The Impact of Web Analytics Tools on the Performance of Small and Medium Enterprises

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ABSTRACT

In the era of data analytics, the use of web analytics tools is widely spread among Small and Medium Enterprises (SMEs), especially in the e-commerce sector, to analyze web usage data and measure website performance due to the several features it provides. Most web analytics studies were conducted based on marketing rather than a managerial point of view. Therefore, there is a necessity to study the impact from a managerial perspective by exploring the impact on financial and non-financial performance and the decision-making process. This study assessed the impact of web analytics tools on the overall performance of SMEs, targeting Saudi SMEs and considering the lack of web analytics studies in this sector in Saudi Arabia. The sample involved eight Saudi SMEs who participated by answering interview questions, which were analyzed using thematic analysis. The findings demonstrated four main themes: the current web analytics tools used by Saudi SMEs, the motivations behind their use, and their impact on SMEs' performance and decision-making. The results showed that these tools positively affect the overall performance of SMEs. Google Analytics (GA) was the tool most used by the sample. Seven motives were discovered that encourage SMEs to use web analytics tools. This study also addressed the common Key Performance Indicators (KPIs) used by the participants. Concerning decision-making, it was found that web analytics tools affected and supported SMEs' decisions. Furthermore, this study evaluated the role of Zid, the Saudi e-commerce platform for data analytics and performance measurement.

Keywords-web analytics tools; SMEs;KPIs; google Analytics; e-commerce; data analytics

I. INTRODUCTION

Until recently, Saudi SMEs relied on social networks to sell their products and services through simple direct messages. However, with the establishment of e-commerce platforms, such as Salla and Zid, most SMEs now have online stores to operate their businesses. These platforms help SMEs to start and grow their businesses online by creating and designing their online stores, managing their inventory, providing different types of digital payments, and delivering marketing solutions. The Saudi government plays an important role in supporting SMEs, as it established Monsha'at in 2016, Saudi Arabia's General Authority for Small and Medium Enterprises, to regulate, support, develop, and sponsor the SME sector. Monsha'at created an academy to provide different online courses in e-commerce, marketing, and supply chain management, to help SMEs gain knowledge in various business areas. The number of SMEs operating in Saudi Arabia increased to 752,560 in the first quarter of 2022, showing a 14.6% increase yearly [1]. To survive in this competitive sector, SMEs have to exploit digital technologies in various areas. Outsourcing information technology support could help SMEs operating in the e-commerce sector to continue adopting e-commerce technology [2]. Today, SMEs have access to a wide range of e-commerce technologies and data analysis capabilities that facilitate their development journey. Although e-commerce offers a great opportunity to build a competitive advantage over other competitors, the challenge is to what extent they can employ technology to make decisions on a solid basis [3].

In our data-driven world, most decisions are based on data analytics. Data analytics provide huge opportunities for SMEs in production, marketing, and quality control [4]. On the contrary, some obstacles prevent SMEs from adopting advanced data analytics, such as mastering big data analytics and data mining techniques [5]. Previous studies specified these obstacles as weak data infrastructure, limited financial resources, lack of IT skills, lack of analytical expertise, limited business cases, and data security and privacy concerns [6-8]. Based on these obstacles, some SMEs rely entirely on web analytics tools such as GA due to their usability, free cost, and availability of online tutorials. In addition, GA installation does not require technical skills [9]. Web analytics tools enable

enterprises, marketers, web developers, and web designers to attain a great deal of insights. In [10], a set of benefits of web analytics was illustrated: understanding user behavior, generating data on customer demographics and geolocations, identifying new and returning visitors, determining the frequently visited pages, and representing key metrics. In [11], it was stated that understanding how to use web analytics tools is essential for every entrepreneur.

According to [12], there are seven leading e-commerce analytics tools: Kiss metrics, RetentionGrid, Metrilo, Clicky, Adobe Marketing Cloud, GA, and Crazy Egg. GA is a Google marketing platform that provides numerous business and marketing insights for free and is one of the best-known web analytics tools. However, there are monthly paid plans for more advanced features. Web page owners can trace customers' visits and generate data related to their purchasing behavior. Accordingly, they can choose the best method to reach and acquire potential customers and promote their products/services. GA can collect data from different system types, such as customer relationship systems, websites, and mobile applications. This tool helps businesses measure the success of their marketing campaigns, assess the effectiveness of their promotions, and understand the customer journey. As a result, they can view and understand the full picture of their online presence [10].

To the best of our knowledge, there is a lack of research on the impact of web analytics tools on the overall performance of SMEs. Many studies focused on examining the impact of web analytics tools from a marketing perspective [13-16]. In addition, as there is a lack of investigations on the Saudi SME sector, it is necessary to study the impact of web analytics tools on the overall performance of Saudi SMEs. Saudi SMEs and e-commerce platforms rely on web analytics tools more than on big data analytics to analyze web usage data due to the various barriers to the use of the latter. Therefore, it is necessary to understand the current situation and investigate how the use of web analytics impacts the performance of Saudi SMEs. This study aimed to investigate the impact of web analytics tools on the overall performance of SMEs in Saudi Arabia. The research objectives were to understand the current use of web analytics tools in Saudi SMEs, identify the reasons for their use, and investigate whether web analytics tools have a positive or negative impact on their overall performance. Overall, this study extends previous web analytics studies by providing new insights related to their use from a managerial eye.

II. LITERATURE REVIEW

A. *Web Analytics Overview*

Web analytics aims to collect and analyze web usage data and traffic [17]. Web analytics is the technology and method for the collection, measurement, analysis, and reporting of website and web application usage data [18-19]. Web analytics is under the umbrella of web mining, specifically web usage mining [20]. However, web analytics is a descriptive analytics methodology, as it describes web usage data, using different metrics to provide insights about a website and how it is being used, while web mining focuses on identifying previously unknown patterns from Internet data. There are two main categories of web analytics. Off-site web analytics collect and measure data about an enterprise's online presence outside the website through the audience, electronic Word-Of-Mouth (e-WOM), and buzzwords. On-site web analytics focus on collecting and measuring data about customers' clicks and visitors' behavior. Most web analytics tools apply on-site analytics as they help website owners compare metrics against their Key Performance Indicators (KPIs) to generate more insights that can be used in the decision-making process [20].

Web analytics emerged during the evolution of the Internet using web server log files. In 1993, WebTrends was one of the leading commercial software companies that utilized web server logs for data collection and analysis [21]. Log files have some downsides as they do not provide information about the size or resolution of the client's screen, keyboard pressing, or clicking behavior [18]. As a result, page tagging or JavaScript tagging became another method to collect data without using log files. Page tagging works based on JavaScript code embedded in each web page [22]. Page tagging has more features, as it produces clean and reliable data, suitable for analyzing human activities [10]. Using page tagging, it is easy to identify unique visitors through cookies and browser fingerprints. On the other hand, web log analytics is less expensive and suitable for analyzing sensitive and historical data. Although web server logs and page tagging are the two main methods used to capture data, there are more comprehensive methods such as web beacons, event logs, application-level logs, and packet sniffers [18, 23]. Cookies are the most common data collection method used in web analytics [18]. Cookies are small text files embedded in the user's computer, and there are two types: session cookies, which are removed once the visitor leaves the website, and persistent cookies, which remain on the visitor's computer [24]. Furthermore, it is possible to combine two or more data collection methods, depending on the business goal [23].

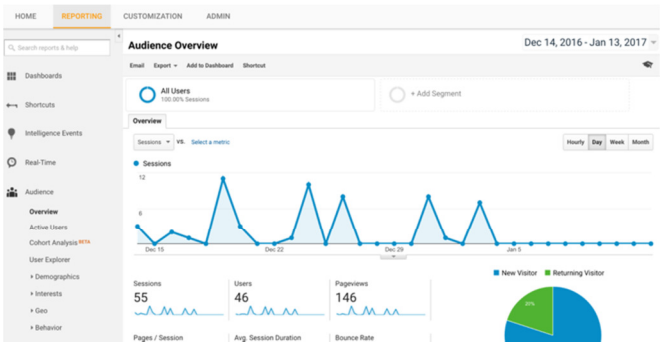

Fig. 1. Google analytics report dashboard.

Most data produced by on-site web analytics are based on customers' clicks. Reports illustrate data about visitors (total visitors, number of visitors, and unique visitors), page views (individual page views along with some mathematics such as total, average, minimum, and maximum), time (session duration, time spent per visitor), and referrers (keywords, websites, and trends) [23]. The referrer is the URL that originally generated the request for the current page view or object [19]. These are the most important and popular web

analytics metrics used by businesses and marketers. Figure 1 shows an example of a GA dashboard report. However, organizations can use other external data sources, such as surveys, public information on social media, and competitor comparisons [18]. Similarweb is one of the common software companies that specialize in measuring digital traffic and website performance [25]. One of its features is benchmarking, which enables businesses to compare themselves against rivals or compare two different businesses.

B. Web Analytics Tools

Choosing the right and most suitable web analytics tool is a critical process as it influences long-term strategy, particularly in the decision-making process [26]. In [22], the criteria for selecting the correct tool were usability, functionalities, technical details, and total cost. Accordingly, businesses have to submit a Request for Proposal and analyze their needs before selecting a web analytics tool. Globally, several web analytics tools are widely used, such as GA, Yahoo, Hotjar, Adobe Analytics, and Microsoft Advertising.

In 2005, GA was introduced as a free-service Google marketing platform product to track customer journeys and enhance Return On Investment (ROI). GA is the most popular and fastest-growing traffic analysis tool [27]. The ability to integrate with other Google products such as its search engine, AdWords, and Ads Manager, as well as non-Google products, is one of the main features that increased its popularity among SMEs [28]. GA features have been studied in multiple studies [11, 28-29]. In addition, Google offered free GA heat maps that can be installed directly in the Chrome browser, called Page Analytics. Heat maps show the density of customers' clicks on webpages [23]. However, since 2019, it has been blocked for multiple users because Google stopped updating the extension [30]. Hotjar provides two main products to understand customer click behavior: heatmaps and recordings [31]. There are three types of heatmaps: scroll maps, click maps, and move maps, and Figure 2 illustrates the first two. These heatmaps can be integrated with GA for effective results. Given the increasing use of free web analytics tools such as GA, in [26] it was proclaimed that these tools are useful for enterprises with a low number of visitors, but they could result in a low business improvement for those who already have a large number of visitors.

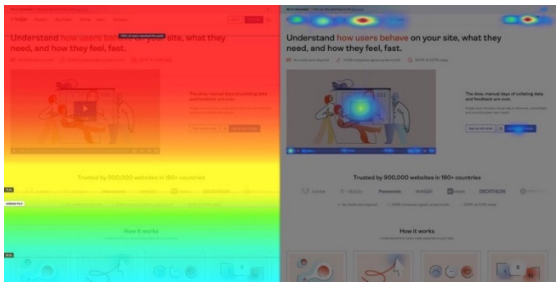

Fig. 2. A Hotjar scroll map and click map.

C. The Use of Web Analytics by SMEs

SMEs are highly supported by the Saudi government due to their power in the economy. In Saudi Arabia, two major e-commerce companies help SMEs build and operate their websites: Salla and Zid. Zid Analytics supports three major web analytics tools: GA, Hotjar, and Crazyegg, and all these tools can be integrated with SMEs' online stores. Figure 3 shows the web analytics tools that are listed in the Zid application store. In [26], a comparison framework was developed, showing that an enterprise's size influences its selection of web analytics tools. GA is the most popular web analytics tool among SMEs. In [32], an ontology model was proposed that aimed to integrate web analytics data into e-commerce. From a sample of 150 SMEs, 68% of e-commerce SMEs used GA to analyze their web data. Web analytics can provide great benefits to SMEs. In [33], it was stated that integrating the technical perspective of Web log analytics with a business/marketing perspective can highlight not just what insights can be gained, but how they can be used to guide effective decision-making about the specific website.

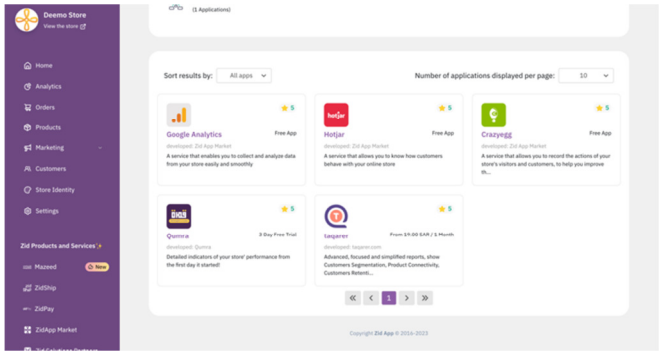

Fig. 3. Zid application store.

D. Web Analytics Tools and Performance of SMEs

Today, financial metrics are no longer enough to measure the performance of companies, as SMEs need to employ a combination of financial and non-financial indicators to assess their performance, and there is a complexity in measuring non-financial indicators [34]. For e-commerce enterprises, web analytics tools provide a way of measuring non-financial indicators by tracking website data, enabling SMEs to understand their online presence. Web analytics metrics and KPIs play a role in measuring website performance. Web analytics is the foundation of a performance-driven website [35]. To set the correct web metrics and KPIs, companies must identify their business goals and objectives. In [29], the importance of aligning KPIs with the business strategy was addressed, a framework was provided to help SMEs make better use of web analytics, and it was shown that identifying KPIs based on the type of website is an efficient method for SMEs. The most common KPIs used by commerce websites are Conversion Rates (CR), Average Order Value (AOR), customer loyalty, and bounce rate [21]. For example, in e-commerce, if an SME's business goal is to increase its customer base, it has to focus on a certain performance indicator, conversion rate. The conversion rate is calculated by taking the number of conversions and dividing it by the total number of ad interactions [36]. To achieve this goal, it is also important to reduce bounce rate and assess the reasons why customers leave the site without making a single transaction [37].

The Zid platform provides another service called Qumra, which is an application that provides all the detailed performance indicators for the stores operating under it and financial metrics such as total cash on delivery, service charges, vouchers, and total value-added tax. Figure 4 shows all the performance indicators measured by Qumra, which offers different subscription plans at affordable prices and is flexible to use [38].

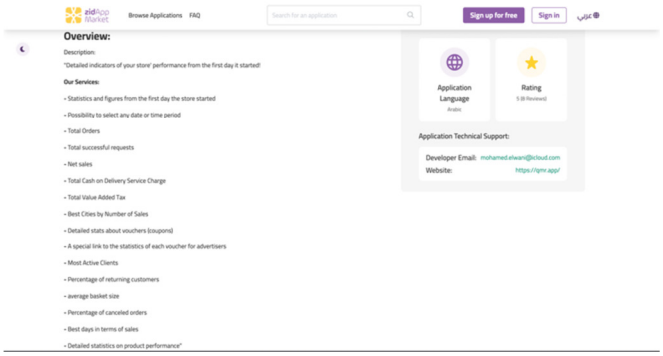

Fig. 4. Qumra application services.

To conclude, big and small enterprises have started to invest their time and money in web analytics due to its effectiveness. There is a positive correlation between usage frequency and user satisfaction with a web analytics tool, based on each activity: measuring, collecting, analyzing, and reporting [22]. SMEs must also be aware of the importance of data-driven decision-making. Lastly, SMEs must keep up to date with digital changes by exploring trends and opportunities that will allow them to become more competitive and innovative in the market [39].

III. RESEARCH METHODOLOGY

According to [40], there are eight well-known qualitative research approaches. This study investigated the impact of web analytics tools on SMEs' performance in Saudi Arabia by adopting an interpretive qualitative approach, aiming to understand in detail how the participants view web analytics tools and performance. In Saudi Arabia, the SME board defines SMEs based on two factors: the number of employees and revenue. Small enterprises consist of 6 to 49 employees or revenue of 3 to less than 40 million riyals (from $799.9K to less than $10.7M), while medium enterprises consist of 50 to 249 employees or revenue ranging from 40 to 200 million riyals ($10.7-53.3M) [41]. The study sample was selected with these factors in mind. Accordingly, the target sample was Saudi SMEs that used web analytics tools to analyze their web usage data, and these were chosen from LinkedIn, Instagram, and WhatsApp accounts. To accomplish the research goal, semi-structured in-depth interviews were conducted with some Saudi SMEs, aiming to generate focused findings. The interviews began at the end of December 2022, and each audio file was transcribed to be ready for the analysis phase. During the interviews, the interviewer managed and controlled the discussion to keep it within the scope of the investigation. Most of the questions were open-ended, so they provided the participants with the opportunity to elaborate. Additionally, follow-up and extension questions were asked to generate in-depth explanations and insights. All interviews were conducted online due to the difference in the geographic locations of researchers and participants. The participants were eight employees from different SMEs. Replication was the main criterion for identifying the maximum number of interviewees required [42]. Furthermore, the positions of the participants depended on the size of the SMEs. In small enterprises, owners were interviewed, while in medium enterprises, the e-commerce manager, digital marketing expert, and online store manager were interviewed, as shown in Table I.

TABLE I. INTERVIEW OVERVIEW

Interview no.	Independent company	Participant position	e-commerce platform	Enterprise size
1	No	Digital marketing experts & store manager	Salla	Medium
2	Yes	Owner	Zid	Small
3	Yes	Owner	Zid	Small
4	Yes	Co-founder	Zid	Small
5	Yes	Owner	Zid	Medium
6	Yes	Vice president	Zid	Small
7	Yes	Owner	Zid	Small
8	Yes	E-commerce manager	Zid	Medium

The names of the participants were kept secret for ethical considerations. A consent form was provided to each interviewee in Arabic and English. The form specified the researcher's name, research topic, and aim. The data collection procedure was cleared to ensure the privacy of the participants.

To derive substantive insights from the interviews, thematic analysis was considered the most appropriate methodology to employ. Thematic analysis is defined as a method for systematically identifying, organizing, and offering insight into the patterns of meaning/themes across a data set [43]. To ensure that the interview questions reflected the research objectives, the first interview was conducted as a pilot with a participant from the same research sample. The data generated from the interviews was in verbal form. Voice-recognition software was used for transcription. Since the participants were employees of Saudi SMEs, most of the interviews took place in Arabic. Therefore, all the transcripts were translated into English, using Microsoft Word to code and analyze the data. The codes were combined into different categories based on their similarities. Then, the main theme and subthemes were generated from these categories. Lastly, the findings were reached. Both authors agreed on the main themes after coding each interview individually and discussing the derived categories, themes, and sub-themes.

IV. RESULTS

The findings showed that web analytics tools positively affect the overall performance of Saudi SMEs within the e-commerce sector, particularly in three major pillars: financial performance, nonfinancial performance, and the decision-making process. Products, customers, advertising, and delivery aspects fall within the category of nonfinancial performance. In response to the question "From your experience, do web analytics tools have a positive or negative impact on the overall

performance and how?", One participant said: "Significantly positive. Because without these tools it will take a lot of time and effort to reach our target customers. Also, we might target the wrong customers. But, with these tools, it will be easy to reach our target customers" (Participant #3).

At first, the current situation was determined regarding which web analytics tools were used by the sample. Then, the reasons that motivated them to use these tools were identified. After that, the impact of the web analytics tools on financial, non-financial performance, and decision-making was analyzed. Four main themes were derived from the data: web analytics tools used by SMEs, SMEs' motivations, SMEs' performance, and the decision-making process. Each theme reflects one of the research objectives, as shown in Figure 5.

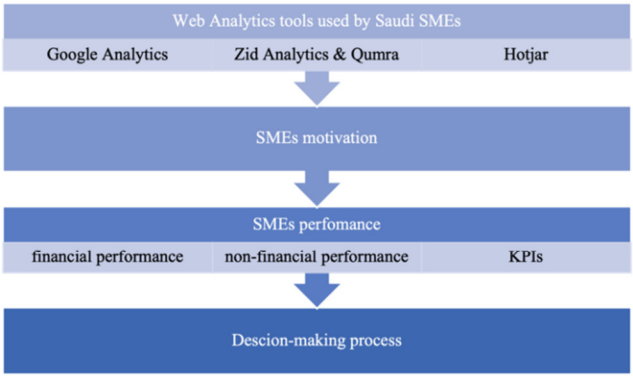

Fig. 5. Research result themes.

A. *Web Analytics Tools Used by SMEs*

The research findings identified the three most major and frequently used web analytics tools among the participants: GA, Zid Analytics and Qumra, and Hotjar. Each tool offers a set of features or characteristics.

1) *Google Analytics*

Although all participants used GA to analyze and measure their web usage data, they did it in different ways. Some of the participants depended entirely on GA to measure performance, while some diversified their web analytics tools using Hotjar or Zid and Qumra analytical dashboards along with GA. Four of the participants agreed that GA provided more comprehensive web analytics metrics than other tools. For instance, "For more accurate and comprehensive metrics, we use Google Analytics" (Participant #3), and "Google Analytics is more general and provides us with a big picture" (Participant #6). All participants stated that GA provides accurate results. The first participant indicated the difference between the new version of GA, which is G4, and the previous one, Universal Analytics (UA): "Google Analytics G4 provides me with more accurate results than UA". On the other hand, Participant #8 said: "Google Analytics provides a close and accurate result of 95-96%".

In terms of performance, one of the participants indicated the importance of GA: "The performance indicators produced by GA are one of the main things that help us reach our goals, they tell us where we are going. What are the things we need to focus more on? What are the points we need to learn from? What should we specialize in or be distinguished to benefit from them? It serves as a reference for us" (Participant #3).

GA also helped two of the participants identify sales, customers, and campaign problems, solve them, and assess the solutions. "Google Analytics helps me identify the problem related to, for example, a drop in certain page links. We find solutions and solve the problem completely. After one month we assess the solution, and we see a big difference before and after. It helps us improve the website's performance and increase sales in general" (Participant #1).

2) *Zid Analytics & Qumra*

Seven participants built their websites through Zid and took advantage of the Zid analytical dashboards and reports. Six participants used Qumra, also a Zid product, to measure their performance through several performance indicators. Participants who used both Zid Analytics and Qumra agreed that they were similar in terms of usability. Both tools can be used by any Zid website owner. "Zid is one of the most important companies in Saudi Arabia that provide you with a platform and they support you in the analysis process" (Participant #2). Regarding the Qumra Application, several features were identified by the participants:

- Qumra is simpler than GA: "In Google Analytics, the language of numbers speaks greater, but in Qumra, it may be very simple" (Participant #2).
- Qumra provides limited performance indicators: Qumra provides a list of performance indicators, which were not enough for one of the SMEs. The owner saw that Qumra helped them in specific areas but not all of them: "Up to now, it has not met all the needs of company owners. But it helps us to understand products, for example, we can see which is the best-selling product. It helps us to understand the geographical data related to high AOV. Also, it helps us to answer questions like 'What is the shipping company preferred by our customers?'. These are examples of how Qumra performance indicators help us" (Participant #2).
- Qumra is available at an affordable price: "It has a simple price of forty-nine riyals per month. It is good for those who are looking for quick information" (Participant #2).
- It is easy for non-professional data analysts to use Qumra: "Qumra is unique in terms of targeting those who have the basics and a simple limit of knowledge in terms of data analysis" (Participant #2).

Lastly, only one of the participants who had built their website with Zid declared that the Zid analytical dashboard provided inaccurate results: "The figures that were presented in Zid were inaccurate. We never relied on them. We rely on our work, through internal analysis" (Participant #7).

3) *Hotjar*

Only three of the participants used the Hotjar web analytics tool, which concentrates on the Heatmap feature for its analysis. In their view, heatmaps helped them design their online stores and understand customer behavior: "There are specific things we checked through Hotjar because it illustrates

a screenshot of customers' behavior on the site, so we know if this button is not clear. This is a page where a specific element needs to be removed, enlarged, reduced, or even added again" (Participant #6), and "It has a very big role, for example, understanding the customer journey. In Hotjar we can know the customers' focus, what they see, and more" (Participant #5).

B. Motivations of SMEs

Participants were asked about their reasons for using web analytics tools. Figure 6 shows the seven motives found to encourage them to continue using these tools to analyze their websites and measure their performance.

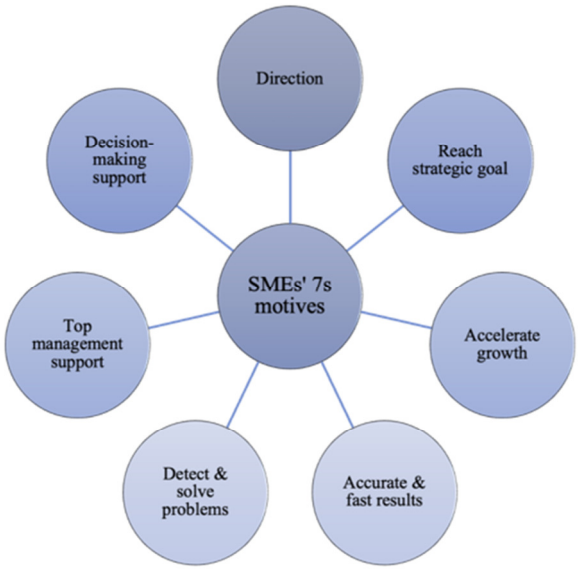

Fig. 6. SMEs' seven motives for using web analytics tools.

1) Direction

Four participants agreed that web analytics tools provide direction and guide them in their business growth: "Web analytics tools help us to go further" (Participant #2), "Web analytics tools provide us with daily and monthly performance indicators. Also, they help us to understand whether we are on the right path or not in terms of accomplishing our goals" (Participant #5), and "Web analytics tools are a compass for the online store" (Participant #3).

2) Reach Strategic Goals

Half of the participants stated that web analytics tools help them reach their strategic goals and objectives: "Web analytics metrics show us whether we have reached the target goals or not" (Participant #5), "In the business world, the more we have an accurate and large amount of data, the easier we can reach our goals" (Participant #3), and "In 2022, I used Google Analytics intensely, and frankly, I had a growth in sales of more than thirty to forty percent" (Participant #1).

3) Accelerate Growth

Participants saw that web analytics tools played a role in accelerating their business growth. Business growth is defined by the participants as accomplishing goals, increasing customer base, increasing sales volume, and product success: "I think the deeper we go into web analytics tools, the more we rely on them, they make a great impression on us, and they give us positive and accurate results. The impression can be the success of the company and maybe the success of the product" (Participant #3), and "Web analytics tools help us to accelerate our reach or speed of growth" (Participant #3).

4) Accurate and Fast Results

Six participants confirmed that web analytics tools provided them with quick and accurate results on web analytics metrics. When discussing this motive, one of the participants likened web analytics tools to a book that consists of historical and real-time data. "The first thing is the speed of measuring results. In the business world, the time when you are late launching a new product, or there is a delay in advertising such a product, many people have been racing you in this matter" (Participant #3), and "Web analytics tools provide a close and accurate result of approximately 95%" (Participant #8).

5) Detecting and Solving Problems

Detecting and solving problems was the most frequently mentioned motive among the participants to use web analytics tools. "Sometimes we see that there is traffic on particular products but not on other products, so we know that there is something wrong, for example in the price, so we adjust the prices or offers" (Participant #4). "Web analytics tools help us to understand the problem. For example, we sometimes see that a product is added to the basket without purchases, then we find that the product description is not clear or incomplete" (Participant #4).

6) Top Management Support

One of the participants declared that top management support plays a role in increasing the use of web analytics tools. Also, he stated that management awareness of web analytics increased after the COVID-19 pandemic and that employers started to know some of the keywords used in web analytics such as CR: "Top management support and awareness increased after COVID-19 related to the use of web analytics tools" and "After the COVID-19 pandemic, the manager became interested, for example, in CR. The development related to analytics is greater than before the pandemic" (Participant #1).

7) Decision-making Support

Web analytics tools supported four of the participants in the decision-making process. One of the participants discovered that customers did not spend more than a specific amount on one basket, so they decided to replace one of their products with an alternative product. For example: "We came down with a product with fewer features and less service. We dropped the price to an average of five hundred or six hundred riyals. It was also seasonal" (Participant #2). "We can't make decisions if there is no data or numbers in front of us. I mean, it's always the numbers that give us clear signals" (Participant #4). "Web analytics tools help us make decisions because they enable us to monitor the website status with full details from A to Z" (Participant #8).

C. SMEs' Performance

The participants were asked about the impact of using web analytics tools on measuring and monitoring performance. Most of the participants were aware of their important role in assessing financial and non-financial areas using several performance indicators. The main theme was divided into three sub-themes: financial performance, nonfinancial performance, and KPIs. "Of course, these web analytics metrics help us to improve and develop the performance in general" (Participant #1). "For us, it gives us great flexibility for the company in its performance at the level of KPIs from the operational side or as an outcome" (Participant #5). In addition, one of the participants clarified that web analytics tools have a greater impact if they are used by professionals or subject experts in SMEs: "We have brought in special people or people who have great experience in this area, and they have helped us greatly. So, number one is: to go to competent people" (Participant #3).

1) Financial Performance

The results showed three major effects of web analytics tools. First, they increase cash flow. For instance, they helped one of the participants identify the right time to advertise and sell seasonal products: "We discovered that people wanted to buy seasonal products before the season, so we added the products before their time. This helps us to dispose of old products and benefit from the cash" (Participant #2). In addition, web analytics tools reduce costs: "We found that the Eastern province prefers Aramex as a shipping company, rather than SMSA, so we canceled the other company to increase the orders and reduce the cost economically" (Participant #2). Furthermore, web analytics tools minimize the possibility of loss. "Instead of consuming a lot of human energy who may succeed with me or not. The technology in this way gives me an accurate, clear, reliable measurement that can be referred to at any time." (Participant #3). In summary, web analytics tools help SMEs manage their resources better.

2) Nonfinancial Performance

Most participants used web analytics non-financial performance indicators to assess or measure their performance in terms of products, delivery, advertisement campaigns, and customer satisfaction. Eleven effects were generated from the interviews and combined based on their similarities into four categories:

a) Products

- Web analytics tools help improve products by facilitating the understanding of several metrics: "Web analytics tools help us to monitor how far the customer accepts the products we offer. What percentage of customers enter the website and conduct a transaction? Well, how many of those who bought return to buy, or send a coupon to a second person to buy our products? It measures the impact of the product in the market" (Participant #8).
- Web analytics tools help sell the right product: "Let's assume that we decided to sell a new product, and we entered the market without relying on analysis tools. If the product is a wrong choice, and the target group is wrong, it will be a loss, starting from entering the market up to reaching customers" (Participant #3).
- Web analytics tools help select the right time to launch a new product: "In the year 2020, we sold certain products during the summer season. The year after that we did not. Through GA we found that customers were looking for these products before the summer season. It helped us to add these products at a specific time based on customer demand" (Participant #2).
- Web analytics tools help identify products that need more investment: "Sometimes data determine products that we should pay attention to and invest in more, although we did not think that this would achieve results; data can give us another perspective" (Participant #4).
- Web analytics tools help assess product quality: Some of the participants used external web analytic data collection tools like surveys and A/B tests to assess customer experience and product quality. "Surveys were sent to customers to evaluate the quality of the entire experience, including the product, and the delivery service, these help us greatly" (Participant #6).

b) Advertisement

- Web analytics tools help to assess the impact of social media influencers: "In Google Analytics, we can evaluate the advertisers or the influencers who advertise our products. Also, we can evaluate the advertisement channel based on it, and the conversion rate" (Participant #5).
- Web analytics tools help businesses understand advert impressions: "Google Analytics shows you the numbers of visitors currently, especially after ads or huge campaigns, through the entry rate and conversion rate" (Participant #5).

c) Delivery

- Web analytics tools help SMEs discover the locations of high basket value: "We found that some small cities in Saudi Arabia have a high basket value compared to big cities like Riyadh, so we studied why. We discovered that physical stores in small cities are few and far between. So, they order a large number of products with one shipping cost rather than buying one or two products including shipping cost, and repeat ordering more after one month for example. Especially during the COVID-19 pandemic, more of the orders were from small cities such as Jizan" (Participant #2).
- Web analytics tools help businesses identify suitable shipping companies: "Through the analysis, we identified that the eastern province prefers Aramex as a shipping company more than SMSA, so we added a different shipping option" (Participant #2).

d) Customers

- Web analytics tools help SMEs understand customer behavior: "During the World Cup, we made a quick campaign, and the return was more than 2,500 orders. Based on these tools we analyzed our current customers and what they wanted or preferred, so we introduced an offer

(buy one product and get one free)" (Participant #2). "These tools help us understand the customer. For example, through the exit rate within a certain page, we can see that some customers don't like the shipping method or the payment methods, and we act upon that" (Participant #5).

- Web analytics tools help SMEs reach the right target customers: "Web analytics tools help us understand customer behavior, improve customer experience and identify the target customers to reach them in the marketing campaigns" (Participant #6).

3) KPIs

Regarding the use of KPIs, the participants were divided into two categories. Three of the participants did not rely on web analytics KPIs to measure their performance but used sales and ROI to assess their overall performance. Participant #1 said: "We rely on sales by 90%, and the other 10% we focus on customer satisfaction". However, most of the participants realized the importance of KPIs and planned to set their own KPIs that aligned with their strategic goals by the beginning of 2023. One of the main reasons for this is that after the COVID-19 pandemic, top managers became more aware of web analytics tools in general and non-financial performance indicators, such as the CR. However, five participants relied on web analytics KPIs to assess their performance and make decisions. The common KPIs used by the participants were CR, AOV, and retention rate. Other KPIs used were the number of visits, click-through rate, transit time, delivery rate, traffic growth, and total number of orders. Also, financial KPIs were used, such as total sales and ROI.

D. Decision-making Process

Web analytics tools had a great impact on SMEs' decisions. The participants were asked: "How far do web analytics tools impact a company's decision-making?". Six of the eight participants said that web analytics metrics affected their decisions, both day-to-day and long-term. "Web analytics tools results could tell us to stop investing in specific products that do not reach the target sales, so in this situation, we continue to sell the available stock and then we start looking for an alternative product" (Participant #4). "As e-commerce, we can change our decisions on large campaigns based on web analytics tools results, in terms of adjusting prices, modifying discount methods, packaging, and bundling. These are all changed periodically based on the reports. Reports are important to us" (Participant #5). "Web analytics tools affect our decisions by 60%" (Participant #8). Figure 7 presents a Venn diagram of the three main performance pillars that are impacted by the use of web analytics tools in SMEs.

V. DISCUSSION

Based on the findings, it is obvious that Saudi SMEs use web analytics tools in several areas, such as product improvement, problem-solving, decision-making, and goal achievement. However, most of them limit their use to free tools, in particular those oriented toward marketing areas, as these serve their current needs. GA was the main tool used by participants to analyze web usage data, possibly due to enterprise size [26]. Enterprise size plays a role in selecting a web analytics tool and SMEs are more oriented to free web analytics tools, particularly GA. In addition, the study did not find challenges related to the use of web analytics tools. On the contrary, the participants were satisfied with their frequent use of web analytics tools, as in [22]. Furthermore, the results should encourage SMEs that have not yet used these tools to utilize them to measure and monitor their online store and overall performance. The three main motivators among the participants were achieving strategic goals, detecting and solving problems, and providing direction.

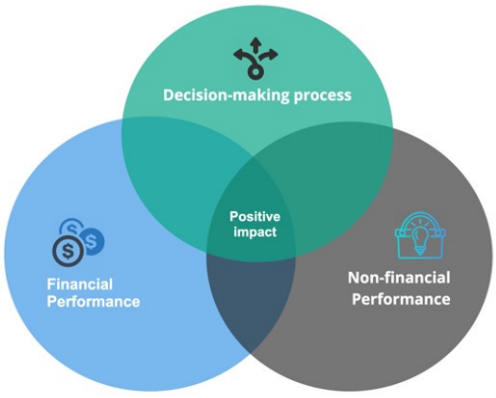

Fig. 7. The impact of web analytics tools on the performance of SMEs.

E-commerce SMEs in Saudi Arabia are growing rapidly, especially since the COVID-19 pandemic. In addition, they have gained a lot of government and private support. This study proved the key role of the Zid e-commerce platform in the SME sector, particularly in terms of web analytics. Although Qumra is a recent application, it has become one of the most important applications for SMEs that use the Zid platform, especially as a convenient measure of performance. Qumra developers need to consider SME reviews to level up the application. The results showed that heatmaps are still not commonly used by Saudi SMEs, despite their benefits in terms of understanding customer behavior. Web analytics metrics and KPIs were the main focus of SMEs, rather than heatmaps.

For measuring performance, the KPIs used were a mix of financial and non-financial performance indicators, providing insight into increased awareness of these types of indicators [34]. Furthermore, the findings demonstrate that they complement each other during the performance measurement process. The selection of KPIs was aligned with the enterprise goals [29] and website type in this research sample of e-commerce websites [21]. The most frequently used performance indicators were CR, AOV, and sales volume. Although increased awareness is related to non-financial performance indicators, some top managers are concerned only about sales and ROI as major indicators. Therefore, it is recommended to expand their knowledge of non-financial indicators, as they have recently become as important as financial indicators. The use of web analytics tools helps SMEs achieve their enterprise goals, supports decision-making, and improves enterprise performance. However, SMEs have to reconsider their use of web analytics tools in the long term,

increase their analytical knowledge, and hire expert analysts to analyze their web data in-house or through more advanced tools. The reason for this suggestion is that free tools are not considered a permanent solution for them and can lead to fewer improvements [26]. Expanding the number of visitors will increase the customer base.

VI. CONCLUSION, IMPLICATIONS, AND FUTURE WORK

This study assessed the effects of web analytics tools on the performance of SMEs in Saudi Arabia by interviewing some SME owners and employees. Thematic analysis was used to analyze the interviews, generating four main themes. Each theme reflected a research objective. At first, the web analytics tools used by the sample were determined. Then, seven motives were identified that encouraged SMEs to use web analytics tools, and finally, the impact of web analytics tools was established on financial and non-financial performance, and decision-making. Along with performance, it was determined that the sample used KPIs frequently. The findings convey that web analytics tools positively affect the overall performance of SMEs.

This study delineated three essential pivotal managerial implications for SME founders, managers, and the broader Saudi SME sector. At first, decision-makers in small- to medium-sized enterprises, whether involved in strategic, tactical, or operational capacities, must deepen their understanding of diverse KPIs and their effective application. Second, SMEs must recognize the importance of web analytics tools in improving performance measurements. Lastly, considering the substantial economic contribution of SMEs in Saudi Arabia, the findings of this study aim to fortify the sector by advocating for the adoption of web analytics tools, underscored by the seven key motivators.

The generalizability of the findings among SMEs in Saudi Arabia is limited. This limitation requires future researchers to expand the sample size and encompass a wider range of industries and countries. It is important to note that this study specifically focused on the e-commerce sector in Saudi Arabia.

REFERENCES

[1] "Over 750,000 SMEs operating in Saudi Arabia, a 15% increase on 2021," Small & Medium Enterprises General Authority, Monsha'at report, Jun. 2022. [Online]. Available: http://monshaat.gov.sa/en/node/9515.

[2] L. A. Hussein, A. S. Baharudin, S. Kiumarsi, and M. F. Hilmi, "Factors Influencing the Intention to Continue using B2B e-Commerce in Manufacturing SMEs," *Engineering, Technology & Applied Science Research*, vol. 10, no. 2, pp. 5528–5533, Apr. 2020, https://doi.org/10.48084/etasr.3373.

[3] S. Kaabi and R. Jallouli, "Overview of E-commerce Technologies, Data Analysis Capabilities and Marketing Knowledge," in *Digital Economy. Emerging Technologies and Business Innovation*, Beirut, Lebanon, 2019, pp. 183–193, https://doi.org/10.1007/978-3-030-30874-2_14.

[4] M. Bianchini and V. Michalkova, "Data Analytics in SMEs: Trends and Policies," OECD, Paris, France, Jun. 2019. https://doi.org/10.1787/1de6c6a7-en.

[5] S. Coleman, R. Göb, G. Manco, A. Pievatolo, X. Tort-Martorell, and M. S. Reis, "How Can SMEs Benefit from Big Data? Challenges and a Path Forward," *Quality and Reliability Engineering International*, vol. 32, no. 6, pp. 2151–2164, 2016, https://doi.org/10.1002/qre.2008.

[6] S. Y. Coleman, "Data-Mining Opportunities for Small and Medium Enterprises with Official Statistics in the UK," *Journal of Official Statistics*, vol. 32, no. 4, pp. 849–865, Dec. 2016, https://doi.org/10.1515/jos-2016-0044.

[7] M. Dittert, R. C. Härting, C. Reichstein, and C. Bayer, "A Data Analytics Framework for Business in Small and Medium-Sized Organizations," in *Intelligent Decision Technologies 2017*, Vilamoura, Portugal, 2018, pp. 169–181, https://doi.org/10.1007/978-3-319-59424-8_16.

[8] M. Nasrollahi, J. Ramezani, and M. Sadraei, "The Impact of Big Data Adoption on SMEs' Performance," *Big Data and Cognitive Computing*, vol. 5, no. 4, Dec. 2021, Art. no. 68, https://doi.org/10.3390/bdcc5040068.

[9] W. Boufenneche, M. Hebboul, and O. Benabderrahmane, "Web Analytics Tools for e-Commerce: An Overview and Comparative Analysis," in *International Conference on Managing Business Through Web Analytics*, 2022, pp. 51–72, https://doi.org/10.1007/978-3-031-06971-0_5.

[10] U. P. Jyothi, S. Bonthu, and B. V. Prasanthi, "A Study on Raise of Web Analytics and its Benefits," *International Journal of Computer Sciences and Engineering*, vol. 5, no. 10, pp. 59–64, Oct. 2017, https://doi.org/10.26438/ijcse/v5i10.5964.

[11] C. Truong, H. Phuong, N. Thi, and H. Trang, "Web analytics tools and benefits for entrepreneurs," BSc Thesis, Lahti University of Applied Sciences, Lahti, Finland, 2017.

[12] "7 Must Have Ecommerce Analytics Tools," *Ecommerce Platforms*, Jan. 08, 2015. https://ecommerce-platforms.com/ecommerce-selling-advice/7-must-ecommerce-analytics-tools.

[13] J. Maintz and F. Zaumseil, "Using Web analytics for content marketing performance measurement," presented at the 5th International Conference on Contemporary Marketing Issues, Thessaloniki, Greece, 2017.

[14] J. Järvinen and H. Karjaluoto, "The use of Web analytics for digital marketing performance measurement," *Industrial Marketing Management*, vol. 50, pp. 117–127, Oct. 2015, https://doi.org/10.1016/j.indmarman.2015.04.009.

[15] B. Plaza, "Google Analytics for measuring website performance," *Tourism Management*, vol. 32, no. 3, pp. 477–481, Jun. 2011, https://doi.org/10.1016/j.tourman.2010.03.015.

[16] Z. Hosseini, S. Mohammadi, and H. Safari, "An Assessment of the Impact of Information Technology on Marketing and Advertising," *Engineering, Technology & Applied Science Research*, vol. 8, no. 1, pp. 2526–2531, Feb. 2018, https://doi.org/10.48084/etasr.1620.

[17] N. S. Redkina, "The development tendencies of web analytics tools," *Automatic Documentation and Mathematical Linguistics*, vol. 51, no. 3, pp. 112–116, Jun. 2017, https://doi.org/10.3103/S0005105517030050.

[18] G. Zheng and S. Peltsverger, "Web Analytics Overview," in *Encyclopedia of Information Science and Technology, Third Edition*, Hersley, PA, USA: IGI Global, 2015.

[19] J. Burby, A. Brown, and WAA Standards Committee, "Web Analytics Definitions," Web Analytics Association, Washington, DC, USA, Aug. 2017.

[20] R. Sharda, D. Delen, and E. Turban, *Business intelligence, analytics, and data science: a managerial perspective*, Fourth edition. New York, NY: Pearson, 2018.

[21] H. Singal, S. Kohli, and A. K. Sharma, "Web analytics: State-of-art & literature assessment," in *2014 5th International Conference - Confluence The Next Generation Information Technology Summit (Confluence)*, Noida, India, Sep. 2014, pp. 24–29, https://doi.org/10.1109/CONFLUENCE.2014.6949041.

[22] I. Bekavac and D. Garbin Praničević, "Web analytics tools and web metrics tools: An overview and comparative analysis," *Croatian Operational Research Review*, vol. 6, no. 2, pp. 373–386, Oct. 2015, https://doi.org/10.17535/crorr.2015.0029.

[23] A. Kaushik, *Web Analytics: An Hour a Day*. Indianapolis, IN, USA: John Wiley & Sons, 2007.

[24] L. Kumar, H. Singh, and R. Kaur, "Web analytics and metrics: a survey," in *Proceedings of the International Conference on Advances in*

Computing, Communications and Informatics, Chennai, India, May 2012, pp. 966–971, https://doi.org/10.1145/2345396.2345552.

[25] "Website Traffic - Check and Analyze Any Website," *Similarweb*. https://www.similarweb.com/.

[26] K. Nakatani and T. Chuang, "A web analytics tool selection method: an analytical hierarchy process approach," *Internet Research*, vol. 21, no. 2, pp. 171–186, Jan. 2011, https://doi.org/10.1108/10662241111123757.

[27] "W3Techs - extensive and reliable web technology surveys." https://w3techs.com/.

[28] M. M. Savitha and S. M. Illuru, "Google Analytics," *International Research Journal of Modernization in Engineering Technology and Science*, vol. 4, no. 6, pp. 4319–4323, Jun. 2022.

[29] D. Heller, "Web analytics: functions, KPIs and reports in SMEs," BSc Thesis, Universität Koblenz, Koblenz, Germany, 2016.

[30] "Page-Analytics Chrome extension - Analytics Help." https://support.google.com/analytics/answer/6047802?hl=en#zippy=%2Cin-this-article.

[31] "Hotjar: Website Heatmaps & Behavior Analytics Tools." https://www.hotjar.com/.

[32] M. del M. R. García, J. García-Nieto, and J. F. Aldana-Montes, "An ontology-based data integration approach for web analytics in e-commerce," *Expert Systems with Applications*, vol. 63, pp. 20–34, Nov. 2016, https://doi.org/10.1016/j.eswa.2016.06.034.

[33] A. Ferrini and J. J. Mohr, "Uses, Limitations, and Trends in Web Analytics," in *Handbook of Research on Web Log Analysis*, Hersley, PA, USA: IGI Global, 2009, pp. 124–142.

[34] M. Nastasiea and C. Mironeasa, "Key Performance Indicators in Small and Medium Sized Enterprises," *TEHNOMUS - New Technologies and Products in Machine Manufacturing Technologies*, pp. 46–53, 2016.

[35] V. Kumar and G. A. Ogunmola, "Web Analytics for Knowledge Creation: A Systematic Review of Tools, Techniques, and Practices," *International Journal of Cyber Behavior, Psychology and Learning (IJCBPL)*, vol. 10, no. 1, pp. 1–14, Jan. 2020, https://doi.org/10.4018/IJCBPL.2020010101.

[36] "Conversion rate: Definition - Google Ads Help." https://support.google.com/google-ads/answer/2684489?hl=en&ref_topic=24937.

[37] D. Chaffey, D. Edmundson-Bird, and T. Hemphill, *Digital Business and E-commerce Management*. London, UK: Pearson UK, 2019.

[38] "Zid App Market," *Zid App Market*. https://apps.zid.sa.

[39] M. F. Mubarak, F. A. Shaikh, M. Mubarik, K. A. Samo, and S. Mastoi, "The Impact of Digital Transformation on Business Performance: A Study of Pakistani SMEs," *Engineering, Technology & Applied Science Research*, vol. 9, no. 6, pp. 5056–5061, Dec. 2019, https://doi.org/10.48084/etasr.3201.

[40] S. B. Merriam and R. S. Grenier, "Introduction to Qualitative Research," in *Qualitative Research in Practice: Examples for Discussion and Analysis*, Hoboken, NJ, USA: John Wiley & Sons, 2019, pp. 3–18.

[41] "Kingdom of Saudi Arabia - Ministry of Commerce," Ministry of Commerce, Riyadh, Saudi Arabia, Dec. 2016. [Online]. Available: https://mc.gov.sa:443/en/mediacenter/News/Pages/13-12-16-03.aspx.

[42] B. Marshall, P. Cardon, A. Poddar, and R. Fontenot, "Does Sample Size Matter in Qualitative Research?: A Review of Qualitative Interviews in is Research," *Journal of Computer Information Systems*, vol. 54, no. 1, pp. 11–22, Sep. 2013, https://doi.org/10.1080/08874417.2013.11645667.

[43] V. Braun and V. Clarke, "Thematic analysis," in *APA handbook of research methods in psychology: Research designs: Quantitative, qualitative, neuropsychological, and biological*, 2nd ed., vol. 2, Washington, DC, USA: American Psychological Association, 2023, pp. 65–81.