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Inclusion of Data Science For The Administration of Data Lakes, Data Analytics And Visualization For Big Data Applications And Services

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Abstract: The research set out to assess how analytics applied to large amounts of data may help revolutionize the global economy. Consultants versed in marketing transformation and the use of big data served as the sample for this research. A total of 396 consultants were invited to take part in the research by receiving the online survey questionnaire; however, only 118 actually got around to starting the survey. The fact that barely half of businesses generate business events and just a quarter of businesses assess critical performance metrics like profitability demonstrates the necessity for such information. It raises the question of whether or not this category is in high demand. The genuine effect is more significant than whether the change is radical or revolutionary, at least from a pragmatic point of view. In addition, recent research indicates that enterprises can provide exact customer support using the new interface, which is consistent with the expected growth in post-purchase boost. Given the prevalence of these shifts, the results are not surprising. Because of the proliferation of mobile and social apps, consumers now have more options than ever before for gathering the information they need to make educated purchasing decisions. This research reveals that both institutions and consumers have higher expectations for the use of automation and self-service communication. The findings confirmed the importance of such feedback in providing a foundation for companies to validate their concerns.

Keywords: *Advertisement Marketing, Big Data Analytics, Digital Transformation*

1. Introduction

Businesses, governments, and companies in today's digital world need to amass massive amounts of data for use in making decisions. Large amounts of data are collected, but they are useless unless we can recognize patterns and make conclusions from them [1]. In today's digital environment, all businesses have access to data that should be utilized to guide decision-making and ensure they are in step with digital transformation trends internationally. All aspects of current global economic decision-making rely heavily on the economics of data, digital transformation, and analytics [2]. Whether it be healthcare, manufacturing, retail, or public administration, today's market success requires data-driven choices from every company. Organizations in the fields of production technology and information are increasingly looking to use AI or find AI-based businesses to work with. Artificial intelligence may help individuals operate more efficiently or spend less time at the office by eliminating the need for laborious tasks. Therefore, AI will help the marketing business by enhancing digital marketing and the analysis of markets [3].

According to the narrative, market actors may generate enormous value with the use of big data. Is it true that more data always means better communication? [4] claimed that limited information "is so important to people, it is these tiny little spoons that we take out whenever we search, chat, listen, buy or do anything else online". Similarly, [5] suggests using very limited data, such as anecdotal reports from bars, gyms, cars, houses, and eating establishments. When these apparently unrelated pieces of information are put together, they often reveal crucial causal links that Big Data has been missing. In Medallion, it's a significant question mark to tailor the marketing process utilizing the aforementioned technologies to analyze large or tiny data: customer privacy. It is important to recognize the potential privacy risks associated with this data collection. On May 25, 2018, the EU General Data Protection Regulation (GDPR) will become fully effective, even for non-EU businesses. GDPR compliance is mandatory for any firm handling customer, resident, or business data from the European Union. CEO of Google parent company Alphabet, Eric Schmidt, elaborates [6]: Big data is becoming a practical reality. This information is being gathered by the machines we use on a regular basis. This leads to a particular question, who is utilizing this data and why?" Some individuals avoid providing personal information for fear of data gathering and misuse pay for supposedly free services.

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Recent studies have shown that marketing departments have a critical reasoning habit about the evolving BDA analytical environment. Without a clear grasp of the benefits of technology, an organization's commitment to new technologies sometimes has unintended effects [7]. Numerous marketing firms, as shown by these studies, struggle to keep up with the rapid pace of change and have a superficial understanding of the time, effort, and expertise required to transition to a data-driven culture. In light of these findings, it is undeniable that advertising marketing has been a testing ground for BD strategies right from the start [8]. For instance, Starbucks utilizes big data to analyze consumer information and patterns of behavior to choose the best spot for a new shop and predict its performance. BD aids Starbucks in estimating its chances of achieving its goal of increasing sales revenue. Loads of data, especially from mobile apps and social media, have been shown to have a significant impact on the growth of brands [9].

The advent of the BDA, like past revolutions in new media, will need much thought and time following first observation before any definitive conclusions can be drawn [10]. Although top-level managers recognize BDA's value in maintaining competitiveness, many are still unsure about which technologies and pieces of machinery to put their money on in the early going. The complex and rapidly changing nature of the phenomenon makes sensible theories promising [11], although other theoretical approaches, such as the absorption capacity of technological adaptations and organizational practices, are also considered to have potential implications for explaining BDA implementation. Through their acts and words, individuals in the past construct meanings to make sense of hazy circumstances. The goal of this research is to shed light on how far down the road to adopting big data analytics skills the marketing department really is.

The research set out to assess how big data analytics may be used to further the global economic revolution:

- To get familiar with big data analytics.
- Assess the potential of big data analytics for use in advertising and digital transition.
- Thirdly, we need to figure out how big data analytics can help the advertising and marketing industry expand and flourish.

2. Research Question

The study's goals and objectives were based on the research question. The study topics were geared on illuminating the ways in which big data analytics may effect change in the global economy. The study's overarching goal is to provide insight into how big data analytics might support the international economic reform process?

3. Literature Overview

Understanding Big Data Analytics

A company's big data is the massive amounts of information it collects every day [1]. Researchers assume that big data has features like diversity, sheer bulk, and complexity that make it difficult to handle using conventional approaches to data analysis. Because of its size and complexity, typical techniques of data analysis are inadequate for the analysis of big data. Therefore, new methods are needed to evaluate the data and derive meaning information for directing choices in the advertising industry in the face of big data [2]. Organizations may improve their decision-making with the help of big data analytics by making sense of the data they extract. Growth in an organization's performance may be achieved via the analysis of big data since it reveals patterns and trends that inform production, marketing, design, and customer perception strategies [2]. Big data analytics refers to the process of transforming massive amounts of data into actionable information that can be used to inform strategic choices inside a company undergoing digital transformation.

Big Data Analytics as a Factor of Production

Researchers have made great strides in big data analytics recently. Real-world data storage evaluations reveal massive amounts of data with potential to improve health outcomes. According to the [12], businesses generate massive amounts of data on a regular basis, but this information is useless unless proper methods are in place to analyze and make sense of the resulting patterns. Organizational production methods and economic growth both benefit greatly from the use of big data. No business can flourish without effectively using data to guide decision-making, just as the economy cannot expand without physical or human resources. According to research published by [13], it is believed that there are now over 200 terabytes of data kept in the USA.

was manufactured by companies with over 1,000 workers in 2009. According to the same study, the average amount of data held by businesses is 1 petabyte.

In order to make sense of this ever-increasing data, it has been reported that effective data visualization tools have been developed [14]. Since studying this huge data amount is unstable and complex, businesses are turning to data scientists for help. The vast majority of a company's everyday choices are made automatically via habit or experience. In order to improve a company's performance, big data is changing the decision-making process by providing a competitive advantage [15]. The company's

workforce and the distribution of authority are both expanding as a result of these changes.

Over 70% of businesses in the European Union market have sizable data storage and processing capability. The ability to analyze and interpret big data is far higher in Europe than in other parts of the globe, according to the results of a [12] research. Data-based solutions are expected to contribute to economic growth in nations, firms, and enterprises that have a high capacity to analyze and manipulate large data, as shown by the results. In other places such as Asia, the research revealed that there are over 800 million gadgets in China alone that are beneficial in collecting of personal location data [16]. Decisions involving the management and processing of data on consumer behavior and prospects for use in production processes continue to be influenced by the capabilities to do so, which in turn drives substantial advancements in innovation and technical platforms.

Big Data as a Key Basis for Competition and Growth of Individual Firms

Companies all around the globe may boost their development and competitiveness with the help of big data analytics. Retailers are adopting big data ideas to enhance operational profits by an extra 60% of existing manufacturing capacity, according to a research by [16]. Tesco is employing big data analytics to increase its market share and stay ahead of the competition (Liu et al., 2020), as just one example. Other fields that are touched by big data analytics include insurance and financial services to promote global commerce and economic growth. In order to get better results, forward-thinking companies are actively using big data capabilities [17]. Competitors may be conquered by developing skills to improve on product performance, marketing and interaction with customers, which involve a best practice in handling of big data.

Large databases are not stored in BD, as stated in [18]. The capacity to acquire, evaluate, and act on real-time information is emphasized instead to provide actionable insight and tangible business advantages. In order to better understand consumer needs, evaluate massive volumes of data, and act swiftly with unique insights, businesses are increasingly turning to business intelligence (BD) tools [19]. It helps businesses combine and acquire data resources from complicated dispersed systems that have varying topologies and varied formats. Marketing and service choices may benefit from refined and filtered data thanks to sophisticated, extremely complicated, and cost-effective consumer analysis [20]. BD environments let marketing teams share information and work together more efficiently.

Further, BD helps executives get a deeper understanding of data-driven marketing, empowering them to further advance the marketing process while shielding their brands from ever-changing threats. Companies like Amazon, American Express, BDO, Capital One, GE, MiniClip, Netflix, Next Big Sound, Starbucks, and T-Mobile are just a few of the many that have used BD [21].

More precise analysis and real-time marketing strategy choices are possible thanks to BD since it considers not only the data itself, but also its time and place. To help businesses get useful consumer insights to back up management and market-making choices, certain IT organizations, for instance, keep offering big data analytics (BDA) and smart technology services. BD can help businesses understand environmental assessment, reduce uncertainty, and make better choices.

Organizing Real-Time Decision Making

According to [22], businesses that have BD insight are better able to adapt to changing market conditions and deal with the unexpected. The ability to draw conclusions from data is helpful for revealing many misleading tendencies. It may be difficult to keep track of vast volumes of both structured and unstructured data, but BD text analysis techniques make it possible to spot patterns and other crucial information and knowledge. [15] asserts that the BDA can help businesses, gather real-time feedback from customers, track trends in consumer behavior, and share this data with design teams. Businesses may use the insights gained via BD to develop and fine-tune their marketing approaches. Similarly, businesses may get insight on the primary features of rival products, pricing strategies, and customer opinions.

BD's producing capability helps organizations to optimize price choices based on client spending behavior, develop new value and grasp prospective hazards and how to avoid them. Web analytics, customer analytics, search engine crawling, and search analytics are all examples of BD technologies that help marketers acquire automated knowledge sets about the behavioral characteristics of their customers, paving the way for real-time implementation. Most BDA tools include both descriptive and predictive data, helping businesses to rapidly identify trends that might guide future decisions.

The primary goal of these techniques is to filter out irrelevant or useless information before drawing helpful choices. That is, BD may cover latent knowledge, build fresh understanding, and construct more flexibility as opposed to organizations with low awareness and information needs. To back up this shift, [23] shown that BD technology may help hotels better comprehend guests' inclinations toward contentment, loyalty, and auditing. Therefore, BD helps businesses learn more about their

surroundings, identify potential possibilities and threats in the market, and develop exceptional management abilities.

Uses of Big Data in Marketing

Businesses may now mine in-the-moment data on consumer opinions, product ratings, and suggestions. Similarly, BD helps businesses to handle this data effectively in customer-business relationships, allowing for robust and real-time personalized service. Data on customers' actions may be monitored with the use of the specialized understanding developed via BD programs. Combining this information with conventional market studies yields a more accurate picture of the market's micro-segment, allowing for more refined price and advertising segmentation. In addition, businesses who use BD to get real-time customer insights have a deeper comprehension of unmet customer needs. Businesses may use this knowledge to improve the efficiency of digital advertising and expand the agency's formidable resources.

BD allows stores to take advantage of marketing strategies and increase their return on investment in the market. When business dynamics (BD) are included into personal marketing, customers have more say in the process and report higher levels of satisfaction and proactivity. More customer value can be created, agility can be increased, and flexible product design and manufacturing processes may be encouraged using a BD-driven interactive approach. In order to provide such a satisfying experience for its users, the most popular streaming video on demand services rely on BD. BD is used to generate tailored profiles for each customer, they capture their consumer viewing habits data throughout their watching time. Netflix plans to utilize this information to generate a customized panel and customized movie trailers using AI.

To help businesses better understand their target markets and deliver innovative new goods, BD streamlines the flow of client feedback. A company's capacity to obtain a holistic perspective of the client will guarantee that the final product perfectly matches the customer's criteria. When it comes to spending extensively in bespoke processes for the purpose of producing unique goods and marketing materials and enhancing financial performance, BD has been at the forefront of the industry.

Big Data Application in Consumer Surplus and Productivity Growth

Big data analytics is playing a crucial role in developing stronger productivity growth and consumer surplus in industrial processes. Big data's rising popularity is opening up new avenues for efficiency gains, particularly in the areas of customer value addition and product satisfaction. The total cost of manufacturing, however, is falling dramatically due to these methods. For instance, [24] found that businesses are making better use of big data analytics to boost customer happiness and product quality.

Big data analytics has emerged as a key performance enabler in the pharmaceutical and biotechnology industries in recent years, helping to quicken the pace at which new medications may be developed, assess the effectiveness of potential mediations, and deepen our knowledge of drug interactions and metabolic pathways [24]. The present business climate encourages more output, and improvements in production efficiency are generally seen as contributing to a company's bottom line and the economy as a whole. Big data analytics is also being used to enhance public service delivery and health outcomes. All these advantages contribute to global economic expansion and development.

4. Research Gap

The research set out to discover what ways big data analytics may aid in the process of global economic change. Advertising, government, healthcare, retail, and shopper location data were all examined as examples of industries significantly influenced by big data analytics. Big data initiatives have been proven to have a significant impact on several domains, especially with regards to boosting performance and expansion. Companies and governments alike may make better decisions with the help of big data analytics. Big data has the ability to greatly increase value creation across all market segments in order to enhance productivity, efficiency, and profit margins by better coordinating and allocating available people and material resources.

5. Methodology

An automated online poll and email communication were used to compile the data. The importance of responding to the survey was highlighted in the email. The first reply came right after the survey was sent out, and the second came four days later following a reminder. Marketing consultants are the focus of this analysis. It has been shown that marketing consultants are chosen because they are the most knowledgeable resource for incorporating big data and, therefore, determining the influence it has on a business. Consultants with experience in big data and digital transformation in the field of marketing make up the bulk of this study's sample. Due to time and transparency constraints, just one marketing consultant was used in this scenario.

Therefore, it is difficult to determine whether the findings of this sample are representative of the whole population. All participants should have the skills necessary to assess and track the results of the company's big data marketing initiatives. A question was included in which respondents may rate their level of familiarity with big data marketing.

All senior management consultants were identified as potential interviews using an internal personnel database.

In all, 396 consultants were invited to take part in the online survey, but only 118 actually got around to starting it! After the first request, 56 people filled out the survey, and another 35 did so after being reminded again four days later. One of the 118 registrants was eliminated for not knowing enough about big data marketing, while another 10 were eliminated after supplying just contact information. Three of the remaining 97 respondents were ruled unable to participate, and one respondent's case was dismissed after they consistently responded with "4" to all questions. Of the remaining 93, 73 completed the survey in its entirety, while 20 just partially did so. Those who only completed certain questions on the survey were not eliminated from the final pool of respondents.

6. Instrument

Three to sixteen distinct change indicators are used by the company. Marketing initiatives are the source of these shift indicators. Five people were used as a test group to ensure that the survey's measurements and questions made sense and were easy to understand. Since no serious problems were found, the research continued as planned.

Participants were asked to rate the likelihood that each of many negative and positive outcomes associated with big data marketing would occur on a 7-point Likert scale. It is feasible to analyze data at an intermediate level since only extreme values are provided, which increases the possibility that the response possibilities are uniformly distributed. Because it strikes the optimal balance between respondent burden and data quality while yet allowing for neutral responses, a 7-point scale was chosen for this survey. Respondents were given a description of big data marketing to help them put the survey results in perspective. This is a conceptualization utilized internally by the selected organization.

The dissertation definition was not utilized on purpose because internal resources were supplied instead, since respondents were more likely to connect to the internal definition and would likely still base their replies on the internal definition of big data marketing even if a different definition were given. The article's definition of "big data marketing" differs in two key ways from the internal definition. Participants may think about doing the survey using other digital technologies if internal resources do not indicate which digital technologies drive big data marketing. Although this might undermine the reliability of the results, the possibility of it occurring is low since the employment of the same technology is implied by the study's very description. The dissimilarity in metamorphosis poses a greater danger. Nothing about the change is connected to the internal definition. The participants' philosophical approaches to transformation were incompatible with [25]'s categorization theory of transformation. Thus, changes to digital technology might be considered transformational, despite the fact that they are not. This might skew the findings since less impactful interventions were included. Since this is the case, it's possible the survey's findings don't matter, or just somewhat. A company's value proposition highlights the many advantages they provide to a certain market. Participants were asked how they thought big data marketing may alter the current condition of products and services offered by a firm. On a 7-point Likert scale, how much you like this change is indicated.

Each customer group represents a distinct subset of the company's total clientele. Customers are classified based on their needs, preferences, and personalities. Participants were questioned for expressing how modifications of big data marketing will lead to discovering and reacting to changes in client wants, traits and behaviors, and overall market segmentation.

A company's channels are the means by which it communicates with and inspires its consumers to develop a unique selling offer. Participants were invited to discuss the implications of big data marketing on five different types of channel metrics. This change is assessed on a 7-point Likert scale.

Important assets are those that are required in all areas of a business. Participants were asked to explain how resource consumption may change due of big data marketing. On a 7-point Likert scale, how much you like this change is indicated.

Companies rely on a network of suppliers and partners known as "key partners" to run smoothly. Participants were asked to comment on whether or not they anticipate a shift in the size of their organization's primary partner network as a result of their exposure to big data. The inflow and outflow of cash from sales is known as a company's revenue flow. Big data marketing was put to the test by asking respondents to rate the frequency with which various revenue streams appear.

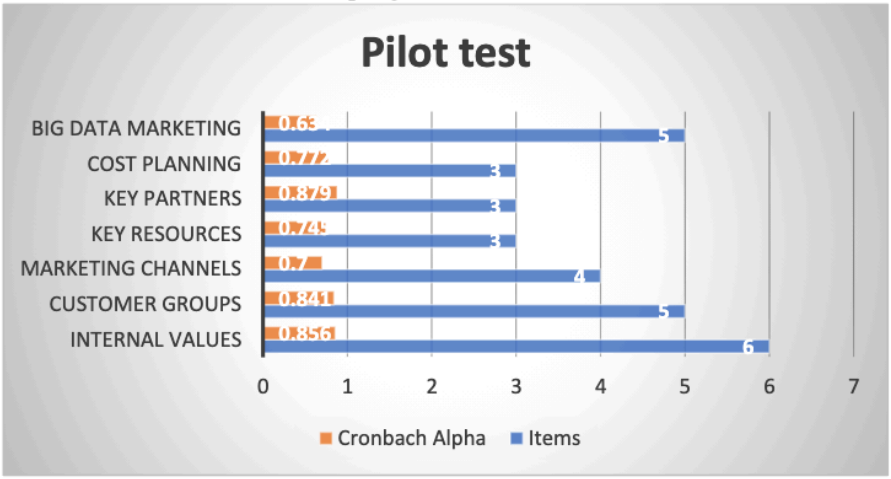
Business start-up expenses are reflected in the budgeting process. Participants were asked to detail how big data marketing would affect the fixed, variable, and bundled prices they're used to.

7. Sampling Technique

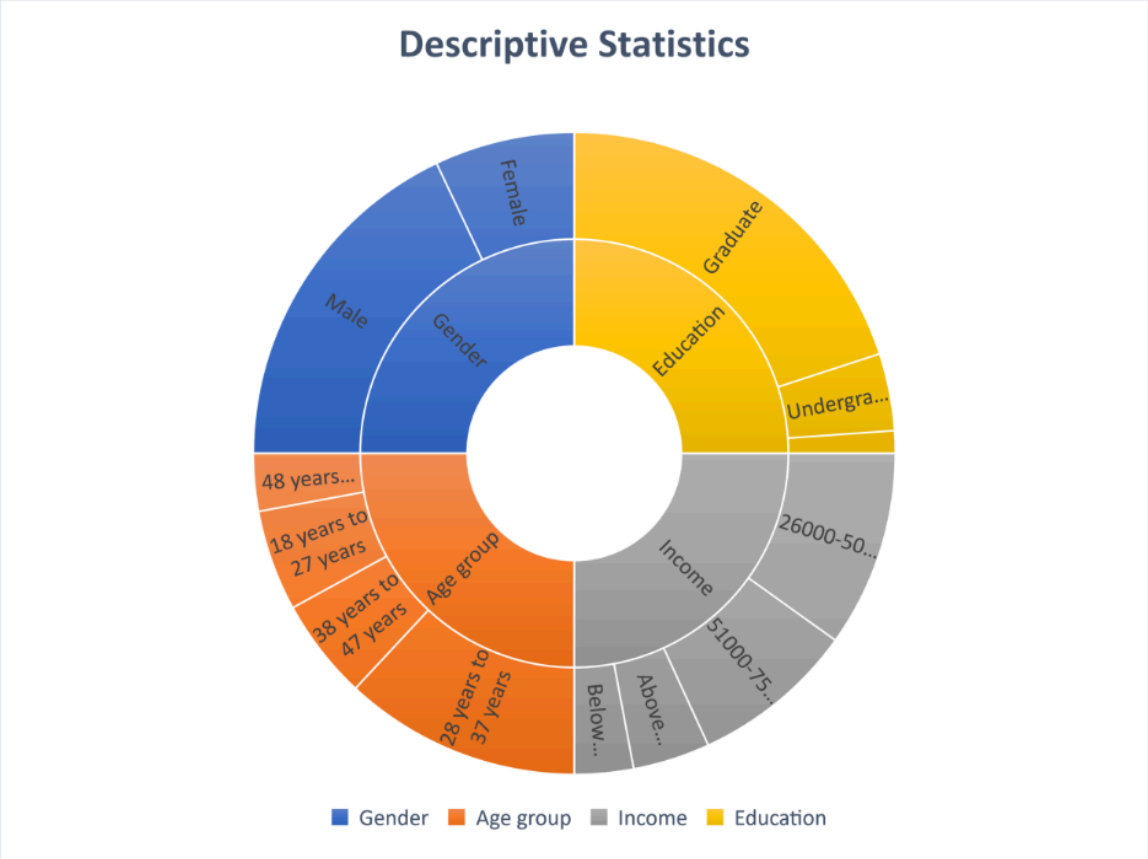
Sampling is the process of selecting a representative subset of a population from which generalizations may be made about that community's characteristics and behavior. Sampling methods may be broken down into two main groups: probability sampling and non-probability sampling. [26] One of the most frequent non-

probability sampling methods used in the social sciences is convenience sampling. It's the process of selecting a subset of a group to research based on how well they've learned about the topic at hand and how easy it is to gather data from them. The use of a convenience sampling method is demonstrated in detail via Tables (1) Pilot Test and (2) Descriptive Statistics.

8. Analysis and Result

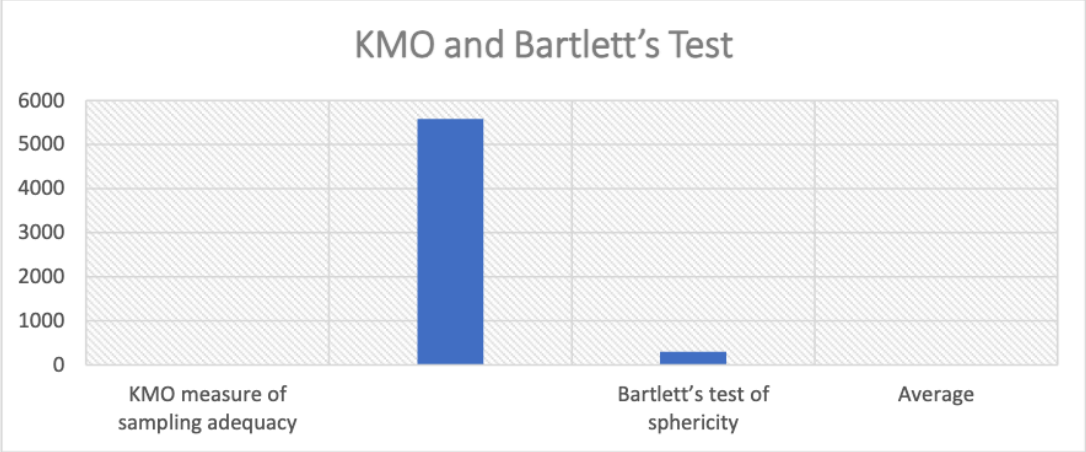


9. Descriptive Statistics

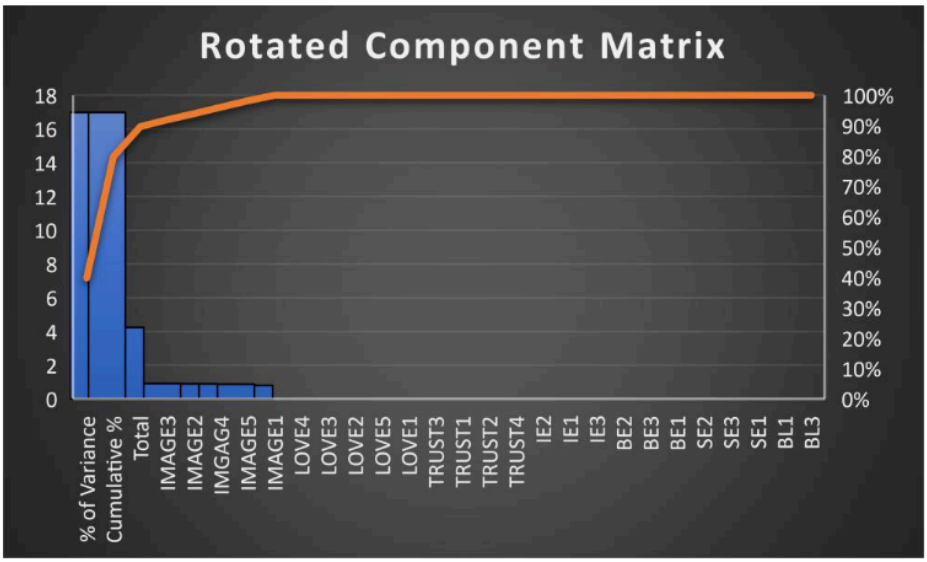


10. Exploratory Factor Analysis (Cfa)

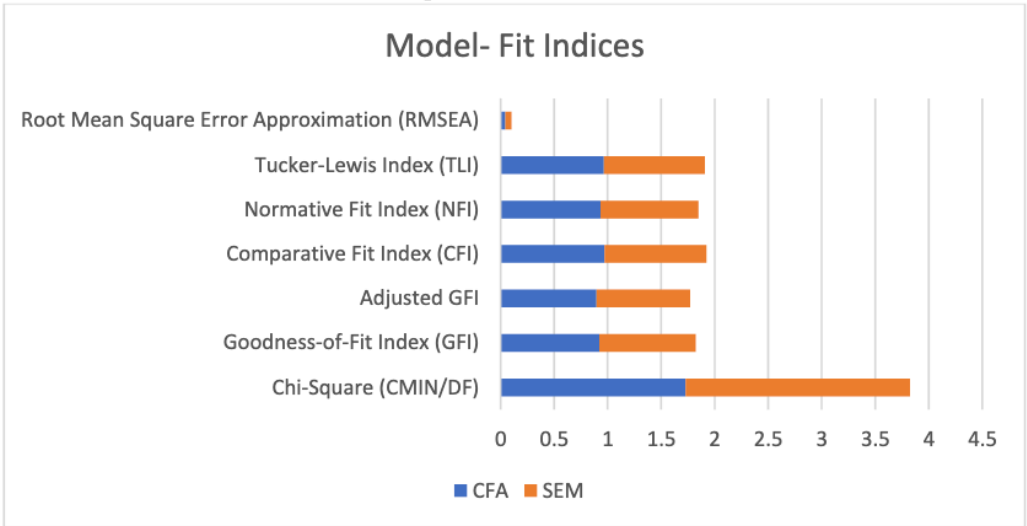
The two tables below provide exploratory factor analysis findings. Table 3 displays the results of the KMO and Bartlett tests.



Bartlett's test of sphericity requires a 1% confidence interval of statistical significance, whereas the KMO measure has to be more than 80%. Here, we may use factor analysis to check if both sets of criteria have been met. You can see the Rotated Component Matrix in Table 4.



It has also been shown that the overall variance and the factor analysis must be more than 60%. According to these results, both estimations are within the accepted range of 50 to 60 percent. Model-Fit Indices are shown in Table 5.



The fit indices in the aforementioned table ought should equal 85% for AGFI. It seems that under both the CFA and SEM frameworks, all of the fit indices have been met. For this reason, the frameworks' fitness-based validity is accepted. Factor loadings at the 5% level are shown in Table 6 for all items and factors.

Construct	Estimate	P Value
Internal Values	0.966	0
	0.95	0
	0.91	0
	0.943	0
	0.925	0
	0.655	0
Customer Groups	0.899	0
	0.909	0
	0.822	0
	0.594	0
	0.701	0
Marketing Channels	0.799	0
	0.726	0
	0.638	0
Key Resources	0.884	0
	0.792	0
	0.634	0
Key Partners	0.675	0
	0.625	0
	0.865	0
Cost Planning	0.883	0
	0.661	0
Big Data Marketing	0.843	0
	1.002	0

As can be seen, the prerequisites for large level factor loading of build elements have been met. The results have therefore achieved construct validity for the whole set of variables, which includes but is not limited to demographics of consumers. Convergent validity refers to how well each measuring item correlates with each other. This idea is predicated on a method of improving theoretical estimations that are statistically connected to one another. The results of convergent validity tests using AVE, composite reliability, and Cronbach's Alpha are shown in Table 7.

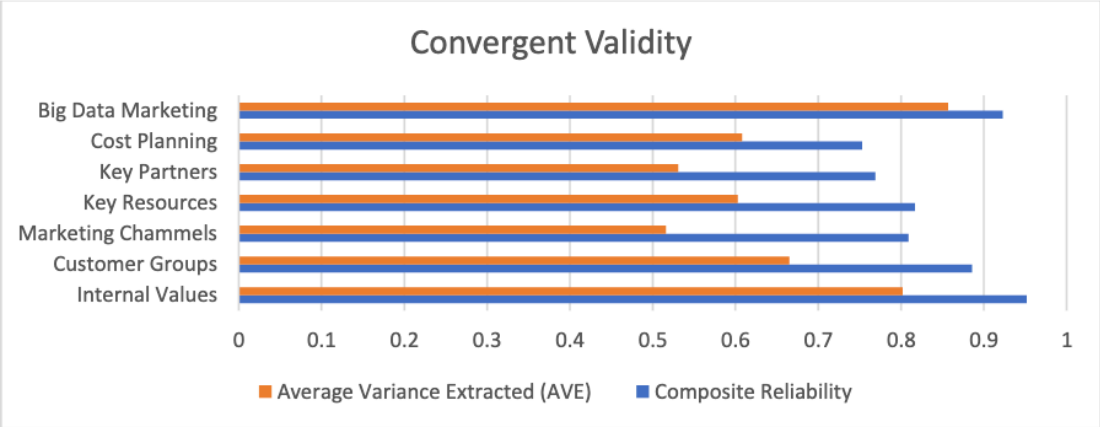
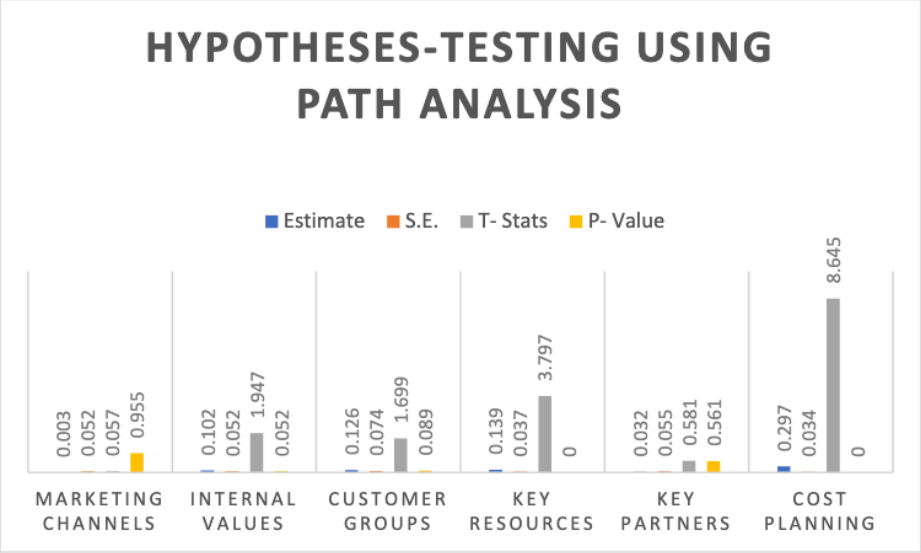


Table (7) displays the convergent validity findings, which suggest that an AVE cut-off value of 0.50 and a composite reliability cut-off value of 0.70 are required for validity [27]. As a result, statistical evidence supports the accuracy of the degree of convergence. Path analysis findings for hypothesis testing are shown in table (8) below.



According to the findings, there is a statistically significant positive link between cost planning and marketing channels (0.102, p 0.10) and internal values (0.126, p 0.10) but no relationship at all with customer groups (0.003, p > 0.10). In addition, the link with the marketing channel is statistically significant and favorable (0.158, p 0.10), as is the association with internal values (0.356, p 0.10), while the relationship with customer groups is not (0.020, p > 0.10). However, there is a positive correlation between important partners and client segments (0.248, p 0.10), the marketing channel (0.246, p 0.10), and the company's core values (0.732, p 0.10). Finally, there is a positive and statistically significant association between customer groups (0.139, p 0.10) and internal values (0.297, p 0.10) but not between marketing channel (0.032, p > 0.10) and big data marketing.

11. Discussion and Conclusions

The study's goal is to learn how big data marketing contributes to a company's digital transformation. Since the effects of big data marketing on all aspects of an organization and across sectors have not yet been studied, further investigation into the topic is required. Previous studies only looked at one variable at a time, one sector of the economy, or one fundamental technology. In addition, companies may use the findings of this research as a jumping-off point to confirm their own business concerns. The fact that barely half of businesses generate business events and just a quarter of businesses assess critical performance metrics like profitability demonstrates the necessity for such information.

New digital technology has the potential and the likelihood of propelling big data marketing in the near future. Therefore, it's important to revise both the definition of "big data marketing" and the digital technologies it encompasses. Like [25], they acknowledged that the validity of their suggested criteria for size and significance may be contested. It raises the question of whether or not this category is in high demand. The genuine effect is more significant than whether the change is radical or revolutionary, at least from a pragmatic point of view.

Companies should expect major changes across the board as a result of big data marketing, with digital transformations predicted to affect just a single sector. The company's value proposition, the types of customers it can identify and serve, its user acquisition and retention strategies, and the efficiency with which it operates will all be significantly impacted.

Furthermore, these studies demonstrate that businesses are required to provide a wider variety of delivery and post-sale support options. Many other research' findings corroborate with these findings. Customers' digital capabilities are improving, and hence they are more likely to make purchases online, as noted by [28]. [29] highlighted that institutions employ diverse digital channels and [30] stated that such channels give institutions with new ways to provide their goods. In addition, recent research indicates that enterprises can provide exact customer support using the new interface, which is consistent with the expected growth in post-purchase boost. Given that we anticipate and prepare for these shifts, the results are not surprising. Because of the proliferation of mobile and social apps, consumers now have more options than ever before for gathering the information they need to make educated purchasing decisions.

There has been an uptick in the variety of ways to pay for products and services as of late, with PayPal and Ideal joining relatively newcomers like Samsung and Apple Pay. A growing number of fintech firms are developing innovative payment systems that will broaden consumers' access to goods and services. This research shows that both institutions and consumers anticipate more usage of automation and self-service communication. These findings jibe with research that highlighted how digitization, involvement, and digital platforms gradually activate automated self-service. Results also reveal that communication in society via co-creation is likely to rise, which is consistent with findings from other studies [31], which highlight digitalization as a role in this rise. Furthermore, the results of this analysis indicate that no shifts in reliance on such services are anticipated.

According to earlier research, the widespread use of digital technologies inside organizations has led to more standardization of administrative procedures. Since the findings are based only on study procedures, it is impossible to explain the variations in findings. From an integration standpoint, the results suggest that further integration into all critical processes is to be anticipated. This research reveals that although physical resources are projected to be used less, intellectual resources are likely to be used more. The agency's present resource use provides an excellent opportunity to observe these results. Using less on-premises IT infrastructure is becoming more common as cloud-based services gain traction.

This research lends credence to our observations of ongoing changes in the ecosystems we've been keeping tabs on. Companies can provide clients with better goods and services thanks to advancements in digital technology. In order to use this technology, many institutions need additional collaboration partners since they lack the necessary resources and experience. In addition, the density of ecosystems across different agencies has to increase, since tight integration is required to provide a constant client experience across all touchpoints.

The findings corroborate the findings of [29], who also did not see a substantial shift in asset sales as a source of income. In addition, respondents to the poll believe that the usage of fees and licenses will expand, since licenses and new kinds for each use are becoming more popular. These findings corroborate the predictions of [29], who predicted that an increase in advertisement usage would accompany the expansion of the Internet. The projected increase in rent is an example of a finding that doesn't mesh with [29].

shift in such funds. The research concludes that subscription fees are also likely to grow in popularity. Given the rising tide of online shoppers and marketing campaigns, this is to be expected.

12. Implications

Collectively, marketing departments must acquire BDA tools, technology, and resource capabilities, and then infer the most effective means of incorporating this data into their ad campaigns. Based on the results of this research, BDA professionals are encouraged to work more closely with their colleagues in other areas of marketing and to encourage the use of advertisements by teaching their peers about analytical concepts and reviewing typical applications. The results cast doubt on the viability of centralized business analysis unless there is a cultural shift toward making decisions based on facts. We suggest that managers investigate the many forms of fresh data and analytical approaches in order to systematically comprehend their relevance to ad marketing. If intelligence collection is simply seen as investigative, its early successes and quick influence on the quality of transparency may be disregarded. We suggest forming a committee whose responsibility it would be to research and apply new tools for better market intelligence. The rational process and greater impact of BDA technicians seem to play a role in our findings, suggesting that the involvement of top executives in making the marketing department more data-driven is driven by this. This is made possible by management, who directs operations but does not force the labeling team to adopt data-driven marketing strategies.

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