

Industrial Espionage and Organizational Profitability: A Review of Nigerian Pharmaceutical Industry

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Abstract

This work is on industrial espionage and organizational performance; a study of selected pharmaceutical firms in Nigeria. The study highlighted on the perceived effects of industrial espionage and as well the remedial actions to salvage Nigerian pharmaceutical firms from the threats of industrial espionage. The study adopted a survey research design and Primary data were obtained through questionnaires which were administered to 85 management staff of six (6) reviewed firms. However, out of the 85 copies of the questionnaires that were administered through kwiksurvey, 60 copies were returned and used for the analysis. The data obtained were descriptively analysed using tables, charts, percentages and mean. The hypotheses were tested using simple linear regression and Pearson moment correlation. The regression result shows that industrial espionage has a significant negative effect on the profitability of Nigerian pharmaceutical firms ($r = -0.543$; $t = 7.243$; $p = 0.000 < 0.05$). The Pearson moment correlations equally shows that adequate information security have positive and significant relationship with the profitability of Nigerian pharmaceutical firms ($r = 0.870$; $p = 0.000 < 0.05$). The study concludes that most pharmaceutical firms with low capital base see industrial espionage as a way to achieve their goals, and such leads to cases of fake drugs that have flawed the Nigerian health institutions. The researchers recommend that federal government, drug regulatory bodies and management of pharmaceutical firms should implement strategies and realistic policies to curb industrial espionage since it's almost impossible to discover or prove cases of industrial espionage; especially when perpetrated by insiders.

INTRODUCTION

Every successful business has a set of information or trade secrets that is known only by the company and people who work there. These trade secrets are well protected from the

rivals because they command great commercial values and competitive edges to the company. Trade secrets of pharmaceutical firms include competitive strategies, recipe and formula for new drugs, process and technique of developing a particular drug, as well as information regarding mergers or acquisition of pharmaceutical firms. Trade secrets can be stolen or misappropriated by the competitors through the act of espionage so as to gain from such information.

Espionage can be traced back to over 2000 years. In the sixth century, the Byzantine emperor Justinian I (483-565) placed monks in China to steal silkworms in an attempt to understand the techniques for making silk (1). Similarly, in 1615, the British tea industry employed espionage as a means of gathering vital business information from China tea industry (2).

The term 'industrial espionage' was widely used during the 1960s (3). However, the advent of Information Communication Technology (ICT) has increased access to information and also created loopholes for desperate competitors to gain access to official business secrets of their rivals; especially through some dishonest employees who leak the ideas, methods, patterns and even suggestions, requests and complaints made to their companies in exchange for money.

Industrial espionage' has been described in various ways by scholars. (3) described industrial espionage as the stealing of business secrets; illegitimate intelligence gathering; and the unofficial disclosure of business information through a dishonest methods. According (4) industrial espionage is the theft of sensitive business information. (5) argued that the aim of industrial espionage is to obtain vital information that cannot otherwise be acquired. (5) emphasized further that the method used to obtain information determines whether it's an ethically acceptable research, or industrial espionage while (6) argued that industrial espionage is a technique for gaining access to technical information of the rivals and transferring the information without permission from the owner. Industrial

espionage is a fast growing trend in most developed and developing economies of the world because there is no business without trade secrets. However, competitors misappropriate the vital business information to enhance their business activities and increase their profits. Among the submissions of various researchers (7) opines that espionage is now prevalent as the ocean tides thousand years ago and that Pharmaceutical industry is a more fertile ground for the misappropriation of vital business secrets.

In the Pharmaceutical companies, nothing is as valuable as the recipe and formula for a new drug. Developing a new medicine that gains regulatory approval can take up to a decade of research and processing. Pharmaceutical companies face high risk at every step of developing a new drug. Both the research phase and regulatory approval processes are costly and time intensive. The first company to market a new drug has a significant competitive advantage. Thus, there is a strong motive for competitors in the pharmaceutical industry to steal vital business information of their rivals; such as trial results of drugs, to accelerate time-to-market and reduce costs, especially R&D expenses.

Be that as it may (8) opine that the quality of information security is determined by the level of investments on remedial actions to salvage an organization from industrial espionage. (9) also suggest that adequate investment in information protection can reduce the industrial espionage threats. Pharmaceutical companies invest on information security to prevent intrusion into their secured trade secrets, but the most part of the budget for information security is spent on Internet security software that protect the organization from the external intrusion (Hackers) and does not limit threats from insiders who are mostly responsible for more than 70% of thefts related to industrial espionage (10).

From the above problem, the central objective of this research is to determine the effect of industrial espionage on the performance of selected pharmaceutical firms within Ilorin, kwara state. Specifically, the study will find out the extent to which misappropriation of trade secrets affects the overall performance of the studied pharmaceutical firms, and as well investigate the ways industrial espionage can be reduced to its barest point in Nigerian pharmaceutical firms. In line with the aim and the objectives of this study, the following research hypotheses were formulated in null form to proffer solutions to the problem under investigation.

H₀₁: Misappropriation of trade secrets has no significant effect on performance of the pharmaceutical firms in Nigeria.

H₀₂: There is no positive significant relationship between information security and performance of the pharmaceutical firms in Nigeria.

REVIEW OF RELEVANT LITERATURE

Conceptual Review

Industrial espionage and organizational performance have become a worrisome issue in business environment. Industrial espionage have raked havoc to the stability and economic

development of many developed and developing economies. According to Benny (2013), Federal Bureau of Investigation (FBI) estimates that United States of America lost billions of dollars each year to industrial espionage. Obtaining vital business information is the central aim of industrial espionage. According to (12) sensitive business information can be either an operational information or Intellectual property. Operational information consists of strategic details, production details, financial and marketing details and research details. Given the advent of information communication technology (ICT), business information is now stored and made public at a faster speed because all relevant operational information are stored and retrieved digitally and can be accessed by the employees and non-employees as well. Hence, industrial espionage becomes a question of locating and gaining access to the digital storage containing the desired piece of business information. (5), (13) as well as (12) argued that the increased openness and transparency in business environment, combined with the technological developments provided by the current information age, have created ample opportunities for gathering competitive business information. Competitors obtain vital business information of their rivals from news pages, corporate web pages, and financial reports from stock exchanges. But when the desired information can't be obtained through the above means, desperate competitors either plant employees in their rivals companies or buy the conscience of the existing employees with money and gifts. The ability to misappropriate vital business information will undoubtedly strengthen the strategic position of the competitors and they could carry out business operations under the blessing of a hostile rival whose trade secrets have been disclosed to desperate competitors.

Generally, industrial espionage is described as an unethical process of obtaining information to sabotage the operations and performance of their rivals. A typical incentive for industrial espionage is money, driven by greed. Similarly, a lesser sense of belonging with low level of commitment in an organization can act as the key motivation for and employee to engage in industrial espionage. (3) argued that the purpose of industrial espionage is to gain unfair economic advantage over a rival while (14) and (12) argue that individuals often are motivated by revenge for lay-offs. Companies that engage in business-to-business espionage leap frog a potentially costly research and development process. Similarly, an illegal acquisition of business ideas will shorten time to market a new product. As such, pharmaceutical firms need to invest more in information security to avoid disclosure of their trade secrets to desperate competitors.

Theoretical Framework

This study is justified with the rational choice theory. The theory of Rational Choice was propounded by Cornish and Clarke in 1997. The theory states that a man weighs means and ends, costs and benefits before making rational choices. The decisions to commit crime are predicated on the proportion of its cost and benefit. The theory assumes that industrial espionage is a purposive and planned behavior to obtain vital trade secrets as the perpetrators lack the resources to enable them legally obtain the information that are relevant

for their business operations. Industrial espionage is calculated and deliberate hence all perpetrators are rational actors who work towards gaining the maximum benefits of vital business information.

METHODOLOGY

This study adopted a survey design using questionnaire. The questionnaire was designed to reflect five (5) point likert scale and 85 copies were distributed to some randomly selected management staff of Tuiyil pharmaceutical Ltd, Ayobami pharmaceutical, De-Lawson pharmaceutical, Sade pharmaceutical, Sam pharmaceutical and Mimi pharmaceutical. Out of the copies administered, 65 copies were returned but 5 copies were not properly filled. As such, only 60 copies were sound and used for the analysis. The data was analyzed descriptively and the hypotheses were also

tested using regression model and Pearson product moment correlation.

Model Specification

In this study, $Y = a + bx$. But from the objective, performance (p) of the selected firms represent y while x represent the independent variable (predictor variable) proxied by misappropriation of trade secrets (MTS). Substituting these in the above equation, we have $P = a + bMTS$.

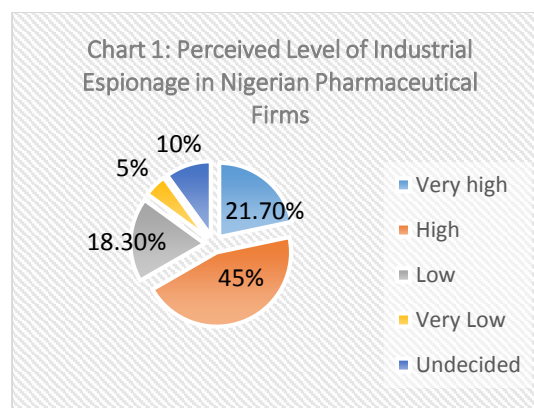
FINDINGS AND DISCUSSION

The respondents of the studied firms were asked to determine the level at which industrial espionage occurs in their respective firms and their responses were clearly shown below:

Table 1: Shows Respondents' Opinion on the Perceived Level of Industrial Espionage in Nigerian Pharmaceutical Firms

Level of Industrial Espionage	Frequency	Response Percentage (%)
Very High	13	21.7%
High	27	45%
Low	11	18.3%
Very Low	3	5%
Undecided	6	10%
Total	60	100%

Source: field Data, 2018



Source: field Data, 2018

Interpretation: From the above tabulated results, 21.7% of the respondents said that the perceived industrial espionage in Nigerian pharmaceutical firms was very high at the time of this study, 45% of them said it was high but not too high, 18.3% further said it was low while 5% declared it was very low. Although 10% of the respondents had no idea as regards to the incidence of industrial espionage in the pharmaceutical

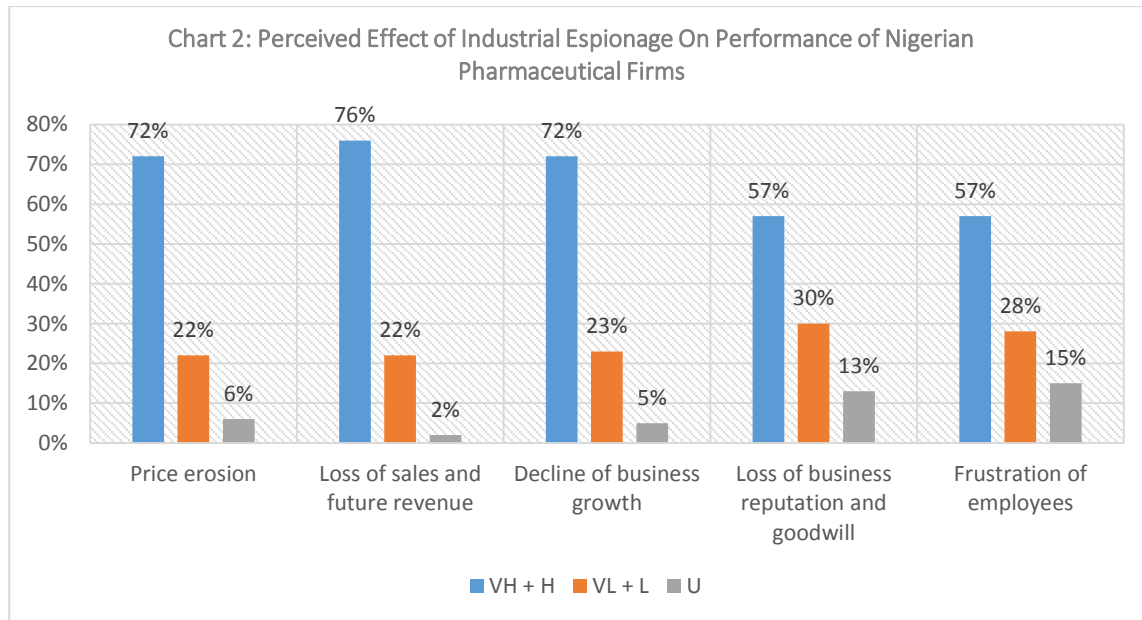
industry, the results showed clearly that industrial espionage is one of the challenges in the pharmaceutical industry. And irrespective of the views of the respondents; whether very high, just high, low or very low, it's obvious that the competitive nature of pharmaceutical firms makes it a more fertile ground for the misappropriation of vital business secrets.

Table 2: Shows the Perceived Effects of Industrial Espionage on Performance of Nigerian Pharmaceutical Firms

Reject any view where $X < 3.0$; otherwise accept.

S/N	Effects	Responses					N	Percent%			X	Remark
		VH(5)	H(4)	L(3)	VL(2)	U(1)		VH + H	L + VL	U		
1	Price erosion	17 (85)	26 (104)	8 (24)	5 (10)	4 (4)	60 (227)	72%	22%	6%	3.78	Accepted
2	Loss of sales and future revenue	21 (105)	25 (100)	7 (21)	6 (12)	1 (1)	60 (239)	76%	22%	2%	3.98	Accepted
3	Decline of business growth	13 (65)	30 (120)	9 (12)	5 (10)	3 (3)	60 (210)	72%	23%	5%	3.50	Accepted
4	Loss of business reputation and goodwill	12 (60)	22 (88)	11 (33)	7 (14)	8 (8)	60 (203)	57%	30%	13%	3.38	Accepted
5	Frustration of employees	15 (75)	19 (76)	10 (30)	7 (14)	9 (9)	60 (204)	57%	28%	15%	3.40	Accepted

Source: field Data, 2018



Source: field Data, 2018

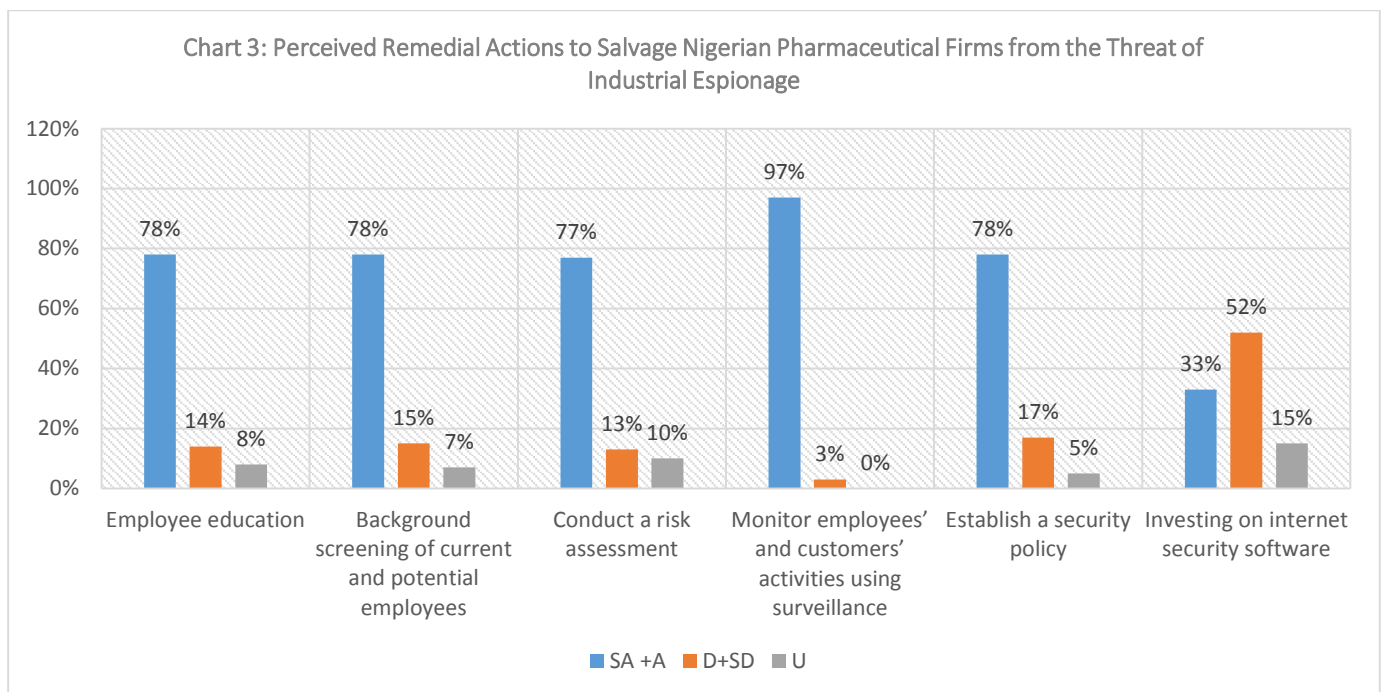
Interpretation: The analysis of the data in table 2 indicates that majority of the respondents accepted the view that industrial espionage affects the performance of pharmaceutical firms in various angles like reduction in prices of products and services, loss of expected sales and companies goodwill, decline of business growth and as well frustration of the employees.

Table 3: Shows the Perceived Remedial Actions to Salvage Nigerian Pharmaceutical Firms from the Threat of Industrial Espionage

Reject any view where $X < 3.0$; otherwise accept.

S/N	Effects	Responses					N	Percent%			X	Remark
		SA(5)	A(4)	D(3)	SD(2)	U(1)		SA +A	D+SD	U		
1	Employee education	27 (135)	20 (80)	5 (15)	3 (6)	5 (5)	60 (241)	78%	14%	8%	4.02	Accepted
2	Background screening of current and potential employees	16 (80)	31 (124)	7 (21)	2 (4)	4 (4)	60 (233)	78%	15%	7%	3.89	Accepted
3	Conduct a risk assessment	17 (85)	29 (116)	8 (24)	0 (0)	6 (6)	60 (231)	77%	13%	10%	3.85	Accepted
4	Monitor employees' and customers' activities using surveillance	30 (150)	28 (112)	2 (6)	0 (0)	0 (0)	60 (268)	97%	3%	0%	4.47	Accepted
5	Establish a security policy	22 (110)	25 (100)	7 (21)	3 (6)	3 (3)	60 (240)	78%	17%	5%	4.00	Accepted
6	Investing on internet security software	9 (45)	11 (44)	17 (51)	14 (28)	9 (9)	60 (177)	33%	52%	15%	2.95	Rejected
	Total Grand Mean										3.86	

Source: field Data, 2018



Source: field Data, 2018

Interpretation: The results of the analysis in table 3 show that the respondents accepted the view that Nigerian pharmaceutical firms can be salvaged from accidental espionage through thorough risk assessment, implementation of a security policies, background screening of current and potential employees to determine employees with unhealthy intentions or those planted by the competitors, adequate sensitization of the employees regarding the potential threats of industrial espionage and their roles in corporate security,

and finally, monitoring the activities of employees and customers using a reliable surveillance. From the same table, item 6 indicates that the respondents rejected the view that investing on internet security software is a remedial action that can reduce industrial espionage to its barest minimum. This is because industrial espionage is mostly carried out successfully by employees planted by the rivals or those who will sell it to rivals for their personal benefit. The employees have access to the company's vital information at every

working moment. As such, more attention should be directed to employees as to ensure adequate information security.

Testing of Hypotheses

Decision Rule: Reject H_0 if $P\text{-value} < 0.05$; otherwise accept.

Hypothesis One

H_{01} : Misappropriation of trade secrets has no significant effect on the performance of Nigerian pharmaceutical firms.

H_{a1} : Misappropriation of trade secrets has significant effect on the performance of Nigerian pharmaceutical firms.

Table 4: Shows the Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	-.543 ^a	.0531	.0310	.61745
a. Predictors: (Constant), Level of Industrial Espionage				
b. Dependent Variable: Performance of Nigerian Pharmaceutical Firms				

Source: SPSS Version 20.00

Table 5: Shows the ANOVA^b

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.243	1	.243	.750	.000 ^b
	Residual	5.938	59	.281		
	Total	7.182	60			
a. Dependent Variable: Performance of Nigerian Pharmaceutical Firms						
b. Predictors: (Constant), Level of Industrial Espionage						

Source: SPSS Version 20.00

Table 6: Shows the Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficient	t-statistics	Sig.
	B	Std. Error	B		
(Constant)	0.097	0.147		0.885	0.000
Level of Industrial Espionage	0.918	.183	-.543	7.243	0.000

a. Dependent Variable: Performance of Nigerian Pharmaceutical Firms

Source; SPSS version 20.0

Interpretation: As demonstrated in the regression analysis, the result of R-value is -.543^a which indicates that there is a strong negative relationship at 54.3% between industrial espionage and performance of the Nigeria pharmaceutical firms. The R-square value shows that 53.1% variation in level performance of the Nigerian pharmaceutical firms is explained in the model. In addition, the coefficient of the

independent variable is 0.918, it therefore shows that when industrial espionage occurs in any Nigerian pharmaceutical firm, the performance of such firm will be reduced by 91.8%. In furtherance, the p-value is 0.000 and the standard p-value is 0.05 which indicates 95% assurance of the research leaving 5% for uncertainty. In that case, we reject the null hypothesis and accept the alternative hypothesis and, therefore, conclude

that misappropriation of trade secrets has significant effect on the performance of Nigerian pharmaceutical firms. These findings corroborate with the submission of (11), whose report on Federal Bureau of Investigation (FBI) shows that United States of America lost billions of dollars each year to industrial espionage.

Hypothesis Two

H_{o2}: There is no positive significant relationship between information security and performance of the Nigerian pharmaceutical firms.

H_{a2}: There is a positive significant relationship between information security and performance of the pharmaceutical firms in Nigeria

Table 7: Shows Relationship between the Perceived Information Security Measures and Performance of the Nigerian Pharmaceutical Firms

		Level of Information Security	Performance of Nigerian Pharmaceutical Firms
Level of Information Security	Pearson Correlation	1	.870
	Sig. (2-tailed)		.000
	N	60	60
Performance of Nigerian Pharmaceutical Firms	Pearson Correlation	.870	1
	Sig. (2-tailed)	.000	
	N	60	60

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

Source; SPSS version 20.0

Interpretation: As clearly presented in the above table, the Pearson product moment correlation coefficient is 0.870 and indicates the correlation matrix of perceived remedial actions aimed at information security and performance of pharmaceutical firms. The analysis indicates that a positive correlation exists between the variables (information security and performance of Nigerian pharmaceutical firms) which was statistically significant ($r = .860$, $n = 60$, $P\text{-value} = 0.000$, $p < 0.05$). As such, the null hypothesis is rejected while the alternate hypothesis is accepted accordingly. In that case, there is a positive significant relationship between information security and performance of the Nigerian pharmaceutical firms. These findings give credence to the study of (9) who suggest that adequate investment in information protection can reduce the industrial espionage threats.

SUMMARY AND CONCLUSION

In this present era, with the current market saturation, competition in pharmaceutical industry is becoming more intense. The standard and quality of drugs is reducing as different firms produces drugs with same function. This makes it easy for companies with low capital base to conduct

athorough research to engage in industrial espionage and misappropriate trade secrets of their rivals. In that case, most firms end up producing fake drugs due to inadequate information regarding the recipe, formula and techniques for producing a particular drug. However, most companies don't report cases of industrial espionage given the fact that it is mostly performed by the insiders, and as such, very difficult to discover, prove or hold the perpetrator (s) accountable. Moreover, the issue is gradually becoming a norm for most companies that wants to follow a shortcut means and become market leader within pharmaceutical companies not minding the effects of their actions on humans' lives, as well as on the companies that own the trade secrets obtained illegally.

The study had so far identified the effects of industrial espionage into five major headlines, which are: price erosion, loss of sales and future revenue, decline of business growth, loss of business reputation/goodwill and frustration of employees that devoted their time and energy in research and development. In addition, the information security measures for curbing industrial espionage were identified to include employee education, establishment of information security policies, risk assessment, background screening of employees and monitoring the activities of employees and customers using surveillance.

Finally, from the descriptive and inferential analysis of the respondents' views, this study has established that misappropriation of trade secrets has significant negative effect on the performance of Nigerian pharmaceutical firms. And that there is a positive significant relationship between information security and performance of the Nigerian pharmaceutical firms.

RECOMMENDATION

National Agency for Food and Drug Administration and Control (NAFDAC) and other drug regulatory bodies, as well as the Standard Organization of Nigeria (SON) and Federal Government must confront industrial espionage in pharmaceutical industry by implementing a realistic set of policies that will deter perpetrators of this unhealthy practices in Nigeria. There must be a comprehensive and absolute overhaul of the drug manufacturing institutions in the country since health is said to be wealth, and no country in this contemporary world would develop with a flawed health institutions. Finally, pharmaceutical firms should implement policies to ensure adequate information security and equally sensitize their employees on how to recognize and avoid industrial espionage threats. The employees should also be well motivated through timely payment of their basic salaries as well as other entitlements due to them to enable them decline all forms of incentives from competitors requesting for the companies trade secrets.

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