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REVIEW ARTICLE

THE WELFARE BENEFITS AND KEY FEATURES OF FRUGAL INNOVATIONS FOR THE BOTTOM OF THE ECONOMIC PYRAMID: THE CASE OF FAST-MOVING CONSUMER GOODS IN NIGERIA

Samson O. AWOYEMI^a; Olawale O. ADEJUWON^{a*} and Waheed O. OLADELE^b

^aObafemi Awolowo University, Ile-Ife

^bLagos State University, Ojo, Lagos

*Corresponding Author Email: wadejuwon@oauife.edu.ng

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ABSTRACT

This paper attempts to fill the gap in three facets of frugal innovation literature using the fast-moving consumer goods (FMCG) sector in Nigeria. The first is the nature of features of frugal innovations from the perspective of Bottom-of-the-pyramid (BoP) consumers. Second, whether frugal innovations actually provide welfare benefits to the BoP consumers and third, to fill the gap of scarcity of frugal innovation studies on non-durable goods. The study was conducted among 126 respondents residing in one of the areas of highest level of head count per-capita poverty rate in southwestern Nigeria. Respondents in the study area were found to earn less than \$1.70 a day. They were also found to purchase low-cost small-sized FMCG offerings of personal and home care products and food and beverages. The study shows that respondents in the study area considered (on a five-point agreement scale) quality (4.18), affordability (4.15), availability (4.10) and sustainability (4.08) to be the sought-after features they consider when procuring the products. Furthermore, results also reveal that respondents indicated (on a five-point impact scale) that the frugal products consumed were very impactful (4.59) on improving personal hygiene. They also indicated that the frugal products were somewhat impactful on reducing household expenditure (3.50) and effecting less incidences on diseases (4.00) while they suggested that the products had a moderate impact (3.40) on providing entrepreneurial opportunities. The study concludes that firm strategies not geared towards creating these features in frugal innovations may not be successful in the FMCG BoP market and that low-cost small-sized FMCG products actually provide welfare benefits to BoP persons.

KEYWORDS

Frugal innovations; Bottom-of-the-pyramid; Fast-moving consumer goods, Welfare benefits; Product features

1. INTRODUCTION

Innovation is considered to be the driver of economic development in modern times. The introduction of new products, processes, organisational procedures and marketing methods created by innovation has helped to create new firms, industries and job opportunities in developing and developed countries. Innovation has also been used in addressing immediate socio-economic and developmental challenges such as providing access to drinking water, eradicating neglected diseases and enhancing food security (OECD, 2012a). For example, the introduction of high-yield and pest and drought resistant seed varieties has been found to improve productivity, income, access to health care and entrepreneurial opportunities for small-scale agricultural practitioners (Oyebola et al, 2017; Adejuwon, 2019). According to Baskaran and Mehta (2016) innovation is associated with technological achievements and it plays a critical role in the world economy.

However, there can be negative effects of innovation. According to Rangan et al. (2015), innovation has been a source of income inequality and social exclusion, deprivation and alienation. Innovation relies on technological advancement and this has resulted in the unemployment of unskilled labour and disparities in income and productivity within and across industries. These have also resulted in unemployment and the winding up of technologically challenged firms. Innovation has also led to reduction in employment due to the increasing use of robots in the production process

and the exclusion of the poor from innovations that enhance physical well-being such as washing machines, dish washers and carpet cleaners. The foregoing has resulted in more acute income disparities not only within African countries but between developed and sub-Saharan African countries (Ilori et al., 2019). This issue has raised concerns among development and management practitioners and has raised a debate on how innovation can be more inclusive in addressing the problems of poverty in developing countries.

Inclusive innovation can be defined as new goods and services which are developed for the billions of poor people living at the bottom-of-the-economic-pyramid (BoP) (Foster and Heeks, 2013). This is a class of innovations purposely developed to meet the yearnings of the common people. Inclusive innovations address the aspirations of populations with low incomes. There are however, many types of inclusive innovation. Inclusive innovation can be frugal, Grassroots, community-based and below-the-radar among others. Grassroots innovation occurs when innovations are produced by members of the very group that the inclusive innovation is supposed to cater for. They usually involve the use of traditional or adapted use of modern technology (OECD, 2012b; Kumar and Bhaduri, 2014). Below-the-radar innovations are developed by rural based small- to medium-sized firms using locally available resources and new technologies for the poor (OECD, 2012b). Frugal innovation has been referred to as systematic attempts by Multi-national Corporations (MNCs) to cut out the luxury and unnecessary features of products developed for

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high-income markets. This class of innovations seeks to bring products, services and systems within the reach of billions of poor and emerging middle-class consumers at the middle and base of the economic pyramid (Bhatti, 2012; Zeschky et al., 2014).

MNCs are recognizing and pursuing the opportunity to serve the BoP market through frugal innovations because this market constitutes the largest untapped global market (Nakata and Weldner, 2012; Tiwari et al., 2016; Ilori et al., 2019). The main idea behind frugal innovations was for MNCs to develop low-cost products for low-income consumers (Hart and Christensen 2002; Prahalad and Hart 2002; Wooldridge 2010; Soni et al., 2014). However, inclusive innovation is based on achieving equality for people that have been excluded from society. Frugal innovation makes a distinction because it focuses on equity (Bound and Thornton, 2012).

According to Swami and Mphole (2016) the BoP market is estimated to consist of about four billion people who earn below \$2.50 per day. Majority of these people live in rural areas in developing countries such as Africa, South Asia, Eastern Europe, Latin America, and the Caribbean. This market segment is not homogenous as it consists of different groups of consumers with varying incomes, access to distribution channels and communal infrastructure across regions and countries (Subrahmanyam and Tomas Gomez-Arias, 2008).

Many facets and constructs of frugal innovations have however remained understudied. Firstly, there are growing tensions between MNCs and development practitioners about the actual beneficiaries of frugal innovations (Cross and Street, 2009; Chataway et al., 2014; Ilori et al., 2019). There are fears among development practitioners that MNCs may be the only beneficiaries of the production of frugal innovation. This debate makes it expedient to determine whether there are actually welfare benefits that accrue from the consumption of frugal innovations by BoP consumers.

Secondly are the key features of frugal innovations. As far as the features of frugal innovations are concerned, there are two perspectives. The first is from the perspective of the MNCs. For example, in a study of 30 examples of frugal innovations Rao (2013) propose that key features can be low cost, easy to use, portable, zero maintenance, low energy consumption, durability and sustainability. Zeschky et al. (2011) argue that frugal innovations may be achieved by reduction in size, limitation of core features, less automation and tailored for environments with poor infrastructure. The second perspective emanates from the BoP consumers and various authors have noted some key features of frugal innovations and why BoP consumers may purchase them. For instance, Anderson and Markides (2007) argued that, for any product to meet the frugal innovation conditions, it must not jeopardize the criteria of affordability, acceptability, availability and awareness. Angot and Ple (2015) also mention the dimensions of affordability, good performance, sustainability, and usability as key characteristics of frugal innovation. The foregoing multiplicity of features suggest that industry specific empirical studies may be necessary to explore how BoP consumers characterize frugal products. Furthermore, studies on fast-moving consumer goods are scarce as most studies have concentrated on durable goods and appliances used by professionals (such as in healthcare facilities) on BoP persons concentrated in resource scarce communities.

This study was conducted in the fast-moving consumer goods sector in Nigeria for three reasons. First, it is an area where MNCs are very active in the Nigerian industrial landscape and second, the sector is one of the largest industrial units in the Country. Third, 133 million Nigerians are multidimensionally poor (NBS, 2022a) and may be considered a veritable target for a BoP market. While Nigeria's yearly retail consumption in 2013 was \$388 billion, it is estimated to rise to \$1.4 trillion per annum by the year 2030. This makes Nigeria an attractive market for MNCs and an apt area for a study such as this (Leke et al., 2014; Adeola and Anibaba 2018).

2. LITERATURE REVIEW

Frugal innovations are products, processes, marketing or organizational methods that aim to reduce inputs in manufacturing and organisational processes with the intention to lower to the barest minimum the cost of purchase of the innovations while at the same time achieving a minimum standard of quality (Tiwari and Herstatt, 2012). Through frugal innovations, low-income individuals in resource poor environments have been able improve their living standards. Frugal innovation has aimed to solve pressing societal problems through ingenuity, while simultaneously generating revenue for MNCs (DeSimone and Popoff, 2000; Porritt 2012).

These innovations aim to create employment opportunities, and incorporate excluded groups in to formal economies, thereby ensuring

inclusive growth (Adejuwon et al., 2016). Many of the targets of MNCs frugal innovations are in rural areas. This has made marketing frugal innovations a logistical challenge for many of the MNCs. Many MNCs have developed marketing models to incorporate rural people in their distribution networks thus providing business opportunities for them. In this way, frugal innovations may provide some welfare benefits for people in the supply chain.

Tran and Ravaut (2016) conducted research on frugal innovation in the healthcare sector and speculated that technology is crucial to advance inclusiveness in healthcare systems. The authors reported that though inexpensive and imperfect, frugal innovations may have the power to ensure that healthcare is inclusive. The authors went further to distinguish types of frugal innovation in medicine as those that reduce cost of treatment and techniques that adapt existing technologies to lower costs and provide affordable treatment to all. Technologies that lower costs (or lean tools) developed for environments characterized by scarcity are sometimes so cost-efficient that they have been introduced as solutions used in high-income settings.

These technologies are not simply stripped-down low-cost versions of medical equipment used in richer countries but are sometimes so technologically advanced that they have been found to be more durable, compact, multi-functional, and sustainable (Zeschky et al., 2014). The study concluded that where there are resource constraints, healthcare providers often fashion novel solutions to provide adequate healthcare to patients.

Frugal innovation may not only raise the standard of living of BoP consumers but it may also provide business opportunities. One main challenge of MNCs as far as frugal products is concerned is setting up distribution networks in rural areas where BoP consumers usually reside. In these areas, large departmental stores do not usually set-up shop in these areas because of fear of not achieving economies-of-scale. Adeola and Anibaba (2018) reported that many MNCs have established links to informal outlets such as street vendors and branded kiosks in rural areas to distribute their products. These outlets may provide employment opportunities for the rural poor. The potential benefits of frugal innovations to the well-being people at bottom of economic pyramid should not be overlooked. Amongst these benefits that may accrue are hygiene and nutrition, providing business opportunities, reduced household costs and improves access to micro-credit.

In terms of features, frugal innovations provide solutions specifically for the low-income market (Agarwal and Brem, 2017). Bedi and Vij, (2016) reported that the consumers in BoP markets always support products that have a low cost of ownership, that is affordable over the life-cycle of a product. Affordability is therefore supposed to be a main feature of frugal innovations ensured by low prices and additional financing options to reach large parts of the population. However, it has also been reported that BoP consumers desire and are able to pay for quality products tailored to their needs (Nakata and Weldner, 2012). Therefore, concentrating simply on low costs in the BoP market may not be a successful strategy for MNCs. The desire for high quality of the frugal innovation appears to be a contradiction to the concept of frugality. Many authors have pointed out that MNCs strive to provide a certain minimum standard of quality in their frugal product offerings. Weyrauch and Herstatt (2016) report that frugal innovations often meet high quality standards in terms of technology, performance, robustness and core benefits. Acceptability by the target market is also a key feature of frugal innovations. Frugal innovations, even more than main stream innovations must fulfil certain specific requirements and quality standards. This is because they are to fit optimally into specific resource constrained environments which may make product acceptability a priority (Tiwari and Herstatt, 2012). Therefore, an important feature to be considered is the acceptability of the product by the BoP market. Sustainability is another important feature of frugal innovations. This term can however be ambiguous if not properly defined and situated in the proper context. Sustainability may imply eco-friendliness, low carbon impacts or green products. In the context of this study however, it means consumers are able to maintain purchases over a period of time and MNCs are able to set up distribution networks to reach the BoP market (Rao, 2013; Adejuwon et al., 2016). The crux of the frugal innovation over all other mainstream innovation is its emphasis on sustainability. Frugal innovations are best identified as the response of firms to the current age of austerity, resource constraints and sustainability concerns. These responses according Hossain (2021) come in the form of sustained quality and affordable offerings over time.

3. RESEARCH METHODOLOGY

Data for the study was obtained through primary and secondary sources.

Primary data were collected from the BoP persons through the use of questionnaire and interviews. The South Western region of Nigeria which consists of six States namely; Lagos, Oyo, Ogun, Ekiti, Osun and Ondo was selected as the area of study. The BoP people were selected using a multi-stage sampling technique. The first stage entailed the purposive selection of one State with the highest level of head count per-capita poverty rate in the region. Ekiti State with 29.70% level per capita poverty measure was selected. At the second stage, three local government areas (LGAs) in rural areas of the State were purposively selected. These LGAs were selected based on the lowest population per LGA. It is expected that local governments with the lower populations will have more people living at the bottom of the economic pyramid. At the fourth stage, only respondents living in mud-brick houses were randomly selected. It is expected that these people could not afford cement brick houses.

A set of questionnaire was used to elicit information on the welfare benefits of the FMCG frugal products sold in the study area. The design of the questionnaire includes two parts with the first part containing questions on the socio-economic characteristics of the respondents to confirm their BoP status, while the second part captures questions relating to the welfare benefits of the frugal innovations and the most sought-after features of the products. Pictorial representations of the frugal products were added to the questionnaire for the respondents to indicate which of the products they frequently purchased. These products were selected from the product range of FMCG companies (accessed at onlinedailys.com) that produce food and beverages and toiletries. The firms are; *Nestle Nigeria Plc, Unilever Nigeria, Friesland Campina, WAMCO Nigeria Plc, PZ Cussons, Chi Limited, OK Foods and Deli Foods*. Products that fulfil the criteria for cost reduction through reduction in product offerings were considered. These are goods that have been offered in single-serve small sizes to reduce costs. That is, they are made by MNCs and satisfy the conditions of considerably lower initial cost or purchase price. That is, same-for-less and maintain core capabilities (Basu et al., 2013; Zeschky et al., 2014; Ostraszewska and Tylec, 2015). For example, toothpaste can be offered in 140g tubes and 10g sachets and powered chocolate can be found in 500g tins and 20g sachets. Selling milk chocolate power and other foods has been a means by which MNCs have been able to reach BoPs in over 30 african countries (Adeola and Anibaba, 2018). Though in smaller sizes, they maintain the same core capabilities as the large offerings. The respondents were asked to rate impact of the products on the welfare measures specifically hygiene, entrepreneurial opportunities, reduced household costs, and less Incidence of disease using a five-point Likert scale that is; 1 = no impact; 2 = slight impact; 3 = moderate impact; 4 = somewhat impactful and 5 = very impactful. A five-point agreement scale where 1 = strongly disagree to 5 strongly agree was used to ascertain the features that best describes the products they purchased. In-depth interviews were conducted on 10% or 13 randomly selected respondents to confirm the information gathered on by the questionnaire and obtain background information and stories regarding the objectives. The questionnaire was interpreted in the local language to respondents who did not understand the questions posed in English language.

4. RESULTS AND DISCUSSION

First, the study confirms that the subjects of the study are BoP persons and that they purchased frugal offerings from MNCs. A total of 126 respondents were found to be living in houses made of mud bricks in the LGAs. The analysis showed that 48.4% of the respondents were females while 51.6% were males. This is in line with estimates of ratio 1.2 male to 1 female. This seems to match the gender ratio in the projected population for 2022 for the age range under study (NBS, 2022b). The largest share (42.9%) of the respondents were found to be between the ages of 21 to 29 years of age. This may be because the survey excluded the 0 to 20 age group which constitutes almost half of Nigeria's population according to NBS (2022b) estimates. The next largest age group in Nigeria was however found to be the 20 to 29 years of age group (NBS, 2022b). Nineteen percent of the respondents held degrees from tertiary institutions while about 13% had no formal type of education while the rest attained primary (29.4%) and secondary (38.9%) education. However, Globaldata (2021) estimates Nigeria's literacy rate for 2021 at 77.62%. The smaller percentage of respondents with no education may be an indication that the Country's literacy rate is improving. About 21% of the respondents indicated that they earned less than N15,000 (\$17) monthly while 29.4% earned between N15,001 and N30,000 (\$17 to \$ 34). Half of the respondents however earned between N30,001 and N45,000 (\$34 - \$51) monthly. This indicates that the highest the respondents may have earned is equivalent to about \$1.70 a day meaning that the respondents fall in the category of BoP consumers.

Table 2 shows the frugal products bought by the BoP persons in the study area. The products are categorized into 3 namely; personal care, home

care and food and beverages. In the homecare category, 76.2% bought a particular brand of homecare product while 84.1% of the respondents have purchased a brand of personal care. In the food and beverage category, 84.8% of the respondents have purchased a frugal offering. These results imply that the respondents regularly use a product of frugal nature thus making the sample suitable for the study.

Table 3 reports the features that best describes the products that the BoP consumers purchased. These mean scores imply that the respondents agreed that these features best described their choice of frugal products. The standard deviation values are within the -2 to 2 range which indicates that measurements are close to the true values. Unpredictably, quality had the highest mean of the variables considered and can be regarded as the most sought-after feature the respondents used to make decisions about their purchase. The respondents agreed (4.17) quality best described the products they chose to purchase. Though as far as durable goods are concerned, quality seems to be a most sought-after feature due to the fact that customers may find attach durability and maintainability features to items of high-quality (Weyrauch and Herstatt, 2016). However, with regards to products that will probably be used once, this finding may be an unexpected result. Interviews to make further enquiries revealed that respondents majorly chose smaller offerings of products with the higher quality as they could not afford the larger offerings of the products since they were even more expensive than others. The mean rating of this feature was followed by affordability as the respondents generally agreed (4.15) that this was an important feature to their purchase decisions. Affordability seems to be the core and foremost feature of frugal innovation as MNCs seeks to reduce prices through many strategies such as stripping products of core features, achieving economies of scale, R&D and cheaper sources of raw material among others. These strategies must however match the BoP consumers of perception of lower costs. From the previous result of quality, removing too many core qualities of innovations to reduce prices may not be an effective strategy.

Furthermore, the results showed that the respondents agreed that acceptability (4.10) was also a core feature. This concept is sometimes used only in the perspective of "acceptable quality" in the literature. However, interviews revealed that it also ties in the other concepts of affordability, quality and sustainability. Finally, the respondents agreed (4.08) that sustainability is a key issue. Interviews revealed that this is not to be misconstrued with green innovations and environmental concerns but the sustained ability of the products to deliver value and at an affordable price.

Table 4 reports the welfare benefits of the products. Respondents indicated that the products purchased were very impactful (4.59) on improving general hygiene in spite of the fact that food and beverages were also included in the category of products. Interviews revealed that there were no better alternatives to the personal and home care products. Some disclosed that it was easier to use these products as they were better alternatives.

Particularly, the use of chewing sticks traditionally for oral hygiene had lost traction due to the time it takes to complete the task of cleaning teeth. Some also revealed that making soap themselves was not a worthwhile venture anymore because of the tedious nature of the production process. The respondents indicated a moderate impact (3.40) of the products on creating entrepreneurial opportunities in the supply chain of the products. About 20% of the respondents indicated that they were traders of some sort. Most of the trading activities included the sale of agricultural produce but also largely the retail of the same products that were examined was observed. Interviews with traders revealed that the availability of small sizes of the products enabled their customers purchase the products and that large offerings were hardly bought. Some also claimed that they made a living from selling the products and without these offerings they did not believe that they would have a viable business venture.

The OECD (2012a) report that persons on the higher income scales on the BoP are able to start business ventures while people on the lower rungs need assistance to survive. This may be the reason for the moderate impact of the products on creating entrepreneurial opportunities as only a few could start a business (Adeola and Anibaba, 2018; Banwo and Momoh, 2022). Respondents also indicated that the products were somewhat impactful (3.50) on reducing household expenditure. While frugal innovations are expected to provide BoP persons with products, they otherwise would not have been able to afford, the idea that they also reduce household expenditure may serve as additional welfare benefits as such income can be saved for future or unforeseen expenses. The results also showed that the products were somewhat impactful (4.00) on reducing incidence of diseases among the respondents. Particular mention

was made during the interviews on the access to the small sachets of milk which provided proteins and vitamins. It was revealed that medical

personnel always prescribed milk as a remedy for malnourishment which the children consumed in its powdered form.

Table 1: Socio-economic Characteristics of the Respondents

Characteristic		Frequency	Percentage
Gender	Male	65	51.6
	Female	61	48.4
	Total	126	100.0
Age	18 - 20 years old	10	7.9
	21 to 29 years old	54	42.9
	30 to 39 years old	23	18.3
	40 to 49 years old	18	14.3
	50 years old and above	19	15.9
	Total	124	100.0
Education	None	16	12.7
	Primary	37	29.4
	Secondary	49	38.9
	Tertiary	24	19.0
	Total	126	100.0
Occupation	Unemployed	26	20.8
	Farming	32	25.6
	Trading	26	20.8
	Artisan	8	6.4
	Others	33	26.4
	Total	125	100.0
Monthly income	Less than N15,000	26	20.6
	N15,000 to N30,000	37	29.4
	N30,000 to N45,000	63	50.0
	Total	126	100.0

Table 2: Frugal Fast-moving Consumer Goods

Product		%	Yes	%	Frequency	%
Home care						
Omo laundry soap	55	43.7	70	56.3	125	100
Sunlight Laundry soap	30	23.8	96	76.2	126	100
Zip Laundry soap	89	70.6	37	29.4	126	100
Morning Fresh Dish Washing Liquid	58	46.0	68	54.0	126	100
Personal care						
Close Up Toothpaste	20	15.9	106	84.1	126	100
Pepsodent Toothpaste	89	70.6	37	29.4	126	100
Lux Bathing Soap	81	64.3	45	35.7	126	100
Vaseline Body Lotion	71	56.3	55	43.7	126	100
Imperial leather Bathing Soap	115	91.3	11	8.7	126	100
Cussons Baby Lotion	105	83.3	21	16.7	126	100
Premier Bathing soap	69	54.8	57	45.2	126	100
Robb Ointment	52	41.3	74	58.7	126	100
Joy bathing soap	63	50	63	50	126	100
Food and Beverages						
Milo Chocolate Drink	19	15.2	106	84.8	125	100
Lipton Tea	79	62.7	47	37.3	126	100
Peak Milk	39	31.0	87	69.0	126	100
Three Crowns Milk	55	43.7	71	56.3	126	100
Chivita Juice	98	77.8	28	22.2	126	100
Happy Hour Fruit Juice	95	75.4	31	24.6	126	100
Caprisonne Juice	112	88.9	14	11.1	126	100
Blue Band Butter	108	85.7	18	14.3	126	100
Hollandia Yoghurt	94	74.6	32	25.4	126	100
Hollandia Milk	63	50	63	50	126	100
Maggi Food Seasoning	28	22.2	98	77.8	126	100
Royco Food Seasoning	113	89.7	13	10.3	126	100
Knorr Food Seasoning	73	57.9	53	42.1	126	100
Mamador Cooking Oil	77	61.1	49	38.9	126	100
Devo Kings Cooking Oil	93	73.8	33	26.2	126	100
Indomie Noodles	50	39.7	76	60.3	126	100
Cabin Biscuit	24	19.0	102	81.0	126	100
Cream Crackers Biscuit	70	55.6	56	44.4	126	100
Coaster Biscuit	55	43.7	71	56.3	126	100

Table 3: Key Features of Frugal Products

Feature	N	Mean	Std. Deviation
Affordability	126	4.15	0.77
Acceptability	125	4.10	0.81
Sustainability	126	4.08	0.78
Quality	126	4.18	0.73

Key: 1 = strongly disagree; 2 = disagree; 3 = neutral; 4 = agree; 5 = strongly agree

Table 4: Welfare Benefits of the Frugal Products

Benefits	N	Mean	Std. Deviation
Improved Hygiene	126	4.59	.541
Provides Entrepreneurial Opportunities	126	3.40	1.140
Reduces Household Expenditure	125	3.50	.937
Less Incidence of diseases	126	4.00	.849

Key: 1 = no impact; 2 = slight impact; 3 = moderate impact; 4 = somewhat impactful and 5 = very impactful

5. CONCLUSION

The study concludes that there are indeed welfare benefits BoP consumers may gain from the adoption of frugal innovations in the context of fast-moving consumer goods. While the concept of welfare benefits may be ambiguous in many contexts, the constructs used in this study may have wide applications in innovations in other frugal product categories such as health, drugs, energy and household appliances among others. There are however more product areas and welfare constructs to consider for future studies. In terms of features, it may be beneficial for MNCs enquire into the most important features BoP consumers and in this case, MNCs should must seek to maintain quality despite pursuits for cost reducing strategies.

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