Application of HaCEM Analysis for Safety Studies in Museum Management

Elochukwu Nwankwo

Department of Archaeology and Tourism, University of Nigeria, Nsukka, Nigeria.

Abstract: *Irrespective of the significant position of museum to the human society, museum is still posed with some challenges which work against its growth and sustenance. Among these challenges are hazards in the museum. Most people would not like to visit or work in a place where their total safety is less guaranteed. This scenario has attracted safety considerations in the museum management. To this regard, this paper had an in-depth study on safety issues in museum management. Adopting the bulk of its primary data from a fieldwork report on Nri Museum in Anambra State of Nigeria, the paper made use of HaCEM analysis which enabled it to study hazards, causes, effects and measures with respect to the museum experience. To this end, possible causes of hazards (minor and major) in the museum, their causes (minor and major), their effects (external and internal) and their control measures (mitigating and eradicating), were unveiled and discussed in the paper. Such studies would improve safety standard of museums, especially Nigerian museums, which would invariably enhance the growth and sustenance of museum and its contribution to humanity.*
Keywords: *HaCEM, Management, Museum, Safety, Sustenance.*

I. Introduction

Museums are "ultimately involved in the task of defending identities and setting up schemes that classify and relate cultural identities" [1]. The position of museum in the societal growth, unity and sustenance has attracted studies from various academic disciplines towards more elaborate and explicit understanding of museum which is expected to be manifested in the contribution of museum to the growth and sustenance of the human society. For instance some studies have adopted varying approaches to this regard [2]. These include sociological approaches i.e. [3]; [4] etc, anthropological approaches i.e. [5]; [6]; [7] etc, archeological approaches i.e. [8]; [9]; [10] etc. All these works are geared towards improving the museum experience and enhancing the imperative role of the museum to the human society.

People visit the museum from different parts of the world for different purposes ranging from exhibition, recreation, research, education, etc. As these different categories of museum visitors enter the museum, they are received by some individuals who are the museum staff and saddled with the responsibility of guiding visitors to the museum and taking care of the museum in all ramifications. The safety of these categories of people in the museum; the visitors and museum staff, has attracted studies in recent times towards improving the safety standard of museums and at the same time developing an area of concentration in museum management. To this regard, "throughout the history of travel, visitors have faced the tourist-related phenomenon of leaving their home environment to visit one which they may find unfamiliar, and has associated risks and hazards inherent associated with their lack of knowledge associated with that environment…" [11]. [12] also noted that tourists or visitors are motivated to destinations with improved safety standard. In the same vain, no matter the degree of emolument, no reasonable staff would like to work in a place where his or her safety is less guaranteed. Overall safety of museum staff and visitors has attracted some relevant studies to that regard i.e. [13]; [14]; [8] etc. For instance, [13] suggested five major ways towards ensuring health and safety in the museum. These include; recognizing the need for action, inspecting the work place, controlling the risks identified, and recording the steps taken. [14] also suggested proper information dissemination amongst museum staff and visitors towards improving safety in the museum.

The inability of most museum managements to ensure safety in their museums has resulted in varying degrees of accident cases on both the museum staff and visitors. These museum managements have not taking time to critically assess the safety rate of their museums [15]. This has left so many museums as death traps to both museum staff and visitors. Previous studies, i.e. [16]; [17]; [18] etc, discussed so much on the importance of safety in tourist destinations which museum is part of. This is because safety rate of these destinations can make or mar the indispensable goals, missions and visions of these destinations. Museum as one of the leading tourist destinations in the world is faced with safety challenges. Nigerian museums are not exceptional more especially, local and small museums which attract less management concern from their managements. This has left some questions to be addressed with respect to safety issues in museums. These questions include; what are the possible human hazards in the museum? What are the causes of these hazards? What are the effects of these

hazards to the museum growth and sustenance? And finally, how can these hazards be controlled to improve safety standard in the museum? Articulated and effective answer to these questions is a key to ensuring museum safety in Nigeria and other nations of the world, and also one of the keys for ensuring museum growth and sustenance. Okpoko opined that "management is the key to museum safety and safety in the museum should be taken very seriously…" [8]. He went further to state that safety is needed in museums so as to protect museum staff and visitors, and at the same time making museum a safe place to visit since among the legal responsibilities of a museum is ensuring the safety of both museum staff and visitors hence accidents costs museums a lot and personal injury claims as a result of accidents in the museum are very expensive these days [8]. This has called for more researches towards improving the safety of museums in Nigeria. Such called motivated this study which tends to address the above research questions. Methodologically, the study made use of a research reports on the Ethnographic Study of NRI Museum and Ethnographic Study of Igbo-Ukwu Museum, all in Anambra State of Nigeria. These fieldwork reports formed the bedrock of the primary sources of this study. Documentary sources were equally used to augment data from the primary sources. Also the study made use of HaCEM analysis so as to have a comprehensive study of hazards, causes, effects and control measures, with particular reference to the museum experience.

II.   Epistemology Of Museum

Many definitions have been given to the understanding of museum. For instance the International Council of Museum (ICOM) sees museum as "…non-profit permanent institution in the service of the society and of its development, open to the public which acquires, conserves, researches, communicates and exhibits for purpose of study, education and enjoyment, the tangible and intangible evidence of people and their environment" in [8]. Also "…museums are institutions created by the society for the purpose of collecting, preserving and exhibiting man's history and culture, both past and present, for the purpose of education, enjoyment and sustainability of man's cultural history" [19]. These definitions encompass the wholesomeness of museums and its categories. The definition given by ICOM directs us the various functions of the museum to the human society. [8] noted that museum has four major functions it plays to the society which accommodate other functions. These include; collection, preservation, education and exhibition. These indispensable functions of the museum are chronologically arranged. Take for instance; collection entails collecting valuable material and non-material aspect of a peoples' culture; preservation or conservation in the other hands entails preserving and taking care of those aspects of a people's culture it collects; education entails enlightening the general public on the aspect of a people's culture to promote cultural tolerance and appreciation; and finally, exhibition entails displaying those aspects of culture for the public to view and appreciate.

Typologically, museums can be classified in varying dimensions as noted by [8]. It can be classified on the basis of who runs it, the type of object it collects, the service location of the museum, the audience the museum is serving and method of exhibition [8]. If classified on the basis of collection, they include; industrial museums, military museums, geology museums, history museums, art museums, ethnography museums, general museums, archaeology museums, science and technology museums, etc. when classified according to its managerial source, they include; government museums, private museums, armed forces museums, commercial museums, university museums, etc [14]; [8]. Irrespective of its differences in typology, museum has much value to the society. Take for instance, museum "…gives people opportunities to rediscover themselves (including their natural resources) and to identified their place in the past and the role it can play in the contemporary world" [20]. Museum also "…fosters political unity and promotes cultural identity especially in countries with diverse ethnic groups" [21]. Ekechukwu went further to state that "museum promotes indigenous technological development by encouraging local crafts men to produce their wares. In this way it also promotes scientific research and development" [21].

III.   Hacem Analysis

HaCEM (Hazards + Causes + Effects + Measures) analysis was proposed by Nwankwo, E.A. in 2011 [26]. It is a modern analytical method used in the analysis of safety issues in a system. It gives an elaborate study of facts and implications with respect to safety in a system. HaCEM analysis is an answer to a call towards exposition and eradication/mitigation of risk rate in a system which arguably brings discouragement in a system. To this regard, HaCEM analysis is of four distinctive but non-detachable divisions aimed at analytical studies of facts and implications. These four divisions are as follows;

➢   Hazard [Ha] - in this aspect, the analytical method exposes various risks human beings are prone to in a system. It also discusses the work rate of these hazards towards human beings in a system. All category of risk or hazard in a system identified. There could be minor and major hazards.
➢   Causes [C] - the second stage of HaCEM analytical method is to concentrate on the causes of the identified hazards in a system. Various factors can cause varying degrees of risks in a system. This method unveils

these causes and tags them to their individual risks which they expose a system to. These causes can equally be grouped into minor and major causes.

➢ Effects [E] - the next concentration of HaCEM analytical method is making an analysis of the effects of those identified hazards in a defined system. Surveying the extent at which those hazards effects the system's output, cohesion or plans towards achieving the overall goal or mission of the system. Both external and internal effects are considered.

➢ Measures [M]- having identified those hazards, their causes and effects to the system, the final stage of this analytical method is working out various measures towards eradicating or mitigating the effects of those risks to the system's growth, productivity and sustenance. Here, concentration is on two variables; eradication and mitigation. While the first looks at those measures that would bring to an end those destructive tendencies of those identified hazards, the second is looking at measures towards reducing the impacts of unavoidable hazards in a system since some risk factors may not be completely eradicated due to their nature in system.

Finally, HaCEM analysis is a risk analytical method used in risk studies in a system. It x-rays major and minor hazards in a system, major and minor causes of the identified hazards, external and internal effects of those hazards on a system, and finally considers eradicating and mitigating measures to the identified hazards.
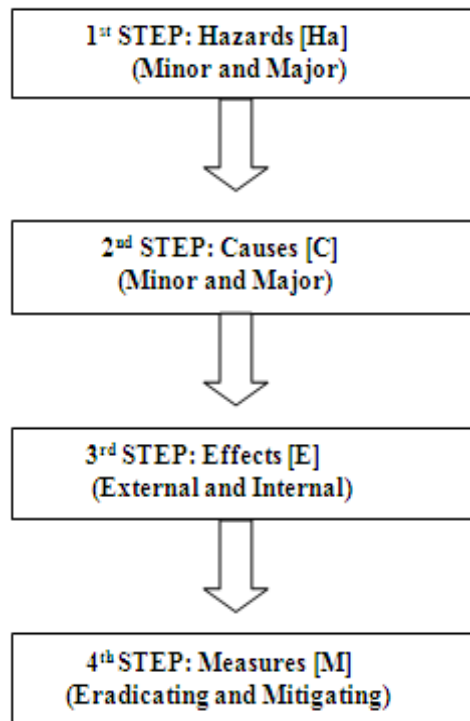

Figure One: HaCEM analysis process.

IV.   Findings And Discussions

The study tends to answer various research questions that were put forward at the beginning of this study. Museum which has of recent been referred to as a global department store of cultures [22] requires intense safety studies towards enhancing the value of museum to the human society. This is pertinent because museum houses ancient treasures [23], and holds the thrust of the society to this regard. Adopting the HaCEM analysis, this study would x-ray various hazards museum staff and visitors are exposed to in the museum, causes of those identified hazards, effects of these hazards to the museum growth and sustenance and finally the control measures of these hazards towards enhancing the role of museum to the unity, growth and sustenance of human society. There will be non-collective application of the HaCEM principles on the identified hazards.

Among these hazards is a collapse building. There is a possibility of a collapse building in a museum thereby injuring museum staff and visitors in the museum at the time of collapse. This can be caused by poor architectural design, outdated architectural pattern, ageing structures, natural factors like erosion, wing, etc. Such incidence would inflict much injury to the museum staff and visitors in the museum and at the same time destroying numerous museum collections and equipments. Such incidence would intensely discourage visits to the museum and working in the museum. To control this hazard, efficient and modern architectural design is

necessary for the museum. Also ageing buildings and walls should either be replaced or redesigned to meet the current demand.

There is also the risk of electrocution which is hazardous to museum staff and visitors. This hazard can be caused by poor electrification in the museum, electrical malfunctioning, exposure of necked wires, etc. this can cause severe health problems to the museum staff and visitor and denying them rest of mind in the museum. Such incidence can equally set the museum ablaze if not checked on time and destroy museum collections and equipments. Such incidence can devalue a museum in the assessment of the public. There is need for proper electrification of the museum, routine check on the electrical wirings in the museum, availability of fire extinguishers in the museum.

Moreover the problem of crime is on the increase in most of the museums in Nigeria [21]. Criminals feast on museum staff and visitors mostly those museums at the hinterlands. This is caused by insecurity or porous security network in and around the museum, also less security considerations at the planning stages of the museum. The effect of this hazard is the loss of cash and other valuables of museum staff and visitors. In most cases museum collections and equipments are left in the mercy of these criminals. Such incidence also discourages museum traffic. To this regard, [24] noted that the museum building should be architecturally designed to enhance security in and around the museum. Also studies by [8] suggested measures of improving museum through diversification of various security concerns of the museum. These include; human security, curatorial security, etc. They also suggested some security measures like the use of modern security devices, electronic security system, etc, towards improving security in the museum [8]. These measures are geared towards protecting museum staff and visitors, also museum collections and equipment.

However, there is also a hazard as a result of suffocation in the museum. In most cases this is peculiar to old museums or unkempt museums. In most cases it is caused as a result of dust from old museum collections, inadequate ventilation in the museum, inadequate sanitary policy of the museum, etc. this is hazardous to human health especially asthmatic patients. Other health problems like cough, catarrh, constipation, etc, can also result from such atmosphere in the museum. Also loss of breath, respiratory infections, and other skin diseases can emanate from such a situation. Suffocating museum building can equally effect the life span of some museum collections. Such conditions can deny a particular museum of its prospective staff and visitors. In controlling such a situation, adequate sanitary policy of the museum should be formulated and adequately implemented, ensuring adequate ventilation in the museum building and making use of relevant deodorants that are not harmful to museum collections and human health.

Table One: HaCEM analysis table for safety studies in the museum practice.

HAZARDS	CAUSES	EFFECTS	MEASURES
Collapse building	Old structures, poor architectural design, natural factors like erosion, etc	Injuries on museum staff and visitors, destruction of museum collections and other equipments, etc	Quality and sustainable architectural design, replacement or redesigning of old structures, etc
Electrocution	Poor electrification, electrical malfunctioning, exposure of necked wires, etc	Health hazards on museum staff and visitors, destruction of museum collections and equipments through fire outbreaks, etc	Quality electrification, routine check on electrical wirings, availability of fire extinguishers, etc
Crime	Insecurity, porous security, etc.	Loss of lives and personal belongings, theft of museum collections and equipments, etc.	Adequate security, security architectural designs, modern security devices, electronic security device, etc
Suffocation	Dust from old collections, inadequate ventilation, inadequate sanitary policy, etc.	Loss of breath by museum staff and visitors, skin diseases and other respiratory infections etc	Adequate sanitary policy, adequate ventilation, use of relevant deodorants, etc.

Dangerous objects	Non secured dangerous objects, exposed dangerous objects, etc	Personal injuries to the museum staff and visitors, etc.	Use of showcases, short writ-ups, museum manuals or guides, etc
Minor injuries	Damaged floors, slippery floors, damaged museum equipments, wrong arrangement of museum equipments, etc	Body pains and unnecessary bleedings, etc.	Restoration of damaged floors, repair or replacement of damaged equipments, often mop splashed waters on the floor, etc.
Fire outbreaks	Electrical malfunctioning, inflammable objects, smoking, etc.	Burns and other health problems, destruction of museum collections and equipments, etc.	Routine check on electrical wirings, availability of fire extinguishers, proper fire control policy, etc.

Moreover, there is also risk arising from dangerous collections in the museum. In some museums like that of Nri museum in Anambra State (where bulk of the primary data of this paper is sourced from), physical touch of some museum collections are harmful to human health. This is often caused by the nature of the object, history of the object, non-protective nature of some objects in the museum, etc. a mere physical touch to these categories of objects in the museum can inflict some personal injuries to either the museum staff or visitors. The nature of some objects demand the use of showcases for their displays in the museum [25]; [8]. Also museum staff and visitors should be well informed on the nature of some harmful objects through the use short write-ups placed very close to the object in question. Also museum manuals or guides can equally be used in passing across such information. Such would reduce the rate of physical touch on some harmful objects in the museum.

In addition, there is also problem of fire hazard in the museum resulting from fire outbreaks in and around the museum. The possibly of fire hazards in the museum can never be undermined by various museum management boards. Fire hazards in the museum can be caused by many factors starting from electrical malfunctioning, smoking in the museum, presence of inflammable objects in the museum, fire outbreaks in the neighborhood of the museum, etc. This can cause much health problems to museum staff and visitors and at the same time destroying valuable museum collections and equipments. To control this hazard, there is need for a routine check on the electrical wirings in the museum, placement of fire extinguishers on some strategic places in the museum, formulation and implementation of proper policy on the use of inflammable objects in the museum, etc. such measures would reduce the rate of possible fire outbreaks in the museum.

Finally, there is also risk of incurring other minor injuries in the museum from other factors except the ones already mentioned in the paper. These minor injuries are detrimental both to the museum staff and visitors. They include all sorts of personal injuries like cuts, dislocation, fracture, bruises, strains, sprains, etc. Such injuries can be caused by damaged floors, slippery floors, damaged museum equipments, wrong arrangement of museum equipments, human carelessness, etc. this can cause unnecessary health discomfort to the museum staff and visitors though unnecessary bleedings and other body pains. To control these hazards, damaged floors should be quickly restored, damaged museum equipments should be quickly repaired or replaced as the case may be, slippery floors should be avoided by the use of floors with frictions and mopping of splashed water on the floor, museum manuals and guides should be used to control the activities of both museum staff and visitors in the museum.

V. Conclusion

Museum contributes to the cultural restoration, stability and sustenance of various traditional societies. On the global scale, it indirectly impacts on the global peace and unity through cultural tolerance. Irrespective of this enormous contributions to the human society, museum is face with some challenges amongst which is hazards which affects two major groups of persons in the museum; the museum staff and visitors. This problem has become a thorn in the fresh of museum's growth, development and sustenance in Nigeria. The use of HaCEM analytical method in safety issues in a system, has reveled various risks and hazards that are inherent in the museum. These hazards include; collapse building, electrocution, crime, suffocation, dangerous objects, fire outbreaks, and other minor injuries. The study equally looked at the various causes of these hazards, their effects on the museum staff and visitors not forgetting the overall museum growth and sustenance. The last aspect of the analysis looked at measures towards controlling these hazards. These measures could be mitigating or eradicating in nature. The adoption of whichever control measure (eradicating or mitigating) is a decision reserved to the museum management and determined by the nature of the hazard. The transformative role of HaCEM analysis to safety issues in the museum management is highly recommended for museum growth and sustenance. Considering the fact that no academic research is a perfect end to any academic [19], it is

necessarily expected that future studies on safety issues in the museum would unveil some other hazards in the museum. Managements and owners of various museums in Nigeria would see the result of this research as a charitable tool towards improving the course of their various museums. This is pertinent because the common effects of these hazards is the reduction in tourist traffic, destruction of museum collections, refusal to work in museums and devaluation of the museum experience by the general public.

References

[1] I. Karp, On Civil Society and Social Identity, in I. Karp, C. M. Kreamer and S. D. Lavine (Eds), *Museums and Communities: The Politics of Public Culture* (Washington DC: Smithsonian Institute Press, 1992).

[2] A. Newman and F. Mclean, Capital and Evaluation of the Museum Experience. International Journal of Cultural Studies, 7(4), 2004, 480-498.

[3] P. Bourdieu and A. Darbel, *The Love of Art* (Padsow:Polity Press, 1997).

[4] S. Macdonald, *Behind the Scenes at the Science Museum* (Oxford: Berg, 2002).

[5] B. Dicks, *Heritage, Place, and Community* (Cardiff: University of Wales Press, 200).

[6] G. Fyfe and M. Rose, Decoding the Museum's Gaze: Rethinking Museum Visiting, in S. Macdonald and G. Fyfe (Eds), *Theorizing Museums* (Oxford: Blackwell, 1996).

[7] J. J. Peirson, Communicating and Learning in the Gallery 33: Evidence from a Visitor Study, in E. Hooper-Greenhill (Ed), *Museums, Media Massage* (London: Rutledge, 1995).

[8] A. I. Okpoko, *Fundamentals of Museum Practice* (Nsukka: University of Nigerian Press, 2001).

[9] F. N. Anozie, Mini-museum as a Complement to our National Museum System, Proceedings of the 8th Annual Conference of the Archaeological Association of Nigeria, Mina Niger State, 1989.

[10] L. C. Ekechukwu, Disappearance of the Nigeria's Cultural Property: Need for Increased Security, in Bassey Andah (Ed), *Cultural Resource Management: An African Dimension*, 20 (Ibadan: Wisdom Publishers, 1990).

[11] S. J. Page and J. Connell, *Tourism: A Modern Synthesis*, 2 (London: Thompson Learning, 2006).

[12] C. Cooper, J. Fletcher, A. Fyall, D. Gilbert and S. Wanhil, *Tourism: Principles and Practice* (England: Pearson Educational Limited, 2005).

[13] J. David, J. Kelly and F. Swift, The Benefits of Effective Interpretation of Collections in Museum Galleries. *Museum practice*, Issue 51, 2(2), 1997, 36-44.

[14] T. Ambrose and C. Paine, *Museum Basics* (London: Rutledge 11, New Fetter Lane, 1993).

[15] E. Nwankwo, An Ethnographic Study of Odinani Museum Nri in Anambra State, A Fieldwork Report in the University of Nigeria Nsukka (Nsukka, 2006).

[16] S. Clift and P. Grabowski (Eds), *Tourism and Health: Risks, Research and Responses* (London: Cassel, 1996).

[17] J. Wilks and S. J. Page (Eds), Managing Tourist Health and Safety (Oxford: Elsevier, 2003).

[18] J. Wilks, D. Prendergast and P. Leggat (Eds), Tourism in Turbulent Times (Oxford: Elsevier, 2005).

[19] E. Nwankwo, *Management and Operations of Travel Agency in Nigeria and their Implication to Sustainable Tourism Development: A Case Study of Enugu Metropolis*, Masters' Thesis, University of Nigeria Nsukka, 2009.

[20] K. N. Momin and A. I. Okpoko, Museum and People, in Bassey Andah (Ed), *Cultural Resource Management: An African Dimension,* 20 (Ibadan: Wisdom Publishers, 1990).

[21] L. C. Ekechukwu, Cultural Resource Management. An Unpublished Reading Manual, University of Nigeria Nsukka, 2003.

[22] J. Clifford, *Routs: Travel and Transportation in the Late Twentieth Century* (Cambridge, MA: Harvard University Press, 1997).

[23] M. S. Santos, Museums without a Past: the Brazilian Case. *International Journal of Cultural Studies*, 6(2), 2003, 180-201.

[24] S. Baxi, Problems and Requirements of Security: Security in Museum, in O. P. Agrawal (Ed), *A Publication of Museum Association of India* (New Delhi: Navchetan Press, 1987).

[25] J. David, J. Kelly, S. Manson, and S. Swift, *Design Criteria. Museum Practice*, 1(2), 1996, 41-43.

[26] E. Nwankwo, Safety and Security Measures in the Tourism Industry: A Case Study of Old Eastern Region of Nigeria, Ph.D Proposal, University of Nigeria Nsukka, 2011.