

INFLUENCE OF ARCHITECTURE ON DESIGN AND MAINTENANCE OF KITCHEN FACILITIES

Muhammad Nasir Gidado¹, Usman Lawal A. Mani²

¹Department of Architectural Technology Hassan Usman Katsina Polytechnic, P.M.B. 2052, Katsina, Katsina State, Nigeria.

²PhD, Department of Home and Hospitality Management Hassan Usman Katsina Polytechnic, P.M.B. 2052, Katsina, Katsina State, Nigeria

Corresponding Author Email: mnasgee@gmail.com

ABSTRACT

The study focused to identify the influence of architectural design on the procurement and maintenance of kitchen facilities. Architects are believed to possess the know-how on the materials needed in a facility before it even turn into reality. They dictate the right materials, the quantities, the strength, durability and other important factors. Different literatures related to that were all cited. Quantitative approach using a cross-sectional survey research method was used in conducting the study and the total academic staff, technologist and technicians from the departments of Architectural Technology and Home and Hospitality Management of Hassan Usman Katsina Polytechnic totalling 32 were used as the total population for the study. Purposive sampling method was adopted in sampling all the 32 respondents considering their smaller size and regarded as the sample size for the study. Close ended 4 points hedonic form of questionnaire was used to retrieve information from the sampled respondents. It was gathered that at an average mean of 2.84 and 3.25 respectively, architects are considered as the cornerstone of any building facility and they are widely accepted when constructing and securing kitchen facilities. It was also identified that they shape a space and provide conducive environment as well as transform the space from its existing state to an entirely new look at an average mean of 3.34 and 3.13 respectively. with a mean score of 3.41 and 2.84 respectively, maintenance of equipment is believed to be the major way of preventing unnecessary accident regarding equipment and facility usage in an organization and it helps in curtailing the problems of low production and cost of purchasing new facility because of total collapse. It was concluded that architectural design is best guide toward procuring materials and equipments for new facility. It was recommended that they should always be consulted when it comes to construction and procurement of materials and equipments for new facility.

Keywords: Architect, Design, Procurement, Maintenance, Kitchen

1. INTRODUCTION

Kitchen is a section or unit of a particular building being it a hotel, home, school, hospital, factory, industry and many others separated for the sole purpose of preparation, cooking and service of the cooked food to the target customers of where it is located (Olaide, 2020). Kitchen differs from one another based on the aim it was set to achieve, the design it is built upon and the type of operation it is set to be carried out. This is because a standard commercial kitchen may have areas such as storage, wash-up, preparation, cooking and service all separated from one another which is not found in many home kitchens (Alvin, 2016). All these areas requires equipments, tools and utensils for proper, effective, efficient and successful operations as such, there is need for full utilization of the space separated for kitchen so as to contain all the equipments required without much congestion which in turn may cause accident when carrying out day-to-day activities (Rophina, 2023). The equipments should be positioned in such a way that there are gang ways where employees can move freely from one area of the kitchen to the other (Lestari, Shofyan and Ulfah, 2023). The type of equipment available in a particular kitchen normally dictates the type of menu that can be produced in it as it is normally the equipments available that is observed before the staff expertise. Many times employing the service of professional employees without the availability of equipments they are to utilize is just like a waste of resources (Abdu, 1999).

Kitchen equipment are the materials (which can be hand held, on the table or fixed) used in the preparation and cooking of the dishes. For a successful cooking like any other skilled operations, there must be available essential of these equipments and tools to carry out the necessary task (Jalem, 2022). Availability of essential kitchen equipment is not all that matters, but to ensure that the right types of equipments is chosen to suit the job to be done. As in term of quality, artistry and imagination standard of food preparation are higher today perhaps than at any time in the past (Abdu, 1999). And whilst it is true that there exist a universal understanding of cookery through the language of the kitchen, nevertheless, there is ample scope for the development of individual talent when it comes to new and existing forms of food preparation, presentation (Olaide, 2022) .

According to Hunt (2023), Kitchen from architectural perspective is not only focus on design trend and aesthetic aspect but shaping a particular space and providing a conducive environment that can influence users behaviour and perception. Architectural designs are transforming kitchen from a concealed corner of a building regarded as a place just for cooking to multifunctional space where many activities including uniting, socializing as well as creating memories are taking place. As such the layout of a modern kitchen provides space for easy movement with lighting, colour scheme and equipment arrangement to impact the functionality and atmosphere of the kitchen. It is believed that a well designed kitchen can provide enabling environment for smooth running of operations and influence the mood and food choices of the diners (Fontan, 2024). However, not only the equipments needed but, the right type for the task they are expected to carry out. This is because the type of equipment and staff in a particular kitchen of an establishment dictate the type of menu (dishes) the establishment is capable of producing, as the wise saying “you are as good as your tools” and “the right tool for the right job” (Tiwari, 2023). For successful operation in any kitchen, the equipments therein have to be durable, heavy-duty and reliable as they are highly costly which the money used in their purchase cannot be recovered within a short period of time. Therefore, the equipments need to be in proper operation for the target period in order to recover the capital used in their purchase and generate reasonable profit to the organization. These cannot be achieved without proper architectural design such as electrical, plumbing, building and other facilities in respect to proper arrangement and maintenance. This paper therefore focused on identifying the influence architectural designs have on proper arrangement and maintenance of kitchen equipments. It will further move to provide answers to the following research questions:

- To identify the inputs of architecture to kitchen design.
- To determine the contributions of architectural design to kitchen equipments arrangement.
- To assess the benefits of maintenance of kitchen facilities to their improved shelf life.

Architecture and Kitchen Design

Architecture is proved to be the cornerstone of structures in any built environment as it involves all aspects related to planning, designing, as well as building a structure (Newman, 2020). The main aim of architecture is to create spaces that are safe, durable and suited to their intended purposes. As the trend is changing based on the technological advancement and the need of people in various aspects of life, it therefore calls for collaborative effort between architects and kitchen designers to work together to satisfy the need of their clients (Fontan, 2024). Architecture is someone who is qualified and certified to modify and remodel as well as maintain the structural elements of a building. Designers on the other hand are those who artistically and carefully design the décor and furnishing of a building. They in many cases have to consider the structure of the space that they are designing. According to Badiger (2024), architecture is the structural design and layout of a building whereas the design is the how the particular building is decorated or styled. In kitchen design, the architectural aspect will include items such as the cabinet including the island, the colour scheme, plumbing, lighting and equipments arrangement.

Architects utilize the golden principle ‘If it can be imagined, it can be drawn; if it can be drawn, it can be built.’ They have the technicalities of maximizing space as they possess techniques of visualization that they utilize to produce innovative designs (Badiger, 2024). it is pertinent to note that architect always try to bring client’s wish to reality but adapting dimensions, materials, shapes, sizes, colours, hues and shades, patterns, graphics etc. they place their creativity under control so as not to allow it to go astray outside built ability (Chandrakumari, 2023). Kitchen design involves many rehearsals of sketches and several consultations regarding the best materials for carpentry, plumbing, flooring, lighting, and other accessories to be used. There are various reasons why an architect should be involved in kitchen design as he has thorough knowledge of what it shall be before it came into reality. He can be able to advise and provide options regarding the materials to be used and their quality, quantity, factors such as durability, strength, and utility, aesthetic and above all the cost which is what majority of clients are after before embarking into any project (Hunt, 2023). The architect after all the consultations with the client about what he/she need places it on paper in form of drawing and present it to the client to see how the finished product will look like after completion. Bangalore (2023) highlighted the following as the reasons why kitchen design is crucial in the overall architectural design:

- Functionality and efficiency
- Lifestyle and user needs
- Aesthetic appeal
- Integration with other spaces
- Technological integration
- Safety and ergonomics

- Resale value
- Adaptability and future needs.

Contributions of Architectural Design to Kitchen Equipments Arrangement

A well planned and designed kitchen is the one that enables free flow of all the tasks the kitchen was built to be carried out. Hagejard et al, (2020) identified the following as part of the contributions of architectural design to kitchen equipments arrangement:

- **Proper Positioning:** with their vast knowledge on space and its maximization, architects looks at a particular space in a building that is meant to be used as kitchen and as well as the equipments the client is planning to purchase and provide a suitable spacing arrangement and positioning of the equipments for efficient workflow. This does not only stop here as it further includes positioning of sinks, electrical fittings, cold rooms and refrigerators as well as work tops.
- **Free Movement:** architect normally consider the size and type of a particular kitchen and provide gangways in between the various areas (storage, preparation, cooking, service and wash-up) in the kitchen for free movement from one area to the other to prevent accidents.
- **Create Space:** Architects seek to infuse spaces with unique attributes that mirror the client's personality and lifestyle preferences. From crafting custom cabinetry that fits the exact needs of the household to selecting distinctive finishes that enhance the kitchen's character, the architect's role extends beyond basic design; it encompasses the creation of a personalized environment tailored to individual tastes and functionality.
- **Appealing Environment:** The architects right from history back maintained the golden rule of kitchen design "proportions and symmetry" with the belief that certain proportions and symmetry are naturally pleasing to the human eye. This rule created balance between various elements in the kitchen such as the worktops, electrical fittings, cabinet, plumbing etc. to ensure no area feels overloaded. They tried to make sure there is balance between functionality and aesthetic. The welcoming environment is crucial in the kitchen, a space often associated with warmth, gathering, and shared experiences that enrich our lives.
- **Placement of Components:** In modern kitchen design the architect tries to assure his client of maximum utilization of even a limited space so that no little space is wasted. During the initial planning, architect tried their possible best in assuring that each equipment is placed in accordance to where it is suitable for easy operation in each area in the kitchen.
- **Benefits of Maintenance to increased Shelf life of Kitchen Equipments**
- Catering equipments are capital intensive and they need to be kept under constant maintenance and repairs so as to reach or even exceed their expected shelf life. This responsibility is both to the departmental head and the staff who are in direct contact/usage of the equipments. Machines for instance should be in good working condition before permission is given for their usage. Some of the disadvantages of lack of proper maintenance to these equipments according to Davies (2021) are:
- **Render Equipment Inefficient:** efficiency is one of the factors expected from a catering tool or machines so that the expected dishes are prepared and served to the customer as at when expected. But when these machines/tools or utensils are not maintained there will be a lot of time and energy wastage when using them and their production output will also not be adequate.
- **Shorten the Life Span of Equipment:** After their manufacture each equipment/tool/utensil is expected to be in operation for expected period of time so that the money used in its initial purchase can be recovered back and even realize profit. But where they are not fully maintained, there is the greater tendency for them to become faulty before the expected period is reach.
- **Many Causes Complete Total Replacement:** Lack of maintaining a tool or machine may lead to complete total replacement. This is because its efficiency will reduce to an unbearable stage that may lead customers to be running away from the establishment. This condition may also lead to an unnecessary expenditure in the part of the equipment which may become incomparable to its production. Where the tool/utensil is from wood, soaking them in water for long may lead to this same problem.
- **Causes Food Poisoning:** As for example grinding machine, mincing machine, chopping boards, electric mixer, pots, knives etc. If food particles are allowed on these categories of equipments or on their attachments, the food may decay and if used without thorough cleaning may lead to cross contamination and food poisoning.

- **Causes Accident:** Lack of maintenance may lead to faulty in electrical/gas appliance for instance, and if they are used by a careless operator may lead to accident. Sometimes accident may be caused do to loose of some attachment if the equipment is having attachment.
- **Causes Rust on Metal Equipment:** As most of the tools and equipment are from cast iron, brass, copper, silver, steel, Aluminium, wood etc, living them wet may lead to rust, there by spoilage of the tool or equipment. The attachment should after been washed allowed to dry before it is replaced into the equipment.

2. METHODOLOGY

The study was conducted at the department of Home and Hospitality Management, College of Science and Technology, Hassan Usman Katsina Polytechnic popularly known as Gidan Mantua. Quantitative type of approach using a cross-sectional survey was adopted in conducting the study and the population comprises of all academic staff, technologist and technicians of the department of Architectural Technology (20) and Home and Hospitality Management (12) which makes a total of 32 regarded as the total population of the study. Based on the smaller number of the population they were all purposively sampled and regarded as the sample size for the study. Structured close-ended 4 points hedonic scale questionnaire with options; Strongly Agree (SA), Agree (A), Disagree (D), and Strongly disagree (SD), was designed and used in retrieving information from the target respondents. The data collected was subjected to descriptive statistics of average mean (AM) and standard deviation (STD) for the analysis.

3. Result And Discussion

Information retrieved from the target respondents are presented, analyzed and discussed as follows:

Table 1.0: Inputs of Architecture to Kitchen Design

Attitudinal Statements	SA	A	D	SD	AM	STD
Architecture is believed to be the cornerstone of kitchen design.	13	7	6	6	2.84	0.65
They are widely being accepted and contacted when building kitchens for their input.	18	5	8	1	3.25	0.53
Collaborative efforts are required between architects and kitchen designers when building kitchen.	10	5	6	11	2.44	0.71
Not only the building, architects provides advises regarding type of materials and interiors.	8	15	4	5	2.81	0.56
Architects helps client to have a view of what his to be product is to look like before even starting.	20	11	1	0	3.59	0.31

Source: Field Survey, 2024.

The Statistics in table 1.0 indicated that at a critical value of 2.50, architecture is believed to be the cornerstone of a successful kitchen design with a mean score and standard deviation of 2.84 and 0.65 respectively. This is similar to the findings of Newman (2020) that, Architecture is proved to be the cornerstone of structures in any built environment as it involves all aspects related to planning, designing, as well as building a structure. With a mean score of 3.25 and 2.81 respectively, it was indicated that architects are widely accepted and contacted when building kitchen and they provide advises regarding materials and interiors. This corroborate with the findings of Hunt (2023) that, architect can be able to advise and provide options regarding the materials to be used and their quality, quantity, factors such as durability, strength, and utility, aesthetic and above all the cost which is what majority of clients are after before embarking into any project. However, with an average mean of 2.44 and standard deviation of 2.71, it is surprising for the findings to realize that collaborative effort between architects and kitchen designers when it comes to building a kitchen is not considered important. This contradicts the findings of Fontan (2024) who opined that, As the trend is changing based on the technological advancement and the need of people in various aspects of life, it therefore calls for collaborative effort between architects and kitchen designers to work together to satisfy the need of their clients.

Table 2.0: Contributions of Architectural Design to Kitchen Equipments Arrangement

Attitudinal Statements	SA	A	D	SD	AM	STD
Architect shapes a space and provides conducive environment to the users.	18	8	5	1	3.34	0.48
They transform a particular space from its existing state to an entirely different facility for multifunctional use.	16	7	6	3	3.13	0.58

They maximize even a little space to look wider in the eyes of the user.	12	3	4	13	2.44	0.76
Architect helps in the arrangement and positioning of equipments for efficient workflow.	18	6	4	4	3.19	0.61
They provide balance between functionality and aesthetics.	12	4	4	12	2.50	0.75

Source: Field Survey, 2024.

The data presented in table 2.0 shows that at an average mean score of 3.34 and 3.13 respectively, architects are believed to have talent of shaping a space to provide conducive environment to users as well as capable of transforming the space to have an entirely different view from its existing state. This is similar to the findings of Hunt (2023) that, kitchen from architectural perspective is not only focus on design trend and aesthetic aspect but shaping a particular space and providing a conducive environment that can influence users behaviour and perception. The findings also indicated that architects helps in the proper positioning of equipments for efficient workflow and provide balance between functionality and aesthetics at an average of 3.19 and 2.50 respectively, with is similar to the findings of Hagejard (2020) who opined that, with their vast knowledge of building and design, architect help clients in proper positioning of materials and equipments in their buildings for space maximization and provide balance between functionality and aesthetic. Architects are not considered to have the capability of maximizing little space to look wider than its original size in the eyes of the viewer with a mean score of 2.44. this finding is in contrast with the findings of Hagejard (2020) who is of the view that, In modern kitchen design the architect tries to assure his client of maximum utilization of even a limited space so that no little space is wasted.

Table 3.0: Benefits of Maintenance to Kitchen Equipments

Attitudinal Statements	SA	A	D	SD	AM	STD
Maintenance normally keeps equipment ever ready for usage at any time.	14	3	4	11	2.63	0.76
It helps owners to recover back the initial cost of purchase and even realize profit.	12	5	3	12	2.53	0.75
There is no lost in production and increased cost for purchasing new.	17	2	4	9	2.84	0.75
Carrying out one maintenance prevent the company from conducting its other forms.	14	2	3	13	2.53	0.79
Potential accidents are prevented when equipments are maintained.	19	9	2	2	3.41	0.49

Source: Field Survey, 2024.

The data in table 3.0 above indicated that with an average mean of 3.41 and 2.84 respectively practicing good maintenance to equipments is believed to be a major way of preventing accident, lost of production as well as increasing cost of purchasing new equipments in an organization. This finding is similar to that of Davies (2021) who postulates that, lack of maintenance may lead to faulty in equipment which in turn can cause accident when used. He further opined that lack of maintenance to equipments can make them inefficient, and it is prolonged may lead to total replacement. The results further shows that, with an average mean of 2.63, 2.53 and 2.53 respectively maintenance culture when practiced in an organization have the capability of keeping their equipments ever ready for usage which can in turn keep them in operation and lead owners to recover back their money used for their purchase, as well as preventing the organization from further carrying out other forms of maintenance.

4. CONCLUSION AND RECOMMENDATIONS

Maintenance is a process that helps organizations to keep their facilities in good operational condition in order to reach their expected shelf life but these are all not possible without initial proper selection and arrangement which calls for the services of architects and kitchen designers.

The main goal of maintenance cannot be achieve without having qualified personnel who have knowledge about the equipments as well as how they operate. When equipments are maintain they last longer to their expected life span and even exceed, where as if they are not maintain they tend to collapse and causes many unnecessary replacement as well as accident. Architects therefore tried their best to put all necessary things in a particular facility into their fit state so that the facility would look beyond the expectations of client. Based on the conclusion it is recommended that:

- Architects should be contacted when it comes to kitchen construction so as to give professional advises.
- Equipments should always be observed for any changes in sound, movement or productivity so that corrective measures can be taken immediately.
- When maintenance or remodeling is scheduled, architects should also be contacted for any possible development in modern facilities.
- Clients should always update the architect about the exact capital they intends to spend in a facility at the initial stage.

5. REFERENCES

- [1] Abdu, I. (1999), An Introduction to Cookery Course for Hotels and Catering Industry; Footsteps Publication, Portharcourt, Nigeria.
- [2] Alvin, L. (2016). Importance of High Quality Catering Equipment in Commercial Kitchens; Retrieved 2024/07/18, from: <https://medium.com/@Refrigeration/importance-of-high-quality-catering-equipment-in-commercial-kitchens-be53170fc156>.
- [3] Badiger, R. (2021) Significance of an Architect's Perspective in Kitchen Design; Retrieved 2024/07/07, from: <https://promkraftinterior.com/significance-of-an-architects-perspective-in-kitchen-design/>
- [4] Bangalore, S. (2023). Why the Kitchen Design is the Vital in the House Design Process; Retrieved 2024/06/29, from: <https://www.linkedin.com/pulse/why-kitchen-design-vital-house-process-ck-studio-bangalore-7rzfc>
- [5] Chandrakumari, M. (2023) Why Architects & Interior Design Experts Emphasize Kitchen Design More? Retrieved 2024/08/04, from: <https://www.linkedin.com/pulse/why-architects-interior-design-experts-emphasize-kitchen-m-cqgwc>
- [6] Davies, J. (2021) Types of Maintenance Strategies and How to Choose the Right One; Retrieved 23/09/2023, from: <https://hippocmms.iofficecorp.com/blog/different-types-of-maintenance>
- [7] Fontan, J. (2024). Open Kitchen Design; Retrieved 2024/08/21, from: <https://fontanarchitecture.com/open-kitchen-design/>
- [8] Hagejård, S., Ollár, A., Femenías, P., & Rahe, U. (2020). Designing for Circularity—Addressing Product Design, Consumption Practices and Resource Flows in Domestic Kitchens. Sustainability, 12(3), 1006.
- [9] Hunt, J. (2023). How to Design a Kitchen, A Complete Guide; Retrieved 2024/08/11, from: <https://www.huntskitchendesigns.com/design-a-kitchen/>
- [10] Jalem, E. (2022), Classification of Kitchen Equipment; Retrieved 12/10/2023, from, <https://www.scribd.com/document/467350095/Classifications-of-Kitchen-equipments>
- [11] Lestari, A., Shofyan, M. and Ulfah, M. (2023). Identification of the Role of Kitchen and the Use of Traditional Cooking Tools in the Eating Culture of the Baduy Tribe Community; Proceeding of International Conference on Multidisciplinary Academic Studies.
- [12] Medialize.it. (2020). Closed Space Open Place. Retrieved November 24, 2020 from <http://www.medialize.it/closed-space-open-place/>
- [13] Newman, C. (2020). The Relationship between Interior Design and Architectural Design; Retrieved 2024/08/13 from: <https://www.camensarchitecturalgroup.com/blog/relationship-between-interior-design-architectural-design/>
- [14] Rophina, I.C. (2023). Familiarity of Homemakers with Safety Knowledge of Kitchen Practices – A Panacea for Accident-Free Cooking Activities in Homes; South Eastern Journal of Research and Sustainable Development, Vol. 8, No. 1, 2022. ISSN 2705-2001.
- [15] Tiwari, T.C. (2023). The Restaurant Kitchen Equipments Every Restaurant Owner Needs; Retrieved 2024/08/11, from: <https://plumpos.com/blog/the-restaurant-kitchen-equipment-every-restaurant-owner-needs.html>
- [16] Toheeb Olaide (2020) Kitchen and Kitchen Equipments; Retrieved 24/09/2023, from, <https://classnotes.ng/lesson/kitchen-and-kitchen-equipment-home-econs-jss2/>