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Revenue Optimization Through Digital Marketing and Analytics: A Fuzzy Approach for Consumer Firms with Large Customer Base

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ABSTRACT

The recent digital evolution and explosion, which have led to digital marketing growth and its associated channels, have continued to drive the increase in brands' budgetary allocation for these marketing channels. However, questions are beginning to arise from marketing practitioners and brands on the justification of these budgets and their impact on business revenue and performance. Marketing analytics have raised optimism for brands on how embedded opportunities in digital marketing channels can be harnessed. However, research has revealed that firms lack a clear understanding of analytical techniques that can drive brands' business performance across these channels. This dissertation adds to the body of knowledge in this space by investigating how firms with a large customer base can drive and optimize their business performance through digital marketing and analytics using a cutting-edge approach - Fuzzy method, as the key analytic method.

Following a thorough literature review coupled with Delphi interview of practitioners, this dissertation's primary data is grounded from seven case studies that investigated how analytics can drive revenue and business performance of firms across digital channels. The first case examines a diagnostic customer experience for digital marketing channels; the second case explores Fuzzy Analytics (FA) for digital video advertising campaign effectiveness and measurement; the third case explores the digital channel performance optimization of mobile money transaction through an analytical approach; the fourth investigates the Fuzzy expert pricing systems and optimization techniques within the space of marketing science; the fifth case examines the Fuzzy logic expert system for pricing digital services; the sixth case examines the battle for digital customer ownership between the Telco and the Over-the-top (OTT) players; and, the seventh reviews the application of Fuzzy Analytics (FA) in the digital and consumer marketing space.

The findings confirm that Fuzzy Analytics (FA) avails marketers the opportunity of maximizing the rich customer data across the enterprise in real-time to generate incremental revenue for consumer businesses with a large customer base across digital channels. Also, findings reveal that business performance will look promising if analytics techniques are layered on digital marketing channels. However, it was found that digital marketing channels are not optimized because the analytics that are driving the engagement, marketing activities, and customer presentation are not robust enough. This dissertation supports the claim that a firm, which has developed its analytical capability and leverage the rich customer data across the enterprise will compete favorably and drive the customer base's business performance optimally. And finally, results in profit growth.

Keywords: Digital Marketing, Consumer, Analytics, Fuzzy methods, Performance

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1 INTRODUCTION

Firms marketing budget and expenditure are under severe scrutiny due to cost reduction after the economic crisis of 2008, while doing more with less strategy is growing across many industries (Kumar and Shah, 2009; McDonald, 2010; Stewart, 2009). Following many years of professional experience of managing a large customer base and driving business performance across many mobile telecommunication operations in Emerging markets and Europe, the author had witnessed a consistent year on year decline in the marketing budget of consumer firms over the last decade. Another challenge is the major shift in the marketing channel landscape, due to fragmented marketing channels resulting from digital evolution. Consumption patterns have changed due to the digital impact on consumer behavior (Lingqvist, Plotkin, and Stanley, 2015; Busca and Bertrandias, 2020). At the same time, businesses look up to the firms' marketing practitioners to address revenue challenges by optimizing customer base potential to grow the overall business revenue (O'Sullivan and Abela, 2007; Stewart, 2009).

Consequently, digital media has taken a considerable amount of overall media budget across the industries (Raman, Mantrala, Sridhar and Tang, 2012; Hofacker, Golgeci, Pillai, and Gligor, 2020). However, while budget for digital marketing channels is growing, marketers must be able to justify the spending through the revenue these channels are generating for their brands. Hence, marketers need to be more innovative and eventful to manage their customer base across their selected digital channels (Mulder and Vetvik, 2009; Webster and Ksiazek, 2012). While digital analytics provides firms with robust data that complements other data sources, Lavalle et al. (2011) argue that firms' ability to leverage the data into actionable insights is rather an issue than data availability (Gök, Peker and Hacioglu, 2015; Helzlsouer, Meerzaman, Taplin and Dunn, 2020). Therefore, this disseration explore the use of Fuzzy Analytics (FA) and its associated methods, theory and logic on digital marketing problems towards revenue optimization of firms with a large customer base.

The main questions that were formulated are (i) to what extent can consumer firms with a large customer base drive and optimize revenue through digital marketing and analytics? (ii) why do some consumer firms drive and optimize business revenue from digital and marketing analytics while others do not (iii) how can consumer firms deploy digital marketing and analytics towards driving and optimization of business revenue? The study progresses as follows: section two focuses on the systematic review of the literature; section three focuses on research methods and materials; section four, the results and, section five and six, the conclusions, recommendations, and limitations of the study respectively.

1.1 RESEARCH DESIGN AND MOTIVATION FOR THE RESEARCH METHODOLOGY

The primary research strategy of this dissertation is a case strategy approach. This methodology choice was motivated as a result of its suitability towards the research questions. Case study research has seen a reputational growth as a research methodology, suitable for investigating complex issues within the real-world settings (Stake, 2006; Merriam, 2009; Swanborn, 2010; Yin, 2014; Harrison, Birks, Franklin and Mills 2017). This dissertation adopts a research paradigm that follows critical realism (Bhaskar, 1978; Easton, 2010; Sayer, 1992).

This dissertation also leverages the Delphi methodology for the first result of the qualitative survey study that follows a different research paradigm and logic. The survey study's objective and goal were for a clear overview of how organizations see digital marketing and analytics in driving the business performance within a large consumer base setting. The survey results revealed the use of analytics and digital marketing by consumer firms, which raised questions that required a case study approach that led to this study's primary research approach.

It has been posited by critical realists within the marketing discipline that questions that are important for marketing researchers should be "what are the necessary key relationships that are crucial to the understanding of marketing phenomena?" (Easton, 2002; Boateng and Boateng, 2014). In this dissertation, the marketing phenomenon is digital marketing and analytics. The objects (anything with causal power) in this study are consumer and business performance. In consumer marketing, the nature of the marketing channel can influence both the consumer and the business performance and vice versa. The objective of this dissertation, therefore, is to show how consumer firms can drive and optimize their revenue through digital marketing and analytics. The study obtained answers to how the consumer firms with a large consumer base can optimize business revenue through digital marketing and analytics. The study provoked many questions that were later fine-tuned to the final research questions.

In this dissertation, the research process discussion goes along the direction of abductive logic and aligns the characteristics systematically, see FIGURE 1. This study's goal is to develop theories through continuous alignment and interplay between theory and empirical evidence. Overall, the author puts in mind the preliminary theoretical framework throughout this dissertation's development while approaching each case study, which evolves with the data collection and analysis. Consequently, this dissertation's journey took a research process that is iterative because each study serves as a preliminary study for the others.

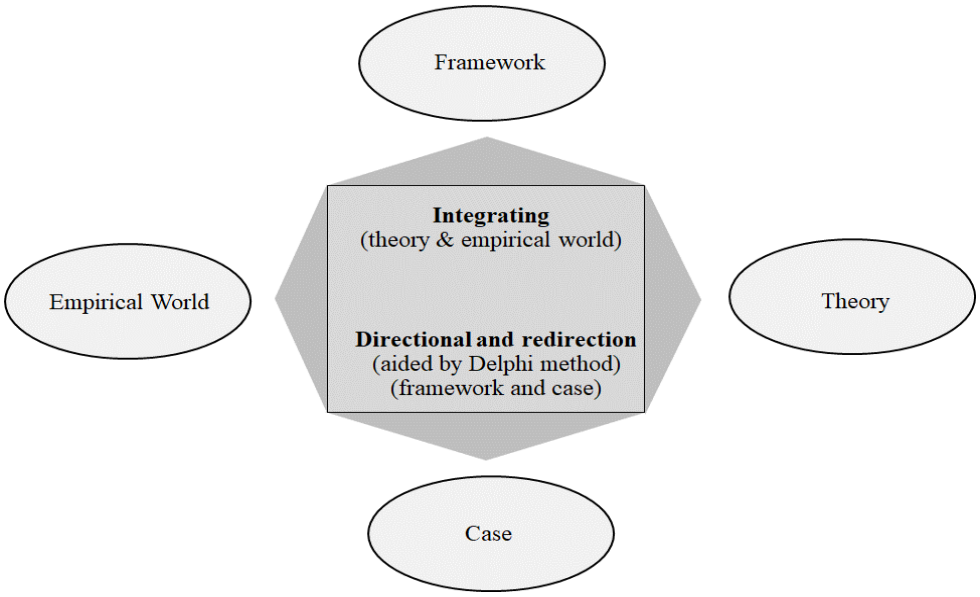

FIGURE 1 Systematic methodology combination (adapted from Dubois & Gadde, 2002)

1.2 RESEARCH QUESTIONS AND FRAMEWORK

This dissertation is defined within the context of consumer marketing (i.e., Business-to-Consumer or B2C marketing), which is generally termed as the marketing of products and services to consumer markets (i.e., individual customers) (American Marketing Association, 2016). Unlike the business market, consumer markets are noted for many customers and general value proposition that can address many segments (mass, youth, adult, teen, or defined segments); and, challenging to manage due to the large customer base (Verhoef, Dahslström and Freundt, 2014; Lilien, 2016), which is significant to the topic of this study. Digitalization has reshaped the entire customer purchase journey (Ryan, Jones, 2009; Sturiale and Scuderi, 2016). Once the customer purchase journey is impacted, there is a direct impact on its bottom line. Therefore, marketing techniques are quickly changing to adjust and leverage new digital marketing techniques. These adaptations have given rise to expanded channels, which are referred to as the digital channels.

As far as consumer marketers are concerned, the expansion of marketing channels along the digital space provides robust opportunities for brands for one-to-one marketing engagement and purchase optimization. Unlike traditional marketing techniques, digital marketing makes data available for brands to better understand and profile their customer base. Due to data availability along these channels, digital marketing and analytics open opportunity for consumer marketers to collect data across the entire touch points at different stages along the customer journey. For this study to attain its goals, this dissertation aims at answering the three research questions as follows:

I. To what extent can consumer firms with a large customer base drive and optimize business revenue through digital marketing and analytics?
II. Why do some consumer firms drive and optimize business revenue from digital and marketing analytics while others do not?
III. How can consumer firms deploy digital marketing and analytics for driving and optimization of business revenue?

The study explores the digital marketing space to understanding its associated channels and methods. While there are many rich literatures in this space, it was difficult to see how businesses and firms can operationalize several techniques and methods proposed in the literature to optimize these digital channels. The author curiosity led to the theory of Fuzzy, which was theorized by Zadeh in 1965. The author found the Fuzzy theory interesting because it can accommodate unclear and subjective boundaries, such as customer judgment. This dissertation through a thorough systematic literature review, found gaps in the application of the fuzzy method in customer experience, pricing, customer selection and innovations in digital ecosystem. Opportunities on how the gaps can be bridged were also identified.

In the first study, the Delphi method was applied to obtain a snapshot from the industries' experts in consumer firms with a large customer base. Four sectors were targeted – they are Mobile Telecommunication, Betting, Financial Technology (FinTech), and Banking. The Delphi survey blended with the gaps in the literature re-shaped the dissertation research questions. FIGURE 2 shows the framework that links the cases in this dissertation with the research questions along the identified gaps in the literature and the Delphi study.

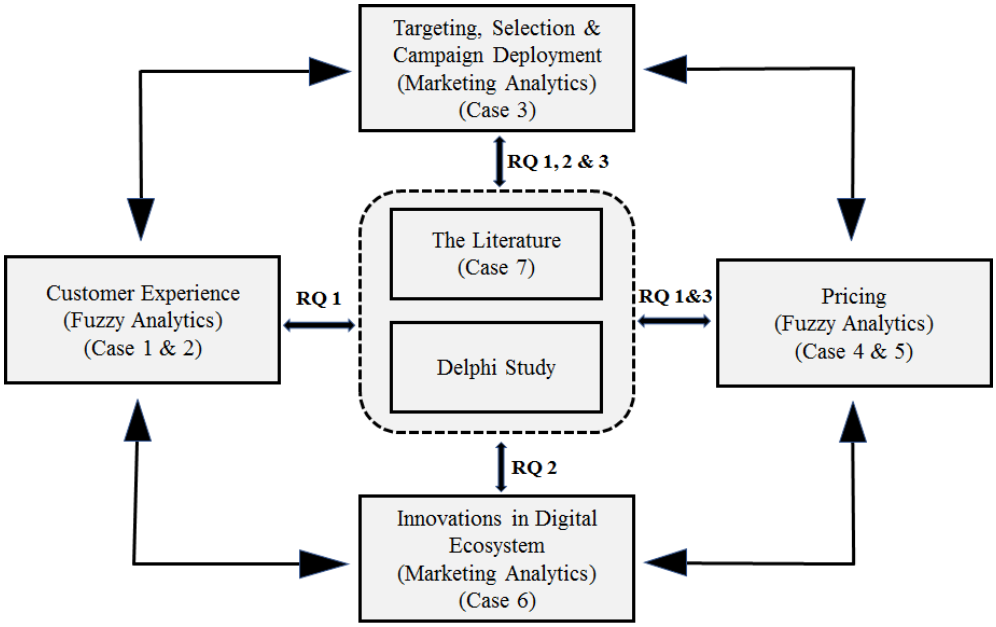

FIGURE 2 Dissertation framework

2 LITERATURE REVIEW

In the dissertation conceptual framework in FIGURE 3, multiple theoretical streams are integrated under a unified model. The framework starts with a systematic literature review of the application of fuzzy theory in marketing, specifically, digital marketing and consumer marketing.

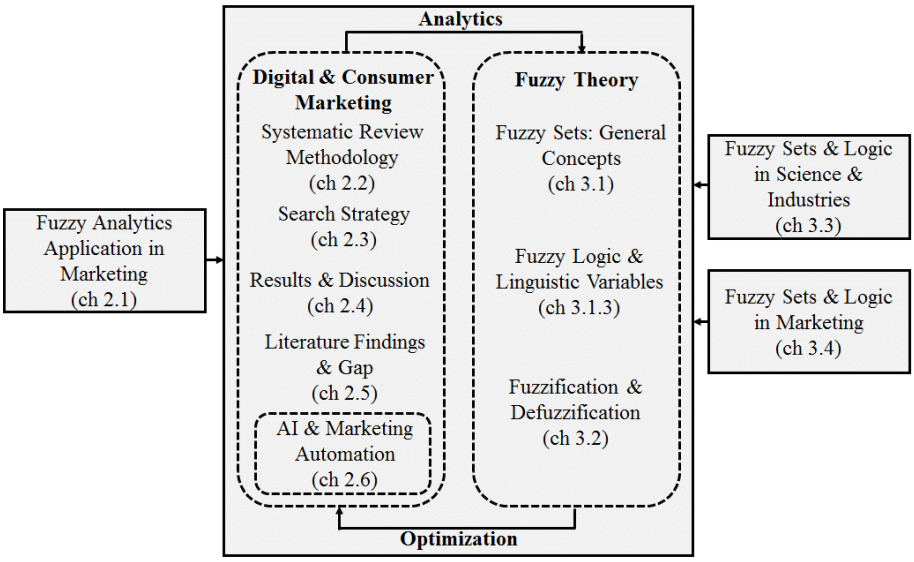

FIGURE 3 Conceptual framework of the dissertation

The review methodology in this study follows the knowledge development process-constructivist (ProKnow-C) (Okoli, and Schabram, 2010; Ensslin, Ensslin, Lacerda and Tasca, 2010), a methodology that follows steps that is similar to a protocol. An extensive search across multiple sources was conducted in this study for the systematic analysis to gather information around the content from different articles that finally make up the portfolio of this review. First, a bibliometric analysis was carried out. This is to ensure that relevant data on published articles, trends, topics of the journals, and most relevant authors are obtained (see Figure 4).

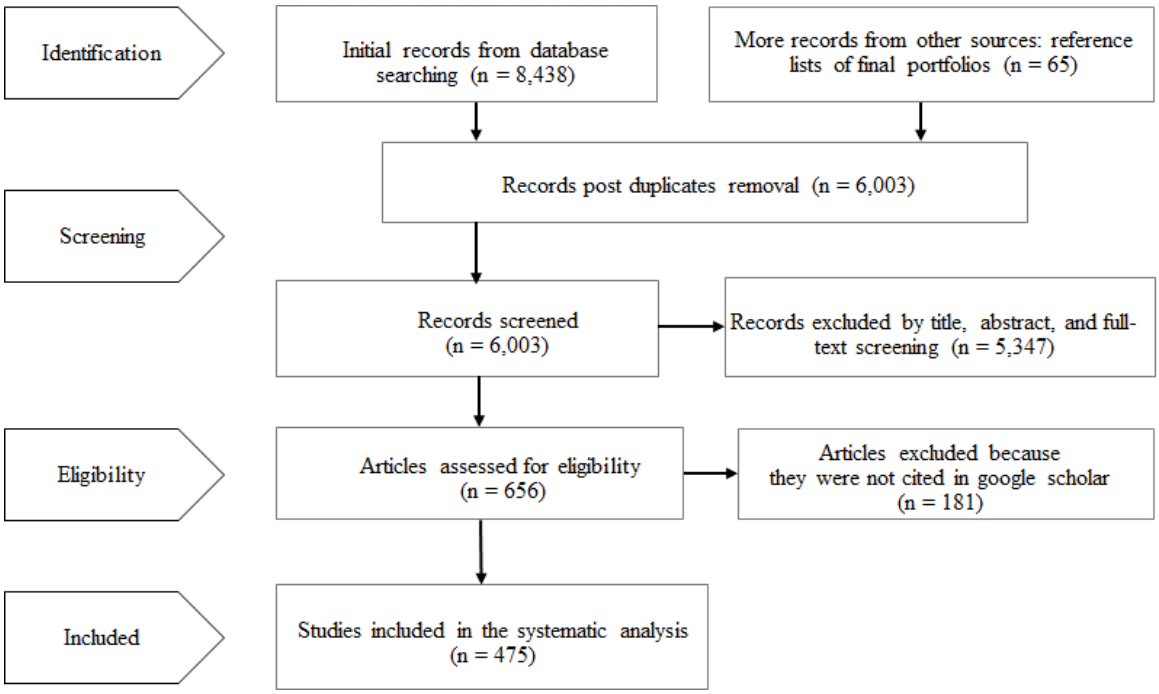

FIGURE 4 Flow diagram of the study selection process. PRISMA model (Moher et al., 2009).

First, the analysis of the initial identified portfolio is conducted resulting in the 475 final articles in this review's portfolio as shown in FIGURE 4. Focus is on the yearly trends of publications, most renowned journals, and authors about this study's topic. After that, a focus on the content of the articles.

This review conducts a content analysis of key articles in the final portfolio to identify each publication's different research approaches and contributions. Following a thorough exploration of the use and application of fuzzy sets, fuzzy logic, and all associated fuzzy theories on all aspects of marketing, a categorization of articles by topic is proposed. First, the articles are categorized into five categories following their application of FA in the marketing field. These categorizations are Fuzzy modeling, Web analytics, Clustering and Segmentation, Performance Analysis, and Fuzzy Market Analysis. The classification of the article topics into these five categories is shown in Table 1.

Table 1 Categorization and classification of the main topics into streams of fuzzy application (FA) in marketing

Categorization	**Article Classification**	**Categorization (%)**

Fuzzy Modeling	1. Fuzzy Application in Social Networks 2. Fuzzy Application in Expert Systems 3. Fuzzy Application in Recommendation Engine 4. Fuzzy Optimization and Multi-Criteria Decision Making (MCDM)	42%
Web Analytics	1. Fuzzy Application in Web Analytics 2. Fuzzy Application in Online Marketing	17%
Performance Analysis	1. Fuzzy Application in Performance Measurement 2. Fuzzy Application in Marketing Programs	2%
Fuzzy Clustering	1. Fuzzy Application in Customer Data Mining 2. Fuzzy Segmentation and Clustering	35%
Fuzzy Market Analysis	1. Fuzzy application in Scoring Methods 2. Fuzzy Application in Portfolio Marketing Techniques	4%

2.1 RESEARCH GAPS

This review explores the use of Fuzzy Analytics (FA) in marketing, and its growing research focus within the fuzzy application community. Topics in these areas are consolidated and reviewed to identify critical open questions and possible future research opportunities. The review of the existing literature in the final portfolio of this study reveals that FA has already been applied to a wide range of areas within the marketing field. However, when compared with the use of Fuzzy logic and theory in other fields such as engineering and control systems, its potential in marketing science is still far from being reached (Ramkumar, Rajasekar and Swamynathan, 2010; Keskin, 2015).

One of the main takeout from this review is that FA has demonstrated a useful property in addressing uncertainty and vagueness associated with customer behavior in marketing. From this insight, coupled with the rate at which digital channel is evolving, this dissertation projects an increase that will be significant in the publication of FA application in digital marketing in the coming years.

Many research applications in marketing have emerged using FA as the modeling techniques. The application around Fuzzy modeling, which consists of expert marketing

systems and recommender systems, will continue to grow along with artificial intelligence (AI) techniques. This growth will move along the digital evolution across many customer touch points. As revealed in this study, another prominent field of marketing is customer behavior and customer satisfaction models. FA offers opportunities in evaluating relations between consumer needs and service attributes. The ability to navigate through the natural language and its statements components has yielded contributions from researchers in product and service areas with quality evaluation and group analysis. However, application in customer experience management is silent in the literature. Marketers have a powerful tool in FA, which can be leveraged in the development of marketing models.

FA model is a new way of carrying out marketing analysis by marketers, which has emerged because of the usage of "if-then rules" instead of the crisp value. With this new modeling approach, marketers are now endowed with sustainable business tools for driving business performance. Marketers promptly can respond to the dynamic and sophisticated consumer market, along with competition and other market fluctuations. Also, customer profiling, clustering, and segmentation are other marketing fields that have witnessed the significant application of FA application. The marketing mix and strategy are other prominent areas of fuzzy applications in marketing science according to this review's findings – though, application in the pricing side of the marketing mix is scanty.

In all these applications, marketers have seen an increase in marketing analysis because of the use of FA in several aspects of marketing. However, literature has been silent on four key areas critical to marketers on how marketers can leverage Fuzzy methods to drive business performance. These are areas of customer experience, pricing, target and customer selection for campaign management, and digital innovation in platforms and over-the-top (OTT) players within the digital ecosystem.

3 METHODS AND MATERIALS

3.1 DELPHI METHOD

This dissertation used the Delphi method to gather insights from the experts across consumer firms with a large customer base as the basis for exploration and investigation into the other cases conducted in this study. Delphi technique stands as one of the research methods that are used for prospective inquiries. It is widely considered suitable for analyzing and exploring opinions regarding a specific topic. These opinions are opinions that are made without influence or pressure from the experts within the group. The

implication of this is that one can validate any consensual study's output in the near future (Kaushik, 2009; Helmer, 1998). The Delphi survey study was conducted to establish the experts' view in various service organizations on the impact and use of digital marketing and analytics in business performance. The study follows the stages, as shown below in FIGURE 5.

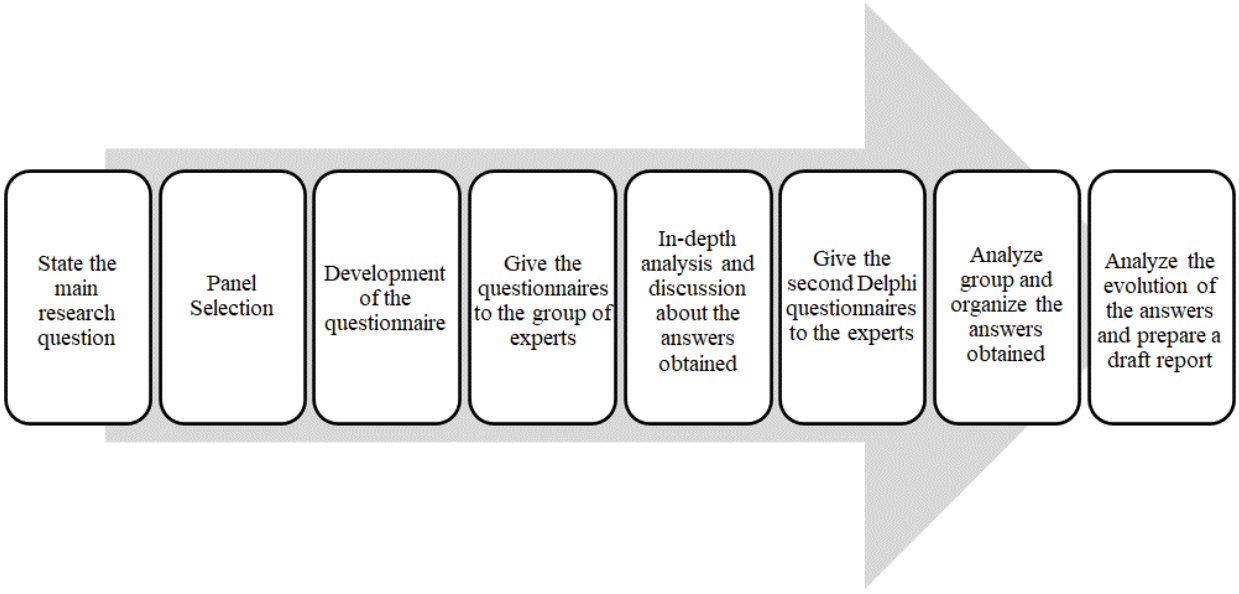

FIGURE 5 Stages of Delphi study. (Based on Hsu and Sandford, 2007; Torrecilla-Salinas, De Troyer, Escalona and Mejías, 2019).

The technique seeks a group of experts' opinions to assess agreement and resolve the disagreement on an issue (Jones and Hunter, 1995; Crane, Henderson and Chadwick, 2017). The Delphi process comprised of two rounds. In round 1, the experts were asked to rank 18 statements independently across two domains, using a 5-point Likert scale ('strongly agree,' 'agree,' neutral 'disagree,' 'strongly disagree'). Participants have the opportunity to fill in a free-text within each segment of the survey for the chance to elaborate or explain responses. Experts demographics were collected, including gender, current job position, and industry. Round 2 was also a survey to some participants in round 1 to ask questions around additional statements and clarify some of their comments in round 1. Round 1 survey was distributed through an online form to the email addresses of the experts. A total of 9 statements were included in the first section. The second section also contains another 9 statements. The first domain is digital marketing, while the second domain is marketing analytics.

3.2 MOBILE INDUSTRY - CASE FOR FIRMS WITH LARGE CUSTOMER BASE

The mobile telecommunication choice as the service industry where this dissertation derived its cases is due to the large customer base that characterizes the mobile industry.

In answering the research questions in this study, the dissertation articles leverage the mobile telecommunication broad consumer characteristics in developing cases to arrive at the research findings. Due to the rapid technological changes and digital explosion, the mobile telecommunication industry has evolved, thereby benefiting its large consumer base while destroying the boundaries between industries (Kuebel, Limbach and Zarnekow, 2014; Stone, 2015). Hence, the mobile telecommunication industry as the industry of choice where the articles' cases of this dissertation are derived.

3.2 DATA TYPE AND SOURCES

The primary data for this dissertation is from a mobile operator in Nigeria. All the case studies sourced data from the Business Intelligence (BI) system across the mobile operator's network elements. Table 2 summarizes the types of data that were collected for each of the cases in this dissertation.

Table 2 Data collection summary

Case	Case Focus	Collected Data
Case 1	Customer experience	Mobile customers data across the digital channels *(n=1200)* • Real-time video usage data • Data usage and consumption data • Customer location and periodical spend • Device types
Case 2	Customer experience	A broad characteristics cross-section of mobile users with different types of mobile devices (n=150). • Video add view (time, length, traffic, and usage) for 14 days • A real-time survey on the mobile app also captured • Customer data on usage movement across digital products and services
Case 3	Digital channel optimization	Usage logs of mobile money customers across all transaction channels for 90 days, *(n=300).* • Usage across the digital channel and non-digital channel • Activities data across all other cellular behavior (usage, traffic for data and voice)
Case 4	Review	
Case 5	Digital service pricing and Pricing Adjustment	The entire data user and non-data user on the customer base *(N=20.2 million)*

		• Data users; Non-data users • New customers • Product purchase history, customer usage, and lifetime on the network
Case 6	Digital customer ownership – Telco & OTT rivalry	OTT (over-the-top) protocols and traffic of all smartphone users *(n=10.2 million)* • Protocol traffic at the customer level • Data usage; overall base traffic; data usage and consumption; voice traffic and consumption at the protocol level
Case 7	Review	

4 RESULTS AND THEORETICAL CONTRIBUTIONS

RQ1: To what extent can consumer firms with a large customer base drive and optimize business revenue through digital marketing and analytics.

This dissertation identifies four areas of gap where literature has been silent as to how Fuzzy Analytics (FA) has been leveraged by firms with large consumer base to drive business performance through digital marketing and channels: (1) customer experience; (2) pricing, (3) targeting and profiling and, (4) innovation within the digital ecosystem. To the best of the knowledge of the author, This study represents the first to attempt to assess the level of opportunity and the extent to which large consumer firms can leverage digital marketing and analytics to drive business performance by (1) linking consumer marketing activities and business performance with digital marketing channels, and (2) linking consumer marketing activities and business performance to firms' analytic capabilities. The evolution of digital channels has provided marketers with this rare opportunity.

However, in an environment with a large consumer base having a large amount of customer data, optimal leveraging of these channels becomes a challenge if techniques and analytics that can drive insights in real-time for one-to-one marketing of the customer base are not available or not implemented (Martin and Murphy 2017). Therefore, this study findings show that Fuzzy Analytics (FA) avail marketers the opportunity to leverage the rich customer data across the enterprise in real-time to generate incremental revenue for the consumer within a large customer base across digital channels support Mende et al., (2019) submission.

Moreover, this dissertation's findings emphasize the need for firms with a large consumer base to implement a recommendation engine driven by underlying analytics, such as machine learning techniques in driving business revenue across digital marketing channels. Through robust case studies, this dissertation has shown that when analytics techniques are layered on both digital and non-digital channels of consumer firms, digital channels are

more promising. It was found that digital marketing channels are not optimized because the analytics driving the engagement, marketing activities and customer presentations are not robust enough. These finding also supports Verhoef et al. (2016), Columbus (2019) and Rahwan et al. (2019) position.

RQ2: Why do some consumer firms drive and optimize business revenue from digital and marketing analytics while others do not?

Consumer firms with a large customer base that have not invested in a well-integrated CRM and customer marketing solution cannot leverage the rich data across her enterprise towards business optimization (Ambler & Robert, 2008; Kotler, Kartajaya, Setiawan, 2016). This submission aligns with the findings of this dissertation. Marketing automation facilitates the orchestration and integration of tools, people, and processes through automated workflows (Huang and Rust, 2018). It is software or platforms that follow a pre-programmed rule such as Fuzzy expert systems that is well discussed and implemented in this dissertation across customer experience, pricing, and targeting and selection of customers.

Marketing automation driven by analytics has a single purpose: to let machines perform repetitive, monotonous tasks (Longoni et al., 2019). Findings in this dissertation reveal that consumer firms that invest in such analytics-driven automation tend to drive their business performance effectively. In marketing operations, automated systems such as campaign management solutions and analytical models get input from data across the enterprise. Generally, the result is a more efficient, cost-effective approach and workforce that is more productive for a business. This approach frees up time for marketing professionals to focus on more important tasks that require the personal touch and ability to reach out to millions of customers (Baum et al., 2011; Reese 2018; Kaplan and Haenlein 2019). The findings in this dissertation show that this is one reason why some firms leverage digital marketing channels and analytics to drive and optimize performance while others do not.

RQ3: How can consumer firms deploy digital marketing and analytics in driving and optimization of business revenue?

Innovations that the digital ecosystems have witnessed in recent years have brought about a massive transformation into the digital space (Friedrich, Hall and El-Darwiche, 2015). This transformation due to innovative digital services and platforms has brought with them may changes that cut across many industries and the way consumer firms go to market with their products and services. For large consumer firms in the service or utility industry to compete, they must have the capability to engage their customer base in a one-to-one marketing approach below the line (BTL). Findings in this dissertation reveal that such BTL and segmented engagement require the availability of robust capability and tools that are integrated with all data sources across the enterprise for seamless delivery of such

targeted campaigns. For such consumer firms to optimize revenue potential from the large customer base, campaign management tools must be in place. Following this dissertation's findings, a clear and holistic customer base management framework is required to help brands optimize embedded opportunities in these digital channels. While these tools, integrations, and systems may be expensive, their payback time is almost immediate compared to the incremental revenue they will generate.

A successful deployment of integrated digital marketing and analytics platforms and processes for driving a firm's business performance starts from fully understanding the customer base (Gallino and Moreno, 2014). According to this dissertation's findings, firms can achieve this by leveraging existing customer relationships and transactional data and ends with strategic deployment of marketing intervention activities to grow customer satisfaction and, ultimately, customer revenue through digital channels. (Verhoef, Reinartz, and Krafft, 2010). The concept of customer base management through CVM with a blend of innovations across the digital space is still relatively new, and only a few brands have been able to successfully implement this rich customer base management approach to drive their proposition development and revenue optimization strategy (Eggert, Ulaga, Frow and Payne, 2018). The mobile telecommunication industry is one sector that understands this concept extremely well and has used it to increase revenue and, at the same time, improve customer satisfaction (Dadzie, Dadzie and Winston, 2019).

This dissertation findings have established that as digital channel expansion continues to change the way the brands engage with their customers, brands need to continue to identify customer segments based on their behavior, the needs and preferences of each segment along different channels to drive a profitable business (Branda, Lala and Gopalakrishna, 2018).

5 CONCLUSION, IMPLICATIONS AND RECOMMENDATIONS

5.1 CONCLUSION

The knowledge of consumer firms with a large customer base is advanced in this dissertation by the need for the firms to continue to grow revenue from their existing base through marketing analytics. Firms need robust and advanced analytical techniques to understand the customer base and provide tailored services to their customer base. This dissertation explores how Fuzzy Analytics, a cutting-edge subset of AI, can drive consumer revenue in consumer firms with a large customer base.

Determining the appropriate marketing channel for a campaign proposition and aligning the channel with the customer base's appropriate target segment is one of the significant challenges within the marketing functions. Once a firm cannot effectively achieve this, neither channel nor performance can be optimized. Therefore, consumer firms with a large customer base must invest in marketing people with specific skills that cut across commercial, analytics, and operations for successful customer base management. Robust investments must be made on systems and integration across all enterprise systems for full automation of marketing activities for effective customer base management.

Findings reveal that firms' deployment of digital marketing and analytics to drive business performance involve specific steps on the part of the firms**.** Firms need to uncover the anonymity associated with the customer across digital channels to serve the customer well. A robust integrated platform of identity management in the digital marketing space is also essential for brands. As soon as a brand has developed the capability to uncover a customer's identity across all digital touch points and links with internal data, it can then leverage customer emotion, motivation, behavioral and environmental context to drive value and service to the customer.

Moreover, brands need to move a step forward in predicting propensity for behavior to address customer issues proactively. Firms also need to transform the personalization capability of brands to manage their customer expectation. Capabilities like text analytics and the use of artificial intelligence and machine learning will contextually help in real-time targeting and improve customer engagement and customer response to call to action. While doing these, measurement methodologies must be incorporated into the entire campaign and engagement process for proper tracking performance and incremental revenue – this is one of the critical findings of the Delphi survey of this dissertation.

5.2 IMPLICATIONS AND RECOMMENDATIONS

The submission of Johnston et al. (1999) regarding one of the merits of case studies is true for this dissertation – it generates robust insights for the practice and managers. These managerial implications across the case studies in this dissertation are highlighted so that marketers will be able to use digital marketing and analytics to drive and optimize business performance across any large consumer base. Analytics and its associated techniques can be operationalized within the day to day marketing functions of firms with a large customer base. Findings in this dissertation show that marketing analytics approach and techniques could be simplified and adopted while leveraging the rich and robust data that the consumer firms have within their enterprise. For marketers tasked with driving the business revenue

performance through analytics, fully integrated campaign management would be required before analytics output can be optimally leveraged.

Also, marketing automation of the analytical models' extracts into the integrated campaign management solution with the ability to configure offerings and deliver timely communication is the secrete of the success across the digital channels. No matter how accurate an analytical model can be, if marketers do not automate the end-to-end process delivery of the campaign, the marketing programs' results cannot be encouraging.

Marketers must take cognizance of the importance of channels in the course of driving business revenue and performance. Digital channels have come with a robust opportunity for marketers. However, the traditional channels still have their place in the way marketers take their products to the market (Opreana and Vinerean, 2015). For firms to fully leverage the power of analytics in driving business performance, marketers must be equipped with an integrated and robust campaign management solution. The solution must be integrated to enable automation across base management operational activities and eliminate manual iterations as much as possible.

For marketers, using data analytics to improve customer experience and target the right set of customers is very important for optimizing digital marketing campaigns. As large consumer firms continue to increase their digital marketing budget yearly, demand for more customer experience trackable events will also rise. Hence, a need for more innovative ways on the part of marketers to measure campaign effectiveness along the customer experience journey to justify digital marketing's growing budget.

As marketing practitioners continue to find the appropriate balance for the allocated digital budget and the effectiveness of these channels, findings in this dissertation narrow the effectiveness and customer experience measurement gap in the digital space.

Pricing is an integral part of the marketing function and critical to a firm’s overall survival. It is an aspect of the marketing mix that a firm cannot afford to get wrong. Whenever commercial managers consider the right price point for products or services, factors such as marketing strategy, competition, and the associated value that consumers perceive to be suitable for the products must top the list for consideration.

Price adjustments are tools used by firms to remain competitive amidst a turbulent and fiercely competitive market. In practice, managers are confronted with pricing-related decision-making with enormous business performance consequences if the products are not well priced. In such a situation, when managers lack enough evidence, or when experts lack all the relevant data to make an informed judgment, experts leverage fuzzy linguistic terms. Fuzzy logic draws its strength from its ability to absorb ambiguity and apply vagueness and imprecise data to make a sound judgment, such as pricing decisions.

Another important implication for managers among the findings of this dissertation is that poor techniques and capabilities for channel optimization of the consumer base across available channels often undermine these channels' performance. Results indicated that clustering is efficient for target selection. The mapping of clusters with the appropriate digital channel of transactions revealed that business performance could be optimized along the digital channel. Moreover, the analytic model's output enables suitable cross-selling and up-selling campaigns to optimize the customer base.

The author would like to encourage marketers to pay more attention to the measurement and evaluation of marketing investment in digital marketing activities – the panel study in this dissertation reveals that this is still a challenge. The marketers must be able to account for the incremental revenue that is derived from all channels – both digital and non-digital.

6 LIMITATION AND AVENUES FOR FUTURE RESEARCH

Generally, for future works, only a little discussion exists in which researchers have used FA in the context of driving marketing and business performance. This opens research opportunities in the digital marketing space for the application of FA across digital channels. There is a considerable research opportunity in applying FA to current problems and realities daily confronting consumer businesses and marketers in this digital age.

One limitation widely shared by literature reviewers is that many articles would have been involuntarily omitted during the final portfolio preparation in a systematic review of the literature. While it may not be exhaustive, this dissertation draws conclusions from a comprehensive and extensive list of published articles. Thus, it opens the door for potential overlaps between areas in which FA has been applied in the field of marketing science.

Detail explanation regarding the evolution of the research question along the dissertation development has been explained. The need for the case study method for the research questions and its appropriateness for this dissertation has also been clearly explained. Furthermore, why the mobile telecommunication industry has been chosen as an industry with a large consumer base, upon which these dissertation case studies are grounded, has also been detailed.

Three research areas exist where transparency cannot be compromised – they are data collection, analysis, and reporting stages. This is vital for other researchers to perform the same research and make quality interpretation in their own way. (Dubois and Gibbert, 2010). However, according to Järvensivu and Törnroos (2010), in abductive studies, analytical results' validity is not guaranteed by transparency. Easton (2010) argues that the most critical aspect of validity comes from critical realism and its associated philosophical assumptions of which interpretation is a vital component of the findings. Therefore, the

author is aware that despite the rich customer data at the disposal of this study, which this study leveraged in all the cases in this dissertation, the data source is still limited to only one industry among several industries with large consumer firm. Though, the data collection method, which consists of actual customer data, has been argued to be the best data collection method in the literature (Piekkari et al., 2010; Woodside and Wilson, 2003), it is safe to assume that consumer behavior across different industries will be slightly different.

7 CASES AND STUDY FOCUS

This section presents the cases along with the study focus of this dissertation.

Table 3 Cases and Study Focus

Title	Case	Publication outlet	Study focus
A diagnostic customer experience measurement for digital marketing channels	CASE 1	Proceedings of European Marketing Academy - EMAC (2018)	Diagnostic measurement of customer experience
Towards Fuzzy Analytics for Digital Video Advertising Campaign Effectiveness and Customer Experience	CASE 2	International Journal of Fuzzy Logic and Intelligent Systems (2019)	Fuzzy analytics application of customer experience of digital customers
Analytical approach to digital channel performance optimization of mobile money transactions in emerging markets	CASE 3	Innovative Marketing (2020)	Analytical approach to digital channel optimization
Fuzzy Expert Pricing Systems and Optimization Techniques in Marketing Science	CASE 4	Frontiers in Artificial Intelligence and Applications (FAIA), (2020)	Fuzzy Expert Pricing System & Optimization
A Fuzzy Logic Expert System for pricing digital services: the case of price adjustment for a mobile service provider	CASE 5	International Journal of Fuzzy Logic and Intelligent Systems (2020)	Fuzzy Expert Pricing Tools for pricing digital services
Battle for digital customer ownership between the telco and Over-the-top (OTT) players: Emerging markets perspective	CASE 6	African Journal of Science, Technology, Innovation, and Development (2020)	An innovative and analytical framework for OTT and Telco ecosystems
Fuzzy Analytics Application in Digital and Consumer Marketing: A Literature Review	CASE 7	Smart Innovation, Systems Technology, Springer Book, (2020)	A review

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