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Data Analytics and Personalized Marketing Strategies in E-commerce Platforms

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Abstract: This study aims to identify the most adapted digital data analysis tools for developing individual marketing strategies in the e-commerce segment. This descriptive study employed a mixed approach, incorporating qualitative and quantitative research methods. The study used the following ranking methods: the cross-expert rating (based on individual opinions of 15 specialised organisations) and the arbitration rating of the most relevant resource - G2.com. Subsequently, a comparative analysis of the leading E-Commerce Analytics applications was performed to obtain the ranking results. Using a methodology that considered expert ratings, cross- and arbitrage ratings, and user feedback, it was found that Glassbox was the best option for large enterprises, particularly for large e-businesses. Google Analytics, on the other hand, is more prevalent among smaller companies and is considered a more versatile tool for data analysis. The importance of choosing the right tool for data analytics in e-commerce was also highlighted in the study, as the wrong choice can lead to financial losses and loss of investment. Future research in this area includes the creation of universal algorithms for selecting data analytics software solutions, expanding the range of data analytics applications, and providing more details to understand the specific needs of e-commerce platforms.

Keywords: E-Commerce Analytics, Data Analytics Software, E-commerce Platforms, E- Business, Marketing Strategies, Personalized, Rating, Oversaturation of the Market.

Introduction

E-commerce platforms are virtual environments or software solutions that provide businesses with the means to efficiently conduct commerce over the Internet. They combine the infrastructure for creating and managing online stores, including payment options, order and inventory management, personalisation, analytics, and customer data protection. These platforms help businesses leverage the potential of e-commerce and facilitate online trading processes, contributing to improved user experience and increased competitiveness (Xiao et al., 2023; Qi et al., 2023; Pagey, Mannan & Youssef, 2023).

The use of E-commerce Platforms has significant advantages in terms of modern business. E-commerce platforms contribute to the global economic growth by providing businesses with access to the global market via the Internet. This helps to increase the audience and potential customers (Liu, 2023; Lucas, Lunardi & Dolci, 2023; Soleimani, 2022).

Additionally, such platforms simplify the transaction and payment process, providing convenience for customers and increasing conversions. Thanks to analytical tools, e-commerce platforms provide insights into customer behaviour, allowing businesses to improve their marketing strategies and personalise their approach to customers. Moreover, these platforms help to efficiently manage inventory, orders, and customer interactions, contributing to improved operational efficiency and customer satisfaction (Chong & Ali, 2022; Jebamikyous et al., 2023; Hendricks & Mwapwele, 2023).

Given the advantages of using E-commerce Platforms, it is advisable to develop this industry, which shows significant dynamics in attracting investments:

- according to Forbes Advisor (Baluch, 2023), in 2022, the global volume of trade transactions carried out through electronic commercial systems and platforms amounted to USD 6.310 trillion. By 2026, this figure could reach USD 8.148 trillion. (an increase of 30 %). In addition, today 20.8 % of global trade transactions are conducted on the Internet, and by 2026 this figure may reach 24 % (an increase of 13.3 %);

- according to Adobe (Top ecommerce statistics for 2023, 2023), 2.64 billion users are expected to make at least one online trade transaction in 2023. At the same time, the global e-commerce market will continue to grow by 8 percent annually;

- according to Statista (E-commerce worldwide, 2023), on average, users buy up to three products per order, for an average amount of up to USD 2.71 per visit. USD per visit. At the same time, the most profitable organisations operating on the Internet are from Asia (USD 1.7 trillion in 2022), and the most successful E-commerce Platform (as of December 2022) is Amazon with a capitalisation of USD 857 billion. (Alibaba took second place with a result of USD 233 billion US).

The above industry statistics indicate the importance of developing E-commerce Platforms in the modern business environment. The significant volume of trade transactions through these platforms, the projected growth of the global e-commerce market, and the success of leading players in this area confirm their great potential. The growing dynamics of investment attraction demonstrates confidence in this sector and its future prospects. The development of E-commerce Platforms not only contributes to the convenience of customers and businesses, but also has a significant impact on the global economy, establishing them as a key tool for modern trade and entrepreneurship (Ahi, Sinkovics & Sinkovics, 2023; Shuai, Li & Zhang, 2023; Yang, Chen, & Chen, 2023).

The development of E-commerce Platforms not only reflects the ongoing drive for digital transformation, but also provides businesses and consumers with essential tools for efficient electronic commerce transactions. The ability of digital commerce services to support and simplify the buying and selling process, provide personalisation and data storage, along with the growing popularity of online shopping, makes them an essential part of the modern business environment. In general, the high level

of investment and the significant business potential of E-commerce Platforms point to their important place in shaping the future global economic landscape (Huang, Asemi & Mustafa, 2023; Ballerini et al., 2023; Nurchayati et al., 2023).

Research Problem

The use of Data Analytics in E-commerce Platforms is essential for an effective management and growth in today's competitive business environment. Data analytics provides valuable insights into customer behaviour, preferences, and trends, which in turn helps to optimise marketing strategies, personalise offers and improve the user experience (Zhu, 2023; Verma et al., 2023; Singhal, Ahuja & Monga, 2023).

However, there are accompanying challenges. Firstly, processing large amounts of data can require significant resources and capacity to ensure speed and accuracy of analysis. Second, data privacy and security become critical issues as they contain personal and financial information of customers. The third issue is the challenge of interpreting data - analysts must be able to identify significant relationships and patterns in a sea of information. Given these challenges, it is important developing comprehensive approaches to data analysis and data reliability to succeed in the e-commerce market (Alsubari et al., 2022; Alrumiah & Hadwan, 2021; Taherdoost & Madanchian, 2023).

The use of Personalised Marketing Strategies in E-commerce Platforms is an important means of attracting and retaining customers in today's digital business. These strategies allow you to tailor marketing efforts to each customer's individual preferences, needs, and purchase history, which ensures more effective and relevant communication. Capturing the attention of customers through personalisation helps to improve the user experience, increase engagement and reduce bounce rates. By analysing customer data, individual offers, recommendations, and special promotions can be developed, which increases conversions and the likelihood of repeat purchases (Irene, 2023; Susiang et al., 2023; Purnomo, 2023).

However, there are accompanying problems. First, collecting and analysing data for personalisation may raise privacy and data protection issues. Secondly, it is important to avoid intrusiveness in marketing communications so as not to cause a negative reaction from customers. The third challenge is to ensure the accuracy of data analysis, as incorrect conclusions can lead to the failure of personalisation. To succeed in personalised marketing, it is important to balance the effectiveness, security, and relevance of communications in order to guarantee a positive customer experience (Wan, 2023; MH & Bari, 2022; Dobrița, 2023).

For a successful personalised marketing strategy in e-commerce, it is important to have the right digital data analytics solutions. These solutions help to collect and analyse data about customers, their online behaviour and purchases. Analysing this data allows realising the customer needs and preferences and create personalised content and offers. In addition, Data Analytics systems help to segment the audience and determine effective marketing strategies for each segment. They also allow measuring the results and analyse them in order to improve your strategy over time. Thus, Data Analytics plays a key role in the development and implementation of personalised e-commerce marketing strategies (Yeung, Wong & Tam, 2021; Gao, 2021; Blancaflor & Samonte, 2023).

Research Focus

Currently, there are many digital Data Analytics solutions (according to G2.com (Best E-Commerce Analytics Software, 2023), there are about 168 digital applications) used on E-commerce Platforms, but due to their sectoral, specialised nature and software and technical features, there is no possibility of a one-time successful selection of software solutions adequate to user requirements. Given these circumstances, the current study aimed to identify the optimal digital software applications for data analytics in the field of e-commerce.

Thus, the focus of this study was to analyse and evaluate various software tools for data analytics in the context of e-commerce. As a result of such an analysis, it will be possible to identify the optimal solutions that will take into account individual business needs and help to analyse data with greater efficiency and accuracy. This, in turn, will contribute to improved marketing strategies, detailed management decisions, and, ultimately, to the competitiveness of e-commerce businesses.

This study can make a significant contribution to the development of the e-commerce industry as a whole. Given the rapid growth rate of this market segment and constant competition, the implementation of data analytics is becoming a strategically important success factor. Making the right choice of digital data analytics solutions can help businesses save time and resources and increase the efficiency and stability of their operations.

Research Aim and Research Questions

The purpose of the study was to determine the optimal digital applications of the Data Analytics system for the formation of personalised marketing strategies in the field of e-commerce.

Research objectives:

1. To explore the capabilities of Data Analytics software solutions in the context of developing successful personalised marketing strategies in the e-commerce industry.
2. The identification of experts who have researched the market of digital Data Analytics applications for E-commerce Platforms.
3. The determination of a sample (based on the analysis of expert opinion) of analytical programmes and services that can be used in the field of digital commerce and e-business.
4. To perform a comparative analysis of ratings formed by selected experts for Data Analytics tools that are used or can be used on E-commerce Platforms.
5. To identify the best digital solutions for using Data Analytics in building personalised e-commerce marketing solutions.

Research Methodology

General Background

Exploring the capabilities of Data Analytics software solutions in the context of developing successful personalised marketing strategies in the e-commerce industry is a key aspect of modern business practice. Personalised marketing strategies are becoming increasingly important for businesses as they allow them attracting and retaining customers, improving their experience, and increasing profits (Fu, 2023; Alves Gomes & Meisen, 2023; Nguyen & Mai, 2023).

With the help of Data Analytics software solutions, business entrepreneurs can collect and analyse large amounts of data about their customers, their behaviour, and preferences. This allows them developing personalised offers, recommendations, and promotions that precisely match the needs and interests of each customer. As a result, conversion rates increase, the average purchase cheque rises, and the number of bounces decreases (Rautiainen, 2023; Kelvin & Novani, 2023; Chen & Wan, 2023).

Digital Data Analytics applications in the context of developing successful personalised e-commerce marketing strategies offer businesses a wide range of opportunities to achieve greater success in this competitive market – Table 1.

Table 1

Generalised capabilities of modern digital solutions of the Data Analytics system used in e-commerce

Capabilities	Description	Link

Capabilities	Description	Link
Collecting and analysing customer data	Data Analytics software solutions allow collecting and processing large amounts of customer data, including their purchases, browsing, preferences, and behaviour on the website. This information allows creating detailed customer profiles and understand their needs.	Rajput & Singh (2023)
Personalised recommendations	Data analytics can be used to develop individual recommendations for each customer. For example, the system can offer products that are likely to be of interest to a particular customer based on their purchase history and preferences.	Vullam et al. (2023)
Audience segmentation	Analytical tools allow dividing the audience into different segments depending on their characteristics and behaviour. This allows creating specialised marketing campaigns for each segment.	Griva et al. (2023)
Conversion analysis and optimisation	Data analytics can help to determine which marketing strategies and campaigns have the greatest impact on conversions and profitability. This allows optimising the budget and resources for maximum results.	Panicker, Vijay Kumar & Yadav (2023)
Personalised offers and promotions	Based on data analysis, it becomes possible to create individual offers and promotions for customers. This helps increasing customer loyalty and retention.	Ma (2022)
Forecasting and strategic planning	Data analytics allows us to develop sales forecasts, identify new opportunities, and develop strategies for the future.	Tang et al. (2023)

Source: author 's own development

However, it should be borne in mind that the use of Data Analytics software solutions also faces challenges, such as the need to ensure the confidentiality of customer data, as well as the importance of maintaining the relevance and accuracy of data. It is important to have the right infrastructure and expert team in place to successfully implement and effectively use Data Analytics in the development of personalised e-commerce marketing strategies.

Sample / Participants / Group

Based on the results of the search among open data, a number of relevant expert organisations were identified, whose websites contain relevant information and relevant rating recommendations on the use of digital solutions of the Data Analytics system in the field of e-commerce. A brief description of the expert organisations is given in Table 2.

Table 2

Characteristics of the expert community

Organisation name	Description	Link
Mayple	Mayple is an expert organisation that offers a new approach to hiring top marketing professionals.	Spitz (2023)
The Ecomm Manager	The Ecomm Manager is an expert organisation that provides resources and information on the best tools for e-commerce analysis.	<i>10 Best Ecommerce Analytics Software For Trend Analysis In 2023</i> (2023)
TrustRadius	TrustRadius is an expert organisation that provides reviews and insights into e-commerce analytics tools.	<i>eCommerce Analytics Tools</i> (2023)

Organisation name	Description	Link
Intuz	Intuz is a web resource that provides information on top e-commerce analysis tools.	<i>Top 10 E-commerce Analytics Tools for Maximising Business in 2023 (2023)</i>
Geckoboard blog	Geckoboard Blog is a web resource that provides an overview of the seven top e-commerce analytics tools for 2022.	Stanley (2022)
Financesonline.com	Financesonline.com is a resource that provides a list of the top 20 e-commerce analysis software.	Baker (2023)
Databox	Databox is an organisation that provides information on the best analytics tools for e-commerce.	<i>7 Best eCommerce Analytics Tools Databox Blog (2023)</i>
AIMultiple	AIMultiple is a source of research and information on analytics tools for the e-commerce industry.	<i>Top 10 E-commerce Analytics Tools in 2023 & Selection Guide (2023)</i>
Hotjar Ltd.	Hotjar Ltd. is a company that specialises in data analytics and visualisation tools for the e-commerce industry.	<i>8 user-friendly ecommerce analytics tools to grow your store (2023)</i>
Omnisend Blog	Omnisend Blog is a web resource that provides an overview of analysis tools for the e-commerce industry.	<i>10+ Best ecommerce analytics tools for 2023 (2023)</i>
Geekflare	Geekflare is a resource that provides information about e-commerce analytics tools.	<i>8 Best E-commerce Analytics Tools for Marketers (2023)</i>
EngageBay	EngageBay is an organisation that provides information and resources on analytics tools for e-commerce.	<i>12 eCommerce Analytics Tools for Pro-Level Business Tracking (2023)</i>
DataChannel	DataChannel is a web-based source of analytical information and research that provides an overview of analytics tools for the e-commerce industry.	Roy (2023)
Influencer Marketing Hub	Influencer Marketing Hub is an organisation that provides information and resources on analytics tools for e-commerce.	<i>Best eCommerce Analytics Software to Drive Sales and Achieve Growth (2023)</i>
6sense	6sense is a company that specialises in analytics technology for e-commerce.	<i>Market Share for Top Ecommerce Analytics Technologies (2023)</i>
G2.com	G2.com is an online platform that provides reviews and ratings of various software products, including e-commerce analytics tools.	<i>Best E-Commerce Analytics Software (2023)</i>

Source: author 's own development

Among the most relevant expert organisations (16 companies in total - Table 2), G2.com provides the most opportunities for analysing digital relationships with Data Analytics for E-commerce Platforms and contains the largest database of these software solutions for use in the e-commerce sector. Given this feature, G2.com is singled out as the main expert organisation, with whose conclusions the average cross-rating of the other 15 companies will be compared.

Instrument and Procedures

In this study, a comparative analysis of two methods of rating digital solutions of the Data Analytics system for E-commerce Platforms based on the following principles were applied:

1.A generalised cross-rating based on the frequency of mention and ranking by the number of times the top places were occupied. The field under study consists of 65 digital applications identified based on the analysis of expert opinions from 15 specialised organisations.

2.G2.com expert rating based on the principles of user surveys (popularity, satisfaction) and relevant metrics described in the relevant section of the methodology (G2 Research Scoring Methodologies, 2023). The research field consists of 168 currently known applications for data analytics in the field of e-commerce. G2.com applies the following criteria system: Pricing, Meets Requirements, Ease of Use, Ease of Setup, Ease of Admin, Quality of Support, Has the product been a good partner in doing business? Product Direction (% positive), Metrics for Digital Analytics Software, Product Analytics for Product Analytics Software, Analytics for E-Commerce Analytics Software, Reporting for Digital Analytics Software, Administration for E-Commerce Analytics Software, Administration for Digital Analytics Software, Other for Digital Analytics Software, Generative AI for E-Commerce Analytics Software, Reviewers' Company Size, and Discussions.

The research procedure involved the following steps:

- 1.The definition of the expert community (Table 2).
- 2.The identification of the key expert - G2.com.
- 3.The formation of the researched field - a sample of applications (65 - according to the cross-rating of 15 expert organisations and 168 according to the G2.com rating).
- 4.The determination of the optimal Data Analytics application for E-commerce Platforms by cross-rating and G2.com rating.
- 5.The comparative analysis of the leading digital solutions according to the G2.com criteria system (G2 Research Scoring Methodologies, 2023).
- 6.Analytical conclusion on the optimal digital application of the Data Analytics system for E-commerce Platforms, which will be useful in developing personalised marketing strategies.

Data Analysis

The subject area of the current study consisted of 65 digital Data Analytics applications used in the e-commerce and e-business industry. The corresponding dataset of the expert (according to 15 relevant organisations) rating is presented in Table 3.

Table 3

Dataset of digital solutions of the Data Analytics system for E-commerce Platforms

Service for Analytics of E-commerce Platforms	Mayple	The Ecomm Manager	TrustRadius	Intuz	Geckoboard blog	Financesonline.com	Databox	AIMultiple	Hotjar Ltd.	Omnisend Blog	Geekflare	EngageBay	DataChannel	Influencer Marketing Hub	6sense	Frequency of Mention
Google Analytics	1		1	4	4	13	2		1	2	5	1	1	2	12	13
Kissmetrics	2	6		9		10			7			3	4	5		8
Optimizely	3			1	1							8				4
Hotjar	3		3	8			6	4	2			4	3			8
Crazy Egg	5			2	2	7	4					2		8		7
Glew.io	6			3	3				8	7	8	6	8			8

Service for Analytics of E-commerce Platforms	Mayple	The Ecomm Manager	TrustRadius	Intuz	Geckoboard blog	Financesonline.com	Databox	AIMultiple	Hotjar Ltd.	Omnisend Blog	Geekflare	EngageBay	DataChannel	Influencer Marketing Hub	6sense	Frequency of Mention
Supermetrics	7			5	5						1	10				5
Woopra	8	4	7	6	6	12	5		6	5	3	9	2	4		13
Matomo	9			7	7							11	9			5
Mouseflow		1								4						2
Mixpanel		2				9		2	5	6	4	5	6	3		9
Glassbox		3						6		3			5	7		5
Heap		5				6		5								3
MikMak Insights		7														1
Triple Whale		8								11						2
Profitero		9														1
OWOX		10						9								2
Brightpearl			2			5										2
Looker			3			1										2
Yotpo			4			3										2
Twilio Segment			5			8										2
Riskified			6													1
Webgility			8													1
Adobe Marketing Cloud			9			11				10				6		4
Kount			10													1
Adverity			11													1
BetterCommerce			12													1
Zinrelo			13													1
Clicky			14			15										2
Zilliant			15													1
DataWeave			16													1
Easyinsights			17													1
Shoppingfeed			18													1
DataFeedWatch			19													1
ApiaryAI by Swarmalytics			20													1
FullStory				10		17										2
Shopify						2										1
SellerPrime						4										1
Webtrends						14										1
StatCounter						16										1
RJMetrics						18										1
IXXO Multi-Vendor Software						19										1

Service for Analytics of E-commerce Platforms	Mayple	The Ecomm Manager	TrustRadius	Intuz	Geckoboard blog	Financesonline.com	Databox	AIMultiple	Hotjar Ltd.	Omnisend Blog	Geekflare	EngageBay	DataChannel	Influencer Marketing Hub	6sense	Frequency of Mention
Octopus						20										1
Databox							1					7				2
Lucky Orange							3									1
Shopify analytics							7		3	8		12				4
Syndigo								1							2	2
Bluecore								3								1
Edrone								7								1
Segmentify								8							9	2
WooCommerce Analytics									4							1
Omnisend										1						1
Metrilo										9					10	2
Savvycube											2					1
Semrush											6					1
Amplitude											7					1
Pacvue Commerce														1		1
Metorik															1	1
ChannelAdvisor															3	1
Custora															4	1
Granify															5	1
BloomReach															6	1
Bolt															7	1
ChannelSight															8	1
Cloud.IQ															11	1

Source: author 's own development

Only applications that were mentioned at least 2 times are allowed for cross-analysis: the sample is reduced to 27 applications.

Research Results

According to the proposed methodology, the cross-analysis of expert ratings (samples from 15 expert organisations - Table 2) was based on the principles of ranking by the frequency of mention and the number of leading positions - Table 4.

Table 4*Dataset of digital solutions of the Data Analytics system for E-commerce Platforms*

Service for Analytics of E-commerce Platforms	Frequency of Mention	Relative Ranking by Mention Frequency	Number of Times of Occupying the First Leading Position	Number of Times Occupying the Second Leading Position	Number of Times Occupying the Third Leading Position	Number of Times Occupying the Fourth Leading Position	Number of Times Occupying the Fifth Leading Position	Relative Ranking by Priority
Google Analytics	13	0.107	5	3	0	2	1	0.765
Kissmetrics	8	0.066	0	1	1	1	1	0.083
Optimizely	4	0.033	2	0	1	0	0	0.076
Hotjar	8	0.066	0	1	3	2	0	0.129
Crazy Egg	7	0.057	0	3	0	1	1	0.111
Glew.io	8	0.066	0	0	2	0	0	0.043
Supermetrics	5	0.041	1	0	0	0	2	0.057
Woopra	13	0.107	0	1	1	2	2	0.182
Matomo	5	0.041	0	0	0	0	0	0.000
Mouseflow	2	0.016	1	0	0	1	0	0.020
Mixpanel	9	0.074	0	2	1	1	2	0.145
Glassbox	5	0.041	0	0	2	0	1	0.035
Heap	3	0.025	0	0	0	0	2	0.010
Triple Whale	2	0.016	0	0	0	0	0	0.000
OWOX	2	0.016	0	0	0	0	0	0.000
Brightpearl	2	0.016	0	1	0	0	1	0.011
Looker	2	0.016	1	0	1	0	0	0.022
Yotpo	2	0.016	0	0	1	1	0	0.009
Twilio Segment	2	0.016	0	0	0	0	1	0.003
Adobe Marketing Cloud	4	0.033	0	0	0	0	0	0.000
Clicky	2	0.016	0	0	0	0	0	0.000
FullStory	2	0.016	0	0	0	0	0	0.000
Databox	2	0.016	1	0	0	0	0	0.016
Shopify analytics	4	0.033	0	0	1	0	0	0.011
Syndigo	2	0.016	1	1	0	0	0	0.025
Segmentify	2	0.016	0	0	0	0	0	0.000
Metrilo	2	0.016	0	0	0	0	0	0.000

Source: author 's own development

Table 4 provides information on the frequency of mention and rating of e-commerce analytics tools in the Data Analytics system. Key findings:

1. Google Analytics has the highest ranking in terms of frequency of mention and frequency of position in the first leading position. It was mentioned 13 times and ranked first 5 times.

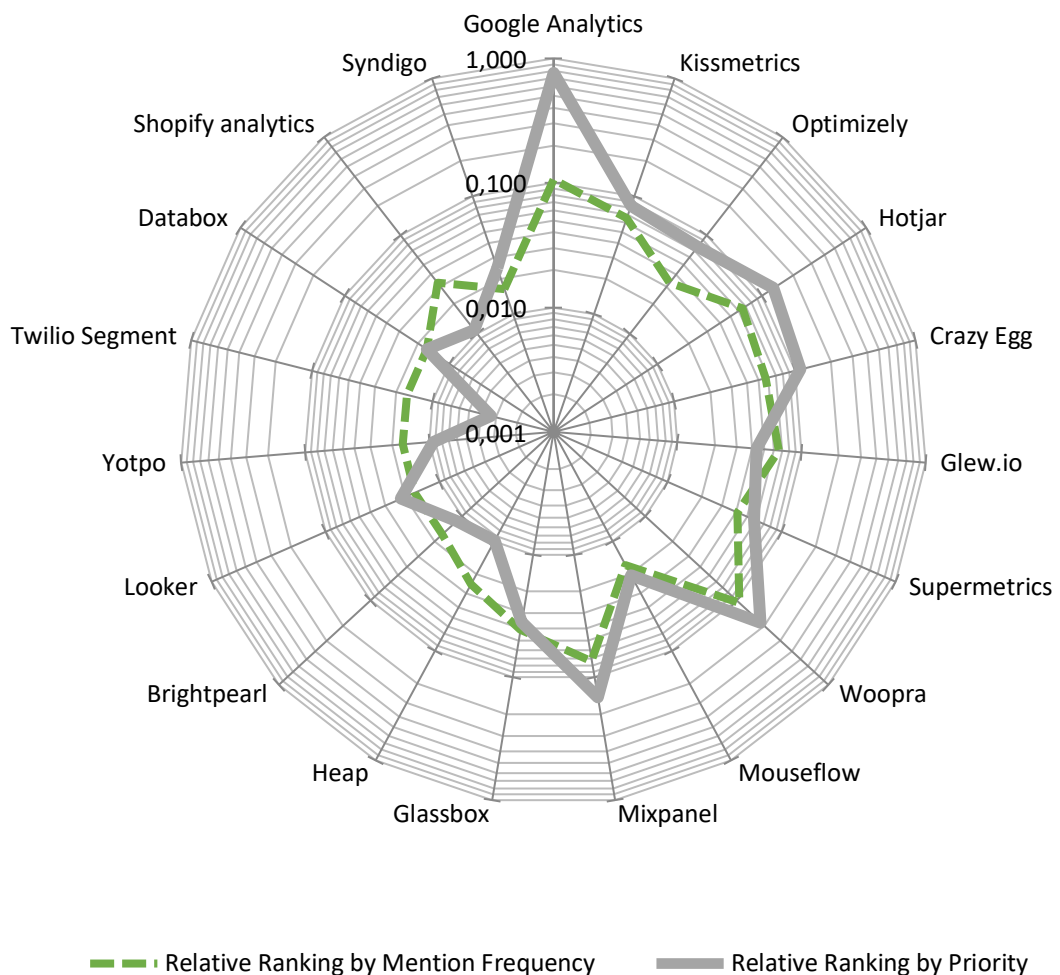
2. Woopra also has a high ranking and the highest number of mentions among the other tools. It was mentioned 13 times and ranked in the fifth leading position 2 times.
3. Kissmetrics and Mixpanel have the same ranking in terms of frequency of mention, but Kissmetrics was less frequently mentioned in the top positions.
4. Other tools, such as Optimizely, Hotjar, Crazy Egg, also have their own frequencies of mention and rankings by position, but they are less popular among respondents.

This data can be used to determine which e-commerce analytics tools are the most popular and most frequently mentioned in the top rankings. Google Analytics and Woopra are among the top leaders in terms of frequency of mention and popularity.

In order to determine the optimal Data Analytics application for E-commerce Platforms, let's perform a graphical analysis of the cross-expert ranking - Figure 1.

Figure 1

Graphical analysis of the cross-expert rating of digital applications of the Data Analytics system for E-commerce Platforms



Source: author's own development

This data (Figure 1) shows which e-commerce analytics tools are the most popular and most frequently mentioned in the top rankings. Google Analytics and Woopra are among the main leaders in terms of frequency of mention and popularity.

To determine the optimal Data Analytics application for E-commerce Platforms, we can consider both rankings: Relative Ranking by Mention Frequency and Relative Ranking by Priority. The best choice will take into account both factors.

By Relative Ranking by Mention Frequency:

1. Google Analytics has the highest frequency of mention.
2. Woopra also has a high recall rate.

3. Kissmetrics, Hotjar, Glew.io, Crazy Egg, Mixpanel, Supermetrics, Glassbox, Shopify Analytics, Brightpearl, Twilio Segment, Databox, Mouseflow, Heap, Triple Whale, OWOX, Adobe Marketing Cloud, Clicky, FullStory, Syndigo, Segmentify, Metrilo all have lower recall rates than Google Analytics and Woopra.

By Relative Ranking by Priority:

1. Google Analytics has the highest priority.
2. Woopra has the second highest priority.
3. Hotjar, Mixpanel, Crazy Egg also have a high priority score.

Taking into account both ratings, Google Analytics and Woopra stand out as the best options for use in the Data Analytics system for E-commerce Platforms.

The G2.com service (Best E-Commerce Analytics Software, 2023), chosen by the arbitration expert, allows you to get a graphical interpretation of the rating of all known digital business intelligence tools (168 applications), according to the methodology provided on the website (G2 Research Scoring Methodologies, 2023). The scoring methodology used on G2.com provided a more objective basis for comparing different tools, as it takes into account user feedback and expert opinion. This helped creating reliable ratings that could be relied upon when choosing e-commerce data analytics software.

The methodology used by G2.com to compile its expert rankings for digital business intelligence tools for e-commerce is based on the important principles of user surveys and the use of specific metrics. To achieve objective and accurate assessments, the product popularity, user satisfaction, and other criteria were taken into account. The field under study includes 168 well-known e-commerce data analytics applications.

The criteria system used by G2.com analysed in detail various aspects of each product, including cost, relevance, ease of use and other parameters. This methodology helps to create reliable ratings that assist users in choosing the most appropriate tools for e-commerce data analysis.

The overall G2.com rating is shown in Figure 2.

In the overall G2 Grid® Scoring (Best E-Commerce Analytics Software, 2023 - Figure 2), the following applications for analysing business processes in the e-commerce environment are leading: Flipkart Commerce Cloud Selection Manager, Glassbox, Mixpanel, Triple Whale, Mouseflow, edrone, OWOX BI, Stackline, Heap, DataFeedWatch, etc.

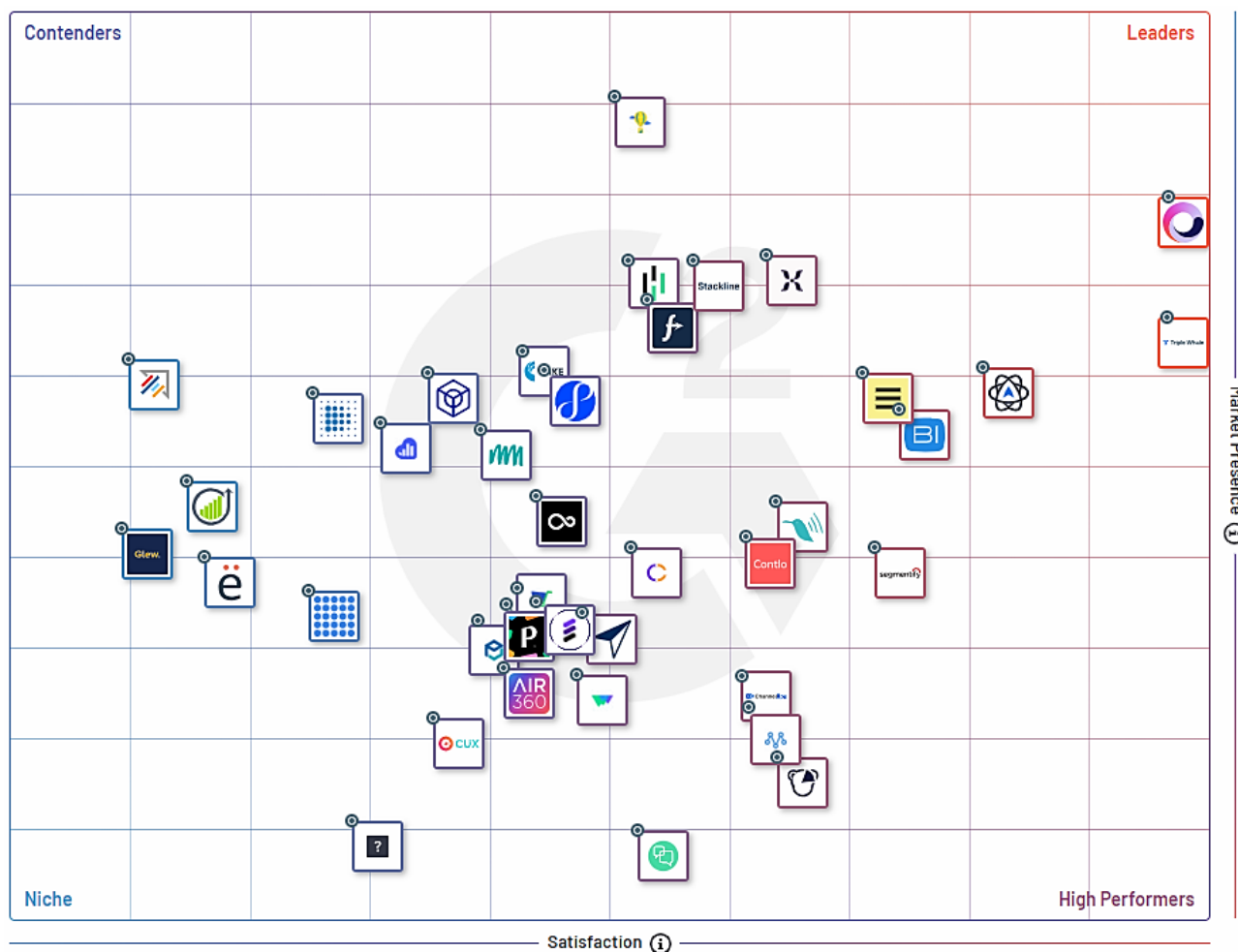
However, as mentioned in the methodology section, G2.com also uses cross-ranking by global “popularity” and “satisfaction” (which consist of a corresponding set of metrics described on the website (G2 Research Scoring Methodologies, 2023)) to determine market leaders - Figure 3.

According to the ranking (Figure 3), G2.com identifies Glassbox, Triple Whale, and Mouseflow as leaders in digital business intelligence for e-commerce. This indicates that these tools are highly popular among users and are able to meet their needs.

It is important to keep in mind that tool ratings may change over time, as the digital analytics market is constantly evolving. Therefore, users and arbitration experts should regularly update their knowledge and analyse the current ratings to choose the best tools for their e-commerce needs.

Figure 2

Overall rating “Best E-Commerce Analytics Software” by G2.com



G2 Grid® Scoring

Source: Best E-Commerce Analytics Software, 2023

It can be observed that the cross-expert ranking and G2 Grid® Scoring have different leaders: Google Analytics and Glassbox. It is interesting to note that the correlation point for the expert and arbitration ratings is the Mixpanel app (Figure 1 and Figure 3), while all other participants in the ratings have different scores and, accordingly, occupy different leadership positions. Using the comparative analysis tools of G2.com, let's compare the leaders of the cross-expert rating and G2 Grid® Scoring - Figure 4.

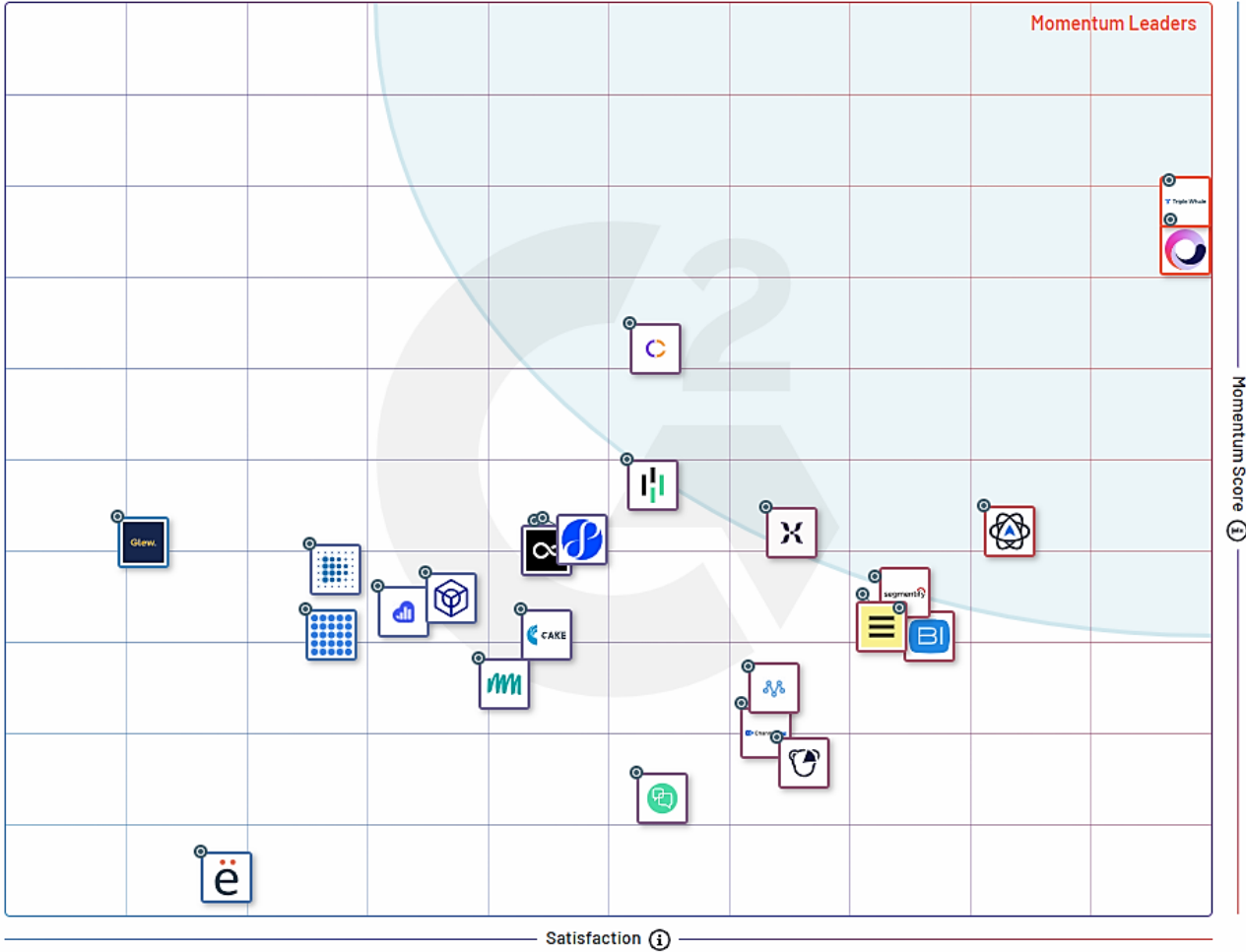
In comparing Google Analytics and Glassbox based on user reviews (Figure 4), it can be noted that both products have received high ratings from their users. Google Analytics received a 4.5/5 rating based on 6,176 reviews, while Glassbox received an even higher 4.9/5 rating based on 554 reviews. The interface evaluation of Google Analytics and Glassbox shows similarities in functionality with some special features and customisation – Figure 5.

Based on the results of the comparative analysis, we note that G2.com experts choose Glassbox as the best Data Analytics tool for E-commerce Platforms, despite the fact that Google Analytics has significantly more reviews (which is a sign of a more objective assessment for Google's service). This is because G2.com classifies Glassbox as an E-Commerce Analytics application, while Google Analytics

classifies it as Content Analytics. Also, the majority of large business users (Enterprise (> 1000 emp.)) choose Glassbox (71.7% of all users), while Google's service is more characterised by the small business niche (Small-Business (50 or fewer emp.) - 60.2% of all users).

Figure 3



Determining the leaders of the G2 Grid® Scoring rating



Source: Best E-Commerce Analytics Software, 2023

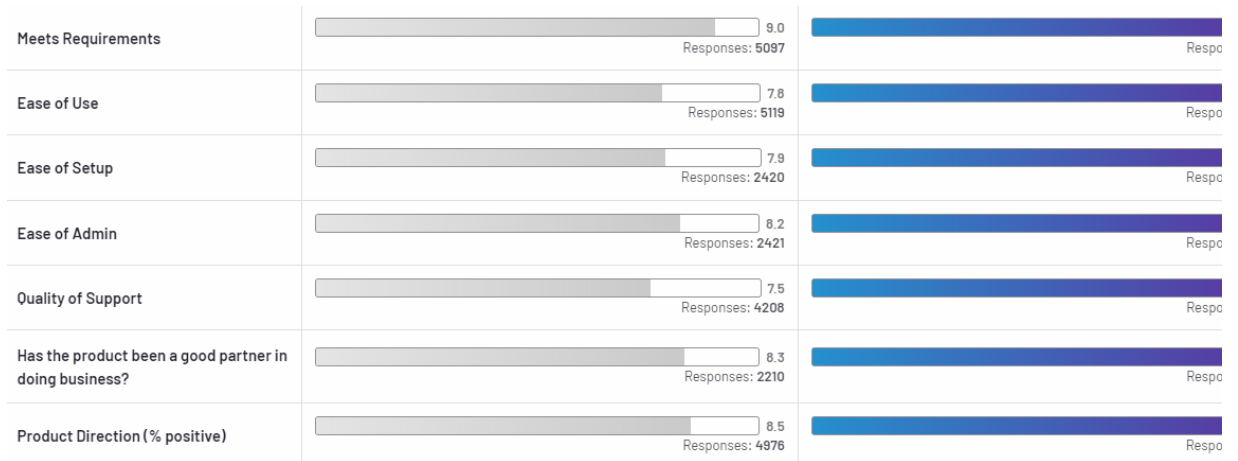
Figure 4

Comparative analysis of the leaders of the cross-expert rating and G2 Grid® Scoring in the G2.com system

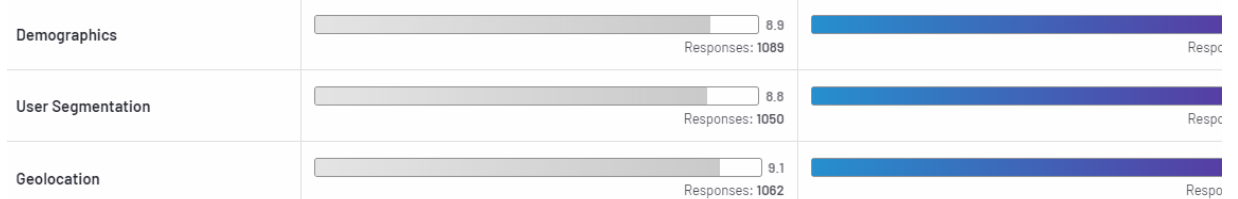
	 Google Analytics	 Glassbox
Star Rating	★★★★★ 6,176 reviews	★★★★★ 554 reviews
Market Segments	Small-Business (60.2% of reviews)Ⓞ	Enterprise (71.7% of reviews)Ⓞ
Entry Level Price	No pricing information available	No pricing information available
	Free Trial Unavailable	Free Trial Unavailable

a) At a Glance

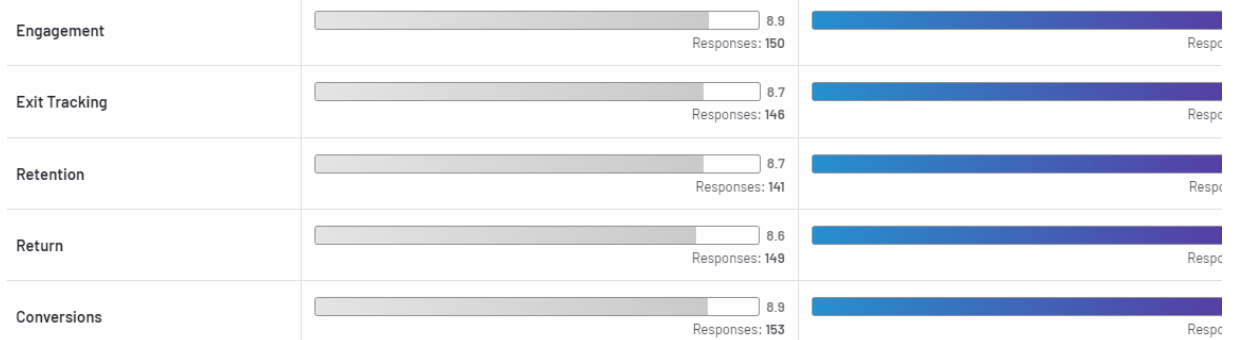
b) Pricing



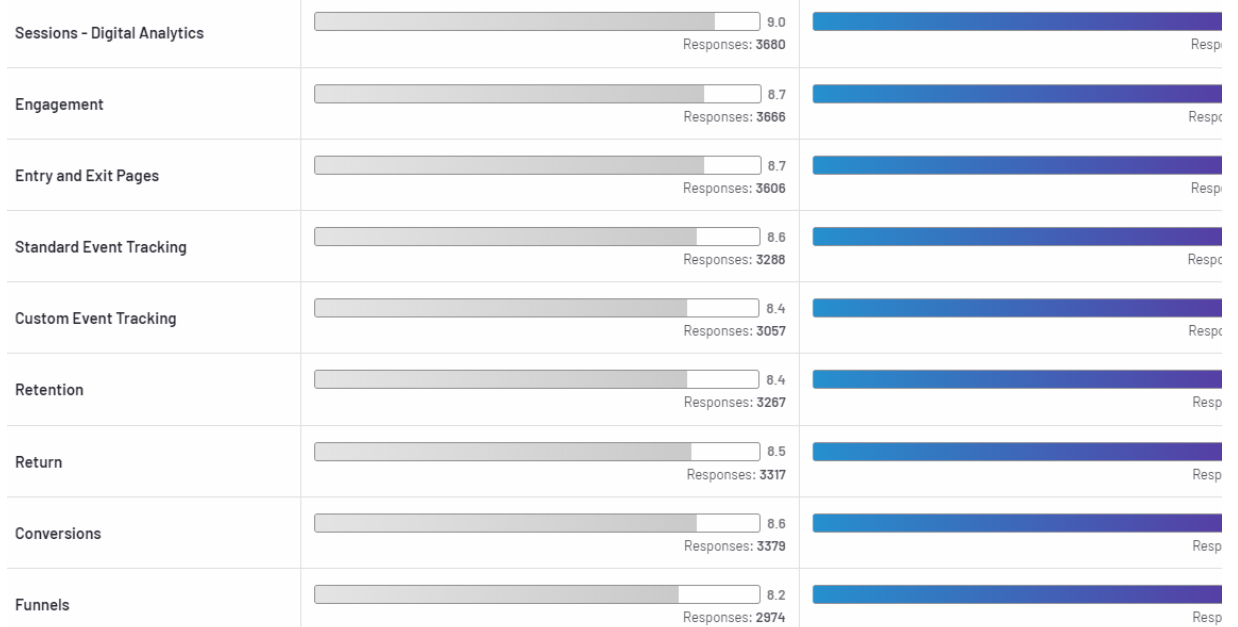
c) Ratings















d) User Identification for Mobile App Analytics Tools




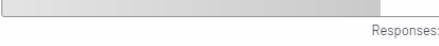

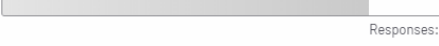

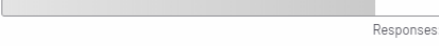





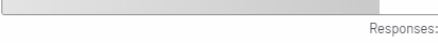

e) Metrics for Mobile App Analytics Tools











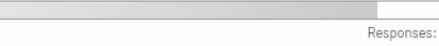

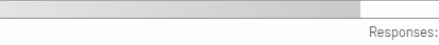

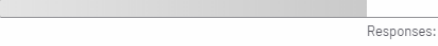

f) Metrics for Digital Analytics Software

Custom Event Tracking	 8.5 Responses: 934	 Respo
Real-Time Insights	 8.9 Responses: 1077	 Respo
Attribution	 8.5 Responses: 984	 Respo
Dashboard	 8.9 Responses: 1092	 Respo
User Path Tracking	 8.7 Responses: 1037	 Respo
User Activity History	 8.6 Responses: 1013	 Respo

g) Tracking & Reporting for Mobile App Analytics Tools

Real-Time Reporting	Feature Not Available	 Respo
Trending	 8.5 Responses: 3218	 Respo
Retroactive Reporting	 8.3 Responses: 2936	 Respo
Segmentation	 8.4 Responses: 3175	 Respo
Mobile Reporting	 8.6 Responses: 3114	 Respo
Unification Across Devices	 8.3 Responses: 2798	 Respo
Custom Reports and Dashboards	 8.5 Responses: 3332	 Respo

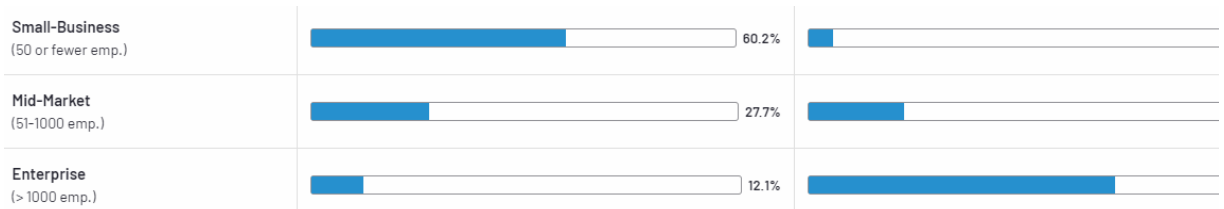
h) Reporting for Digital Analytics Software

User Data	 8.5 Responses: 3366	 Respo
Site Search Reporting	 8.5 Responses: 3185	 Respo
Load Time Monitoring	 8.4 Responses: 2974	 Respo
Campaign Tracking	 8.7 Responses: 3106	 Respo
E-Commerce	 8.5 Responses: 2389	 Respo
Promotional Messages	 8.1 Responses: 2124	 Respo
Administration Alerts	 8.3 Responses: 2497	 Respo

i) Other for Digital Analytics Software

API / Integrations	 8.5 Responses: 2315	 Respo
QA Testing	 8.2 Responses: 2028	 Respo
Performance and Reliability	 8.9 Responses: 3145	 Respo
User, Role, and Access Management	 8.9 Responses: 3255	 Respo

j) Administration for Digital Analytics Software











k) Reviewers' Company Size

Marketing and Advertising	21.2%	Financial Services
Information Technology and Services	7.7%	Retail
Computer Software	6.6%	Insurance
Internet	4.7%	Telecommunications
Retail	2.8%	Banking
Other	57.1%	Other





l) Reviewers' Industry

Shared Categories	Google Analytics and Glassbox are categorized as Mobile App Analytics and Digital Analytics	
Unique Categories	Google Analytics is categorized as Content Analytics	Glassbox is categorized as Customer Journey Mapping, Digital Experience Monitoring (DEM), E-Commerce Analytics, Product Analytics, Digital Experience Platforms (DXP), Session Replay, Customer Journey Analytics, Heatmap Tools Show More

m) Categories

 Chartbeat ★★★★★	 Contentsquare ★★★★★
 Amplitude ★★★★★	 Hotjar ★★★★★
 Semrush ★★★★★	 Heap ★★★★★
 Pendo ★★★★★	 Smartlook ★★★★★

n) Top Alternatives

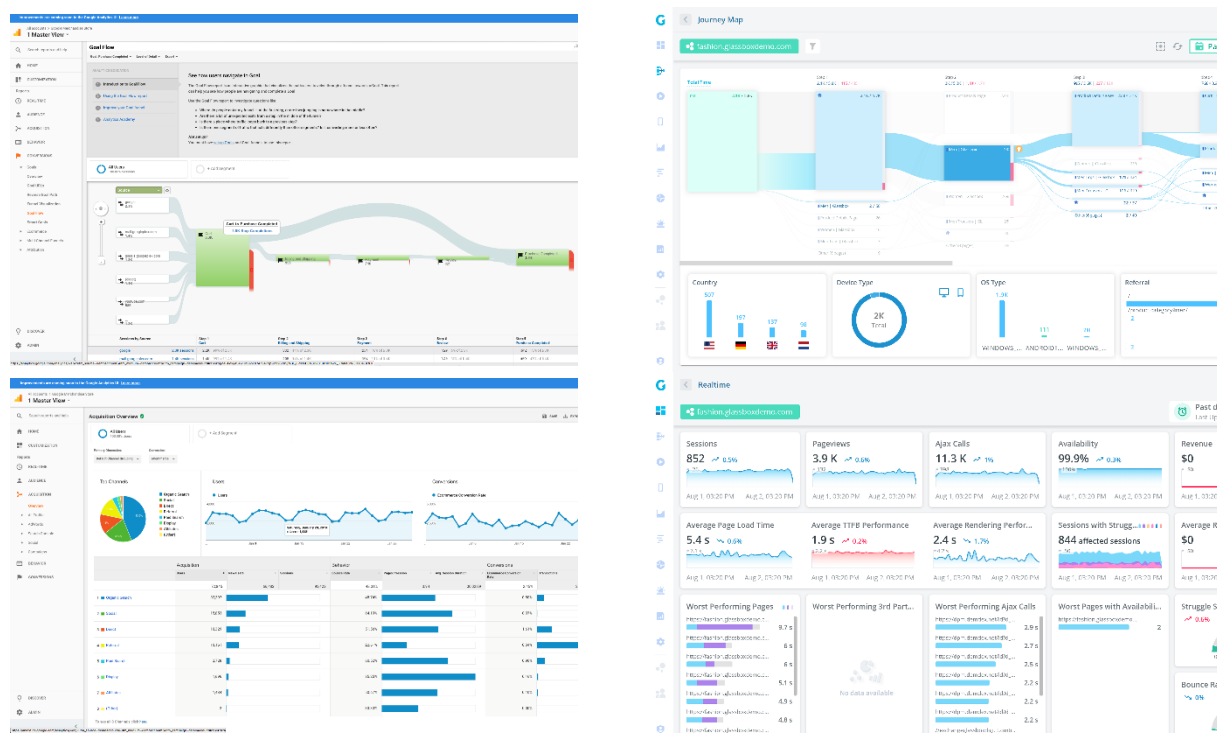
Most Helpful Favorable Review	<p> Kristin H. Verified User in Higher Education</p> <p>Google Analytics is the gold standard for free web analytics. As clean as it is comprehensive, this tool allows you to track, organize, and report information relatively easily.</p>	<p> Thomas O. Verified User in Financial Services</p> <p>Well first of all its really easy to use and to get setup. literally and running in a few hours. In terms of looking up sessions - find all sessions I need very quickly based on any kind of attribute of data which was part of the...</p>
Most Helpful Critical Review	<p> Verified User in Publishing</p> <p>Many of the metrics have hidden definitions that cause major confusion for many users. Sessions at the hit level are not in fact total sessions, just entry sessions for that hit. The sampling also gets to the point where the data is unusable, even on the...</p>	<p> Verified User in Apparel & Fashion</p> <p>The replay is very clunky, the videos often skip and don't really show you a great deal of detail which can be very frustrating. The support team at sessioncam were not very helpful during my experience. I decided to use sessioncam for customer...</p>

o) Reviews

Source: Best E-Commerce Analytics Software, 2023

Figure 5

Comparison of Google Analytics and Glassbox front-end solutions



a) interface *Google Analytics*

b) interface *Glassbox*

Source: Best E-Commerce Analytics Software, 2023

Thus, it can be summarised that the cross-rating assessment of 15 expert organisations as a Data Analytics tool for E-commerce Platforms sees Google Analytics, while the arbitration rating of the expert service G2.com identifies Glassbox as the optimal analytical application to be used in the field of professional e-commerce. Based on the results of the study, we believe that most users should use Google Analytics as a universal analytical platform with a wide range of functions to build a personalised e-commerce marketing strategy, but large enterprises should consider using Glassbox as a balanced sectoral analytical system adapted to intensive e-business.

Discussion

Based on the results of the study, the following theses are presented for discussion:

- E-commerce Platforms are the present and future of global business;
- Data Analytics tools and systems allow effectively developing, implementing and maintaining personalised marketing strategies used in e-commerce;
- Data Analytics applications used in e-commerce have a number of practical advantages, without which it is almost impossible to organise a successful e-business;
- the market of software solutions for Data Analytics for E-commerce Platforms is oversaturated with offers, which creates threats for potential users in case of making the wrong choice and investing in ineffective software;
- based on the results of cross-expert and arbitration ratings, the optimal Data Analytics tools have been identified, graded by the scale of business activity: the universal (and more suitable for small businesses) is the Google Analytics application, and the Glassbox application is appropriate for large e-businesses.

The first thesis is confirmed by Huang, Asemi & Mustafa (2023) (on the study of the sentiments of e-commerce resource users and the forecast of the industry development), Ballerini et al. (2023) (on

the global progress and business adoption of E-commerce Platforms), Nurchayati et al. (2023) (on the increase in global demand for digital commerce services among both ordinary consumers and business users), Chong et al. (2023) (on the inevitable factors of deep penetration and tight integration of digital commerce into the social sphere and streaming information space), Ferraz et al. (2023) (on increasing the integration of the e-commerce system into the social space of consumers through the development of the after-sales service subsystem). These publications confirm the established fact of the systemic global development of E-commerce Platforms and their increasing influence on the world economic space.

The thesis about the impact of Data Analytics tools for E-commerce Platforms on the effectiveness of personalised marketing strategies is confirmed in the relevant publications by Zhu (2023) (on the benefits of using “precision” marketing with the help of neural networks, AI and other solutions of the fourth wave of industrial development), Verma et al. (2023) (on the significant improvement of the e-business logistics industry with the help of data analytics tools), Singhal, Ahuja & Monga (2023) (on improving the efficiency of production processes in the formation of data-oriented products in the e-business industry), Taherdoost & Madanchian (2023) (on improving the efficiency of marketing strategies and e-business in general through the use of security subsystems of Data Analytics tools), Alsubari et al. (2022) (on the problem of fake reviews as a systemic obstacle to e-business development, which is solved by Data Analytics). Thus, these authors authorise the potential of Data Analytics applications and software solutions for the development and solution of key problems in the e-commerce industry.

The third thesis of the practicality of Data Analytics applications for E-commerce Platforms is confirmed by the scientific research of Rajput & Singh (2023) (on the collection and analysis of customer data used for e-business development), Vullam et al. (2023) (on the implementation of personalised recommendations that help to expand and retain the customer base in the e-commerce industry), Griva et al. (2023) (on the possibility of segmentation and grouping of customer bases by various characteristics, which helps in the development of multi-vector marketing strategies), Panicker, Vijay Kumar & Yadav (2023) (on the analysis and optimisation of financial support and conversion of e-business), Ma (2022) (on the formation of targeted and promotional offers based on personal preferences of customers, which contributes to the sustainable growth of the consumer base), Tang et al. (2023) (on the main task of the Data Analytics system - forecasting and strategic planning of e-business development vectors). Accordingly, these publications confirm the practical usefulness of using the Data Analytics system for the development of e-commerce and e-business.

The thesis about the oversaturation of the E-Commerce Analytics market is currently unexplored and creates a dilemma of successful choice for potential users. If the wrong software solution is chosen, and it is subsequently integrated into their own e-business structures and e-commerce platforms with the corresponding direction of financial and investment flows, a potential consumer is likely to lose these investments. Therefore, the study of Data Analytics solutions and systems for E-commerce Platforms is an extremely relevant task with practical implications.

The applied methodology of cross-expert rating and arbitrage rating with a wide range of G2.com metrics, using the example of identifying industry leaders, demonstrates a practical opportunity for potential users and representatives of large e-businesses to determine the optimal range of market analytics tools that allows them to form a successful personalised marketing strategy and promote their goods and services in the global economic space.

Further iterations in the chosen research vector are aimed at expanding and deepening the obtained results:

- the development of a universal algorithm for the selection and application of E-Commerce Analytics software solutions;

- the expanding the sample of Data Analytics applications for E-commerce Platforms, their classification, clustering, and system analysis;
- empirical studies on the integration of individual Data Analytics applications for real organisations operating with the help of E-commerce Platforms services with the corresponding assessment of the effectiveness of such actions;
- the development of detailed recommendations on the use of the Data Analytics system for the development and improvement of e-business efficiency in the field of e-commerce;
- research and development of detailed recommendations for developers to expand and optimise the functionality of Data Analytics software solutions for E-commerce Platforms.

To summarise the discussion, it can be noted that a number of the above scientific works confirm the results of the current study in terms of the potential of data analytics tools for the development of marketing campaigns in the field of e-commerce, but the focus of this work is on the practical implementation of the studied issues, namely, on the selection of optimal software solutions that will contribute to the sustainable and effective development of the business community.

Conclusions and Implications

This study found that e-commerce is an important component of global business today and in the future. The use of Data Analytics systems in this industry permits the development and implementation of effective personalised marketing strategies. Data Analytics tools are of practical value for successful e-commerce operations, but the market for software solutions in this area is saturated, which can create risks for businesses. The research results confirm that the choice of Data Analytics tools should be justified and suitable for the specific scale of the enterprise.

Using a methodology based on expert (cross- and arbitrage) ratings and user feedback, it was determined that Glassbox is the best choice for larger enterprises, particularly, for large e-businesses. Google Analytics, on the other hand, proved to be popular among smaller businesses and was recognised as a more versatile Data Analytics tool.

The study also demonstrated the importance of choosing the right tool for data analytics in e-commerce, as the wrong choice can lead to negative financial consequences and loss of investment.

Future research in this area includes developing universal algorithms for selecting Data Analytics software solutions, expanding the selection of applications for analysis, and deepening understanding of the specific needs of e-commerce platforms.

Suggestion for Future Research

Future researches in the realm of e-commerce and Data Analytics should encompass various crucial aspects. Firstly, there is a need for the development of universal algorithms for the selection and implementation of Data Analytics software solutions, considering factors like enterprise size, industry, and specific objectives. Expanding the repertoire of applications available for analysis is essential to cater to evolving e-commerce needs, especially those incorporating emerging technologies like AI and machine learning. A deeper understanding of the unique requirements and challenges within e-commerce platforms should guide the development of more tailored Data Analytics solutions. Continuous monitoring of market dynamics and how trends impact the effectiveness of these tools is necessary. Additionally, future researches should delve into the risks associated with erroneous tool selection, understanding the potential financial consequences and loss of investments. Finally, adopting user-centred approaches by incorporating user feedback and preferences into tool development and evaluation will be instrumental in ensuring successful adoption and utilization within the e-commerce landscape. In summary, future research should aim to provide comprehensive guidance for e-commerce businesses in selecting and applying Data Analytics solutions. This includes developing algorithms,

diversifying software options, deepening industry insights, monitoring market dynamics, assessing risks, and adopting user-centered approaches to meet the evolving demands of the e-commerce landscape.

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Conflict of Interest

None.

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