



Marketing Decision-making among Fast Moving Consumer Goods (FMCG) Manufacturing Firms in Nigeria: The Place of Quantitative Analysis

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Abstract: *Modern day organizations are managed through carefully crafted policies backed by optimal objective decisions. In order to avoid suboptimal operations in marketing activities, decision science models are employed to complement anecdotal and intuitive decision-making. This paper explored the application of quantitative analysis in marketing decisions among fast moving consumer goods (FMCG) manufacturing firms in Nigeria. Literature review revealed that quantitative analysis tools like Markov analysis, games theory, inventory model, time series and forecasting technique, transportation models, and optimization model enhances marketing decisions in the areas of managing inventory, sales forecasting, management of market share and competition analysis, managing waiting lines etc. The quantitative techniques enumerated above can be applied to numerous marketing activities for optimal marketing decision-making. FMCG firms that seek to make objective decisions to drive marketing operations should thus resort to quantitative approaches to decision-making; and in order to effectively match the demand of planning units in FMCG firms, operations researchers in Nigerian should create marketing models to support marketing decision-making of FMCG firms.*

Keywords: *Quantitative analysis, marketing decisions, fast moving consumer goods*

Introduction

Managing an organization involves formulating policies and making decisions for the good governance of the work place. A formal organization is made up of strategic business units; production, human resources, finance, marketing, research and development etc (Stoner, Freeman & Gilbert, 2013). Hence, management must make policies and decisions in each of these functional units of the firm for the overall performance and growth of the enterprise. Decisions can be made through qualitative and quantitative resources for the optimization of the firm activities. Marketing which is one of the most prominent SBU's of the organization makes policies and decisions from company/product conceptions, production, selling and distribution of merchandize and services (Kotler & Keller, 2012; Kotler & Armstrong, 2012).

The practice of marketing in the work place involves both qualitative and quantitative decision making. The marketing manager employs both qualitative and quantitative analytical

tools for optimal decision making in the areas of product management, marketing communications, cost and pricing decisions, and distribution management. Others includes, strategic, forecasting and forward planning of marketing activities, customer and competition management, marketing research etc. (Kotler, 2000; Bagshaw, 2011). It is imperative to note that guess or intuitive decisions are sometimes misleading and costly to management, application of quantitative analysis to marketing decisions helps firms to make objective and optimal decisions for effectiveness marketing system. A marketing executive that disregards the use of quantitative basic analytical tools may lead the department and the firm to suboptimal operations and consequent risk of extinction, considering the complexity of the operating business environment (Halikias, 2009; Wireenga, 2008). Hence, because of the dynamic nature of the business environment the use of quantitative analysis or applied philosophy science for marketing decisions is laudable.

Quantitative analysis, management science or operational research is computational study of the organization in action (Agrawal, Subramanian & Kapoor, 2010; Halikias, 2009). Thus, quantitative techniques has made major contributions to the efficiency of the organization by improving both functional and top level decision making in the firm. Historically, management science or quantitative analysis started in the late 1930's and has grown in an upward trajectory in the last three decades (Agrawal *et al.*, 2010). Hence, in order to research into the war efforts during the Second World War. Operational research scientist developed and used these techniques to enhance effectiveness and efficiency in the war. These techniques are linear programming, games theory, inventory model, transportation model, shortest route models, optimizing techniques etc (Bagshaw, 2011; Wierenga, 2008). These techniques find its routs to business organizations immediately after the Second World War which began with the industrial revolution. Today operational research techniques are applied virtually in every field of human endeavours; public governance, private institutions, and non-profit organizations (Halikias, 2009).

The fast moving consumer goods manufacturing sector in Nigeria provides consumer care products that are needed for daily consumption. This sector contributes significantly to the growth of the Nigerian economy (Ejiba & Omolade, 2016). The industry is made up of companies that supplies cost effective products that are in high demand in the markets. These products in the FMCG sector include food and beverages, personal health and hygiene products, household washing and cleaning utensils (KPMG, 2016). Hence, companies that play in this industry in the Nigerian markets are, Unilever, PZ, Nestle, Cadbury, Dangote Sugar, Dangote Flour, Flourmills, UACN, Nigerian Breweries Plc and Guinness Plc etc (Lagos Business School, 2016). Thus, some of these institutions are also seen playing in the global markets (KPMG, 2016).

It is important to note that since FMCG is often cited as a low margin - high volume game, managing input cost remain very important as small margin gain still have a significant impact on the bottom lines due to large volumes. Managing production, scheduling, inventory carrying, products distribution etc. requires leveraging quantitative techniques to manage these marketing and related business activities in the FMCG industry (Halikiars, 2009; Wierenga, 2008). Hence, the business model of the FMCG companies worldwide indicates that

applied philosophy of science or quantitative management of the organization cannot be completely isolated in the life of the industry.

The Concept of Quantitative Analysis

Quantitative business methods, quantitative analysis applied philosophy of science, management science and operational research can be used interchangeably. It is the mathematical or computational study of an organization in action (Agrawal *et al.*, 2010; Halikias, 2009). Quantitative analysis came into being during the Second World War. In order to deepen research into the war efforts, the Americans and the Britain etc. assembled team of operational researchers; mathematicians, physicist, economist, engineers, scientist, statisticians etc. This team of researchers brought their combined knowledge and capabilities and developed models used in driving the war (Margo, 2007; Eliashberg, 1993).

Thus, the focus of the operations research team during the World War II was on production, operations and distribution logistics (Eliashberg, 1993). Some of the management science techniques used are linear programming, network analysis, inventory models, games theory, transportation model, shortest route models, optimizing techniques etc. (Bagshaw, 2011; Stecke, 2005). However, immediately after the Second World started the industrial revolution, the research scientist where disbanded at the end of the war, but the same problem that confronted the military also faced the various industries, but in different contexts. The operations researchers came into the industries and used these techniques for business decision (Stecke, 2005; Beresnev & Suslov, 2010).

Operations research or management science techniques are applied into making marketing decisions. Literature on operational research in marketing commenced significantly in the 1960s (Eliashberg, 1993). Hence, in practical terms techniques such as markov analysis, games theory, optimizing models, time series additive and multiplicative models, regression models etc. are used for marketing modeling (Bagshaw, 2011; Beresnev & Suslov, 2010; Halikas, 2009). Thus, a marketing manager at the end of a financial year should know the number of customers that started patronizing his business and the number that has defected to the competition. The marketing SBU's studies this transition pattern with the aid of a model called Markov analysis (Bagshaw, 2011). The marketing department uses this model to know how best to manage the company market share through superior customer service to mitigate defection but rather built and grow market share. With the Markovian Chain, Marketing will be able to know the firm market share in the medium to long term; a forward planning and forecasting tool for marketing decisions, (Bagshaw, 2011). Hence, customer patronage data collection is imperative.

The marketing department in the organization most times studies factors that affect the behaviour of sales. There are several factors which are endogenous and exogenous that affects sales of company product or services. Thus, sale is a function of several variables; such as the price, quality, advertising, consumer taste and preferences, income of the consumer, general economic conditions etc. The marketing department can employ regression model to study the pattern or trend and also to predict the likely behaviour of sales in the future (Althuisen, Wierenga & Chen, 2016). Thus, this activity can be managed by the department or planning

unit of the firm. It can also be outsourced to consultants upon provision of necessarily data. What is happening in the environment can be reduced to functional relationships through marketing modeling as:

$$Y = f(X_1; X_2; X_3; X_4; \dots ; X_n).$$

Where

Y	=	Sales Revenue
F	=	Functional relationship between variables
X ₁	=	Price of the product
X ₂	=	Advertising
X ₃	=	Price of substitute products
X ₄	=	Quality of competitor products
X _n	=	State of the Nigerian economy

Thus, sale (Y) is the dependent variable in the marketing model above. This model explains that sales revenue is a function of price of the product (X₁), Advertising (X₂), price of substitute product from the competition (X₃), the quality of competitors' products (X₄) and the general condition of the Nigerian economy (X_n). The player in the FMCG sector in Nigeria should be aware that each of these independent variables affects or influences an outcome in the sales of their products (Bagshaw, 2011). Hence, this will help the marketing managers on how best to manipulate the endogenous factors X₁ and X₂ which are within the control of the firm in order to adapt to the exogenous factors of X₃, X₄ and X_n which are beyond the control of the organization (Kotler & Armstrong, 2012; Beresnev & Suslov, 2010). Quantitative analysis helps marketing managers to predict marketing activities and to effectively manage the marketing business.

A marketing department taking advantage of quantitative analysis can adequately manage stock in its warehouse and logistics management through the employment of inventory model, transportation and shortest routes models respectively (Stecke, 2005; Margo, 2007; Bagshaw, 2011). Hence, virtually every activity in marketing can be explained with the help of management science or operational research. Marketing modeling which involves simulating marketing activities by reducing the variables in the environment to functional relationships is made possible with the employment of decision science or applied philosophy of science.

Concept of Marketing Decisions

Decision making is the process of making choice from several alternative courses of actions. Business people are confronted with several alternatives in the decision environment, objective and optimal decision making is expected from the chief executive or top echelon managers. The onus of making decisions in the marketing department lies with the marketing manager in tandem with the corporate vision of the organization (Kotler & Keller, 2012; Kotler & Armstrong, 2012; Stoner *et al.*, 2013). Hence, marketing is divided into functional areas with

specific duties and responsibilities. Each of these sub-marketing divisions requires optimal decisions for the overall effectiveness of the marketing system (Kotler, 2000).

Thus, marketing is expected to effectively manage these SBU'S; marketing research, product management, marketing communications, distribution management, pricing and cost management, sales management and strategic marketing management etc. and deliver superior products and services to the firm stakeholders within the marketing value chain (Sharma, Drishan & Grewal, 2001). Hence, marketing department should carryout effective decisions in the marketing mix variables, making optimal choices in the product design, quality and specifications, pricing, promotion and place management.

The fast moving consumer goods (FMCG) companies are expected to make sound decisions in the evolving domains of marketing by leveraging the right resource mix configuration. In other words, the firm should make decisions about marketing resources that will be used to execute the functions of marketing. Resources such as human capital, machines, methods and materials for the conception, production, selling and distribution of goods and services should be decided by the marketing manager. However, inputs from other functional units of the organization are needed for a more robust decisions on marketing resources should be utilized (Althuizen *et al.*, 2016). Thus, decisions about marketing resources are laudable as these resources usually help the firm performance and boost creativity at work.

The marketing manager of a fast moving consumer goods (FMCG) company has to contend with several factors which are external to the firm, and of which the management should put into consideration in decision making. These factors are the market (customers), competition suppliers and distributors, the external macro-environmental forces; government regulations and politics, economy, socio-cultural, technology etc. (Kotler, 2000; Kotler & Armstrong, 2013). Hence, it is imperative for marketing management to make the foregoing strategic decisions for the growth and survival of the enterprise.

The entire marketing system in the work place involves both qualitative and quantitative decisions. Marketing managers can only be effective in decision making by complementing the two domains of decisions. However, decision making is a continuous one and seen as the pervasive element of a marketing manager's job, whether dealing with a product or service, objective decision making is laudable in the face of a dynamic business environment (Bagshaw, 2011; Althuizen *et al.*, 2016). Hence, objective marketing decisions can be achieved with the employment of quantitative analysis which should support the intuitive or guess domain of the manager, i.e., marketing decisions can only be made through oral anecdote or intuitive reasoning. The computational or marketing metrics tools should always be used to aid marketing and business decisions.

Quantitative Analysis and Marketing Decisions

The application of mathematical or decision science tool for marketing decisions has been studied by academics and scholars of industrial mathematics, engineering, economics, statistics, management science etc. From theoretical and practical perspectives, it was revealed that quantitative analysis or applied philosophy of science aids business decisions and organizational effectiveness since World War II till date (Wierenga, 2008). Hence, marketing

decisions are supported with analytical mathematical models. Historically, before the advent of operations research and its incursion to the industry, marketing research was only based on collecting facts from respondents. These facts were never subjected to quantitative or statistical analysis. The introduction of data analysis with statistical tools helps drive better and objective decision making in marketing (Wierenga, 2008; Halikias, 2009). Marketing models are very useful in modern day organization in the various sub-units of marketing; advertising, media planning, pricing, sales force allocation, forecasting and inventory management and control. "They marked the beginning of an explicit analytical approach to marketing decision making".

Operations research has an important role in marketing decisions as it involves the combine knowledge of multidisciplinary subjects such as economics, mathematics, statistics, industrial engineering and management (Agrawal *et al.*, 2010). This combined knowledge is used to evaluate alternative courses of actions in marketing for optimal decisions. It is important to note that in decision making, usually two or more heads are better than one. Using the combined capabilities of the foregoing subjects makes problems solving easier both in the marketing department and the organization. Management science helps marketing to build marketing mix decision models. "Complex prescriptive marketing mix models are now common-place in the marketing literature" due to the incursion of decision science in marketing (Barnard & Sharp, 2000). Hence, these models help guide marketing managers in making decisions. However, marketing is increasingly becoming more scientific due to the use of complex quantitative and statistical modeling of marketing mix outcomes.

Furthermore, the application of quantitative analysis helps marketing decision makers to study the causal connections and correlation of variables in the field of marketing. Tools such as time series and forecasting models; additive and multiplicative models can be used to study the trend, seasonal variations, cyclical variation and residual or irregular. Historical data can be used to predict sales or revenue with the help of the regression model (Bagshaw, 2011). Thus, decision models claimed insight into marketing effectiveness mostly seems to assume that a regression equation implies causation", i.e. Y_0 (Sales) = $a + b_1 X_1 + b_2 X_2 + b_n X_n$. This helps the marketing manager to investigate and make decisions on the influence of X_1 (Advertising), X_2 (price) and X_n (Price of competition product) on the sales revenue of the product (Barnard & Sharp, 2000; Bagshaw, 2011). Hence, with this model, the marketing manager can make decision on the strength of relationships between the independent variables X_1 , X_2 and X_n and the dependent variables (Y_0). The extent to which the predictor variables impact the criterion variable can also be explained with the aid of the model.

Quantitative analysis is one of the most potent primary functions involving marketing decision making in both public and private organizations. The marketing department has wide ranging functions such as managing markets and market share, competition management, sales and inventory management, cost and profit management, transportation and supply chain, etc. Management science tools such as Markov analysis, games theory, time series and forecasting models, inventory models, optimization techniques, transportation model, shortest route model etc. are used to aid marketing decisions (Lee, Oh & Pines, 2015; Singla, 2016). Thus, the work of operations research is the means of taking the decisions and the provision of

data to marketing managers to take the most valid decisions (Singla, 2016).

New product development and management is made effective with the help of operations research. In originating a new product, the concepts will usually be subjected to screening and business analysis this involves quantitative analytical tools such as inventory model, linear programming, breakeven model etc. (Urban, 2007). Hence, mathematical models and quantitative techniques have found an increasing number of applications as tools for marketing management decision making. Quantitative analysis are most useful to marketing managers in decision areas that are highly complex and dynamic where reliance on intuitive or anecdotal methods of decision making is practical impossible. New product introduction is one of the complex challenges confronting marketing management. Managers often are in states of dilemma; either to introduce the concept, discontinue the concept, or do further analysis. Management science helps the product manager to better understand breakeven analysis and duration of sales, costs judgments, investment and capital budgeting etc. surrounding the development of the new products (Mihaita, 2006; Urban, 20078).

Empirical study investigating the nexus between quantitative analysis and business decisions revealed that quantitative analysis has significant influence on the domains of business such as production, marketing, finance, research and development (Onukwulo, Onwuka & Nagbala, 2014). Hence, management science significantly influences decisions in marketing activities. Successful marketing decisions rely on management science techniques to evaluate alternative courses of actions and opt for the best that will yield the greatest opportunities for success. Therefore, decision making in the field of marketing has relationship with decision science whether dealing with a product or service, promotion, costing and price, place and channel management (Kotler & Armstrong, 2012; Beresnev & Suslov, 2010).

According to Kotler & Armstrong (2008), this aspect of using mathematical tools or models to make marketing decisions is referred to as marketing by numbers. Hence, managerial decision making in marketing involves the assemblage in intuitive knowledge and operational research results (Althuizeen *et al.*, 2016). Marketing management which is an endeavour or proper utilization of resources to achieve stated market and competitive objectives can only be effective and efficient with the help of management science tools or applied philosophy of science (Halikias, 2009).

Managerial Value of Quantitative Analysis

Quantitative analysis has helped in the area of marketing model building which has further enhanced the practice of marketing positively. It has also created better understanding of the development and nature of marketing phenomena on the part of practitioners and academics (Eliashberg, 1993; Stecke, 2005). Hence, marketing models and decision science are used to solve real life industry problems. The value of inventory model, Linear programming, decision analysis, games theory, time series additive and multiplicative models, queuing models etc are very laudable. Some of these tools are used to keep the right levels of stock in the organization; others are used for optimum production decisions, competition management among rival firms. Customers' traffic in banks and restaurants can be effectively managed with queuing model and the historical data of sales in any organization can be studied to carryout

forecasting and planning with the help of time series and forecasting models (Bagshaw, 2011; Beresnev & Suslov, 2010; Althuizen *et al.*, 2016).

Marketing decisions can only be made through intuition; this is always complemented with quantitative analysis since a great number of the activities in marketing deals with numbers (Kotler & Armstrong, 2008; Kotler & Armstrong, 2012). Hence, these techniques help build marketing models which are used today in civil aviation, government agencies, private production and services organizations, non-profit organizations etc. The managerial value of applied philosophy of science in enhancing work place marketing activities cannot be overemphasized. Marketing scholars and practitioners who disregard the application of operations research tools in marketing may drive their institutions to extinction.

Conclusion

Marketing policies and its attendant decisions at work can be complementarily made through qualitative and quantitative means. Managers in modern day organizations could not afford to make decisions only through hunches or intuitive reasoning. A part of the organization involves numbers or quantitative and requires computational analysis of marketing scenarios. It is therefore imperative for marketing leaders both in the industry and academics to promote the usage of both qualitative and quantitative methods in a complementary manner that will yield optimal decision making. It is important that marketing departments in the industry should have planning units where techniques relevant to marketing will be used to develop the competences of staff in that unit for effective operational research work. Since those who carry out the decision science operations are distinct from management, there should be consistent interface between marketing managers and staff of planning units. This will ensure cross fertilization of ideas and objectives marketing decision making.

Most importantly, marketing departments in the work place should wholeheartedly embrace quantitative analysis this is because from proper x-ray, the vast majority of the techniques in operations research or management science are for marketing aids. On the labour marketing demand and supply analysis, there is shortage of operational research analyst, making demand for analyst by companies is higher than supply. To this end, it is imperative for marketing departments in Nigerian tertiary institutions to create sub specializations called marketing models and operations. This will help train younger generation of marketing scientists, bearing in mind that today complex organization and environment requires multi-disciplinary approach to decision making.

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