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Management of Risks and Implication on the Nigerian Manufacturing Sector

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Abstract
The study seeks to identify the sources of risks in the manufacturing organizations, identify the risks that should be retained, ascertain how to assess and prioritize risks, and ascertain the implication of managing risks.
The study was carried out primarily through the survey method and interview of employees in five manufacturing organizations in Nigeria.
Secondary data were obtained through books, journals, and internet. Findings indicate that the sources of risks in the manufacturing organizations include employees, suppliers, customers and competitors; small risks, risks that are large, and all risks that are not avoided or transferred are retained; risks are assessed and prioritized by determining the severity of loss, and probability of occurrence; Improperly assessed and prioritized risks result in waste of time dealing with risks that are not likely to occur.
Risk management is simply a practice of systematically selecting cost effective approaches for minimizing the effect of threat realization to the organisation. All risks can never be fully avoided or mitigated simply because of financial and practical limitations. Therefore all organizations have to accept some level of residual risks. However, if risks are improperly assessed and prioritized, time can be wasted in dealing with risk of losses that are not likely to occur. Spending too much time assessing and managing unlikely risks can divert resources that could be used more profitably. Unlikely events do occur but if the risks are unlikely enough to occur it may be better to simply retain the risk and deal with the result if the loss does in fact occur.
Keywords: Risk Identification, Risk Assessment, Risk Charting, Risk Checking, and Risk Management

1.0 Introduction

Risk management is the human activity which integrates identification of risk, risk assessment, developing strategies to manage it and mitigation of risk using managerial resources. The strategies include transferring the risk to another party, avoiding the risk, reducing the negative effect of the risk, and accepting some or all of the consequences of a particular risk.
Risk management is the process of identification, analysis and either acceptance or mitigation of uncertainty in investment decision making. Essentially, risk management occurs anytime an investor or fund manager analyses and attempts to quantify the potential for losses in an investment and then takes the appropriate action given their investment objectives and risk tolorence (www.investopedia.com/terms/r/riskmanagement.asp).
Risk management is the identification, assessment, and prioritisation of risks on objectives, whether positive or negative) followed by coordinated and economical application of resources to minimize, monitor and control the probability and/or impact of unfortunate events or to maximize the reaction of opportunities(Douglas, 2009).
In ideal risk management, a prioritization process is followed where by the risks with the greatest loss and the greatest probability of occurring are handled first, and risks with lower probability of occurrence and lower loss are handled in descending order. In practice the process can be very difficult, and balancing between risks with a high probability of occurrence but lower loss versus a risk with high loss but lower probability of occurrence can often be mishandled.
Intangible risk management identifies a risk that has 100% probability of occurring but is ignored by the organisation due to lack of identification ability. For example, when deficient knowledge is applied to a situation, a knowledge risk materializes. Relationship risk appears when ineffective collaboration occurs. Process engagement risk may be an issue when ineffective operational procedures are applied. These risks directly reduce the productivity of knowledge workers, decrease cost effectiveness, profitability, service, quality, reputation, brand value, and earnings quality.
Intangible risk management allows risk management to create immediate value from the identification and reduction of risks that reduce productivity. Risk management also faces difficulties allocating resources. This is the idea of opportunity cost. Resources spent on risk management could have been spent on more profitable activities. Ideal risk management minimizes spending while maximizing the reduction of the negative effects of risks. In

financial institutions, enterprise risk management is normally thought of as the combination of credit risk, interest rate risk or asset liability management, market risk, and operational risk. Its impact can be on the very existence: the resources (human and capital), the products and services, or the customers of the enterprise, as well as external impacts on society, markets, or the environment (Ezigbo, 2011).

1.1 Objectives

The study has the following specific objectives

- To identify the sources of risks in the manufacturing organisations
- To identify the risks that should be retained
- To determine how to assess and prioitize risks
- To ascertain the implication of risk management.

1.2 Hypotheses

The study proposes the following hypotheses

H_1The sources of risks in the manufacturing organizations include employees, suppliers, customers and competitors

H_2 Small risks, risks that are large, and all risks that are not avoided or transferred are retained

H_3 Risks are assessed and prioritized by determining the severity of loss, and probability of occurrence

H_4 Improperly assessed and prioritized risks result in waste of time dealing with risks that are not likely to occur.

1.3 Methodology

The study was carried out primarily through the survey method and interview of employees in five manufacturing organizations in Nigeria.

Secondary data were obtained through books, journals, and internet. A sample size of 353 was obtained from the population of 3000 at 5% error tolerance and 95% level of confidence using yamane's statistical formular. 300(84.99%) of the questionnaire distributed were returned while 53 (15.01%) of the questionnaire distributed were not returned. The questionnaire was designed in likert scale format. The researcher conducted a pre-test on the questionnaire to ensure the validity of the instrument. Data collected were presented in frequency tables. Chi-Square statistical tools were used to test the hypotheses.

2.0 Literature Review

2.1 Steps in the Risk Management Process

(1) Identification

Risks are about events that, when triggered, cause problems. Hence, risk identification can start with the source of problems, or with the problem itself.

Risk sources may be internal or external to the system. Examples of risk sources are stakeholders of a project, employees of a company or the weather over an airport. Risks are related to identified threats. For example, the threat of losing money, the threat of abuse of privacy, information or the threat of accidents and casualties. The threat may exist with various entities, most important with shareholders, customers, and legislative bodies such as the government.

When either source or problem is known, the events that a source may trigger or the events that can lead to a problem can be investigated. For example, stakeholders withdrawing during a project may endanger funding of the project; privacy information may be stolen by employees even within a closed network; lightning striking an aircraft during take off may make all people onboard immediate casualties. The chosen method of identifying risks may depend on culture, industry practice and compliance.

Common risk identification methods include the following.

- **Objective – based risk identification**
  Organisations and project teams have objectives. Any event that may endanger achieving an objective partly or completely is identified as risk.

- **Scenario – based risk identification**
  In scenario analysis, different scenarios are created. The scenarios may be the alternative ways to achieve an objective, or an analysis of the interaction of forces in, for example, a market or battle. Any event that triggers an undesired scenario alternative is identified as risk.

- **Taxonomy – based risk identification.**
  Taxonomy in taxonomy – based risk identification is a breakdown of possible risk sources. Based on the taxonomy and knowledge of best practices, a questionnaire is compiled. The answers to the questions reveal risks (http://www.sei.cmu.edu/library/abstracts/reports)

- **Common – risk checking**
  In several industries, lists of known risks are available. Each risk in the list can be checked for application to a particular situation.

- **Risk charting**
  This method combines the above approaches by listing resources at risk. Threats to those resources-modifying factors which may increase or reduce the risk and consequences it is wished to avoid. One can begin with resources and consider the threats they are exposed to and consequences of each. Alternatively, one can start with the threats and examine which resources they would affect, or one can begin with the consequences and determine which combination of threats and resources would be involved to bring them about (Crockford, 1986).

(2) Assessment

Once risks have been identified, they must then be assessed as to their potential severity of loss and to the probability of occurrence. Therefore, in the assessment process it is critical to make the best educated guesses possible in order to properly prioritise the implementation of the risk management plan. The fundamental difficulty in risk assessment is determining the rate of occurrence since statistical information is not available on all kinds of past incidents. Furthermore, evaluating the severity of the consequences is often quite difficult for immaterial assets.

(3) Potential Risk Treatments

Once risks have been identified and assessed, all techniques to manage the risk fall into one or more of these four major categories: (Dorfman, 2007).

- Avoidance (withdraw from or not become involved)
- Reduction (optimize- mitigate)
- Sharing (transfer – outsource or insure)
- Retention (accept and budject)

Ideal use of these strategies may not be possible. Some of them may involve trade-offs that are not acceptable to the organization or person making the risk management decisions.

Risk avoidance

Risk avoidance includes not performing an activity that could carry risk. An example would be not buying a property or business in order to not take on the liability that comes with it. Another would be not flying in order to not take the risk that the airplane was to be hijacked. Avoidance may seem the answer to all risks, but avoiding risks also means losing out on the potential gain that accepting (retaining) the risk may have allowed. Not entering a business to avoid the risk of loss also avoids the possibility of earning profits. Increasing risk regulation in hospitals has led to avoidance of treating higher risk conditions, in favour of patients presenting with lower risk (McGiven and Fischer, 2012).

Risk reduction

Risk reduction involves methods that reduce the severity of the loss. Examples include sprinklers designed to put out a fire to reduce the risk of loss by fire. This method may cause a greater loss by water damage and therefore may not be suitable. Halon fire suppression systems may mitigate that risk, but the cost may be prohibitive as a strategy.

Outsourcing could be an example of risk reduction if the outsourcer can demonstrate higher capability at managing or reducing risks (Roehrig, 2006).

Risk retention

Risk retention involves accepting the loss when it occurs. True self insurance falls in this category. Risk retention is a viable strategy for small risks where the cost of insuring against the risk would be greater over time than the total losses sustained. All risks that are not avoided or transferred are retained by default. This includes risks that are so

large or catastrophic that they either cannot be insured against or the premiums would be infeasible. War is an example since most property and risks are not insured against war, so the loss attributed by war is retained by the insured. Also any amount of potential loss (risk) over the amount insured is retained risk. This may also be acceptable if the chance of a very large loss is small or if the cost to insure for greater coverage amounts is so great it would hinder the goals of the organization too much.

Risk transfer

Risk transfer means causing another party to accept the risk, typically by contract or by hedging. Insurance is one type of risk transfer that uses contracts. Other times it may involve contract language that transfers a risk to another party without the payment of an insurance premium. Liability among construction or other contractors is very often transferred this way. On the other hand, taking offsetting positions in derivatives is typically how firms use hedging to financially manage risk.

Some ways of managing risk fall into multiple categories. Risk retention pools are technically retaining the risk for the group, but spreading it over the whole group involves transfer among individual members of the group. This is different from traditional insurance, in that no premium is exchanged between members of the group up front, but instead losses are assessed to all members of the group.

(4) Create a Risk Mitigation Plan

Select appropriate controls or counter measures to measure each risk. Risk mitigation needs to be approved by the appropriate level of management. For example, a risk concerning the image of the organization should have top management decision behind it. Whereas, IT management would have the authority to decide on computer virus risks. The risk management plan should propose applicable and effective security controls for managing the risks. For example, an observed high risk of computer viruses could be mitigated (treated) by acquiring and implementing anti virus software. A good risk management plan should contain a schedule for control implementation and responsible persons for those actions.

(5) Implementation

Follow all of the planned methods for mitigating the effect of the risks. Purchase insurance policies for the risks that have been decided to be transferred to an insurer, avoid all risks that can be avoided without sacrificing the entity's goals, reduce others, and retain the rest(http://www.en.wikipedia.org).

2.2 Principles of Risk Management

The International Organisation for Standard (ISO) identifies the following principles of risk management. Risk management should

- Create value- resources expended to mitigate risk should be less than the consequence of inaction, or the gain should exceed the pain.
- Be an integral part of organizational processes
- Be part of decision making process
- Explicitly address uncertainty and assumptions
- Be systematic and structured
- Be based on the best available information
- Be tailorable
- Take human factors into account
- Be transparent and inclusive
- Be dynamic, iterative and responsive to change
- Be capable of continual improvement and enhancement
- Be continually or periodically re-assessed.

2.3 Types of Risks

Operational Risk: An operational risk is defined as a risk incurred by an organisation's internal activities. It is the broad discipline focusing on the risks arising from the people, systems and processes through which a company operates (http://en.wikipedia.org). Operational risk is a form of risk that summarizes the risks a company or firm undertakes when it attempts to operate within a given field or industry. Operational risk is the risk that is not inherent in financing, systematic or market- wide risk. It is the risk remaining after determining financing and systematic risks, and includes risks resulting from breakdowns in internal procedures, people and systems.(http://www.investopedia.com)

Credit Risk: Credit risk refers to the risk that a borrower will default on any type of debt by failing to make payments which it is obligated to do. The risk is primarily that of the lender and include lost of pricipal and interest, disruption to cash flows, and increased collection costs. The loss may be complete or partial and can arise in a number of circumstances, such as

A consumer may fail to make a payment due on a mortgage loan, credit card, etc.
A business or consumer does not pay a trade invoice when due.
A business or government bond issuer does not make a payment on a coupon or pricipal payment when due.
An insolvent insurance company does not pay a policy obligation
An insolvent bank won't return funds to a depositor.(http://.en. Wikipedia.org/wiki/credit_risk).

To reduce the lender's credit risk, the lender may perform a credit check on the prospective borrower, may require the borrower to take out appropriate insurance, such as mortgage insurance or seek security or guarantees of third parties. The higher the risk, the higher will be the interest rate that the debtor will be asked to pay on the debt.

Sovereign Risk: Sovereign risk is the risk of a government becoming unwilling or unable to meet its loan obligations, or reneging on loans it guarantees. Many countries have faced sovereign risk in the late -2000's global recession. The existence of such risk means that creditors should take a two- stage decision process when deciding to lend to a firm based in a foreign country: one should consider the sovereign risk quality of the country and then consider the firm's credit quality (Cooper, 1998).

3.0 Result and Discussion

This section presents the analysis of data collected in the course of this study. Data were presented in tables for analysis. Hypotheses 1, 2, 3 and 4 were tested by chi- square test statistics, using SPSS.

Table (1) What are the Risk Sources in the Manufacturing Organisations?

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	Employees: To increase productivity and competitiveness, management should have good relationship with their employees.	260 (268.75)	40 (31.25)	300
2	Suppliers: Organization must acquire resources from their environment to produce goods and services.	250 (268.75)	50(31.25)	300
3	Customers: Organizations that don't have sufficient customers will not survive.	280 (268.75)	20 (31.25)	300
4	Competitors : They use tactics like price reductions, new product introductions, and advertising campaigns to gain advantage over their rivals.	285 (268.75)	15(31.25)	300
Total		1075	125	1200

Source: Field Survey, 2013

H_1The sources of risks in the manufacturing organizations include employees, suppliers, customers and competitors

Table (2) Chi –Square Tests Computed from the Frequency Cross Tabulation

	Value	Df	Asymp.Sig.(2- sided
Pearson Chi- Square	115.596[a]	2	.000
Likelihood Ratio	139.527	2	.000
Linear- by- Linear Association	62.039	1	.000
N of Valid Cases	1200		

Source: SPSS Version 15.00

Table (2) shows the output of the computed Chi- Square values from the cross tabulation statistics of observed and expected frequencies. With the response options of agree and disagree based on the responses of the research subjects from the five manufacturing organizations; Pearson Chi-Square computed value (X^2_c= 115.596) is greater than the Chi –Square tabulated value (X^2_t =5.99) with 2 degrees of freedom (df) at 0.05 level of alpha (X^2_c

=115.596, p, < .05)

Decision Rule

The decision rule is to accept the alternate hypothesis if the computed Chi- Square value is greater than tabulated Chi-Square value otherwise reject the alternate hypothesis and accept the null hypothesis.

Since the Pearson Chi- Square computed X^2_c= 115.596 is greater than Chi-Square table value X^2_t =5.99, the null hypothesis is rejected and alternate hypothesis is accepted. Thus, we conclude that the sources of risks in the manufacturing organizations include employees, suppliers, customers, and competitors.

Table (3) What are the Risks that should be Retained?

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	Small risks where the cost of insuring against the risk would be greater over time than the total losses sustained.	270 (272.6)	30 (27.3)	300
2	Risks that are large or catastrophic that cannot be insured against or the premiums would be infeasible.	298 (272.6)	02 (27.3)	300
3	All risks that are not avoided or transferred are retained by default.	250 (272.6)	50 (27.3)	300
Total		818	82	900

Source: Field Survey, 2013

H_2 Small risks, risks that are large, and all risks that are not avoided or transferred are retained

Table (4) Chi –Square Tests Computed from the Frequency Cross Tabulation

	Value	Df	Asymp.Sig.(2- sided
Pearson Chi- Square	9.164[a]	2	.010
Likelihood Ratio	9.260	2	.010
Linear- by- Linear Association	.308	1	.579
N of Valid Cases	900		

Source: SPSS Version 15.00

Table (4) shows the output of the computed Chi- Square values from the cross tabulation statistics of observed and expected frequencies. With the response options of agree and disagree based on the responses of the research subjects from the five manufacturing organizations; Pearson Chi-Square computed value (X^2_c= 9.164) is greater than the Chi –Square tabulated value (X^2_t =5.99) with 2 degrees of freedom (df) at 0.05 level of alpha (X^2_c =9.164, p, < .05)

Decision Rule

The decision rule is to accept the alternate hypothesis if the computed Chi- Square value is greater than tabulated Chi-Square value otherwise reject the alternate hypothesis and accept the null hypothesis.

Since the Pearson Chi- Square computed X^2_c= 9.164 is greater than Chi-Square table value X^2_t =5.99, the null hypothesis is rejected and alternate hypothesis is accepted. Thus, we conclude that Small risks, risks that are large, and all risks that are not avoided or transferred are retained

Table (5) How can Risks be Assessed and Prioritized?

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	By determining the severity of loss.	290 (287.5)	10 (12.5)	300
2	By determining the probability of occurrence	285 (287.5)	15(12.5)	300
Total		575	25	600

Source: Field Survey, 2013

H_3 Risks can be assessed and prioritized by determining the severity of loss and probability of occurrence

Table (6) Chi –Square Tests Computed from the Frequency Cross Tabulation

	Value	Df	Asymp.Sig.(s2- sided
Pearson Chi- Square	17.405[a]	2	.000
Likelihood Ratio	17.438	2	.000
Linear- by- Linear Association	10.799	1	.001
N of Valid Cases	600		

Source: SPSS Version 15.00

Table (6) shows the output of the computed Chi- Square values from the cross tabulation statistics of observed and expected frequencies. With the response options of agree and disagree based on the responses of the research subjects from the five manufacturing organizations; Pearson Chi-Square computed value (X^2_c= 17.405) is greater than the Chi –Square tabulated value (X^2_t=5.99) with 2 degrees of freedom (df) at 0.05 level of alpha (X^2_c=17.405, p, < .05)

Decision Rule

The decision rule is to accept the alternate hypothesis if the computed Chi- Square value is greater than tabulated Chi-Square value otherwise reject the alternate hypothesis and accept the null hypothesis.

Since the Pearson Chi- Square computed X^2_c= 17.405 is greater than Chi-Square table value X^2_t =5.99, the null hypothesis is rejected and alternate hypothesis is accepted. Thus, we conclude that risks can be assessed and prioritized by determining the severity of loss and probability of occurrence.

Ta**ble (7) What are the implication of Risk Management**

S/N		AGREEMENT	DISAGREEMENT	TOTAL
1	Improperly assessed and prioritized risks result in waste of time dealing with risks that are not likely to occur.	270(91.7)	30(8.3)	300
2	Spending too much time assessing and managing unlikely risks can divert resources that could be used more profitably.	280(91.7)	20(8.3)	300
Total		550	50	600

Source: Field Survey, 2013

H_4 Improperly assessed and prioritized risks result in waste of time dealing with risks that are not likely to occur.

Table (8) Chi –Square Tests Computed from the Frequency Cross Tabulation

	Value	Df	Asymp.Sig.(s2- sided
Pearson Chi- Square	11.481[a]	2	.003
Likelihood Ratio	10.823	2	.004
Linear- by- Linear Association	11.386	1	.001
N of Valid Cases	600		

Source: SPSS Version 15.00

Table (8) shows the output of the computed Chi- Square values from the cross tabulation statistics of observed and expected frequencies. With the response options of agree and disagree based on the responses of the research subjects from the five manufacturing organizations; Pearson Chi-Square computed value (X^2_c= 11.481) is greater than the Chi –Square tabulated value (X^2_t=5.99) with 2 degrees of freedom (df) at 0.05 level of alpha (X^2_c=11.481, p, < .05).

Decision Rule

The decision rule is to accept the alternate hypothesis if the computed Chi- Square value is greater than tabulated

Chi-Square value otherwise reject the alternate hypothesis and accept the null hypothesis.
Since the Pearson Chi- Square computed X^2_c= 11.481 is greater than Chi-Square table value X^2_t =5.99, the null hypothesis is rejected and alternate hypothesis is accepted. Thus, we conclude that improperly assessed and prioritized risks result in waste of time dealing with risks that are not likely to occur.

Concluding Remarks

Risk management is simply a practice of systematically selecting cost effective approaches for minimizing the effect of threat realization to the organisation. All risks can never be fully avoided or mitigated simply because of financial and practical limitations. Therefore all organizations have to accept some level of residual risks. However, if risks are improperly assessed and prioritized, time can be wasted in dealing with risk of losses that are not likely to occur. Spending too much time assessing and managing unlikely risks can divert resources that could be used more profitably. Unlikely events do occur but if the risks are unlikely enough to occur it may be better to simply retain the risk and deal with the result if the loss does in fact occur.
Prioritizing too highly the risk management processes could keep an organization from ever completing a project or even getting started. This is especially true if other work is suspended until the risk management process is considered complete.

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