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## New product development process and its impact on business performance in Nigeria

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### Keywords

New Product Development Process, Strategy, Product, Business Plan, Business Performance

### Abstract

*To remain competitive in today's hyper-competitive marketplace, it is important for manufacturing organizations to adopt new processes and systems for the development of their new products as well as improvement of the existing ones. This research proposes a new model that incorporates many factors that are found to positively influence the new product development (NPD) process and business performance and many other important parameters, which negatively affect the application of a new product development model and business performance, are also discussed. The research sample consists of 180 Nigerian manufacturing industries. The sample in this study are designed using convenience sampling method, 2 copies of the questionnaire were administered in each of the 180 manufacturing industries that served as sample. Out of the total sample of 360, 230 useable questionnaires were returned representing a response rate of 63.89%. Data were analyzed with the use of statistical methods such as factor analysis, correlation analysis and reliability analysis. Validity and reliability test indicate that all variables are valid and reliable. Based on the data analysis, the findings observed that although some of the results correspond to the previous findings. However, it is found that culture, strategy and the ability of the personnel affect not only the NPD business plan but also the business performance.*

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### Introduction

The society expects that all the manufacturing industries should continuously improve their business performance. To do this, all industries strive to operate and compete in an expanding and dynamic environment, and new product development is a vital source of competitive advantage. As posit by Grupta et al (1986), Edgett (1996) and Taylor et al (1994), Vourlioti et al (2008) technological evolution, the highly competitive environment and the varying (diversified) customer needs, have forced enterprises to search for and apply new product development processes that could improve their product unique characteristics, quality and business performance. According to Vourlioti et al (2008), Balbontun et al (2000), industries adopt its own standards and different approaches to design new product development process (NPD), depending on its size, types and number of products or services that it produces, as well as its business environment. Consequently some industries focus their attention on the improvement of the product's technical specifications, while other look for new product development processes that could reduce the development time and accelerate the production process and the business performance. Basically, there are two elements needed for an effective new product development – process and people. According to Techeuchi and Nonaka (1989), Wheelwright and Clark (1992), Prasad (1996) and Vourlioti et al (2008) in the last few decades the rule of the new product development “game” have dramatically changed. Industries have

realized that high quality, low cost and differentiation strategies are not enough to lead them to business success (Kaplan and Norton, 2001). Pooltan and Barclay (1998). They posited that innovation should be focused on customers, while its success depends on how much innovation conceptualizes consumers needs and requirement. According to Calantone et al (2000s), Gevirtz (1994), there is no one right strategy for a company, rather for new product development, the different stages are allowed to overlap, and to accelerate the product development process right from the idea generation to commercialization. The product development process should focus on the following strategies, time to market, low product cost, low development cost, innovation and technology, quality, reliability and robustness services and responsiveness (Calatone et al 2000) techniques to speed cycle time while maintaining product quality, and customer satisfaction. Positive business performance includes concurrent engineering, integratig marketing, research and development, teams and reducing product complexity (Gevirtz (1994) Droge et al (2000) Calantine et al (2000).

The objectives of this study are

- The description of NPD processes, which constitute one of the basic success components for a manufacturing industries.
- the determination of the NPD methods that have occasionally been used from manufacturing industries in Nigeria
- The examination of the NPD practices and their importance for business performance.

In summary, the study examines the need for establishing new product development processes and investigates whether the adoption of such processes enhances industries competitive advantage and business performance. Specific factors affecting an enterprise goals / business success are examined and a new model concerning the factors affecting the NPD process is presented.

### **Literature review (conceptual framework)**

According to Armstrong and Kotler (2005) a new product is a good, and service or idea that is perceived by some potential customers as new. New product can be referred as original products, product improvement, product modifications and new brands that the firm develops through its own research and development effort. According to David and Nigel (2001), new products and services introduction can be classified according to (1) newness to the market and (2) the extent of customer value created, resulting in the following types of new products.

Transformational innovation: products that are radically new and the value created is substantial. Examples include CNN news channels, Automated Teller Machines (ATM) and digital cameras.

- Substantial Innovation: Products that are significantly new and that can create important value for customers. Example include Kimberly - Clark Huggies /Nappies and Diet Colce
- Incremental Innovation: New products that provide improved performance or greater perceived value (or lower cost). An example is a new Coca-Cola flavor.

Booz and Allen and Hamiltan (1982), propose six types of new products based on the degree of newness to the firm and market. These includes

- Radical products: Products that are completely new to the world (10%)
- New product line: Products that are new to the organizations but not necessarily new to the markets (20%)

- Additions to product lines: Product that supplement an organizations established product line (26%)
- Modified products are existing products that have undergone some major or minor improvements (26%)
- Repositioned products: Existing products that are targeted to new market segments (11%)
- Cost reduction products: New product that provide similar performance but a lower cost (7%)

According to Ewah et al (2008), new products are the life blood of companies, large or small. Proficiency in new product development can contribute to the success of many companies. If companies can improve their efficiency at launching new products, they could double their bottom line. It is necessary that companies developed new products to replace those that have become outdated or introduce completely new products that will be captivating before larger market.

According to Bowen et al (1994), new product development is a fundamental process for an enterprise and constitutes a basic source for revitalizing and improving firm's competitive advantage NPD is a dynamic process, which requires the combination and exploitation of all the enterprise capabilities, in order for a new product with unique characteristics which will satisfy market needs to be produced (Marsh and Stock, 2003).

According to Ewah et al (2008), new product can be defined as an innovation or modification or invention of an existing product to an extent that consumer perceive the modified version as a different or existing product just entering the market.

In 1996, Lynn Garry et al developed model of new product development success, and the model used a new technique called Benchcashing, which implies sending knowledgeable informant a series of cases and asking them to identify key factors. He and his colleagues uncovered ten critical determinants for successful new product technology and innovation. The factors include:

- having a structure new product development process
- having a clear share vision on the team
- developing and launching a product within the proper time frame
- refining a product after launch and having a long term view
- processing the optimal team skills
- understanding the market and its dynamics
- securing top management support for the team and the team's vision
- applying lessons learned from past projects
- securing good team chemistry
- retaining team members with relevant experience

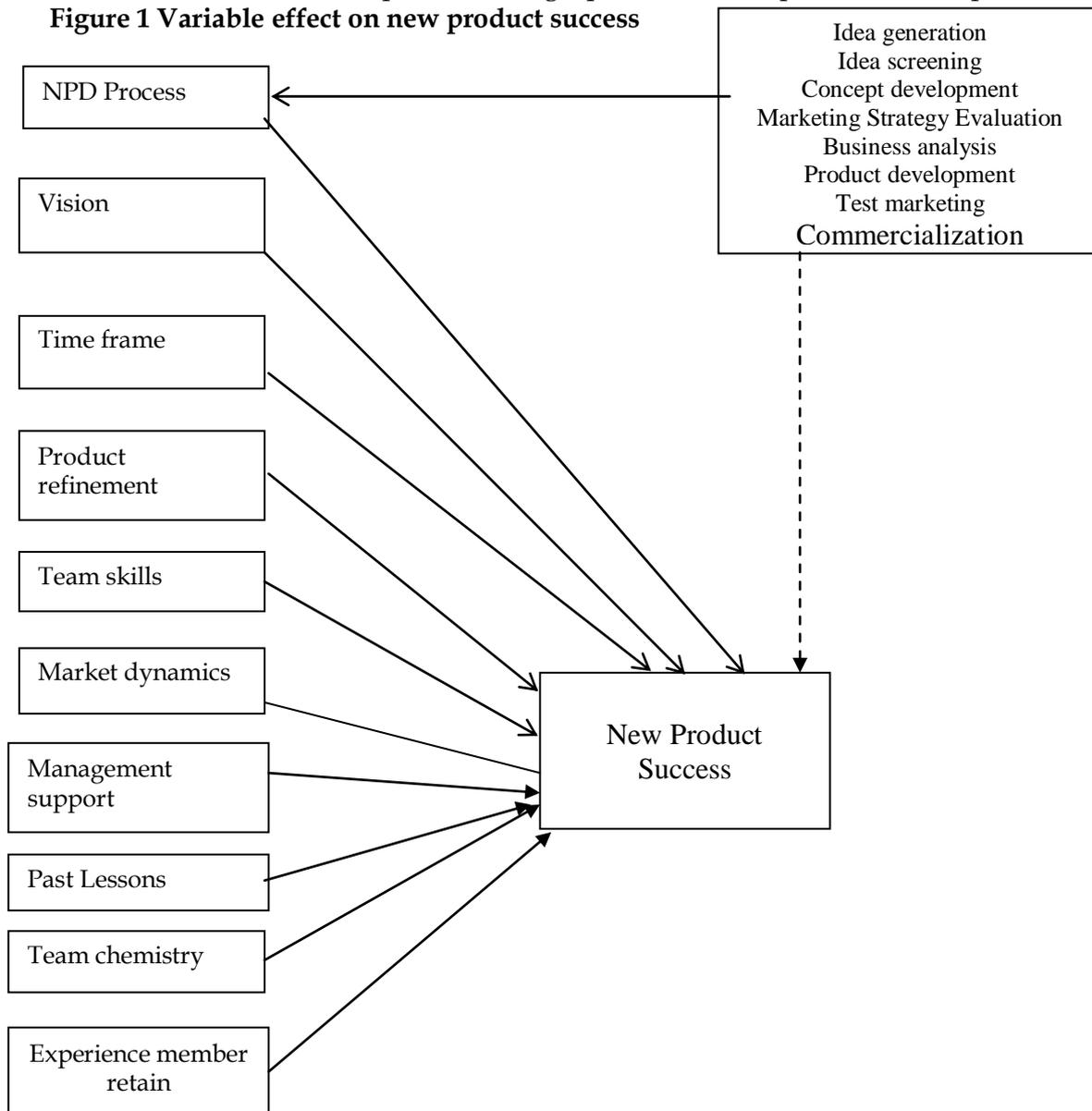
They also posit that, the product development process and a clear and shared vision, are the most critical factors for new product development success. While cooper and Kleinschmidt (1986) found that having a structure new product development process, including idea generation, screening and evaluation, testing development and launch has a positive impact on new product success. Argris and Schm (1978) also assert that having a shared vision of the project is important to new product success. Ewati 2008 posit that vision signal to the new product developers on team members on what the goal is and having a structured "NPD" process gives them or the company a frame work and partial environment for accomplishing the vision.

Other salient steps in NPD includes

- idea generation – systematic search for new product creating idea

- idea screening – most important ideas are selected
- concept development and testing - attractive ideas are refined into testable product concept
- marketing strategy development - involve designing an 'initial entry strategy'
- business analysis – review costs, sales, and profit projections to find out whether it meet company predetermined goal
- test marketing – pilot survey or testing of the product before target market to ascertain their acceptance or rejection for the new product
- Commercialization – if accepted, then large quantities of the product will be produced.

**Figure 1 Variable effect on new product success**



Source: Ewah et al (2008)

### **Empirical evidence of new product success**

According to Ewah et al (2008), in 1994, Mercer Management Consulting in collaboration with the R & D magazine, gathered data from 193 enterprises and found that there are some

relationships between (a) new product development practices and new product development process performance and (b) product life cycle and firms revenues.

According to Haiss (1992) in a study of 200 new business products success and failure introduced by some 100 companies revealed major factors that differentiate winners from losers. These factors were, superiority of the new product, strong market orientation and marketing proficiency, and superior technological and production capabilities. Superiority of the product refers to other competing products in terms of better meeting products in terms of better meeting customers needs, unique features not found in competitive offering, high quality, innovativeness and lower cost to customers. Strong market orientation and marketing proficiency was characterized by the good research prior to product development, good understanding of the market, strong market and distribution efforts, and guidance by knowledgeable marketing people. Superior technological and production capabilities implied that the company had a strong and capable engineering and production base for the new product. Based on these studies, according to Ewah (2008), it can be adduced that certain factors positively affect new product success. For instance, high quality offerings are more likely to succeed than low quality product. The product that better meets customers' needs and offer benefits not found in competitive products stand a better chance of succeeding. In addition, new product success is enhanced when competent and faithful marketing personnel direct the product launch.

### **Benefits of successful new product**

According to Ewah (2008), new product teams strive to develop technical knowledge and achieve commercial objective by building innovation capacity, that would make the company and its product remain competitive in an ever dynamic business environment. Other benefits include

- creates a market for the firm or company's product and improve its productivity level
- sustain the profit of the company as a going concern
- increase consumers selectivity or choice making
- acceptance for a company's product and create a good image for the company
- all resources of a company are put into useful purpose, especially idle resources
- reduces the threat of obsolescence which hangs over some products
- result of full employment level for the firm and growth of the economy
- result to company diversification objective
- Translate to positive diffusion process in the minds of market segment.

### **Response why some, new products fail**

According to Agbonifor et al (1998) as adduced by Forster (1978) which encapsulates the views of other scholars, new products fail because of the following reasons

- the basic concept, specification or proposition was at a fault or out of step with the true nature and needs of the markets, technology or manufacturing capabilities of the company
- price, size, performance, disability or specification may be wrong
- technological skills of the company may have been stretched beyond reasonable bonds
- assessment of market potentials and its location were wrong, or the estimate of the timing (of either acceptance by the market or launching of the products) was wrong
- competitive strength, especially the power to launch a countermove, was underestimated
- there as no systematic programming or control of the work
- technical and production design and planning were rushed

- the whole product planning operation was badly organized or rushed
- all other research and evaluation were skipped or rushed
- too much time was taken in the initial launch, other companies managed to leap frog into the national market and establish their market position first
- The products were “Ivory Tower” The product were out of the tune with the market needs and therefore the products were unassailable.
- The global or international aspects were over looked

But in the case of our society (Nigeria) the main reason for new product failure could also include, poor quality, artificial features, lack of information about the product, resistance to change by some consumers, false content, indecent packaging, stringent government policy and laws among others (Ewah et al 2008).

### The relationship between new product development process and business performance

There are few works that discusses about the relationship between new product development process and business performance (|Vourlioti et al 2008), Adis and Jublee (2010), Zirger and Madique (1990), Cooper and Kleinschmidt (1995), Balbontin et al 2000, among others. They posit that new product development process success is influenced by certain factors - the new product development plan, importance of firms strategy, the required personnel skills for an effective new product development process, management involvement in the new product development process, organizational culture, the importance of the new product development process for improving product quality and the importance of the new product development process for improving business performance.

### Research Model

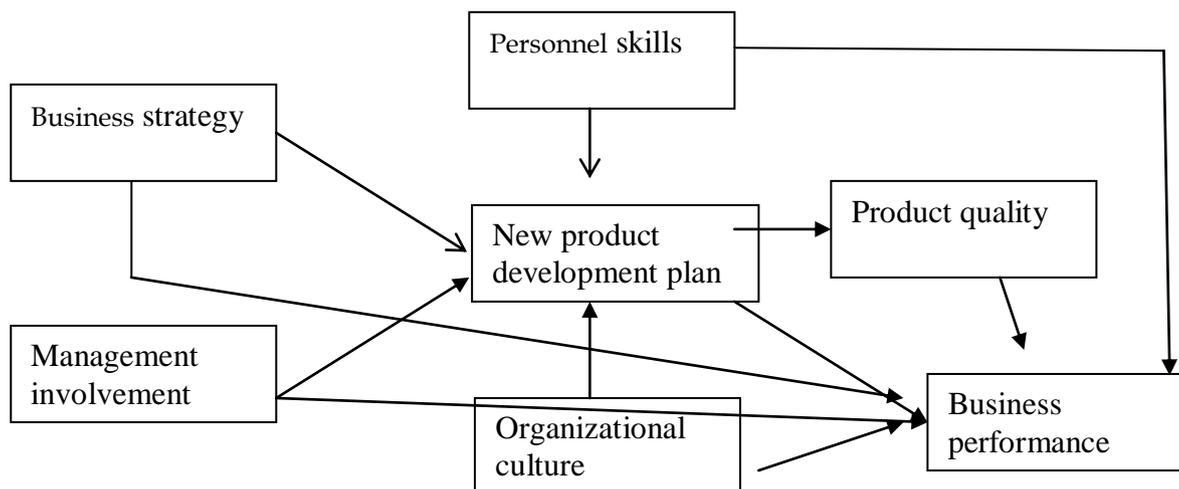


Figure 2 : New Product Development Model

Source : Fieldwork (2013)

The research model (figure 2) presents the factor that affect the NPD process that are examined in this study. These factors are the implemented business strategy, the skills of the personnel, the management involvement in the new product development process, and the organizational culture. Additionally, the new product development plan, product quality and the business performance are included in the model as dependent factors.

**Table 1: Research Model Factors and Previous Researches**

s/n	Factors	Items <sup>x</sup>	Supporting researcher
1	Business strategy	(5)	Booz et al (1982), Effendi et al (2010) Nwokah et al (2009), Cormican and O Swilivan (2004), Vourlioti et al (2008) Effendi et al (2010)
2	Personnel skill	(4)	Song & Parry (1993), Ewah et al (2008) Vourlioti et al (2008)
3	Management involvement	(3)	Smiths Reinertsen, (1991), Lee et al (2000) Eeah et al (2008) Vourlioti et al (2008)
4	Organizational culture	(8)	Souder, (1987), Ewah et al, Brown and Eisenhardt (1995), Vourlioti et al (2008)
5	Applied New product development process (NPD Process <sup>xx</sup> )	(2)	Page, (1993), Adis & Razli (2009), Nwokah et al (2009), Vourlioti et al (2008), Dooley et al (2004)
6	NPD Process Duration <sup>xx</sup>	(3)	Page (1993), Ewah et al (2008) Nwokah et al (2009), Vorulioti et al (2008)
7	Essential NPD Resources <sup>xx</sup>	(2)	Comican & O'Sullivan (2004), Vourlioti et al (2008, Ewah et al (2008)
8	Level of NPD Process Goal Achievement <sup>xx</sup>	(7)	Kleinschmidt (1994), Balbontin et al (2000) Vourlioti et al (2008) Ewah et al (2008) Cooper & kleinschmidt
9	Product quality	(4)	Doll & Vonderempse (1991), Cooper & Kleinschmidt (1996), Vourlioti et al (2008)
10	Business performance <sup>xx</sup>	(3)	Nwokah et al (2009), Ewah et al (2008) Effendi et al (2010)

<sup>x</sup> In parenthesis is the number of items remaining in the final model (after using factor analysis)

<sup>xx</sup> NPD plan is measured using these five different factors

However, for review of the concept and associated empirical studies, it is hypothesized

H1<sub>1</sub>: strategy positively affects new product development plan

H2<sub>1</sub>: personnel skills positively affect new product development plan

H3<sub>1</sub>: management involvement positively affects new product development plan

H4<sub>1</sub>: organizational culture positively affect new product development plan

H5<sub>1</sub>: new product development plan positively affects product quality

H6: product quality positively affect business performance

H7<sub>1</sub>: new product development plan positively affects business performance

## Research Methods

A structured questionnaire was sent to managers of Nigerian manufacturing industries, and appropriate person within each firm was contacted and then questionnaires were either sent to them either by e-mail or given to them during a pre-arranged meeting. Totally, 180 Nigerian manufacturing industries has been selected and accepted to participate in the research, 2 copies of the questionnaire were administered in each of the manufacturing industries that serve as sample. The sample used for this study was convenience sample, and the use of convenience sample has been found relevant in previous studies (Hall and Lockchin, 2000). Out of the total

sample of 360 questionnaires given out to respondents 230 useable questionnaires were returned, representing a response rate of 63.89%. Those who finally answered the questionnaire are CEOs (21%), managers (43%), directors (66.6) and line managers (29.4). The average previous job - experience of all participants is 15years.

**Table 2: Descriptive statistics of the measured items**

Factors	Items	Mean *	Standard deviation
BUSINESS STRATEGY	Implementation of a specific strategy for its new product activities	3.87	1.03
	Degree of flexibility of the applied strategy	3.76	1.06
	degree of well defined action fields in your NPD process	3.52	0.94
	Degree of well defined goals to all the personnel, that the company wants to achieve by the NPD process	3.41	1.02
	Degree of efforts for NPD during the period 2003-2006	2.66	1.56
PERSONNEL SKILLS	Sufficiency of participating skills and team actions of the leader	3.76	0.97
	Sufficiency of the leader to enforce his authority to the personnel	3.68	0.84
	Degree of team work of production personnel	4.01	0.74
	Level of team members that are qualified for all tasks	3.65	1.09
MANAGEMENT INVOLVEMENT	Use of the democratic model of leadership	1.38**	0.49
	Use of the authoritarian model of leadership	1.72**	0.47
	Use of delegatory model of leadership	1.89**	0.32
ORGANIZATIONAL CULTURE	Rewards with gifts provision (e.g. travel, car)	1.76	0.44
	Reward with cash bonus	1.92	0.27
	Rewards with promotion	1.90	0.38
	Degree of using cross function teams	1.87	0.39
	Level that is believed that cross functional teams are important in developing new products	3.08	1.19
	Degree of personnel team working	3.72	1.04
	Level of team members that are qualified for all task	3.79	0.99
	Level that is believed that cross functional teams are important in developing new products	3.67	0.84
APPLIED NPD PROCESS	Degree of application of a new or considerably improved NPD process	2.78	0.98
	NPD process that is applied	2.82	0.82
NPD PROCESS DURATION	NPD duration (in years)	1.69	1.23
	Time of completion of finances analysis (in months)	1.44	2.08
	Time of completion of a promotion process (in months)	4.47	2.08
ESSENTIAL NPD RESOURCES	Degree of overrun cost according to the programmed cost for the new product production	2.04	0.94
	Degree of overrun time according to the programmed time for the new product production	2.02	0.87
LEVEL OF NPD PROCESS GOAL ACHIEVEMENT	Percentage of ideas that come to the step of process development	82%	
	Percentage of ideas that come to the step of construction	68%	
	Percentage of ideas that come to the step of test ad	56%	

	validation		
	Percentage of ideas that come to the step of promotion	54%	
	Percentage of ideas that come to the step of design	58%	
	Percentage of ideas that come to the step of the idea development	64%	
	Percentage of ideas that come to the best idea selection	58%	
PRODUCT QUALITY	Degree of reliability as factor of quality	4.62	0.68
	Degree of performance f a product as factor of quality	4.68	0.69
	Longer life cycle of a product as factor of quality	4.05	1.14
	Degree of correspondence in the needs of consumer as factor of quality	4.33	0.91
BUSINESS PERFORMANCE	Degree of demand of product	4.54	0.72
	Degree of performance of product as a sales factor	4.68	0.68
	Degree of business performance as profitability factor	4.69	0.67

Only item included in the final model are presented.

\* (1 = Not at all - "Negative" ... 5 = Too much - "Positive"), (\*\*1 = Yes, 2 = No)

Source : Author field survey ,2013.

## Data analysis and results

### Descriptive statistics

The participated industries employ on average 220 administrative employees and 88 production - employees. A large proportion of the participating firms are "leaders" 12.5 or "big players" (29.8%), while (25.5%) of them are considered as "competitive" industries or 'small players (20.4%) and while 11.8% of them think of themselves as "followers". As far as business strategy is concerned, Nigerian manufacturing industries implement specific strategy patterns (means score 3.87), which are also very flexible (mean score 3.76). Further, it seems that Nigerian manufacturing industries are reluctant to use a new or improved new product development process (mean score 2.78), but they utilize sufficiently their resources in order to develop new products (average duration of new product development process is 2 years).

Table 2 presents the descriptive statistics of the sample as far as the main factors / items examined.

It is also extracted that the personnel work in groups (mean score 4.01, while technology (email use - mean score 3.06, databases use - mean score 1.84, supply management systems use mean score 3.00). as far as organizational culture is concerned, Nigerian manufacturing industries support team working but they are not "generous" in offering employee rewards.

### Factor and reliability analysis

Confirmatory factor analysis (with varimax rotation) has been performed to examine whether the initial classification of the variable into the specific factors is valid or not (table 3). KMO (Kaiser - Meyer - Olkin) is used to measure the sampling adequacy, accepting a weak threshold (0.5) (Malhotra, 1999). The total variance explained (TVE) score is also used to measure how data is distributed within a range, and also how much the response differ (accepted threshold 0.6)

Further, Cronbach's alpha ( $\infty$ ) realibility test has been performed to asses internal consistency of measurements, adopting the weak threshold 0.6 (nunnally 1978, De Vellis, 1991, Carminess and this analysis indicated that 1. management involvement, 2. new product development process and 3. essential new product development resources, have statistically weak reliability (low Cronbach  $\infty$  scores). These results possible occurred because of the size and

the weak homogeneity of the sample and that the items measure can support the proposed research study model.

**Table 3: - factor analysis**

Factors	Statistics	Items	Loadings
BUSINESS STRATEGY	K.M.O = 0.72 Sig =0.00 (TVE) = 52.047 Cronbach (a) = 0.768	Implementation of a specific strategy for its new product activities	0.844
		Degree of flexibility of the applied strategy	0.764
		degree of well defined action fields in your NPD process	0.762
		Degree of well defined goals to all the personnel, that the company wants to achieve by the NPD process	0.631
		Degree of efforts for NPD during the period 2003-2006	0.557
PERSONNEL SKILLS	K.M.O = 0.5200 Sig =0.00 (TVE) = 71.204 Cronbach (a) = 0.564	Sufficiency of participating skills and team actions of the leader	0.842
		Sufficiency of the leader to enforce his authority to the personnel	0.842
		Degree of team work of production personnel	0.854
		Level of team members that are qualified for all tasks	0.854
ORGANIZATIONAL CULTURE	K.M.O = 0.695 Sig =0.00 (TVE) = 64.733 Cronbach (a) = 0.642	Rewards with gifts provision (e.g. travel, car)	0.752
		Reward with cash bonus	0.804
APPLIED NPD PROCESS		Rewards with promotion	0.584
		Degree of using cross function teams	.0752
NPD DURATION		Level that is believed that cross functional teams are important in developing new products	0.804
ESSENTIAL NPD RESOURCES		Degree of personnel team working	0.584
		Level of team members that are qualified for all task	0.642
APPLIED NPD PROCESS	K.M.O = 0.500 Sig =0.00 (TVE) = 53.884 Cronbach (a) = 0.695	Degree of application of a new or considerably improved NPD process	0.854
		NPD process that is applied	0.898
		NPD duration (in years)	0.864
NPD DURATION	K.M.O = 0.500 Sig =0.00 (TVE) = 69.173 Cronbach (a) = 0.564	Time of completion of a promotion process (in months)	0.824
ESSENTIAL NPD RESOURCES	K.M.O = 0.500 Sig =0.00 (TVE) = 76.173 Cronbach (a) = 0.140	Degree of overrun cost according to the programmed cost for the new product production	0.731
		Degree of overrun time according to the programmed time for the new product	0.733

		production	
LEVEL OF NPD PROCESS GOAL ACHIEVEMENT	K.M.O = 0.809 Sig =0.00 (TVE) = 75.284 Cronbach (a) = 0.8908	Percentage of ideas that come to the step of process development	0.756
		Percentage of ideas that come to the step of construction	0.801
		Percentage of ideas that come to the step of test and validation	0.838
		Percentage of ideas that come to the step of promotion	0.874
		Percentage of ideas that come to the step of design	0.874
		Percentage of ideas that come to the step of the idea development	0.850
		Percentage of ideas that come to the best idea selection	0.921
LEVEL OF NPD PROCESS GOAL ACHIEVEMENT	K.M.O = 0.809 Sig =0.00 (TVE) = 75.284 Cronbach (a) = 0.8908	Percentage of ideas that come to the step of design	0.841
		Percentage of ideas that come to the step of idea development	0.924
		Percentage of ideas that come to the step of the best idea selection	0.822
		Percentage of ideas that come to the step process development	0.924
	K.M.O = 0.810 Sig =0.00 (TVE) = 84.993 Cronbach (a) = 0.828	Percentage of ideas that come to the step of construction	0.966
		Percentage of ideas that come to the step of test and validation	0.918
		Percentage of ideas that come to the step of promotion	0.882
PRODUCT QUALITY	K.M.O = 0.560 Sig =0.00 (TVE) = 75.793 Cronbach (a) = 0.670	Degree of reliability as factor of quality	0.880
		Degree of performance of a product as factor of quality	0.846
	K.M.O = 0.560 Sig =0.00 (TVE) = 75.793 Cronbach (a) = 0.655	Longer life cycle of a product as factor of quality	0.848
		Degree of correspondence in the needs of consumer as factor of quality	0.878
BUSINESS PERFORMANCE		Degree of demand of product	0.882
		Degree of performance of product as a sales factor	0.877
		Degree of business performance as profitability factor	0.856

Source: Author field survey 2013.

### Correlation Analysis

The results of the correlations analysis (table 4) show that there are many statistically significant relationship between the factors included in the model (significance level  $<0.05$  or  $<0.01$ ). thus, looking at the table 4, it is realized that many hypotheses of the research model from figure 1 have been confirmed, while some new correlations between these factors have also been extracted specifically, a strong positive correlation. ( $r = 0.436$ ) between the level of new product development goal achievement and the personnel skills appeared, possibly indicated that the level of the new product development process goal achievement is affected by the skills of the personnel who have the responsibility for completing the new product development process. This result only partly confirms the second hypothesis, since personnel skills affect only the level of the new product development process goal achievement – i.e. business performance and not the other factors in the new product development plan factors

Likewise, it can be seen that new product development process is related to (i) the business strategy ( $r = 0.354$ ) and (ii) The organizational culture ( $r = 0.234$ ).

These results confirm hypotheses H1 and H4, which concern the factors affecting the new product development process. Hypothesis 3, which concerns relationship between management involvement and new product development, is not confirmed ( $r = 0.138$ ). This perhaps indicates that management involvement is weak in Nigeria manufacturing industries. When the organizational strategic planning is clear and the organizational environment is conducive, product development processes is supported. It is also noticed that product quality is related with the level of new product development process goal achievement that the industries wished to achieve ( $r = 0.406$ ) and the applied new product development process ( $r = 0.308$ ), but it is not related to the new product development plan as a whole so hypothesis 5 is only partly confirmed. Likewise, organizational culture is related with the implemented organizational strategy ( $r = 0.252$ ). A relationship also exist between culture and personnel skills ( $r = 0.384$ ), underlining the important role of organizational culture in the successful implementation of a new product development process.

Product quality is related to the business strategy ( $r = 0.329$ ) as well as to personnel skills ( $r = 0.388$ ). These relationships imply that an efficient organizational strategy has to be supported b capable and efficient personnel, in order for premium products to be developed. Also the development of a new product is associated with the selected new product development process ( $r = 0.337$ ), the new product development process duration ( $r = 0.944$ ) and the value of the essential new product development resources ( $r = 0.534$ )

Moreover, it is noticed that business performance is related with the business strategy

**Table 4: Correlation analysis**  
**CORRELATION ANALYSIS**

	Business strategy	Personnel sills	Management involvement	Organizational culture	NPD duration	Level of NPD process goal achievement	Applied NPD process	Essential NPD recourses	Product quality
Personnel skill	.173	-							
Management	.151		-						
Orgnaitional	.252								
NPD duration									
Level of NPD goals	.241	.436(**)					-		

achievement Applied NPD process Essential NPD NPD "Roadmap"	.354 .263			.234		.328(*)			
r		.388				406(*)	.337*	.534(**)	
sig.									
Product quality	.329(**) .004	.388(**) .001					.405(**) .007	.308(**) .009	
r									
sig.									
Business performance	.325(**) .004	.394(**) .001	.162	.226		.412 0.007	.316 .009		.342 .006
r									
Sig									

\* correlation is significant at the 0.05 level (2 -tailed)

\*\* correlation is significant at the 0.01 level (2- tailed)

Source : Author field survey 2013.

It is noticed more specifically that business performance is related with the level of business strategy implemented by the manufacturing industries ( $r = 0.342$ ), the personnel skills ( $r = 0.394$ ), management involvement ( $r = 0.162$ ), organizational culture ( $r = 0.226$ ), level of NPD process goal achievement ( $r = 0.412$ ) applied NPD process ( $r = 0.316$ ) and quality to product ( $r = 0.342$ ). This finding support extant literature that posit that new product development process success is influenced by certain factors - new product development plan, importance of firms strategy, the required personnel skills for an effective new product development process, management involvement in the NPD process, organizational culture and level of product quality (Vourlioti et al 2008), Azaze - Azizi and Jublee (2010), Zirger and Madique (1990), among others. These results confirm hypothesis H6 and H7.

## Conclusions

The analysis have shown that new product development plan is mainly related to the business strategy, the organizational culture, partly the personnel skills, while management involvement does not necessarily have a statistically significant positive effect on the "NPD" plan. However, for successful business performance- business strategy, management involvement;ss personnel skills, organizational culture, "NPD" plan, product quality, the level of "NPD" process goal achievement and the applied "NPD" process adopted and implemented, all significantly affect the level of a business performance.

## Managerial implications

From the managerial perspective, the first managerial implication concerns the findings that new product development process has significant relationship with business performance, especially in manufacturing industries in Nigeria. Developing economies firms, hoping to initiate new products, should take note of the new product development process plan and its impact on business performance. It can be concluded that if all the steps of the NPD process are

not followed, then the new product will not meet the targeted quality standard, neither will it meet customer expectations and needs, and thus it will not be profitable and will not have a positive impact on the business performance. Understanding of the requirements of customers as regard the product, poses advantage for the activities of new product development. Likewise, industries should further strengthen their new product development process, to improve the chances of success of new products and likewise business performance.

This study also contributes significantly to the industry players. Manufacturers will benefit from the findings which concluded the study on new product development process, and its impact on business performance in Nigeria. Academically, the findings from the study add new understanding to knowledge and literature, particularly in the area of new product development.

### Limitations

Limitations associated with sample size could limit the influences of new product development process and business performance. The sample since is considered as relatively small (180 manufacturing firms with 230 useable questionnaire) may limit the influence of the findings of this study. This was due to the respondents' unwillingness to return their questionnaires. Therefore, a similar study could possibly be applied to bigger sample.

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