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Beyond Architecture: Entrepreneurship diversity crosswise multidisciplinary nature of the profession

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Abstract-Over the past century, an architect has tended to be regarded as a "master builder". They are ascribed the combined characteristics of a designer, engineer, sociologist and scientist in their creative faculty for the present modern age. Despite the bequest of the technological era, building processes continue to fragment and the leadership role of the "master builder" is uncertain. Nevertheless, studies have revealed that unusual forces have emerged to change the leadership role architect's play in the built environment. Therefore, the article explores the multidisciplinary nature of architecture and postulated diversity of content in the architecture profession as an entrepreneurial opportunity for professional sustainability. This conceptual paper recommends innovations in the architectural education system and diversification of the professional practice.

Keywords—-architecture, education, profession, diversity, multidisciplinary

I. Introduction

For the past legendary period, architecture was recognized as a root source to all other professions in the built industry [14; 10]. The institution of the architectural profession across many universities worldwide is evidence of its significant place in the development of urban planning. Architecture existed in the conventional rudiment of practice until the Industrial Revolution era. The revolution created new proprieties and new responsibilities for the modern day architect [26]. In respect of the industrial transformation boom, however, the profession still suffered several impediments, especially the leadership role and socioeconomic standing of architects [15]. Hence, the architect and the profession still experiencing a problem in terms of the leadership role and competitive scope of architectural practice is an exceedingly contentious issue [5; 11]. Indeed, the present competitive economy demands reassessment of the role and scope of practice for architects. Therefore, it is necessary in this competitive knowledge-based economy to re-examine the various specialisations that have evolved from within architecture. This could possibly serve as entrepreneurial diversity (either a backward or forward integration approach) for the new breed of architect. This evaluation only implies seeing the architecture profession in her pre-historical "master builder" metaphor and to reclaim her trade and business legacy.

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This article employs an analytical descriptive methodological approach with a critical literature review of architecture as an entity and its creator (architect) in a multidisciplinary context.

As a matter of fact, this conceptual article renews a deliberation from an earlier time as regard to whether the architecture profession is a 'jack of all' profession or not? This directs us to examine the significant challenges the profession is facing in its root formation: what constitutes architecture as an entity; who is an architect; and how can his/her role in the built industry be enhanced. The three questions would suggest direction and approach towards consensus on the development of the new breed of architects for a sustainable future. The issue raised would probably enable us to retrace the art and craft history of architecture and reclaim the past glory of the architectural profession. Finally, the focus of this article facilitates new channels on how to re-position architects and the profession on their natural leadership position.

II. Architecture Profession: A Review of Literature

A. *What is Architecture?*

From early human civilization, man is recorded to have employed the use of an innate practice to assemble his dwelling, termed as the architecture of the Stone Age. The modern day is witnessing sophisticated architecture. In this regard, several scholars have defined architecture in new terms. The various definitions of architecture describe the metaphorical understanding of different scholars. At the same time, these connotations spell out the purpose as well as capacity of architecture as an encompassing profession.

The critical literature review distinguished architecture as an all embracing discipline. The scholastic description of architecture demonstrated the ever evolving nature of architecture as process in nature, which covers all aspects of human endeavours. According to [9], architecture entails assuming a leadership position in the design process of working with the client (individual or organisation) for the benefit of society as a whole. He identified the problem and developed ideas on the alternative solutions. The process of designing, planning and organizing spaces in a building structure and environment for human activities all fall within the core responsibilities of architecture [12]. The practice of creating the physical structure with the input of clients and

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occupants integrates the principles of business, economic, sociology, and engineering science.

Subsequently, [21] emphasised that the scope of architecture is enormous and all-embracing as relates to property, space, environmental control, health and safety and all other support services. Also encompassed by the architecture discipline are forward maintenance management, re-of-construction of the building project (renovation, redevelopment, and re-alteration) and general planning of the urban environment for sustainable development of a nation at large. In the real sense of it, everyone in the society eats, drinks, sees, sleeps as well as breathes architecture because permeates all social endeavours. In fact, other intellectuals have expanded the scope of their definition of architecture to cover every aspect of human endeavour [12]. Architecture connoted everything: the house we live in, office we work at, hospital where we seek healthcare, school where we seek knowledge and religious buildings where we worship are all the product of architectural creativity. In the same light, architecture creates a self-contained microclimate environment for mankind's continued existence.

However, table 1 below gives the different definitions of architecture as an all-round discipline.

Table I. CONNOTATION OF ARCHITECTURE PROFESSION

Scope	Scholar	What is Architecture?
Art and science	[33]	Art and science of planning and construction of sound, economical and elegant buildings for residential and non-residential purposes; to create the desired environment both inside and outside the building.
Leadership	[22;6]	It is a profession which entails assuming a headship position in the design process and construction of building structures by working with clients and all other professionals for the end users in the built environment.
Creation	[33; 19; 8; 5]	It is the creative process of making and involves the many disciplines of craft and design. It affects every aspect of our experience in rich and evocative habitats.
All-encompassing	[27; 31]	Every fabric of our society is architecture.
Generalist	[36]	The ability to think for all and design for all is a metaphor of the training scope of architecture.
Function	[22]	Designed architecture is for function, utility, usefulness as building is an efficient machine.
Process	[5]	It is process of planning, designing, managing buildings and their services for the organizational operation and performance.
Resources management	[12; 19]	Management of method, machine and man.
Sustainability	[11; 34; 25]	It comprises of sustainability in the aspect of climatic, cultural, ecological, health, social, economic and spatial design process.

Payne (2000) cited in [32] comments on the current knowledge based economy and competitive market, which has created the demand for a comprehensive forward integration such as design and build, build operate and transfer (BOT) for the advancement of facilities management in the core value of architecture as a profession.

Despite the various perceptions of architecture, a critical extrapolation of the wide range of the definitions suggested some common platform. The common sense approach proposed architecture as an entity of disciplines, professions or processes with a diverse background on the knowledge of other trades. Overwhelmingly, masters of architecture (Vitruvius, Frank Lloyd Wright and Le Corbusier) summarized architecture within the seven core values - function, form, and feeling, economy of space, time, money, and material. The heterogeneity and diversity of architecture is illustrated in figure 1.

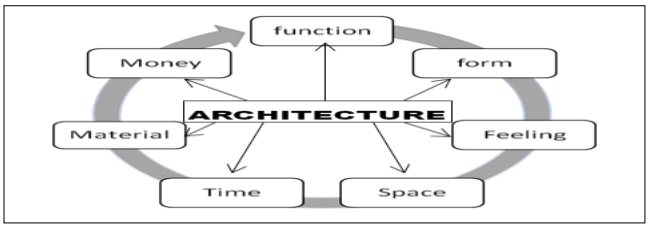

Figure 1. Seven values of architecture [30]

The actor in this discipline could be termed as a generalist and thinking tank for a sustainable environment. As a matter of fact, who is this actor who acts as an agent of sustainability for clients, users, and the general public in the urban planning? The next section of this paper takes an x-ray look at the man or woman called "Architect".

B. Who is an Architect?

As earlier reviewed, human beings are never alone without architecture - it accommodates us, our occupational and leisure activities take place in it, and we are hardly ever free from its impact. Undoubtedly, this locates the architectural profession as interdisciplinary in nature. On this note, there is a practical need to discuss the chief influencer of this aspect of society, who could be seen as the determinant of the worth of progress in the built environment. Hence, the creation of a model society requires the architect to have a clear knowledge of the other professions in the built environment for the actualization of the desired sustainable social organization [11; 34; 25].

Clearly, the role of the architect is distinct in the built industry and society at large. Though varied in scope of practice it is predominately a design inclination [5]. However, all professional architects at one time graduated from a school of architecture. In the category, they all belong to one of two different schools of thought: being either idealist or realist architects [7]. In this current competitive and volatile economy, who can we refer to as an architect? [24] noted that those architects who focus on design are properly called idealist while, the other group could be referred to as realist

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architects because they focus on implementation. Therefore, who is an architect in this competitive, knowledge-based age? Before providing an answer to this question, we need to grasp a full understanding of a conventional architect.

Since, an architect is the actor that creates architecture, and their endeavors cover all activities required to actualize the subject matter, the first stage in the actualization process includes a creative imagination, mental abstraction, evaluation of alternative options, production of virtual or real-time model and, module and material specification documents, and certifying the proposed structure against the client's requirements. While, the second stage of actualization involves implementation and management of the construction process. Hence, this implies that architect's role fractures into two distinctive stratums. The strata are the design phase and construction phase. Though, the role is clear, but most of them are generalist, idealists who still focus on design in their practices [13]. Therefore, it is clear that most architects' orientation of practice is a one-sided inclination. In this regard, [29] asked: Does one architectural style fit all in the global economy? Practically, this is food for thought which demands a different way of looking at architectural practice. In accordance with the general ideology of architecture, there exist hierarchical practices among architects, in the order of design-build-manage. The interpretation of this is in line with Rodrik and Kruger's idea on "where architects go" from the primary responsibility as a form giver (design).

Nevertheless, [19] supported that role of an architect is like a manager who acts in the capacity of planning, managing, organizing supervising, controlling and co-coordinating process of project implementation. Contrarily, [37] disputed this acclaimed leadership role for the architect in the construction management process. He further noted that several forces have combined to distort this leadership role which architects play within cross-functional building teams. It appears from this leadership context that architects' claim to be the head of the building team is vague and is critically challenged by other professions. However, Thomas Fowler cited in [33] criticized architects as being to blame for their own predicament. He reported: the creation of other new professions (colour/illumination consultant, construction/ project and facilities managers) resulted out of the inability of architects to discharge their responsibilities in full capacity. In addition is their inability to foresee the reality that their role in the construction industry is far beyond designing as form giver and specification writer.

[27] established some vital attributes which recognized architects in the capacity of jack of all trades and such qualities are: personality traits, a capacity to comprehend client's requirements and translate these intangible demands into the tangible product of architecture. Thus, multitalented thinking tanks, personal resilience and achieving intrinsic fulfillment even though financial reward is imperative were all professional qualities of an accomplished architect. They further synchronized the aptitudes required of an architect within the frame of critical self-examination questions (see Table II).

TABLE II. ARCHITECT'S APTITUDE SCALE OF SELF-ASSESSMENT

Items of skill	Proficiency questions	Purpose of the skills
Skills of creativity	Are you a creative dreamer, an initiative someone?	Problem solving imaginative capacity in terms of new and creative solutions to design and construction problems.
Problem solving skills	Are you capable of constructive judgment?	The capacity to balance the idealist opinion and realistic resolution for the practical consideration of the project's success.
Motivational skills	Are you capable to prove your idea and enthuse?	An architect must be able to project ideas and philosophies to others.
Diplomacy skills	Do you have the ability to work with others?	Integration of personal and other professional ideas for optimum solution.
Visualization skills	Can you visualize space, colour, and texture?	Ability of an architect to produce delightful product practically depends on visualization.
Propriety skills	Do you have a sense of what is adequate, timely, and fitness?	Good architecture must meet the required standard of time, location and efficiency.
Synthesis skills	Can you synchronize details into one coherent solution?	The project conceptualization and execution demand amalgamation of information.
Perseverance	Do you have the doggedness to accomplish projects under tight constrains?	The intricacies and challenges of meeting project deadlines within the tight budget.
Technology skills	Do you have knowledge of art and science?	The modern-day architecture is shifting toward techno-design in nature.
Massing skill	Are you good in composing constructs and judgment?	The primary role of architect is design by integration of geometric forms.
Communication skills	Do you have the ability to express yourself graphically, orally, and in writing?	The essence of communication skill is for the dissemination of ideas.
Management skills	Are you business oriented?	Realization that architecture products involve management of man, machine and method as relates to money, time and other intangible issues.

In consequence, a reduction in the worth and their strong hold on the leadership role was set off by architect themselves. It could also be the starting point for questioning the justification and ethical value of their leadership role in the construction process. As noted by Deamer [8], architects should recognize the imperative of becoming specialists by diversifying their practicing perspective. Tan [31] contributed that the new breed of architects should develop interest in art and craft, the tectonics of construction, management (project

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and facilities management) with dynamic design-build-manage enterprises [19].

According to [6] in his article "New Learning Environments for the 21st Century: Exploring the Edge", successful completion of an architectural program with multidisciplinary course content provides the required advantage for the architect to play the leadership role in the construction process. He stressed that leaders are generalist in nature engaging in an integrative thinking and the road to leadership normally resulted out of a generalist foundation before the attainment of specialist recognition. He denoted architecture as a "get it together profession" which had concern for the general outcome and the willingness to effect the concern depends on the architect's capability.

Therefore, we can conclude that architecture is a profession of multitalented enterprise. At the same time, the diversity of the architect's roles presents entrepreneurial opportunities for the reality of competitive economy, if explored. Architecture is tangible and intangible in nature. It can be felt, inhabited and used. It characterizes our survival and adds value and sustainability to society. The influences of architecture outlive its creator (the architect).

III. Methodology

This article offers an all-purpose dialogue on architecture as a profession within the different schools of thought and employs an analytical descriptive methodological approach. A critical literature review of architecture as an entity and its creator (the architect) in a multidisciplinary context is discussed. Subsequently, the perspective of scholars on the importance of meeting the reality of a competitive economy for the sustainability of the architectural profession is presented. Firstly, an inductive method is used for analyzing and an analogical method employed for the specialization paradigm of the architecture discipline. The discussion is implementable in the course's structure, programs of study and, disciplinary and university collaboration for the architecture profession. Some recommendations are presented on the entrepreneurial opportunities embedded in the architecture profession.

IV. The Architecture Profession in the Context of "Jack of All Professions"

The advent of globalization has reduced the world to a global hamlet. The professional practice of architecture is becoming more globalised and competitive (Kiernan, 1993; Bang & Markeset, 2012; Ang & Beynon, 2012). In addition, Mistra, Khan and Singh (2010) stressed that technological advancement has equally challenged the profession on the economic realities of the business world. In this sense, the reality that architecture requires intellectual understanding of all the other professions marks it out as a multi-facial discipline. In this instance, why "jack of all trades" perspective for the architectural profession? In this context, the purpose of the question is to identify how the profession can be sustained against all the forces merged to change the leadership role and economic status of the architects in the society he/she serves? The apprehension is of critical importance for the curriculum development and training of the new breed of architects for a sustainable future.

Retarding the diversification of architectural program into fields of speciality with distinction, [4] explain that it is obvious that the correct approach to architectural education is multidirectional. He noted that socioeconomic uncertainty leads to graduate employers demanding that graduating students are multidisciplinary and prepared with the capacity to diversify and see beyond the conformist approach to architectural practice.

In fact, *"Today increasing numbers of architecture graduates seek alternative careers as noted in the survey of interns and young architects and it revealed that nearly one-quarter of respondents do not plan a traditional career in architecture, although they still plan to obtain their license. It reported that respondents working in non-traditional careers received higher salaries, better benefits, and more advancement opportunities"* (Internship and Career Survey, 2003).

[12] and [34] listed ranges of entrepreneurial opportunities in the architectural profession: architectural movie effectors, corporate architect, facilities architect, public architect, architectural educators, architectural photographer, exhibit designer, interior designer, industrial/product designer or web designer; science and technical areas; construction and professional artisans. Unfortunately, most schools of architecture are still practicing old fashion (conventional) design studio [33].

[18] and [35] outlined the critical areas for the diversification of the architectural profession within the diverse foundation of architecture:

- Design and build expertises (BOT, developer, commercial project, PPP initiatives)
- Expansion of the service-related aspects of the built environment (legal, arbitration, tourism)
- Technical maintenance expertise domain (acoustic, illumination, colour, energy)
- Management expertises (construction, project and facilities management).

While [36] elucidated and questioned the nature of the graduating architects being produce in most architecture schools. He noted that the approach of architects having the traditional capacities of design knowledge and skills is still the theme of the International Union of Architects (UIA). The question is how relevant these themes are to the competitive economy of nations. Unfortunately, there is little empirical study to validate and compare conformist (traditional) and dynamic (self-motivated) training.

We proposed a three-step framework for the model of architectural multidisciplinary entrepreneurship opportunity, which is a version of the [36] model of architectural

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specialization. The analytical approach was comprehensive and emphasized four categories of architects at the first degree of tertiary education. The model is illustrated below (fig. 2). The model is significant to elucidate the multidisciplinary entrepreneurial opportunities in the architecture profession. Indeed, the four groups of architects further expanded to sixteen classes of specialization. Subsequently, we deservedly extrapolated the range of entrepreneurial specializations, which is an epitome of the Gafar et al. (2012) assertion "Towards a more entrepreneurship architectural education".

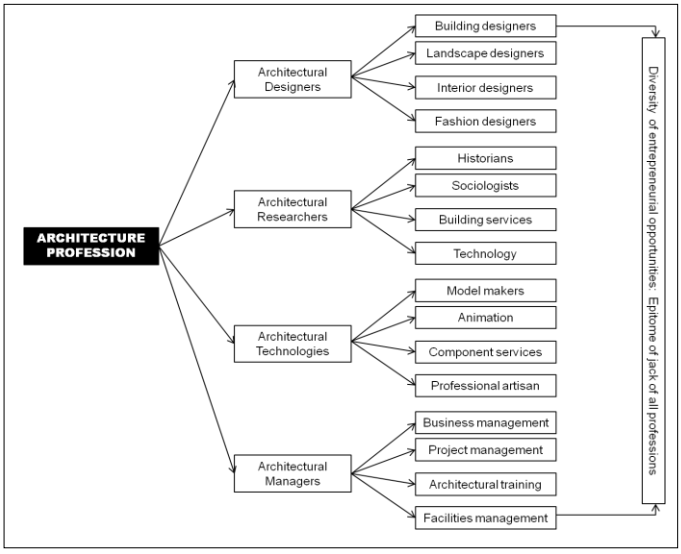

Figure 2: Proposed entrepreneurial opportunities in architecture profession

As many scholars noted, most architectural schools approved three classes of degrees (B.Sc/B.Arch; M.Sc/M.Arch; Ph.D), therefore, the proposed architectural multidisciplinary entrepreneurship opportunity model (AMEOM) of the architecture profession could probably form the framework for the specialisation of architectural training. As earlier put forward, architecture is a multi-disciplinary profession which requires a multidisciplinary teaching approach. Therefore, the challenge is combining various pedagogical approaches from the various disciplines of arts, science, management and commerce. Thus, meeting the reality of social needs and technological progression, architect training should incorporate emerging trends of innovation and entrepreneurship [12]. [16] argued that transformation of an architect into automobile designer, or specialist effect designer would be easy as a result of his/her foundational training.

v. The Implications of the Multidisciplinary Nature of the Architectural Profession

Society is continuously experiencing technological change, onward, revolutionizing the production economy to a knowledge-based economy. Certainly, architecture as a profession is not an exception to this technological invasion. Now architecture is open to the realism of the modern day. Especially, now that architecture is becoming a challenged field for the graduating architects to practice. [15] reported that architecture graduates lead in the American unemployment stakes (13.9%) based on Georgetown University research findings. On this issue, apprehension is growing on the future direction of the architecture profession and the current approach to the training of architects challenged by scholars [8; 22]. Scholars suggest reassessment of curriculum development and application of multi-disciplinary skills in the training of young architects [36; 24]. In this respect, new realities require a unique set of social, professional and personal skills different from the conventional way employed in the past.

[12] believed that most educators in the schools of architecture are well learned with academic theories but have little or no intellectual grasp of socioeconomic reality as relates to entrepreneurship practice. Hence, little attention is given to the dilemma of educates and particularly to the newly graduated designers in the job market. In this instance, in what way does the profession expect to sustain the historic role of an architect when the reality after school is far beyond their academic qualifications? Despite this, some scholars believe that regardless of the challenges, architecture is within the basic hierarchy of life's needs (Maslow's need hierarchy theory) so their services would be in a constant demand.

Therefore, an architect's service would always be in the design studio for the production of buildings [20; 21]. On this point, we take a contrary position believing their opinion to be weak and if we would be objective, the question is why most renowned architectural firms are cross carpeting to other fields? Unfortunately, however, Scott Timbeg cited in [28] reaffirmed in his report "The Architecture Meltdown" that many graduates of architecture simply discovered that they were "leaving academy only to enter a professional minefield". In sum, we see an architect's role as undergoing a dynamic revolution, ever since the medieval era as mason, renaissance movement as an artist (form giver), and the modern epoch as an art-science-commerce collaborative practitioner. Nevertheless, today's realities present the judgment for the two opposing parties.

vi. Conclusion and Recommendations

Recent graduates' unemployment problem is the concern of nations worldwide. Consequently, the technological invasion is shrinking architectural organisation and the employability requirements for the graduates is becoming is more demanding in the current unpredictable job market. This issue shows that the need for change is unavoidable. Hence, what are the changes to effect and how can the revolution be realized? As aforementioned, the philosophy on the nature of architecture in this era is flexible and suggests an adaptable training approach. Subsequently, we need to agree on the disposition

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that architecture is only not designing, but other integral components are construction of the created design by doing.

The transformation to effect is developing the capacity of the architect to think creatively and to envision innovatively and to design practical solutions. In order to operationalised this revolution it is necessary to act by doing (design-build-operate-manage enterprise). Ultimately, the duality of the idealistic approach of the academy and the reality of socioeconomic knowledge is vital for the survival of students in the job market. The future sustainability of the profession could best be accomplished by inculcating diversification orientation in the students along the various lines of entrepreneurial specialization opportunities in the architectural profession. Therefore, it is imperative for architecture as a discipline to act accordingly by developing a comprehensible direction and operational capacities for the establishment and management of architectural curriculum diversity. Subsequently, intellectuals in the profession must develop a workable framework with the following keynotes:

1. Government needs to re-formulate a comprehensive educational policy in accordance to the socioeconomic reality of the competitive economy.
2. The government institutions coordinating, directing and accrediting architecture education should jointly re-examine to guarantee that the new direction of attention adopt an international outlook.
3. In addition, the educational stakeholders need to restructure the architectural curriculum as follows:
   a) Establishment of vision and mission for the transformation of generalist to specialist architectural training.
   b) The multidisciplinary character of the architecture profession demands a multidirectional pedagogical strategic approach. Adoption of both conventional and dynamic teaching styles should be encouraged and implemented.
   c) To promote specialisation within the multidisciplinary nature of architecture. The foundation stage (B.Sc/B.Arch) as a generalist preparatory phase. While the specialisation stage should be at the post-graduate level (M.Sc/M.Arch) of architectural training.
4. To develop university/industry collaboration with emphasis on the research commercialisation.

In summary, presently higher institutions of education are at the heart of entrepreneurship, innovation and the commercialisation-shift era. The entrepreneurial opportunities in the multidisciplinary nature of the architecture profession depend on clear intellectual understanding. At the same time, all stakeholders in the profession need to change their philosophical perception with the appropriate action to revolutionise the education and practice of architecture in the current competitive economy. In fact, to enhance the profession, demand recognition of the conformist teaching approach and pure academic research institutions as out of fashion. In this regard, the article recognizes innovative teaching culture and dynamic professional practice in a mutual collaboration. Particularly, contemporary curricula should change and focus on the genuine requirements of the graduating architects. Consequently, teaching modules should include leadership and business proficiency in conjunction with the design studio. At this juncture, we see future society demanding more of creative and self-motivated architects that can act entrepreneurially in order to impact the society positively.

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