



**RHYTHMIC REALIGNMENTS, PATTERN REINFORCEMENTS THROUGH RITUALS
AND RESPONSIBLE MANUFACTURING IN NIGERIA**

KPAKOL, ABORLO GBARAKA, PHD

Department of Business Administration
Faculty of Administration and Management
Rivers State University, Port Harcourt
Nigeria

GABRIEL, JUSTIN MGBECHI ODINIOHA, PHD

Department of Business Administration
Faculty of Administration and Management
Rivers State University, Port Harcourt
Nigeria

ONYESEINBO DOKUBO

Sawyer Business School
Suffolk University, Boston, MA 02108
USA

ABSTRACT

This research addressed rhythmic realignments and the extent to which new patterns or behavioural modifications to manufacturing are sustained through reinforcements from organisational rituals in enhancing outcomes of responsible manufacturing in Nigeria. The study is conducted as a mono method, adopting the quantitative method in the collection and analysis of the data. The study population comprised seven manufacturing companies in Rivers State, purposively selected in line with the focus of the research. The research also anchored on the dynamic capabilities theory, espousing the imperatives of capacity development in line with the global concerns over environmental and social degradation. Correlation assessments revealed significant relationships between rhythmic realignments (environmental and social) and responsible manufacturing, however, organisational rituals are observed to have an insignificant mediating effect on the variables. The result affirms the significance of rhythmic realignment to organisational relevance and validation, especially in line with emerging sustainability concerns. It was concluded that rhythmic realignments are essential in ensuring adherence and an improved disposition toward responsible manufacturing in Nigeria. It was also recommended that manufacturing companies draw on the unique environmental and social concerns of their context in the development of useful and suitable patterns or responsible operations.

KEYWORDS: - Rhythmic realignment, responsible manufacturing, environmental and social degradation, dynamic capabilities.

1. INTRODUCTION

The Nigerian economy is described as environmentally dependent (Onakoya, 2018; Ngene et al, 2016). This is because, even before the discovery of oil and other natural resources, the country was predominantly fixated on agricultural production and exports (Ngene et al, 2016). While the focus on agriculture has shifted considerably, the impact of industries and economic dependence on the environment has not. Over the years, this focus has intensified alongside growing business interests and emerging opportunities, cascading into the increased exploitation and degradation of the environment (Igbudu & Amadi, 2018). Such have negatively impacted the eco-system, with reports (Allen-Taylor, 2023; Babatunde, 2023) highlighting concerns of deforestation, terrestrial aquatic encroachment, and land pollution. Babatunde (2023) posited that this pattern and the lack of consideration of the social and environmental implications of such are degenerative not only in terms of the obvious or evident problems associated with these patterns to manufacturing but also given their long-term effects on the future of the country.

Global research linked to sustainability development and practices (Ritchie et al, 2020; Binns & Reeves, 2023; Ugboma, 2015), appears fixated with the oil and gas industry. This attention is unarguably justified given reports Binns and Reeves (2023) of the energy (fossil) industry as foremost on the ranking for global industries with the most pollution effects on the environment, as it accounts for around 37.12 billion tonnes of greenhouse emissions into the atmosphere annually. Nonetheless, such focus only narrows and downplays a broader and encompassing challenge which cuts across a variety of sectors and industries worldwide; especially given the role other industries have played and continue to play in the pollution of the environment. One of such is the global manufacturing industry, which according to Ritchie et al (2020), is third on the list of industries and accounts for greenhouse emissions at a rate of 6.3 billion tonnes annually. In Nigeria, responsible manufacturing poses a major challenge, especially due to established patterns of operations within the country and the effect of such behavioural patterns on the environment.

Research (Zheng et al, 2014; China, 2023; Onakoya, 2018) affirms a link between responsible manufacturing and the well-being or quality of life of groups or communities directly impacted by the activities or operations of manufacturing firms, especially in Nigeria. This concern is not only specific to Nigeria but is also considered a global challenge as emphasized by the United Nations Sustainability Development Goals (SDG) (Ritchie et al, 2020). Soparnot (2011) argued that modifications to established behavioural or operational patterns, such as observed in the manufacturing industry, can be daunting for organisations, more so, when such patterns have been relied on for decades and have come to reflect the organisation's rhythm and operational disposition to the environment (Poels et al, 2017; Tucker & Hendy, 2014; Staudenmayer et al, 2002). To effectively adjust and achieve sustainable outcomes such as responsible manufacturing, it is important that interested firms realign their rhythm, and reinforce emerging and suitable patterns through ritualised actions that are emphatic of social and environmental values (Nayak & Chia, 2011; Poels et al, 2017; Boyer & Lienard, 2020).

While the terrain of research addressing responsible manufacturing is well-trodden, scant attention has been expressed in line with the relationship between rhythmic realignments and responsible manufacturing in Nigeria, even so, not much has been done on the role of organisational rituals as a possible mediator of such a relationship. This research aimed to investigate the role of rhythmic realignments in responsible manufacturing in Nigeria. To this end, the specific objectives of the study are threefold. (a) to ascertain particular modifications to manufacturing practices by Nigerian firms in line with environmental and social concerns (b) to determine the correlation between such environmental and social based modifications, or lack of, and outcomes of responsible manufacturing by Nigerian firms, and (c) to examine the mediating role of organisational rituals on the relationship between rhythmic realignment and responsible manufacturing by firms in Nigeria.

2. LITERATURE REVIEW

Dynamic Capabilities Theory

To clarify the relationship between rhythmic realignments and responsible manufacturing, this research adopted the dynamic capabilities theory as its theoretical foundation and base for espousing the relationship between the variables (Barreto, 2010; Kumar & Yakhlef, 2014). The dynamic capabilities theory is a theory that identifies with the imperatives of capacity development and the reconfiguring of behaviour or systems, in line with the emerging demands of the environment (Barreto, 2010). Proposed by Teece and Pisano in 1994 (Dong et al, 2016), the dynamic capabilities theory focuses on the bridging of functions or operations with context; thus, it recognizes the need for behaviour to be responsive and aligned to the increasingly dynamic environment of the organisation. Poels et al (2017) observed that just like living biological organisms, organisations too have rhythms stemming from their need for effectiveness and survival. Such rhythms determine the extent of their embeddedness and ability to flow with the tide and align with the changes or overarching rhythm of the environment as well.

The dynamic capabilities theory applies to this research in that it provides a suitable framework for predicting outcomes of organisational rhythmic realignment, especially with regard to the Nigerian manufacturing industry. The theory emphasizes the development of the organisation's resources, utilizing such in ways that uniquely serve its purpose and facilitate its effectiveness (Swoboda & Olejnik, 2016). Some scholars (Adeniji et al, 2013; Chavez et al, 2022) have also identified relational capabilities and the extent to which partnerships and business collaborations can be used to advance the organisation's strategic and competitive position. These as argued, enable the organisation to build on the capacities and strengths of others. However, the core position of the dynamic capabilities theory, which also draws on the resource-based view, is that organisations have distinct experiences and that no two organisations, even within the same industry are the same (Swoboda & Olejnik, 2016; Dong et al, 2016; Aninkan, 2018).

To stand out, organisations must be able to identify and capitalise on their uniqueness in ways that go beyond economic or financial benefits, to advancing their functional and operational well-being, within their context (Nayak & Chia, 2011). For example, multinational companies such as SHELL and ENI AGIP, which despite huge revenues from oil production, were constantly in conflict with various stakeholders and embattled by court cases which not only impacted their reputation and

image but also contributed to high levels of inefficiency and strained relationships for these organisations (Ugboma, 2015; Igbudi & Amadi, 2018). The theory of dynamic capacity thus proffers a posture to firm-environment fit, exchange and interdependence that is reinforced by the organisation's commitment through its internal disposition and processes, allowing for the alignment of the organisation's rhythm with that of its environment; such that is reflected in the suitability of its patterns and behaviour given the social and environmental concerns of its environment (Barreto, 2010; Swoboda & Olejnik, 2016).

Organisational Rhythm and Rhythmic Realignment

Organisational rhythm describes the patterns, and the cycle of processes, operations and actions, repetitive in nature, which demonstrates the organisation's response to its environment, and its disposition toward the accomplishment of objectives and goals (Poels et al, 2017; Leroy et al, 2015; Ancona & Chong, 1996). Rhythms mirror the organisation's pace when it comes to change and the extent to which it readily adapts, adjusts and reconfigures itself, given emerging market realities and conditions (Shi & Prescott, 2012; Weik, 2015; Maitlis & Christianson, 2014). The organisation's rhythm in this sense, is its patterned approach toward matching the overarching realities of its environment. More specifically, the organisation's rhythm is reflected in the organisation's functional schedules, human resource development and management practices, technology development, and method of operations, all of which demonstrate the organisation's momentum of movement in line with the change events that mark or define its environment (Poels et al, 2017; Tucker & Hendy, 2014; Johns, 2018). It also translates as those practices or actions, necessitated or emerging from the imperatives of change as it concerns time, competition and environmental considerations, and the extent to which such (practices and actions) are suited to the demands of the context (Shi & Prescott, 2012; Aninkan, 2018).

Rhythmic Realignment and Responsible Manufacturing

Manufacturing is central to the economic well-being of any country (Sola et al, 2013; Simbo et al, 2012). Apart from the extraction and refining of raw materials for consumption, manufacturing also entails the creation of utility, through the offering of valuable products and services. However, the process of manufacturing depends substantially on the use of tangible materials, a process that often leads to waste generation; such that can be hazardous, toxic and irking to decent living (Simbo et al, 2012). Bjorkdahl (2020) observed that the increasing calls for green manufacturing are in line with the noted impact and devastation resulting from the poor control and management of the negative effects of manufacturing operations and activities on the social and environmental well-being of communities. Responsible manufacturing thus, describes the conscious and intentional approach to manufacturing that focuses on the minimization and elimination of waste, and the monitoring of production and operational activities on host or local communities (Bjorkdahl, 2020; Sola et al, 2013; Zheng et al, 2014).

The imperatives of responsible manufacturing are also highly pronounced in Nigeria. Babatunde (2023) reported that Nigeria currently falls amongst the top 30 countries with the worst waste management practices. Allen-Taylor (2023), corroborates this observation, noting that only 20% of the large waste produced in the country is collected through a formal system. A figure substantially

lower than the 44% reported by the World Bank to be the average collected by African Sub-Saharan countries. It is also far less when compared to the 90% collection rate reported by European countries. This not only raises concerns as to the shortcomings of Nigerian manufacturing but also demonstrates the increasing shift in focus and attention by the global community in line with waste management, especially, given growing concerns of climate change and environmental deprecation. Allen-Taylor also noted, the poor approach to waste management, is also tied to the poor living standards and health decline in most communities and local environments in the country. The Environmental Performance Index (EPI) score for Nigeria is presented in Figure 1.

Nigeria Environmental Performance Index (EPI) scores

A score of 100 indicates high performance while a score of 0 indicates low performance

EPI	Rank	Scores
Waste Management	152	12.70
Unsafe Sanitation	174	6.00
Recycling	171	4.70
Controlled Solid Waste	123	16.70
Ocean Plastic	124	12.70

The 2022 EPI provides a quantitative basis for comparing and analyzing environmental performance for 180 countries

Table: Dataphyte • Source: EPI • Created with Datawrapper

Figure 1: Distribution of Nigeria's EPI for the year 2022.

Source: Babatunde (2023).

Shown in Figure 1 is the distribution of the waste management performance for 180 countries across the globe. The distribution demonstrates the need for improved waste management activities, particularly within industries such as manufacturing, which as noted, contribute substantially to the overall waste deposits in the country. Igbudu and Amadi (2018) posited that irresponsible industrial practices persist in Nigeria as a result of three major factors (a) the high tolerance for such by members of the society and governing officials, (b) poor regulatory and monitoring activities by governing bodies, and (c) and most importantly, the inertia and unwillingness of manufacturing firms to adjust and emphasis technologies and approaches to manufacturing that align with global practices and recommendations when it comes to responsible production and manufacturing. Onakoya (2018) affirmed the increasing technological changes in manufacturing and industrial practices; a changing trend that has continued over centuries from the onset of steam engines (industry 1.0), to mass production, assembly lines and electricity (industry 2.0), to automation and information technology (industry 3.0), and currently, an advancement toward robotics, 3d printing and smart technologies (industry 4.0).

H1: Rhythmic realignments of a social concern significantly correlate with responsible manufacturing in Rivers State, Nigeria

H2: Rhythmic realignments of an environmental concern significantly correlate with responsible manufacturing in Rivers State, Nigeria

Rhythmic Realignment and Organisational Rituals

Rituals describe the various activities and actions that are engrained in behaviour and which, fundamentally, serves to reinforce values and transition between phases (Boyer & Lienard, 2020; Watson-Jones & Legare, 2016). At the group or organisational level, rituals are important in sustaining the traditions of the organisation. Rossano (2012) described organisational rituals as a tool for integrating and advancing cohesion in the workplace. Organisational rituals are important for the development of the organisation as they contribute to its character, and are also useful in the marking of change or key transitions in the organisation through related ceremonies. According to Stein et al (2021), organisational rituals are the predictable and repetitive behaviour expressed and conducted by organisations in line with strengthening their values and boosting the togetherness or bond between members of the organisation.

Tian et al (2018) noted that as a facet of the organisation's culture, rituals are often engaging and aim at preserving the beliefs and values of the organisation. Boyer and Lienard (2020) rituals are predefined, clearly structured and designed to enrich the behaviour and processes of the organisation, offering meaning to its collective. In this vein, it is useful in the crystallization of ideologies, patterns or norms. This agrees with Rossano's (2012) observation that while rituals are necessary in ensuring continuity and the preservation of traditions, they can also be adopted in the establishment of new systems, and changes in behaviour. This is because they are conditioning factors which instil in the organisation's members, a sense of duty, responsibility and commitment to its cause. Watson-Jones and Legare (2016) on the other hand, identified organisational rituals are embodying much more; arguing that rituals are a communication tool that can also be used to address related functional or operational lapses in the workplace. According to Watson-Jones and Legare (2016), the effectiveness of rituals depends on their consistency, the depth of their meaning, and the extent to which it is symbolic of the organisation's core values and beliefs.

Through rituals, emerging change concerns and the realignment of behaviour or patterns can be provided the necessary support. Rossano (2012) noted that in addressing organisational change, rituals provide the framework in which members are guided, adjusting to the related modifications in the behaviour of the organisation and of their roles in such change. However, researchers have also argued that values, unlike organisational objectives or goals, do not necessarily change, despite the emerging changes or dynamic nature of the environment. This is because, values represent the central or underlying priorities and principles that shape the organisation's disposition to performance, relationship with stakeholders and commitment to ethical conduct (Stein et al, 2021; Rossano, 2012). As such, organisational rituals can be considered useful in the engraining of such principles and values in the workforce, and in ensuring that such are embedded in the psyche of the organisation.

H3: Organisational rituals significantly mediate the effect of rhythmic realignments on responsible manufacturing in Rivers State, Nigeria.

3. METHODOLOGY

This research was underpinned by a positivist epistemological assumption and philosophy of the social world; thus, it adopted a mono method which focused on the application of the quantitative methodology (Saunders et al, 2019). The population for this research was seven manufacturing companies in Rivers State, with a total of 28 management staff, engaged as referents, purposively sampled based on key roles and positions in line with decision-making and supervision in the respective manufacturing companies. Data was generated using the structured questionnaire, drawing on its noted usefulness in ensuring data specificity and research focus. Instrumentation anchored on previous research and operational definitions on the constructs (Poels et al, 2017; Sola et al, 2013; Stein et al, 2021) with the construct (convergent and discriminant) validity utilised in the assessment of data. Each construct was assessed using a 7-item instrument, scaled on the 5-point Likert scale. The reliability test for instruments was carried out using the Cronbach alpha, based on an alpha threshold of $\alpha > 0.70$.

Data Analysis and Findings

The result, following the analysis of the data is presented in this section. Results address the (a) univariate analysis of the descriptive distribution for the particular modifications to manufacturing practices by Nigerian firms in line with environmental and social concerns, (b), the test for the bivariate assessment of correlation between organisational rhythmic realignment dimensions of environmental and social rhythmic realignment, and outcomes of responsible manufacturing by Nigerian firms, and (c) the test for the mediating role of organisational rituals on the relationship between rhythmic realignment and responsible manufacturing by firms in Nigeria.

Univariate Data Analysis

The summaries for the data on the variables are illustrated using the table 1. The analysis centred on identifying dominant features and characteristics that demonstrate the extent of the realignment or modification of manufacturing operations in line with both environmental and social concerns of the context, and in that manner, substantially reflecting realignments and the adoption of manufacturing patterns that match or are in synchrony with the emerging global trends.

Table 1: Summary distribution for the variables

	N	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Environmental Rhythmic Realignment	28	4.0663	1.00451	-2.020	.441	2.682	.858
Social Rhythmic Realignment	28	4.0510	.93412	-2.028	.441	2.699	.858

Responsible Manufacturing	28	4.0612	.95193	-1.666	.441	1.260	.858
Organisational Rituals	28	4.1888	.77961	-2.033	.441	3.917	.858
Valid N (listwise)	28						

Source: Survey Data (2024)

The evidence on the univariate analysis, affirms actions and practices that demonstrate shifts and actual modifications in the behaviour of the manufacturing companies, particularly in line with concerns of the impact or effect of the organisations on the social ($x = 4.0510$) and environmental ($x = 4.0663$) well-being of their context. The result as such reveals evidence of the involvement of the organisations in behaviour which reflects responsible manufacturing ($x = 4.0612$). Similarly, evidence from the analysis affirms to the emergence of practices or traditions in line with behavioural shifts or rhythmic realignments, as a way of institutionalizing or effectively advancing such transitions in the behaviour of the organisation.

Bivariate Data Analysis

The test on the bivariate hypotheses is carried out using the PLS-SEM. The result is presented using Figure 2.

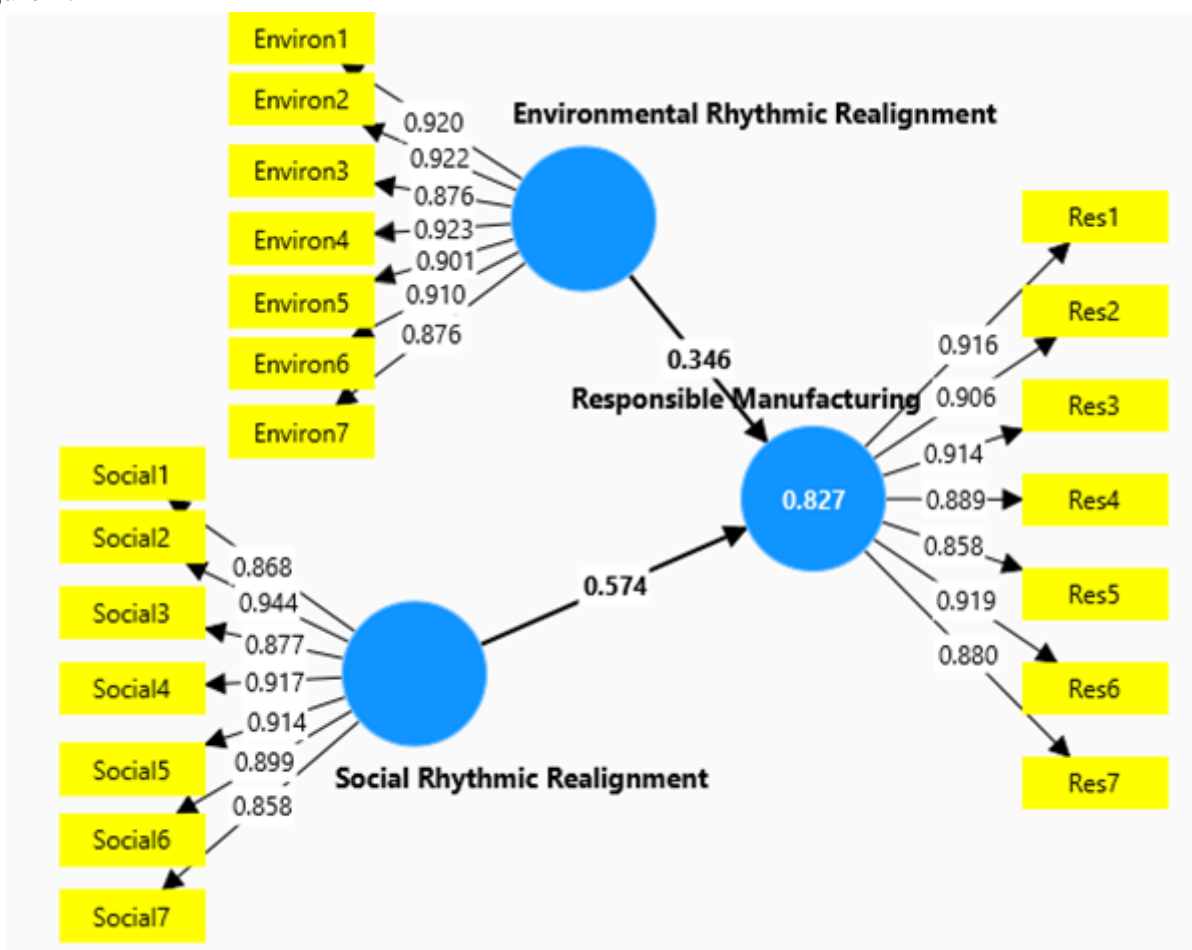


Figure 2: Result for correlation between rhythmic realignment and responsible manufacturing

The result from the test identifies both environmental and social rhythmic realignments as significant to the outcome of responsible manufacturing in Rivers State. The result (Figure 2) affirms the positive role of rhythmic realignment toward the achievement of responsible manufacturing by the organisation. Evidence shows that the social rhythmic realignment ($\beta = 0.574$ and $P = 0.000$), although moderate in terms of correlation, can be considered stronger in terms of its position as an antecedent of responsible manufacturing, compared to rhythmic realignments that are based on an environmental concern ($\beta = 0.346$). Thus, both bivariate hypothetical statements are affirmed as true, based on the evidence.

Multivariate Data Analysis

Mediation analysis for the contextual effect of organisational rituals on the relationship between rhythmic realignment and responsible manufacturing. A three-step assessment for mediating effect is adopted where (a) step one, affirmation of evidence of the significance ($P > 0.05$) of the relationship between predictor and contextual variable, (b) step two, affirmation of evidence of the significance of the relationship between contextual variable and criterion variable, and (c) step three, the evidence of a dominant and more significant indirect (through contextual variable) relationship between predictor and criterion variable, compared to the direct relationship between the variables. The result of the analysis is presented in Figure 3.

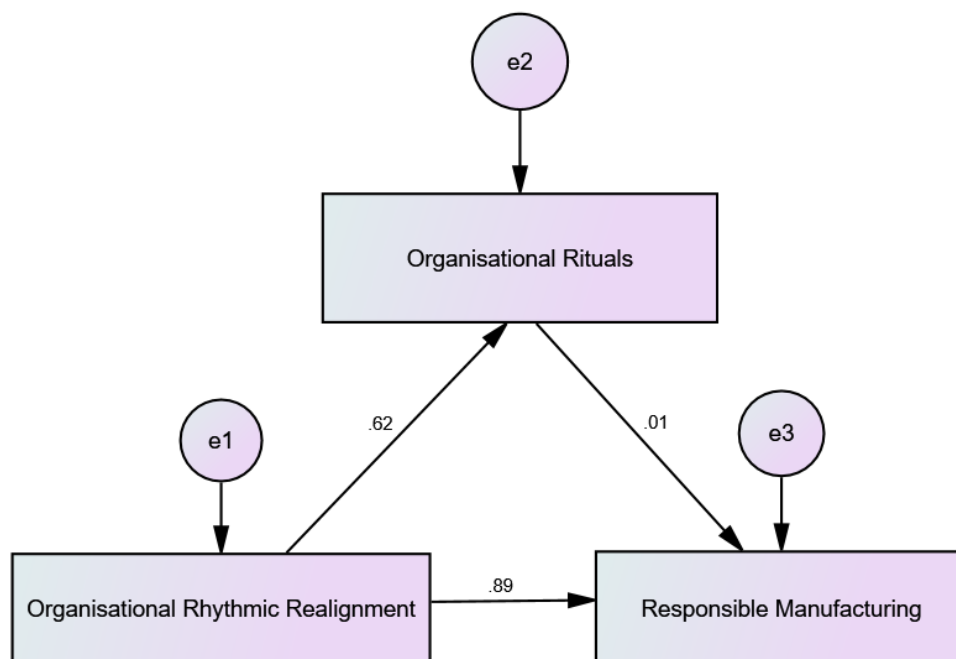


Figure 3: Result of bootstrapping mediation test for the role of organisational rituals

The test for the mediating role of organisational rituals, on the relationship between rhythmic realignment and responsible manufacturing, is revealed to be insignificant. While the relationship between organisational rhythmic realignment and organisational rituals is affirmed to be significant (where $P > 0.05$), thus establishing step one, the nexus between organisational rituals and responsible manufacturing is revealed to be weak and insignificant (where $P < 0.05$). Furthermore, the direct relationship between organisational rhythmic realignments and responsible manufacturing

is revealed to be stronger and more significant ($\beta = 0.89$ and $P > 0.05$) compared to the indirect relationship ($\beta = 0.062$ and $P < 0.05$). In line with this evidence, the multivariate hypothesis of the significant mediating role of organisational rituals is thus rejected.

4. DISCUSSION AND IMPLICATIONS OF THE FINDINGS

The rhythmic realignment of manufacturing companies offers not only a matching of internal and behavioural patterns with the emerging concerns of the context, but it also increases the level of embeddedness of the organisation; strengthening its validation within its operational context or environment (Johns, 2018). The observed relationship between rhythmic realignment and responsible manufacturing is therefore such that mirrors the growing accountability of manufacturing companies, and their increasing demonstration of shifts toward responsible manufacturing in the country. This position is expressed in the adjustments by a wide range of Nigerian manufacturing companies that are currently controlling their waste, and adopting green and sustainable methods and technologies in their manufacturing activities (Igbudu & Amadi, 2018; Onakoya, 2018; China, 2023). The findings also reiterate the views of scholars (Ogar & Samuel, 2019; Bjorkdahl, 2020) on the extent to which related modifications in line with sustainable goals, serve to align the organisation's interests with broader global interests.

This research, through its evidence, affirms to the tenets of the dynamic capabilities' theory (Rossano, 2012) and the application of such within the context of the Nigerian manufacturing industry. The particular concerns of change in this sense, not only call for a reconsideration of actions or practices but also, the development of capacities and infrastructure necessary for the effective actualisation of related goals (Maitlis & Christianson, 2014; Leroy et al, 2015). The environmental and social rhythmic realignment of manufacturing organisations thus offers these organisations a repositioning within their industries that can be considered strategic to global partnerships and healthier relationships with key stakeholders within their local contexts as well. Shi and Prescott (2012) noted that the synchrony or alignment between organisational behaviour and the flow or trend of activities within its environment is crucial to its relevance and capacity for economic value. Related shifts and realignments in the manufacturing activities and practices of Nigerian organisations, demonstrate commitment to social and environmental concerns, thus, reinforcing responsible manufacturing values and contributing to the sustainability of these companies.

5. CONCLUSION AND RECOMMENDATIONS

This research, based on the evidence offered, affirms the imperatives of both social and environmental rhythmic realignments in reinforcing and enhancing the adoption and engagement of organisations in responsible manufacturing in Nigeria. The extent of adjustments in behaviour, allows for modifications that ensure the organisation's capacity for sustained value, healthier relationship with stakeholders and increased validation within their context of operation. While organisational rituals do not significantly mediate the relationship between organisational rhythmic realignment and responsible manufacturing, it is nonetheless, crucial in establishing and sustaining the new patterns and behavioural practices, embedding such in the traditional practices and value system of the organisation. Thus, it is the position of this research that related modifications and

realignments to Nigerian manufacturing operations based on environmental and social concerns, provide the necessary shifts toward responsible manufacturing and that way, synchronize the organisation's interest with global concerns in a way that is beneficial and advantageous to the organisation. Building on this outcome, the following recommendations are put forward:

- i. The modifications or realignment of manufacturing operations based on environmental concerns, should be such that is supported and sustained through relevant policies, infrastructure and operational frameworks, tailored in line with the particular issues of energy efficiency, waste management and optimal resource utilisation unique to the context of the Nigerian manufacturing industry.
- ii. The shifts or adjustments in manufacturing behaviour based on social concerns can be strengthened and reinforced through the development of support programs and funding for social welfare and the well-being of communities and stakeholders of the organisation. This is important in strengthening the social ties of the organisation, and its partnerships, including its advancement of healthier and more collaborative relationships or systems where it is able to access the necessary support and resources, necessary for them to thrive.
- iii. The leadership and management of manufacturing organisations in Nigeria, should develop rituals, such that duly capture and emphasizes their values for the environment and the social well-being of their context of operation. This is important in ensuring continuity and a sustained commitment to practices that are environmentally friendly, and supportive of the social fabrics and communal ties that characterise and define their context of operation.

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