.tupras.com.tr/surdurulebilirlik-ilkeleri">https://www.tupras.com.tr/surdurulebilirlik-ilkeleri</a>
İş Yatırım Menkul Değerler A.Ş.	no	no	<a href="https://www.isyatirim.com.tr/tr-tr/bizim-taniyin/hakkimizda/Sayfalar/surdurulebilirlik.aspx">https://www.isyatirim.com.tr/tr-tr/bizim-taniyin/hakkimizda/Sayfalar/surdurulebilirlik.aspx</a>
Bim Birleşik Mağazalar A.Ş.	yes	yes	<a href="https://www.bim.com.tr/Categories/691/surdurulebilirlik.aspx">https://www.bim.com.tr/Categories/691/surdurulebilirlik.aspx</a>
Koç Holding A.Ş.	yes	yes	<a href="https://www.koc.com.tr/surdurulebilirlik">https://www.koc.com.tr/surdurulebilirlik</a>
Aksa Akrilik Kimya Sanayii A.Ş.	no	no	<a href="https://www.aksa.com/tr/surdurulebilirlik/k-297">https://www.aksa.com/tr/surdurulebilirlik/k-297</a>
Ülker Bisküvi Sanayi A.Ş.	no	no	<a href="https://www.ulker.com.tr/toplum-icin/surdurulebilirlik">https://www.ulker.com.tr/toplum-icin/surdurulebilirlik</a>

Türkiye Şişe ve Cam Fabrikaları A.Ş.	yes	yes	<a href="https://sustainability.sisecam.com/tr">https://sustainability.sisecam.com/tr</a>
Karsan Otomotiv Sanayii ve Ticaret A.Ş.	no	no	<a href="https://www.karsan.com/tr/surdurulebilirlik/surdurulebilirlik-raporu">https://www.karsan.com/tr/surdurulebilirlik/surdurulebilirlik-raporu</a>
Tekfen Holding A.Ş.	no	no	<a href="https://www.tekfen.com.tr/surdurulebilirlik-vizyonu-3-4">https://www.tekfen.com.tr/surdurulebilirlik-vizyonu-3-4</a>
Anadolu Hayat Emeklilik A.Ş.	no	no	<a href="https://www.anadoluhayat.com.tr/surdurulebilirlik">https://www.anadoluhayat.com.tr/surdurulebilirlik</a>
Albaraka Türk Katılım Bankası A.Ş.	no	no	<a href="https://www.albarakam.tr/tr/hakkimizda/surdurulebilirlik">https://www.albarakam.tr/tr/hakkimizda/surdurulebilirlik</a>
Brisa Bridgestone Sabancı Lastik Sanayi ve Ticaret A.Ş.	no	no	<a href="https://www.brisa.com.tr/surdurulebilirlik/">https://www.brisa.com.tr/surdurulebilirlik/</a>
Zorlu Enerji Elektrik Üretim A.Ş.	no	no	<a href="https://www.zorluenerji.com.tr/tr/surdurulebilirlik/surdurulebilirlik-yonetimi/">https://www.zorluenerji.com.tr/tr/surdurulebilirlik/surdurulebilirlik-yonetimi/</a>
DO & CO	no	no	<a href="https://www.doco.com/surdurulebilirlik-oncelikler/?lang=tr">https://www.doco.com/surdurulebilirlik-oncelikler/?lang=tr</a>
Yapı ve Kredi Bankası A.Ş.	yes	yes	<a href="https://www.yapikredi.com.tr/yapi-kredi-hakkinda/surdurulebilirlik/">https://www.yapikredi.com.tr/yapi-kredi-hakkinda/surdurulebilirlik/</a>
Şekerbank T.A.Ş.	no	no	<a href="https://www.sekerbank.com.tr/hakkimizda/surdurulebilir-bankacilik/">https://www.sekerbank.com.tr/hakkimizda/surdurulebilir-bankacilik/</a>
Arçelik A.Ş.	yes	yes	<a href="https://www.arcelikglobal.com/tr/surdurulebilirlik/genel-bilgi/">https://www.arcelikglobal.com/tr/surdurulebilirlik/genel-bilgi/</a>
Coca-Cola İçecek A.Ş.	no	no	<a href="https://www.cci.com.tr/s%C3%BCrd%C3%BCr%C3%BClebilirlik">https://www.cci.com.tr/s%C3%BCrd%C3%BCr%C3%BClebilirlik</a>
Doğuş Otomotiv Servis ve Ticaret A.Ş.	yes	no	<a href="https://www.dogusotomotiv.com.tr/tr/surdurulebilirlik/surdurulebilirlik-1/surdurulebilirlik1">https://www.dogusotomotiv.com.tr/tr/surdurulebilirlik/surdurulebilirlik-1/surdurulebilirlik1</a>
Ereğli Demir ve Çelik Fabrikaları T.A.Ş.	yes	yes	<a href="https://www.erdemir.com.tr/surdurulebilirlik/yaklasimimiz/">https://www.erdemir.com.tr/surdurulebilirlik/yaklasimimiz/</a>

Ford Otomotiv Sanayi A.Ş.	yes	yes	<a href="https://www.ford.com.tr/ford-deneyimi/surdurulebilirlik">https://www.ford.com.tr/ford-deneyimi/surdurulebilirlik</a>
Migros Ticaret A.Ş.	yes	no	<a href="https://www.migroskuru msal.com/surdurulebilirlik">https://www.migroskuru msal.com/surdurulebilirlik</a>
Tofaş Türk Otomobil Fabrikası A.Ş.	yes	yes	<a href="https://www.tofas.com.tr/Surdurulebilirlik/GenelBak is">https://www.tofas.com.tr/Surdurulebilirlik/GenelBak is</a>

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