

Innovation and Organization Competitiveness: A study of Dangote Cement Plc., Nigeria

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ABSTRACT

In Nigeria, organizations encounter challenges in competing with their rivals in various aspects, such as product quality, process, organization innovation, and marketing innovation. Given this context, this study investigated the impact of innovation on competitiveness, with a specific focus on an organization in Lagos State. Survey research was employed, and a purposive sampling was used to select the study's organization and departments, which included eight departments. The population consisted of 70 workers, with a sample size of 59 estimated using Yamane's formula. The collection of primary data involved the utilization of a closed-ended questionnaire distributed through convenience sampling, and data was analyzed via SPSS v26, which provided the descriptive results and regression analysis with a 0.05% significance level. The questionnaire's reliability was assessed using a Cronbach Alpha test, yielding a cumulative score of 0.753. According to the study's findings, competitiveness is not statistically impacted by product innovation, process innovation, marketing innovation, and organizational innovation. Consequently, the study recommended a revisit of policy to promote and foster a culture of creativity and collaboration.

Keywords: *competitiveness, marketing innovation, organizational innovation, process innovation, product innovation*

INTRODUCTION

Innovation is a crucial element in the attainment of all seventeen Sustainable Development Goals (SDGs), serving as a fundamental aspect of global business and economic sustainability (Chaparro-Banegas et al., 2024). Several country rankings have been produced with global innovation and competitiveness indexes. Notably, Nigeria's innovation index rating declined from 96th to 117th out of 131 countries between 2011 and 2020, and the country's competitiveness index ranking declined from 115th in 2012 to 116th in 2019. In contrast, Singapore, Hong Kong, and Malaysia secured the top positions in the competitiveness rankings index in 2019, ranking first, third, and twenty-seventh, respectively, and maintained their strong performance in 2020, with rankings of eighth, eleventh, and thirty-third for innovation (WIPO, 2020 and WEF, 2020).

Furthermore, advanced nations such as Singapore, China, the US, and Hong Kong have had significant economic growth due to their emphasis on innovation-driven productivity (Dempere et al., 2023). The advancements seen in these nations have been attributed to the utilization of sophisticated and advanced techniques for coordinating both their domestic and international activities in order to address the challenges presented by globalization (Subrahmanya et al., 2018). Therefore, the current business environment is characterized by intense competition and the need to source cost-efficient resources to cope with changing dynamics (Yıldırım & Erdil, 2024). As a result, organizations are encountering growing pressure to prioritize innovation, discarding conventional strategies in favor of novel initiatives to thrive in the globally market and maintain competition. Consequently, various aspects are becoming increasingly important in the production of goods and services, including research and development, training, design, advertising, and management. Hence, companies need to think outside the box and actively pursue opportunities to gain a competitive edge and expand their business operations.

Undoubtedly, innovation is regarded as a valuable strategy for gaining a competitive edge; hence, there is the need to comprehensively understand the extent and significance of this effect on organization competitiveness, which justifies the rationale for this research. Therefore, the specific objectives of the study involved: Evaluating the effect of product innovation on competitiveness in Dangote Cement Plc, Nigeria. Determining the effect of process innovation on competitiveness in Dangote Cement Plc, Nigeria. Evaluating the influence of organizational innovation on competitiveness in Dangote Cement Plc, Nigeria. Examining the effect of marketing innovation on competitiveness in Dangote Cement Plc, Nigeria.

The following hypothetical assertions were proposed to guide this investigation:

- H₀₁: Product innovation has no significant effect on organization competitiveness.
- H₀₂: Process innovation has no significant effect on organization competitiveness.
- H₀₃: Organizational innovation has no significant effect on organization competitiveness.
- H₀₄: Marketing Innovation has no significant effect on organization competitiveness.

LITERATURE REVIEW

Conceptual Review of Innovation

Innovation means coming up with and putting into practice novel concepts or procedures that lead to notable progress or expansion. Developing and implementing new concepts or processes calls for businesses to think creatively to solve problems, challenge conventional viewpoints, and adjust to changing customer preferences (Ekeh, 2023). The Oslo Manual (2005) defines an innovative marketing plan, product, service, institutional structure, or approach as one that has been created or recently enhanced. Consequently, innovation can be classified into four broad areas: product, process, marketing, and organization. Furthermore, according to Bloch (2007), innovations have a crucial role in facilitating economic growth. Significantly, the innovation environment in several countries has led to significant transformations, which include:

- The fast spread of Information and Communication Technology
- The prioritization of Research and Development.
- The establishment of global value chains

Also, Garcia and Calantone (2002) described three unique categories of innovation: radical, incremental, and revolutionary. The introduction of novel or unique products or services resulting in significant changes, the birth of fresh businesses and the development of novel ideals, is known as innovation radical. Incremental innovation is the modification and improvement of products, processes, distribution, and production operations in small phases. Revolutionary is, often, the result of ground-breaking scientific or technical breakthroughs, innovations that achieve what most people believe is impossible. Innovation, therefore, is essential to companies as it sets them apart from

competitors, enables them to adapt to changing customer tastes and market circumstances, and eventually increases output, customer happiness, and profitability.

Types of Innovation

According to the OECD (2005), the following comprise the categories of the concept of innovation:

Product Innovation: Products innovation occurs when a service or offering is introduced to the market and then enhanced in response to feedback from consumers. This includes notable enhancements to materials and components, integrated software, convenience for users, or other useful characteristics. Innovations in product design may make use of fresh information or technology, or they might build on previously established information or technology in novel ways. Therefore, any current product of a company is considered a new product if it differs substantially from its earlier offerings in terms of features or intended usage. For example, the production and introduction of a brand-new cement (Dangote BlocMaster Cement, a 42.5-grade) by Dangote using the same chemical composition as their old cement but includes additional cementitious ingredients, such as slag, fly ash, processed sand, Ultrafine GGBS, and silica fume (Punch, 2018). These properties make the cement stronger and last longer while reducing the cement's carbon footprint.

Marketing Innovation: Marketing innovation refers to the introduction of a novel approach to advertising a product that makes substantial changes to its labeling, placement, promotion, or price (Medrano et al., 2020). The goal is to increase sales for the company by better meeting consumer requirements, repositioning the product on the market, or penetrating new markets. The innovative company might come up with a new marketing strategy on its own or borrow it from another company; hence, any product, whether new or old, may benefit from innovative advertising strategies. A new marketing strategy may incorporate substantial alterations to the product's design (alterations to the product's shape and style rather than changes to its functionality). Products whose packaging is the primary element in establishing the product's visual identity may also undergo such modifications. An example of marketing innovation in product design would be a cement product that underwent a major packaging redesign to increase its visibility and customer base. This redesign would include a new bag design for the product, which would give it a more eye-catching appearance and potentially attract customers. For example, Dangote Cement currently has up to four different design packages for its goods.

Process Innovation: Process innovations result in lower production or delivery costs, higher product quality, or the creation or delivery of entirely new or substantially altered goods (Damanpour & Gopalakrishnan, 2001). The process of production includes all the tools and procedures that go into making a product or providing a service. The use of computer-aided design for product development in cement manufacturing or the installation of equipment are examples of modern production processes. Equipment, software, and strategies to source inputs or transport final goods are all part of the delivery process. newly introduced strategic process can include the following;

- Developing procedures for project management
- Introducing a Global Positioning System (GPS) device for truck and goods-tracking
- Implementing a reserve system for cement.

Additionally, the Improvements to methods, tools, and software facilitate processes like financial accounting, selling, maintenance, and information technology, which are also part of process innovations. For example, new and improved tools and tracking technologies, such as fleet video systems, concrete truck monitoring GPS devices, and millers for both fine and coarse grinding, such as the ball mill and rod mill for cement production, have been introduced.

Organizational Innovation: Organizational innovation involves implementing new ways of managing and structuring work processes and procedures (Alshura et al., 2023). This includes adopting, implementing, and establishing training techniques, supply chain management, business restructuring, a model for staff autonomy, partnerships with vendors, consumers, and research institutions, and outsourcing - manufacturing, purchasing, shipping, hiring, and supporting services (Abbas et al., 2020). For example, one major tactic the Dangote group strives to utilize for competitive advantage is workers' training and performance reward systems through team-building activities, rewards based on teamwork, and training on team innovation and creativity. In addition, Dangote Cement employs a meticulous approach to maintain a balance between supply and demand by implementing a robust SCM and value chain strategy to ensure effective scheduling, implementation, control, and evaluation of their operations (Abbas et al., 2020).

Conceptual Review of Organizational Competitiveness

One way to evaluate a business is to look at its competitiveness in relation to its rivals in the same market or sector. According to Ogutu et al. (2023), this concept extends beyond monetary success and includes elements like market position, customer loyalty, brand recognition, staff happiness, and the capacity to swiftly adjust to shifting conditions. Businesses may stay ahead of the competition by enhancing their operating processes, investing in R&D, embracing a growth mentality, and responding to customer preferences (Abbas et al., 2024). According to Tikhonov and Zelentsova (2021), competitiveness edge is crucial in today's economic environment as a key factor to staying in business, attracting customers, capitalizing on opportunities, and making a profit. Porter (1990) investigated the elements that contribute to a country's competitiveness to explain why some nations are very good at some things while others fail. According to the author, productivity is the key element defining a nation's competitiveness, determined by the number and quality of the activities engaged in production and output. Therefore, to obtain long-term productivity benefits, organizations must continually improve product quality via effective marketing, organizational and process activities (Wijaya et al., 2023). In essence, businesses aim to either expand into new markets, keep current customers happy, or get new customers while retaining the ones they already have. However, to effectively do this, companies need to figure out what their rivals are lacking and then come up with a strategy to use innovation (in processes, products, marketing, and organization) to meet customers' demands. This could include making use of previously unrealized market potential or launching a whole new market from scratch; hence, businesses should not consider innovation as a luxury but a necessity.

Theoretical Review

According to open innovation theory, businesses improve their innovation capacities by drawing on internal and external sources of ideas and using traditional and non-traditional channels to reach customers (Marullo, 2020). The theory posits that businesses can benefit from combining ideas from within and outside (from customers, suppliers, competitors, research institutions, and businesses providing supplementary products) rather than relying solely on in-house brainstorming to enhance productivity through innovation (Enkel et al., 2020). According to Orlova (2019), open innovation theory outlines several essential principles, such as accessible borders, inward and outward inventiveness, partnership, patent and trademark management, and environmental engagement.

Empirical Review

The effect of new marketing strategies on manufacturing SMEs' competitive advantage was examined by Nafula et al. (2019). With the use of multiple linear regression, the study examined the survey responses of 284 people. The results showed that almost all manufacturing SMEs were actively innovating, with a primary emphasis on incremental improvements on a modest scale. There was a favorable and statistically significant relationship between marketing, process, and organizational structure advancement and competitiveness. Mbogori et al. (2018) did an empirical study to investigate the impact of innovation on the performance of cement-manufacturing companies. The sample included

79 department heads. The collection of primary data was accomplished via the use of closed-ended questionnaires. The assessment of the questionnaire's validity and reliability was conducted by using Cronbach's Alpha. The data was examined using descriptive statistics, and regression analysis was used to investigate the relationship between the variables. The correlation study showed that there is a positive connection between product innovation and enterprise performance, as assessed by competitiveness. The correlation coefficient (r) was 0.544, indicating a moderate positive link. The coefficient of determination (R^2) was 29.6%, suggesting that 29.6% of the variability in enterprise performance can be explained by product innovation. The p -value (P) was 0.000, indicating that the relationship between product innovation and enterprise performance is statistically significant. Therefore, the null hypothesis is rejected, and H_1 is accepted due to the strong influence of product innovation on performance, which provides firms with a competitive advantage over their competitors.

In addition, Zhang (2024) examined the influence of innovation on the level of competitiveness in building projects. Structural equation modeling technique was used to examine multiple-factor models, and statistical analysis was conducted using AMOOS, SPSS 22.0, and the PROCESS. One hundred eighty-four building-related experts were chosen to complete the survey forms, which primarily comprised real estate, reconstruction units affiliated with China Railway Development Management Group, professional engineering and architecture structures, executive engineering consultancy units, and other entities. The findings revealed that innovation impacts both competition and sustainability, also, sustainability has an effect on the connection between innovation and competitiveness to a lesser extent. Overall, engaging in creative activities and adopting sustainable practices correlates with increased firm competitiveness. An investigation was conducted by Chukwunulu (2019) to examine the influence of organizational innovations on the growth of manufacturing enterprises in Nigeria. The Generalized Methods of Moments were used to assess the data, revealing that organizational innovation significantly influences businesses' growth to a large extent. The Adj R^2 result revealed that organizational innovations were responsible for 79% of the variances seen in the growth of manufacturing businesses. This implies that innovation plays a significant role in predicting Nigerian manufacturing companies' growth and positively impacts economic advancement. The effects of product innovation on sales performance as a competitive strategy were investigated by Mahemba and De Bruijn (2021). A total of 250 workers were selected for the research using a combination of stratified sampling and purposeful selection. Data was collected primarily through a questionnaire, which was analyzed using SPSS version 20. According to the findings, the company was able to boost its competitive position and attract and retain customers by using two strategies: the creation of novel products and packaging innovation. The results showed that product innovation positively impacts competitiveness and increases sales performance favorably.

In addition, Nnodim et al. (2020) examined the impact of Nigerian banks' capacity to innovate in terms of both products and processes on their competitiveness. A total of 244 individuals took part in the research by completing structured questionnaires using the cross-sectional survey approach. Managers from sixteen publicly listed banks operating in the southern region of Nigeria took part in the research, and the influence was evaluated using Structural Equation Modelling (SEM). The findings indicated that both innovations in products and innovations in processes had a positive influence on the competitiveness of the company. Similarly, Timotius (2023) conducted a quantitatively investigated the impact of innovation on competitiveness using a sample of twenty-nine MSMEs to examine four hypotheses. The study analyzed three mediating elements, people, process, and product innovation, as independent variables, while competitive advantage was considered as the dependent variable. The researchers employed purposive sampling and administered a questionnaire to a targeted set of respondents. Significantly, the T -test results demonstrated that the company's strategy of innovating in people, processes, and products had a significant influence on its competitive advantage. Evidently, innovations in processes and people boost them by 47.2% and 44.5%, while innovations in products boost business advantages by 53.1%, respectively. A study conducted by Dahunsi (2023) explored the correlation between competitiveness and innovation. The research used the panel VAR Granger causality technique to investigate the link using secondary data from forty-three enterprises in Nigeria. The results indicated a reciprocal link between competitiveness and innovation, where one aspect

impacts the other. Innovation, according to the research, boosts competitiveness, especially for manufacturing firms measured by capital intensity.

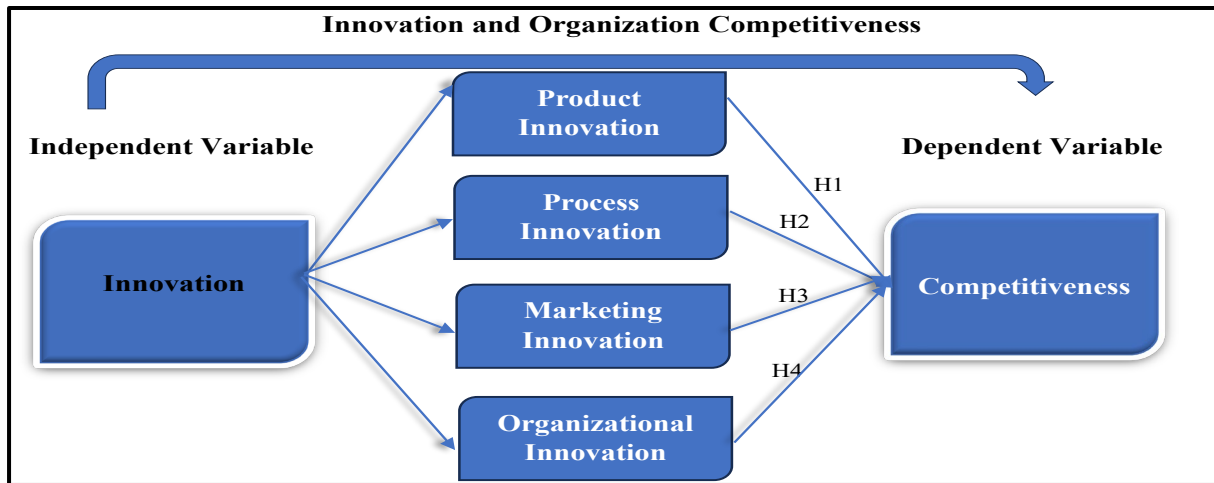


Figure 1: Innovation and Organization Competitiveness

Source: Authors' Conceptualization (2024)

Figure 1 illustrates the study's model, which consists of the concepts that form the basis of the research. Each arrow reflects a hypothesized link between the opposing variables, a presumed relationship between the independent variables: innovation (product, process, marketing, and organizational innovation) and the dependent variable (Organization Competitiveness).

METHODOLOGY

The study used survey research methods. The study's organization and departments were selected through purposive sampling, including production, marketing and sales, HR, operations and procurement, inspection and quality, warehousing, innovation and design departments. The study population comprised 70 workers selected using a simple random selection method, and Taro Yamane's formula (1967) was used to estimate the sample size to be 59. Using a closed-ended questionnaire, primary data was obtained, and convenience sampling was used for data distribution, which targeted willing and available participants to fill out an online survey form. Data was analyzed using SPSS v26, where frequency, mean, and standard deviation were presented and analyzed. Hypotheses were analyzed using simple regression with a 0.05% significance level. The outcomes of the pilot research are detailed below:

Table 1: Reliability Statistics

Cumulative Cronbach Alpha	No. of variables
.753	5

Table 2: Item-Total Statistics

Variables	Cronbach Alpha	Remarks
Product Innovation	.716	Reliable and Acceptable
Process Innovation	.721	Reliable and Acceptable
Marketing Innovation	.604	Reliable and Acceptable
Organizational Innovation	.602	Reliable and Acceptable
Competitiveness	.817	Reliable and Acceptable

The reliability test indicates the questionnaire had a cumulative Cronbach's alpha score of 0.753 with the variables' individual score being; Process Innovation (.721), product innovation (.716), Marketing Innovation (.604), Organizational Innovation (.602) and competitiveness (.817).

HYPOTHESES TESTING: REGRESSION ANALYSIS

Table 3: Model Summary

Predictors: (Constant)	Model	R	R ²	Adjusted R ²	Standard. Error	Durbin-Watson.
Product Innovation	1	.179 ^a	.032	.006	.66402	1.656
Process Innovation	1	-.155 ^a	.024	-.002	.66678	1.722
Marketing Innovation	1	.272 ^a	.074	.049	.64952	1.714
Organizational Innovation	1	.115 ^a	.013	-.014	.67049	1.602

Dependent Variable: Competitiveness

Table 4: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Significance
		B	Std. Error	Beta		
1	(Constant).	3.041	.751		4.050	.000
	Product Innovation	.196	.177	.179	1.108	.275
1	(Constant)	4.351	.520		8.374	.000
	Process Innovation	-.136	.143	-.155	-.955	.346
1	(Constant)	3.073	.472		6.507	.000
	Marketing Innovation	.200	.116	.272	1.719	.094
1	(Constant)	3.597	.397		9.069	.000
	Organizational Innovation	.072	.102	.115	.703	.487

Dependent Variable: Competitiveness

H₀₁: Product innovation has no significant effect on organization competitiveness.

An R-value (correlation coefficient) of .179, as shown in Tables 4 and 5, indicates a 17.9% strength of the association between product innovation and organization competitiveness in the selected organization in Lagos State, Nigeria. Product innovation explains just 3.2% of the observed variance in organization competitiveness, according to the R-squared value of 0.032. Plus, the t-statistic value of 1.108 and p-value of 0.275 indicate positive but no statistically significant effect of product innovation on the competitiveness of the organization, leading to the acceptance of the null hypothesis (H₀).

H₀₂: Process innovation has no significant effect on organization competitiveness.

The tables show an R-value of -.155, revealing that process innovation and organization competitiveness are inversely related in the chosen organization in Lagos State. The R-squared value of 0.024 indicates that 2.4% of the observed variation in organization competitiveness can be attributed to process innovation. Additionally, the p-value of .346 and t-statistic value of -0.955 hence, there is no statistically significant evidence to imply that process innovation has an effect on the competitiveness of the organization, leading to the adoption of the null hypothesis (H₀).

H₀₃: Organizational innovation has no significant effect on organization competitiveness.

The findings revealed an R-value of .272, suggesting a 27.2% level of association between Marketing innovation and organizational competitiveness. This implies that in the selected organization in Lagos State, there is a positive correlation between the variables. With an R-squared value of 0.074, it is deduced that the variance in organizational competitiveness is explained by a 7.4% influence of

organizational innovation. Additionally, marketing innovation has a positive but statistically insignificant effect on organization competitiveness within particular organizations in Lagos State, according to the t-statistic = 1.719 and the p-value of .094, supporting the acceptance of the null hypothesis.

H₀₄: Organization innovation has no significant effect on organization competitiveness.

Furthermore, the findings revealed an R-value of 115, suggesting an 11.5% correlation between Organization innovation and organization competitiveness. This implies that in the selected organization in Lagos, competitiveness of the organization and innovation are positively related. Also, an R² value of 0.013 indicates that organizational innovation accounts for a mere 1.3% of the observed variation in organizational competitiveness. The p-value of .487 and the t-statistic value of .703 indicates in favor of accepting the null hypothesis, which states that organizational innovation has a positive but statistically insignificant effect on organizational competitiveness.

DISCUSSION

The research evaluated the effect of innovation on competitiveness, specifically focused on an organization located in Lagos State. The findings indicate that product innovation positively impacts the competitiveness of the organization investigated, albeit this effect was not statistically significant. On the other hand, process innovation had no positive or statistically significant effect on competitiveness. These findings contradict the assertions made in the quantitative studies conducted by Timotius (2023) and Nnodim et al. (2020), who discovered a statistically significant correlation between product and process innovation and competitiveness. In addition, this study's findings are at odds with those of Mahemba and De Bruijn (2021), who found that product innovation significantly and positively affected competitiveness. Furthermore, the findings indicated that both marketing innovation and organizational innovation had positive effects on competitiveness. Nevertheless, none of the impacts yielded statistically significant results. These results directly contradict the assertions made by Nafula et al. (2019), who stated that marketing and organizational innovations had a substantial and positive effect on industrial competitiveness. The findings also dispute the findings of Chukwunulu (2019), who found that organizational innovations had a significant effect on competitiveness, explaining a substantial 79% of the variance in competitiveness in manufacturing organizations. In contrast to prior research findings (Zhang, 2024; Dahunsi, 2023; Mbogori et al., 2018), the present study contradicts the notion that innovation has statistically significant effects on competitiveness by asserting that there is no such effect.

CONCLUSION

The results revealed favorable impact of product innovation, marketing innovation, and organizational innovation on competitiveness. So, we conclude that product innovation, marketing innovation, and organizational innovation generate positive impact on competitiveness, though not statistically significant. The following recommendations are proposed based on the results: In order to increase the significance of competitiveness via process and product innovation, Organizations should use new and improved tools and methods in the process of creating goods or rendering services, as well as introducing new and improved services or products to the market. This may be accomplished by increasing funding for research and development (R&D), aggressively seeking input and participation from relevant stakeholders, carrying out in-depth analyses, and contrasting results with those of leading industry players to locate opportunities for innovation. For marketing innovation to have greater effects on companies' competitiveness, businesses should try new things when promoting their products by making new and improved changes to how products are labelled, designed, packaged, and promoted. Management can accomplish this by conducting thorough market research to learn about customers' preferences, coming up with innovative advertising strategies, making use of effective marketing tools,

and exploring various pricing options and product/service bundles to satisfy customers' desire for value. In order to enhance the influence of organizational innovation on competitiveness, organizations should foster an innovation-friendly culture by recognizing and rewarding originality, willingness to take risks, and collaboration. This can be achieved through initiatives such as staff training and exploring alternative structures to facilitate inventiveness, rapid adaptation and decision-making processes.

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AUTHORS' CONTRIBUTION

Majekodunmi S. A. conceived and planned the research exercise. Iyobhebhe, I. collected data and conducted data analysis. Ogundele, J. I. provided guidance and finishing touch on the paper.

CONFLICT OF INTEREST DECLARATION

The first author is a Ph. D. student, the second author is a lecturer/thesis supervisor providing mentorship, the third author is the seating Coordinator of the Department of Business as the time of development, submission and publication of this paper. We certify that the article is the author's and co-authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This research/manuscript has not been submitted for publication nor has it been published in whole or in part elsewhere. We testify to the fact that all authors have contributed significantly to the work, validity and legitimacy of the data and its interpretation for submission to Jurnal Intelek.

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