



An Archetype of Architecture

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Abstract

Architecture is the art, and science of the built environment, where a multidisciplinary approach is prevalent. The paper tends to clarify architecture and explain its etymological meaning for an architectural student, practicing professional architect, and academic person. The paper suggests an archetype model using a combination of various logical terminologies that lead to the design of exquisitely defined words in human history. The manuscript relates each principal keyword as self-expressive for ARCHITECTURE. The research is based on the literal analysis of diverse content that covers the wider scope and application of architecture in qualitative research design. The note-taking series from different manuscripts that identify key areas in the field of ARCHITECTURE and their corresponding connection with each acronym was studied. The emerging themes consist of various parameters and help make strong arguments for the archetype model. The twelve emerging themes have been mapped using the mind-mapping technique in network diagrams. In the end, an archetype is explained, linking the connection of all keywords that prioritize the link with different aspects of architecture. Each letter refers to a specific term as A- Anthropometry, R-Responsive, C-Construction, H-History, I-Inspiration, T-Technology, E-Environment, C-Culture, T-Transformation, U-Utility, R-Resources, E-Economy. The author took help from the literature to reinforce the concept. In the end, an archetype is explained, linking the connection of all keywords with different aspects of architecture. The views expressed in the manuscript are based on a review analysis of existing information in the architectural discipline. It was difficult to include expert opinions due to the limitation of time and cost, and a more rigorous study can be planned later. The paper is based on the framework to benefit architectural students, academic people, and practicing architects and professionals about the range of approaches in ARCHITECTURE. Besides many definitions to expound, elucidate and clarify Architecture, the paper is novel in the approach of explaining the word ARCHITECTURE from a diverse perspective. Each letter has been an acronym with a term covering all significant aspects.

Keywords:

Archetype, architecture, etymology, multidisciplinary, thematic classification

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INTRODUCTION

The Encyclopaedia Britannica describes architecture as "the art and technique of designing the building, as distinguished from the skills associated with construction (Architecture | Definition, Techniques, & Theory | Britannica.Com, n.d.)." According to Merriam-Webster's Dictionary, "Architecture is the art or practice of designing, buildings, structures and especially habitable ones (Architecture | Definition of Architecture by Merriam-Webster, 2019)." The word analogy of architecture is based on the essential component as identified by Vitruvius, which includes "utilitas (utilities-function), firmitas (firm-structure) and venustas (beauty-form) (Kunze, n.d.)." The word is borrowed from French architecture, Latin architectūra. Goldschmidt has given a comprehensive explanation of architecture, "it's changing trends towards technological and computational developments, ever-enduring function and form with perfect environmental adaptation" (Goldschmidt, 2016). Jon Woronoff also summarizes in his book on the Historical Dictionary of Architecture, "it is a multifaceted approach towards technology, material usage, construction techniques, new technological application, exploring cost matters, aesthetics, socio-political expression and many more (Ellis-Barrett, 2017)." Another significant contribution to architectural academics is made in the Encyclopaedia of 20th-century architecture, where the history and theory of the profession are explained in the context of the world's most notable architecture. The book features the role of architects, firms, building styles, planning, materials, construction, and professional issues (Stephen, 2004). The changing building types have made complex relations between architectural parameters. Traditional and modernized materials and technologies have given a diversified approach to the architectural profession. The emerging pattern of architectural practices is unprecedented and requires a link with the philosophical meaning of the architectural profession. The interdisciplinary method taught at architectural schools or expressed by professionals still needs a convincing approach towards an explanation. Besides so much complexity in the interconnection of various architectural terminologies, the students need an archetypical system or model that states its story itself. A model is needed to reflect the underlying pattern of interdisciplinary approaches in architecture, joining them under one umbrella. This research is an attempt to develop an archetype. Archetype refers to a pure form, pattern, and behavior universally present. It appears in areas related to behavior, psychological, and literary analysis. Archetypes are closely similar analogies of nature-immersed and inherited traits (Saunders & Skar, 2001; Wolstenholme, 2003). Few studies prioritize the linking role of different terminologies, subjects, or points of exploration in architecture. Hence, there is a need for a universal archetypical model for architecture. John Nuttall has proved that archetypal expression of architecture explores socio-economic and symbolism as design characteristics (Nuttall, 2002). Jody has defined

architecture from various perspectives and described it as a noun that values engineering, creativity, and professional integrity (Brown, 2011). Becky has collected the viewpoint of 121 famous professionals mostly architects (Quintal Becky, 2019).

Archetypes on Architectural Education

This section will highlight the development of archetypes that helps to inspire people over the years since its inception. Archetype was coined by C.G. Jung psychologist and then by Paul Zucker used it in architectural theory in his book *Town and Square*. The archetype theory kept on developing further in 1960 through Aldo Rossi's book, and *Architecture of the City* from 1966 (Thomas Thiis-Evensen, n.d.). Mario Botta defines "Architecture as an artificial fact" (Dimitriu & Botta, 1983). Later 1970 marked the beginning of its practical application in the architectural discipline through the work of Michael Graves, Rob and Leon Krier, and Mario Botta. From the fictional notion of nature, it emerged as a naturalistic phenomenon within the practical field. Historically the archetypes are seen as the reflective involvement of Place and Placemaking with emphasis on historical, psychological, social, and anthropological meaning in objects and a plethora of expressions (Dovey, 1985). Thomas Thiis-Evensen's also describes archetypes as the most basic to its identity, a language for experience and communication between inside and outside, yet quantifiable through 5 scale variation between the bipolar design of questions (Thomas Thiis-Evensen's, 1989). More recently the archetypes are the physical environment shaping the discipline as losing boundaries with its sister disciplines with an envision for design for sharing economy (Jamadar, n.d.). The work of Louis I. Kahn has also been debated as the Archetypes of similar analogies, patterns, and behavior in buildings and their expression. The recent trends in Architecture have been shifted to the Phenomenology of sustainable living, manifested in the environment and human life, broad archetypal, dimensions of experience and meaning (Seamon, 2017). In contemporary practices, the archetypes are seen as the timeless reference of buildings of various typologies through their intellectual appraisal (Pieczara, 2019). The 21st century marked the beginning of new theoretical concepts of contrapuntal, deconstructivism, interdisciplinary approach, theory-practice relation, critical thinking, and the pursuit of open-ended and provisional investigations (Crysler et al., 2012).

OBJECTIVE

The research objective is to devise a convincing methodology for designers in generic, architects, and architecture students. Also, it aims to demonstrate how we can archetypically express the very relation of interdisciplinary terminology in one model, creating their linkage. Architectural education and academics are readily shifting towards diverse disciplines, where future professionals need to be trained in a multidisciplinary approach. The research can familiarize future professionals with the word architecture which is so anonymous and yet self-explainable without going into complexity.

METHODOLOGY

For this purpose, the content analysis technique was chosen, a well-established method for studying the pattern and connection in qualitative research (Nelson & Woods, 2013; Neuman, 2011; Wong, 2010). The content has been sorted in the form of notes, which help identify key points and ideas. Different themes emerge from the existing text, highlighting the importance of categorizing words in twelve different variations, each unique and synergic. The word clustering further helps in grouping the themes in each acronym of Architecture (Figure 1). The graphical expression was created using the mind mapping technique in network diagrams. Some reference documents have been cited and used in the discussion section to support the emerging themes.

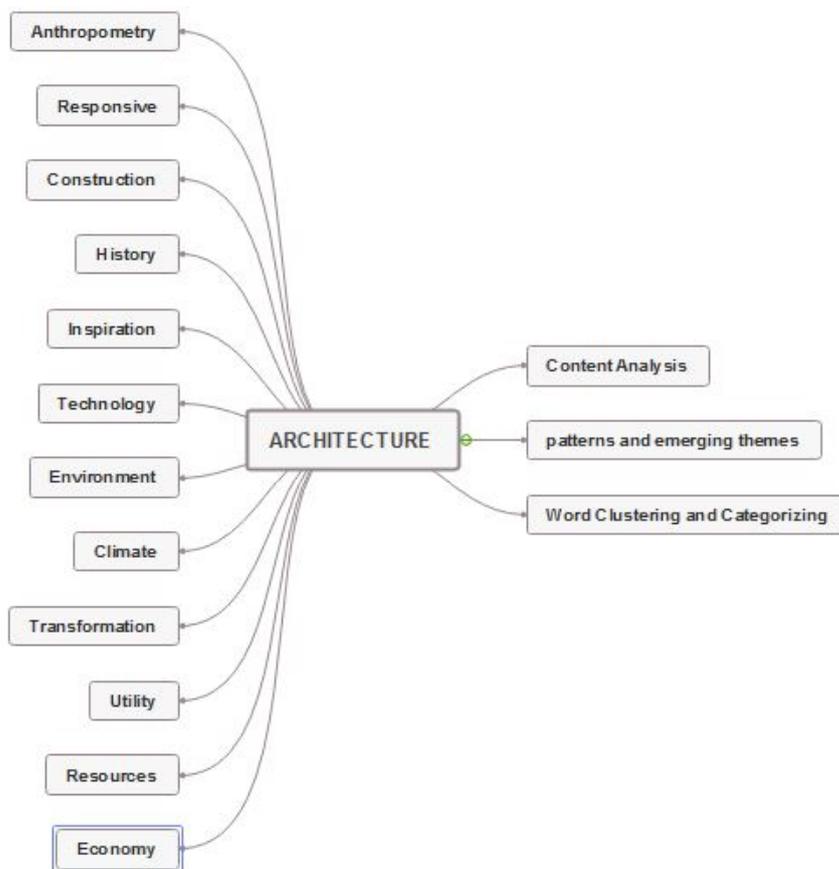


Figure 1. Thematic Methodology. Flowchart (Author Source but inspired from (Alex Milton, 2011))

A fluid, dynamic and expressive way was opted with a constraint to reduce and minimize the overlapping of key themes. However, despite being specific themes for each acronym, there has been a generic overlap in the discussion, which was unavoidable, as recent trends spot the application of multidisciplinary approaches. The Figures (2-13) below in the discussion section will show the graphical mind mapping of 12 emerged themes. However, the whole schematic theme has been combined in one framework at the end of the article (Figure 14).

The analogy of the word A.R.C.H.I.T.E.C.T.U.R.E as explained in (Figures 2-13) is a combination that brings every aspect on board and under one umbrella. For an architecture student, it encompasses diverse subjects and their applications. Academicians and Students can use this acronym to include in all Architectural, interior, and construction projects. By writing a single-word Architecture at one corner of the sheet,

they will ensure that they do not miss out on a single approach in design. It will give students, academia, and practicing architects a paradigm to define their field using a multi-disciplinary approach. Table 1 shows the emerging themes from the content analysis, grouped and clustered under each acronym. The description columns grouped the key concepts related to the main theme.

Table 1. Thematic classification based on content analysis

No	Letter	Abbreviation	Description
1	A	Anthropometry (Figure 2)	Function, ergonomics, proportion, dimension, accuracy, inclusive
2	R	Responsive (Figure 3)	Form, aesthetics, technology, facade, appearance, affordance
3	C	Construction (Figure 4)	Structure, structure analysis, machinery, environment, 3D printing, resources, building life cycle, construction waste
4	H	History (Figure 5)	Historic, events, social, political, ancient civilization, diversity, archaeology, artifacts, vernacular, heritage, preservation
5	I	Inspiration (Figure 6)	Nature, aesthetics, innovation, creativity, biomimicry, organic, utopia, imagination, virtual reality, augmented reality
6	T	Technology (Figure 7)	Digitalization, sensors, Internet of Things (IoT), software, intelligent system, 3D lasers, construction, machine learning
7	E	Environment (Figure 8)	Nature, simulation, energy, GHG emissions, carbon footprints, passive, renewable energy, clean energy, ecosystem, HVAC, systems
8	C	Climate (Figure 9)	climate responsive, environment, classification system, weather, geography
9	T	Transformation (Figure 10)	Futuristic spaces, flexible design, function, nation, values, interiors
10	U	Utility (Figure 11)	Function, zones, commodity, services, anthropometry, space design
11	R	Resources (Figure 12)	Materials, workforce, innovative construction, resource management, sustainability, nature, 7R (waste management) principles
12	E	Economy (Figure 13)	Low cost, profit, business, life cycle, investment, payback, affordability, sustainable design

DISCUSSION AND RESULTS

Based on the results from the mentioned literature and model, each chosen acronym of Figure 2-13 has been explained. The grouped emerging themes have been discussed with the help of various examples, preferably contemporary and covering multi-contextual geography. Moreover, the archetype reflects a universal approach to the architectural profession.

Anthropometry

Anthropometry refers to the non-invasive (Casadei & Kiel, 2021) and scientific study of human measurements (Donald Watson, Michael J. Crosbie, 2004). Designers always in the need of an authenticated, contemporized, and usable reference for designing spaces, systems, and services (Pheasant Stephen, 2017). The very basic of the architectural project relates to the scientific consideration of human body measurements and their relative proportion. It explores the wider application of universally designed built environments. The functional boundaries are the major determinants of human sizes and proportions for designing a space. These dimensions are derived from the anthropometric measurement of various humans to accommodate the diverse needs of individuals inclusively. The optimized design of the building is also based on a comparative study of the measurement and capabilities of diverse individuals.

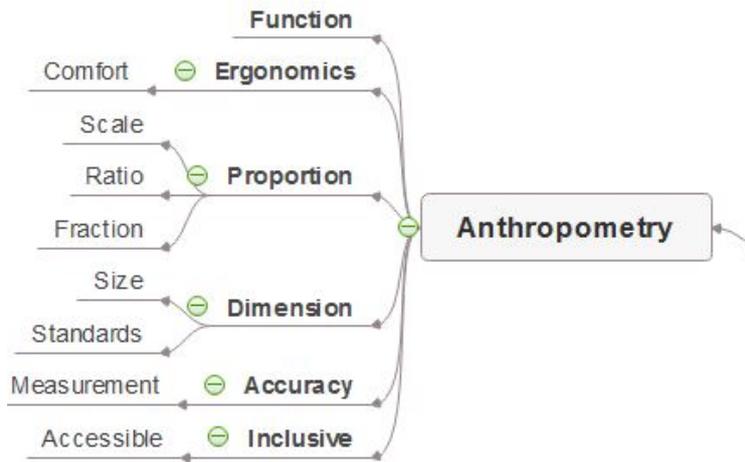


Figure 2. Mind map of A-Anthropometry. Flowchart (Author)

To achieve dimensional accuracy in the complex system of function, human physical dimensions work together with the interactive environment. For example, the design of the hospital is the collective formation of zones concerning its function. The function is lemmatized by the dimension of a particular space in a hospital (Figure 2). Each object placement, together with clearance and circulation will bring the design closer to a physically enclosed space. The interaction between objects required dimension, and their associated circulation will be done with the help of anthropometry. Anthropometry articulates all required information for the design of space by outlining the product and its interaction with the environment. Designers frequently apply standardization, while making choices about anthropometry and ergonomics. The use of time-saver standards and other ergonomic standards provides statistical data about the interaction of the human body in the built environment. The statistical information is based on data collection through a survey of the wider population using recent technologies. The database is based on anthropometric records of variability in genders, weights, geographic regions, ethnic groups, and socio-economic status.

Responsive

Sterk defines responsiveness as the ability of a structure to alter its form in response to changing conditions (Sterk, 2005). However, the approach is not limited to building aesthetics and outer shape but a comprehensive collaboration of computer-driven technologies. Meagher's approach is more comprehensive toward buildings. It is a changeable body regarding permeability, appearance, and affordances in response to the environment or user needs (Meagher, 2015).

Since nature is manifested in the structure's design, it has dynamically affected the responsive character of many building elements. For example, the building shades, blinds, vents, and mechanical facades are determinants of the building's external conditions (Figure 3). The bio-inspiration and reflection of responsive nature have been experienced by user behavior in buildings. Responsive architecture is an adaption of a natural system governed by the user's action as an external stimulus, and response occurs as a change in the system's state (Gronostajska & Berbesz, 2018). The kinetic facades allow the building envelope to be responsive to form and function, showing adaptability to a flexible design. The responsive design is controlled through environmental design, computer, and sensor technology. The exemplary design of Maison de

Verre in Paris (Edwards & Gjertson, 2008) is a remarkable achievement in material innovation and cutting-edge technological development. The climatic adaptive building shells are also grouped into the responsive design of the building. The roof and facade adapt themselves to solar and wind by responding to improve their performance.

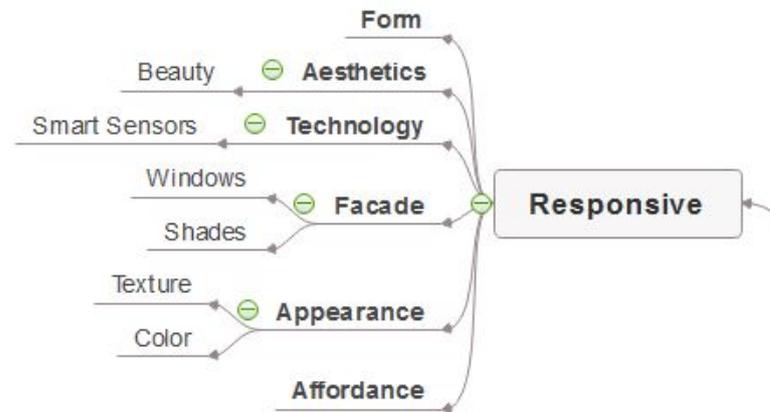


Figure 3. Mind map of R-Responsive. Flowchart (Author)

Furthermore, the building systems have also become intelligent, smart, and responses to human thermal comfort design conditions in the interior. The operation of security controls, openings, heating, ventilation, air conditioning, and lighting are sensor-driven. Many new buildings have smart technology and are connected and responsive to a smart power grid system (Daissaoui et al., 2020). In addition to the examples of responsive design in smart control systems, these technologies have equally been utilized in landscape and environmental design. The strategies like elucidate, compress, displace, connect, ambient, and modify also help integrate responsive technologies in landscape architecture (Cantrell & Holzman, 2016).

Construction

The Oxford dictionary defines construction as a synonym to structure. Construction refers to building a structure or infrastructure on-site using valuable resources. It includes its structural stability and how the building will be built. Construction is one major key component of architecture as it gives reality to a theoretical, philosophical, and drafted approach (Figure 4). A large variety of structural wonders have astonished the world from ancient times until today. The mystical construction of the Egyptian Pyramid, The Great Wall of China, Taj Mahal Monument, Eiffel Tower, Empire State Building, Petronas Tower, Palm Jumeirah Island, Shanghai Tower, Burj Khalifa, etc., and many other remarkable achievements are proven examples of structure and construction. The construction of architectural projects is done in different phases, starting from planning, designing, and executing. Depending on building typology, the structural system working is streamlined and ensured during the planning phase using different structural software like Autodesk AutoCAD, Revit, STAAD Pro, SAFE, RISA, Navisworks, ETABS, and SAP2000.

Various structural classifications and systems help in defining building form. The ropes, cables, struts, columns, beams, arches, Membranes, plates, slabs, shells, vaults, domes, synclastic, and anticlastic help achieve a form of the superstructure. The typical construction process involves machines like cranes, scaffolding, bulldozers, excavators, dump trucks, cement, concrete mixers, Forklift, Loader, pavers, compactors, etc. These are types of heavy machinery that work using hydraulics and reduce manual labor on construction sites. The construction industry is leading fast-track production and on-time completion of projects, tight schedules, reduced risk, etc.

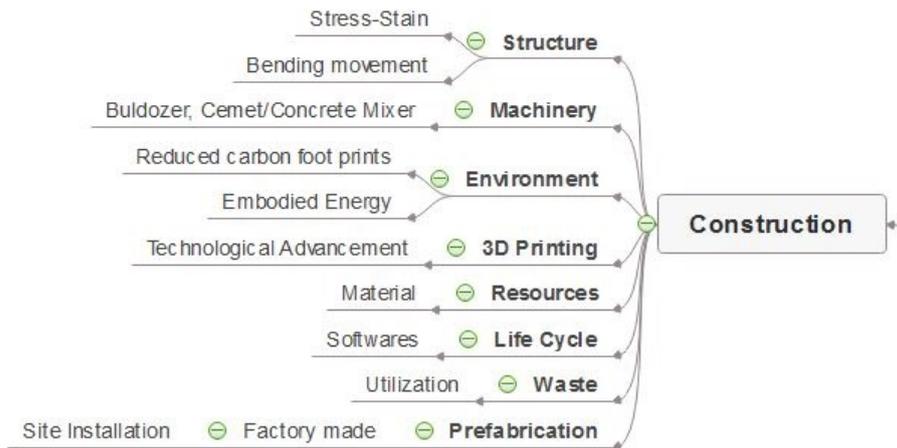


Figure 4. Mind map of C-Construction. Flowchart (Author)

Moreover, sustainable construction is also taking place as environmental concerns increases. Buildings are being considered for their whole life cycle, including the construction cycle, reducing construction waste, and recycling construction bulks. In addition to traditional construction techniques, futuristic construction technologies will change the world through robotic swarm construction, 3d printing, and Lego brick construction modules. The robotics machinery is programmed to perform complex construction functions, housed with sensors to work in synchronization. Construction robots have the potential to speed the completion of work with improved quality construction. To handle issues raised during the construction process, the building industry offers legal implementation. The Construction documents are governed by the legal obligations of the contract, procurement, and design-bid-build.

History

History is the record and interpretation of the past persisting events, human actions, and tangible work that existed through time and space till today (Helen Gardner, Horst De La Croix, 1980). It concerns the deep-rooted traditions of geography, climate, material availability, social and political challenges, and how these factors have helped shape the built environment (Figure 5).

The time-tested achievements in the history of architecture are commendable, celebrated, and appreciated while looking at the historical

perspective of different civilizations. The exemplary work of ancient cultures like Egypt, Mesopotamia, Greek, Romans, Chinese, Persian, Islamic, Baroque, Renaissance, Art Nova, Modernism, And Postmodernism, etc. are just a few remarkable contributions ("Sir Banister Fletcher's Glob. Hist. Archit.," 2018). Architects always need to look back at the past to build the present, dream, and plan. The building history is based on the chronological classification of Stylistic, Physical, Visual, and Documentary shreds of evidence verified through multiple traces of evidence and historical context (Helen Gardner, Horst De La Croix, 1980).

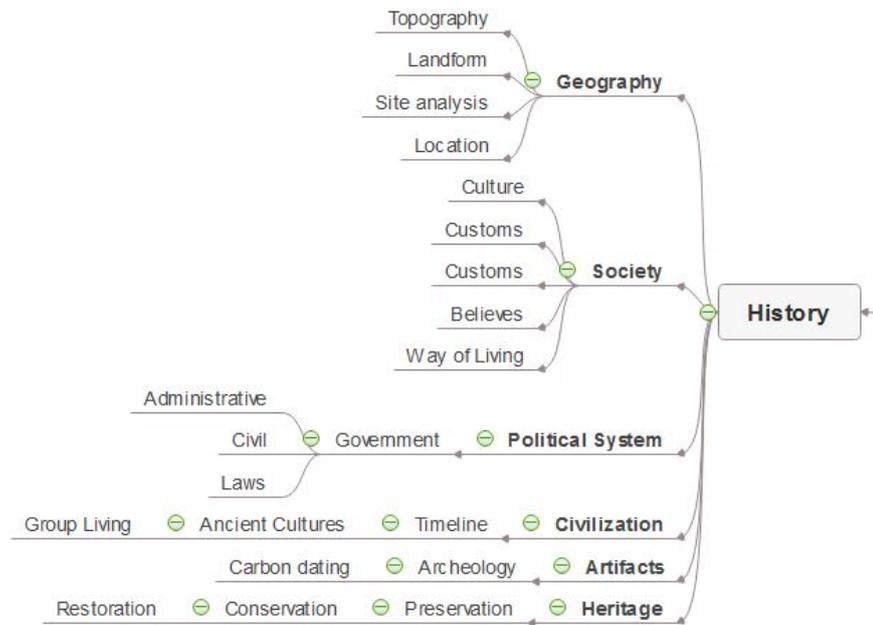


Figure 5. Mind map of H-History. Flowchart (Author)

The historical evolution of building design is a unique and unchanging skill that has manifested itself in different ways throughout time. History has led to the emergence of many radical concepts in architecture like Architectonic, thereomorphic, and anthropomorphic, etc. Culture characterizes architecture and the built environment, and the people reflect their intuition through the social grouping of culture.

Culture is the way of living, customs, beliefs, religion, and social practices of a particular group. The global contribution of a different culture to making advancements in architectural development has a far-reaching impact on people's lives. Architecture celebrates the deeply rooted tradition of cultural diversity. It is reflected in ancient civilization and upholds the identity of a particular area. The tangible and intangible historical and cultural values in architectural heritage and its preservation and conservation are necessary to achieve sustainable development goals. Historians and archaeologists unveil many of the ancient cultures that tell the story of the past, exploring how people lived before and how human civilization evolved. The existence of a vast majority of archaeological sites, historical monuments, artifacts, and objects significant to communities, nations, and humanity strongly

depends on a particular culture. But tangible heritage is valued, appreciated, safeguarded, and illustrious globally. Culture is also communicated by the construction of public buildings. They are the reflection of religious belief that how a particular culture links its philosophies to the emergence of special architectural elements and features. The symbolic representation of ancient construction theories links with their beliefs and culture. Additionally, Architecture also tends to revive the cultural value in places to keep alive cultural practices. Social spaces are another way of increasing interaction among individuals. Historically, the old feature of public squares in the community is still practiced in many places. Greek Agora was the central place in their urban culture. Many European urban centers have preserved those historical public squares surrounded by shops and markets to celebrate cultural festivals. History and culture are also embedded in vernacular traditions of time-tested architecture. Vernacular buildings are considered part of regional culture. Many vernacular building practices are based on local needs, using indigenous materials and reflecting a particular area's local traditions and cultural practices.

Inspirational

Architecture is truly inspirational with the ability to connect with nature. Inspiration gives a philosophical meaning to beauty and function. Inspiration is not taken at random, but a building's functionality must be combined with its aesthetics. The role of intuitiveness becomes predominant in choosing inspiration that can be easily transformed into a more utilitarian approach and maintaining aesthetics (Figure 6).

The pragmatic and theoretical understanding of inspiration helps a designer design building form and function. Inspiration in design is a way of learning how nature has addressed the solution. It brings harmony to the choices available and unlocks creativity and innovation. The Parthenon is an enduring symbol of Ancient Greece, an inspiration for the golden ratio that has been considered the most pleasing to the eye. The falling water house by Frank Lloyd Wright is time tested inspiration of architecture with nature so close to a part of the design itself. Another intuitive inspiration is the bird's wing design of the Sydney Opera House in Australia.

Also, designers can inspire by music, painting, sculpture, or any art piece and bring it to reality as-built structures either two or three-dimensionally. A recent example is Biomimetic architecture, where designers find a sustainable solution by examining natural form, systems, and processes. Other inspirational philosophies that inspire designers seeking solutions to artificial problems are organic architecture, bio morphism, Metaphoric architecture, and Zoomorphic architecture. These natural inspirations add a deeper meaning to replicating natural phenomena and making them a reality in the built environment. The designers must understand the deep underlying pattern, layer by layer, and superimpose it with the prospective architectural solution.

Utopic thought exists in theories of architecture (Johnson, 1994) and is a great inspiration for the future. Utopia is an imaginary world with social equity. It is the imaginary socio-economic order in a community aimed at public perfection (Giroux, 2003). The utopian society is based on social cohesion, equality, well-being, correctness, and reflection of a high level of order. The philosophy is reflected through the built environment, architecture, and urbanism. Utopian architecture is a close-to-perfection phenomenon practiced in decorating the interior of Roman buildings with 3rd and 4th styles of painting. A glimpse of an imaginary world, beautiful scenery, and vistas were created to address the fantasies. In the utopian approach, architecture is a world of fantasy and unimaginable thinking, and then try searching for its endlessness. Ideally and theoretically, architecture propagates social and economic equality in society, but its resonance is a paradigm shift toward excellence.



Figure 6. Mind map of I-Inspiration. Flowchart (Author)

The imaginary world is created through augmented reality, where architectural experience is digitalized. The augmented and virtual reality museum, IMAX Dome and theatre, Hollywood studio, and animation for cinema show the imaginary world and utopian architecture. In the world of architecture, it is an experience that takes the user beyond the level of imagination and dream world.

Technology

With the advent of the 21st century, the design realms cannot remain isolated from technology and its advancement. The futuristic way to design buildings that meet today's and tomorrow's needs will be achieved through technological advancement (Figure 7). The availability of new technology has revolutionized building construction, and the fast-communicated building information modeling has made designers more flexible in decision-making. The additive manufacturing and fabrication of 3D printing emerge as cutting-edge technology for the construction industry. Building applications using drones, Photogrammetry, 3-D laser scanner, and virtual and augmented reality have led designers to more reliably and quickly built solutions. The prefabricated construction of a hospital in Wuhan because of the Covid19 pandemic was an effort of six days that helped designers, the construction industry, and other stakeholders with quick fabrication and on-site assembly.

BIM-integrated design technology allows projects to capture the efficiencies gained by incorporating design, manufacturing, and construction processes without compromising function and aesthetics. This approach has resulted in a high-quality building delivered in a shorter time frame, with more predictable costs and fewer environmental impacts through reduced material use and waste. Compared to conventional construction, the benefits of recent technologies have made resource management easier, with reduced risks and optimized design, construction, and assembly.

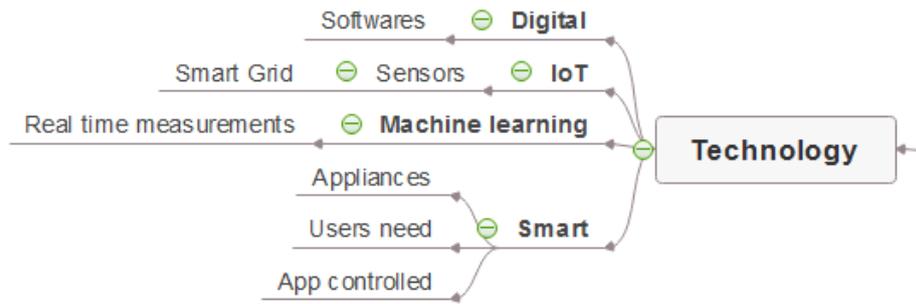


Figure 7. Mind map of T-Technology. Flowchart (Author)

Due to integrated technology, smart cities are necessary for sustainable development (Bibri & Krogstie, 2017). Intelligent buildings with the integration of smart technologies like smart meters, smart elevators, smart appliances, smart infrastructure, smart grid, smart parking, and traffic management are interpreting data to increase comfort and resilience. Future skyscrapers have waste-to-energy technologies, intelligent transportation, and mass transit systems to meet high-tech challenges. Along with the building itself, the concept of smart cities has also gained momentum. It has been named a Digital City, Information City, Intelligent City, Knowledge-based City, Ubiquitous City, and Wired City (Ismagilova et al., 2019) because of deep reliance on digitalization (Al-Saidi & Zaidan, 2020). The use of digital technologies and fast communication in infrastructure services, security, environmental control, and comfort is the priority of architects in the new era of technology. In the age of new challenges like the COVID-19 pandemic, the internet of things (IoT) will be a blessing without reliance on human-to-human or human-to-computer interaction. Technologically speaking, the convergence of multiple technologies, real-time analytics, machine learning, commodity sensors, and embedded systems will play a major role in transferring data. In this context the significant contribution of Google affiliate Sidewalk Labs to prototype a version of a smart city in Toronto, Canada (Goodman & Powles, 2019) is a praiseworthy approach and way forward to what technology can provide.

Environment

The environment includes both natural and built surroundings. Over the past few years, the environment has become highly thought-provoking. The urban ecosystem is putting up sustainable design challenges for the whole community of designers (Figure 8). Today

buildings are expected to be designed with minimum impact on the environment, energy, and ecosystem. The recent agenda of green design, sustainable building challenges, air quality, passive standards, energy, and environmental policies have emerged as pollution issues, rise in earth temperature, climate change, etc., have gained momentum. The buildings are being designed for the entire life cycle and will give additional energy to grid infrastructure. The passive design, sustainable materials, use of renewable energy, rainwater collection, and wastewater treatment are being incorporated into building design. Compliance with energy codes, thermal comfort standards, and green certifications (LEED; BREAM) has enabled stakeholders to invest for greater payback in the longer run (S. Li et al., 2020). The availability of most building simulation software like Energy Plus, BLAST, DOE-2, HVACSIM+, and TRNSYS is helping architects to design eco-friendly, reduced carbon footprints, and zero energy buildings. Building performance simulation allows designers to take intelligent solutions for thermal design, acoustic design, ventilation design, and many other aspects of the primary concern of the environment. The validated process further helps in a more realistic solution that can be safely applied during the buildings' construction and operation.

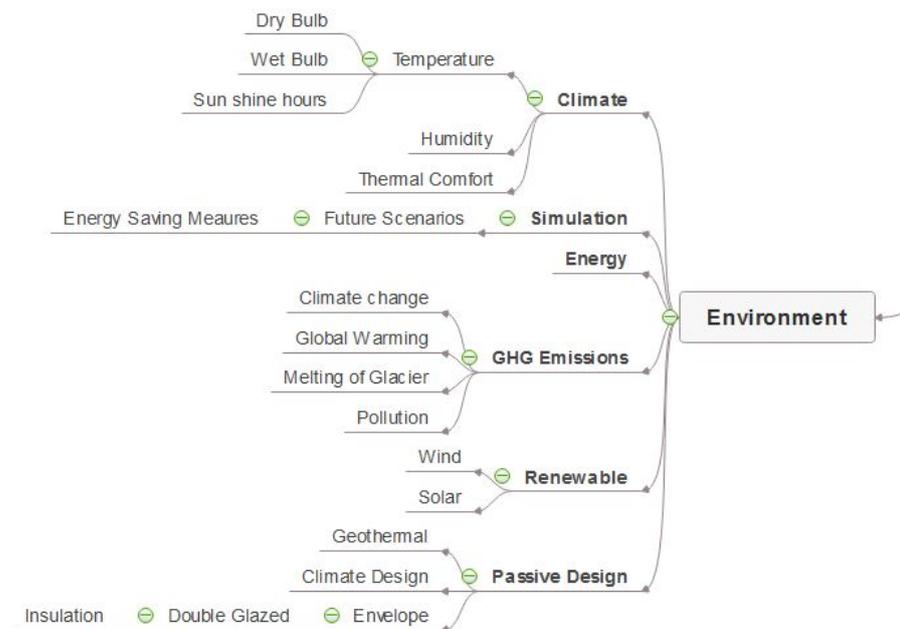


Figure 8. Mind map of E-Environment. Flowchart (Author)

A pivotal contribution of sustainability is to the environment and is ensured with the help of landscape design, ecological consideration, multifunctional landscapes, cleansing, environmental infrastructure, healthy landscapes-Food systems, and productive landscapes (Zeunert, 2017). The landscape design has made a total revolutionary impact on vertically farmed skyscrapers. Urban farming is being applied to various fruits, vegetables, and grains in buildings (L. Li et al., 2020). The natural landscape is utilizing renewable energy concepts to reduce the carbon footprints of an urban farm. The greenhouse technologies such as hydroponics, aeroponics, and aquaponics are a more sustainable way of producing food (Al-Kodmany, 2018).

Climate

Architecture is also driven by climate. Climate is the long-term weather conditions, often determined by the geographical conditions of an area (Werndl, 2016). The variance in climate influences how ancient cultures and civilizations construct shelters, houses, and buildings. Various environmental parameters of temperature, humidity, precipitation, solar radiations, topography, wind speed, direction, etc., are consistently considered in the design of buildings (Figure 9).

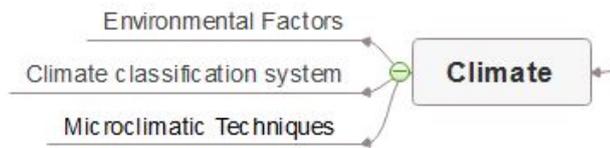


Figure 9. Mind map of C-Climate. Flowchart (Author)

The availability of world-renowned climate classification systems of Thornthwaite (Feddema, 2005) and Köppen (Chen & Chen, 2013) has made the understanding of climate easier for architects. The thermal performance of the building, like its heating, cooling, and ventilation requirements, is greatly influenced by climate and can be experienced in early design phases using simulation software. Climatic design significantly impacts architectural forms, patterns, and passive design considerations. Many initial stage design decisions like orientation, the percentage area of glazing, insulation, shading devices, and many more are based on climate challenges (Liu et al., 2020). The microclimatic site techniques like sun path diagram, sundial; the wind rose, wind square, air movement, etc., help in climate analysis and choosing the right design strategy and guidelines for the designed building. The climate is often combined with comfort for intelligent solutions in the architectural design process. For the use of the building, Givoni-Milne bioclimatic chart, *Mahoney tables*, and Olygyay chart identify the comfort zones for a particular climate and heating-cooling pattern for the buildings.

Transformation

Transformation is defined as an architectural concept or a structure that can be modified, transformed, or altered (Durmus, 2012). It is a change that occurs through manipulations, variations, and rearrangement of a previously existing concept. The change is brought in response to a specific context or a set of conditions that bring a new change without losing identity or concept. Transformation in architecture provides the flexibility to modify their original use for architects and building users (Figure 10). Flexibility is needed for function, layout, design, interior, ambiance, and form. Especially, space transformation is essential besides the original character of space, its social and historical connection, human perception, and experiment (Asefi, 2012). It's really about blurring the boundaries of art, design, landscape, interior, structure, and technology itself (Yi Li, 2017).

Transformation is possible by applying conversion, makeovers, and alterations to basic elements and principles of design. Basic design elements like line, shape, form, color, and texture are combined with the principles like rhythm, movement, proportion, and symmetry in composition. The elements and principles tend to change, translate, rotate, and reflect in a new dimension. In addition to geometric transformation, natural analogies can also help in bringing a positive transformation (Celani et al., n.d.).

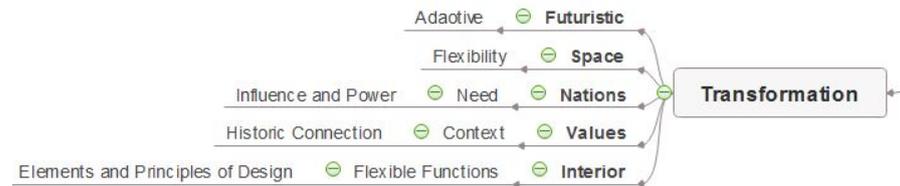


Figure 10. Mind map of T-Transformation. Flowchart (Author)

Urban transformation by applying the horizontal expansion analogy to the design of futuristic vertical cities is organic and isometric (Reinke, 2020)(Novikov & Gimazutdinova, 2021). The transformation is also widely practiced in modernism and contemporary interior design concepts through open floor plans, which provide flexibility to modify a space according to users' changing requirements and needs. The documentary evidence of Hagia Sophia shows the historical, functional, cultural, and social transformation at different times and places is remarkable. The building is still active, even though the work of architecture has been undergoing different transformations. It served as Byzantine Christian Cathedral (537–1204), then Roman Catholic Cathedral (1204–1261), Greek Orthodox Cathedral (1261–1453), Ottoman Mosque (1453–1931), and finally a museum (1935–present) at now. As another example of need-based transformation, London's ExCel Centre was rapidly transformed into the Nightingale Hospital for Covid19 patients after the global Pandemic crisis (Bushell et al., 2020). Many such examples have echoed in other countries, where both developing and developed nations are adopting this transformation to address building users' needs.

Utility

Utility in architecture refers to a function, commodity, and serviceable design. The buildings are designed to meet some functional requirements of the users and stakeholders. The modernist theory of "Form follows Function" states that building form is determined with the help of its function. If the building is functionally good and useful, it leads users to physiological, psychological, and behavioral satisfaction. So, the performance of a building is evaluated in terms of its operation, services, and infrastructure (Figure 11).

Buildings perform various functions, such as a home, an institute, a hospital, an airport, shopping malls, a restaurant, and religious structures. The function is the designers' main priority because it determines the user's comfort in a space. Buildings are based on spatial

functions and serve as a commodity for the daily users who live in and experience them. The requirements and differentiation of space define building utility. The spatial form and building function are categorized as global functions and interfaces, where inhabitants are controlled through the use of space (Turin, 1980).

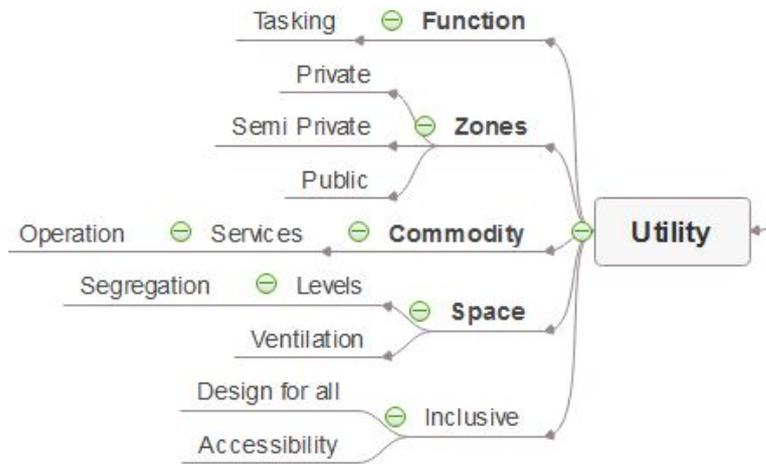


Figure 11. Mind map of U-Utility. Flowchart (Author)

Functionalism is a work of objectivity in architecture. The architects of modernism give priority to functionalism in design. For example, Le Corbusier describes architecture as "a house is a machine for living in." Buildings not only define their functional system but its interaction and linkages with the adjacent and nearby spaces. The need for high connectivity in spaces and prioritization is based on function. The division of segregation and zoning in private, semi-private, and public spaces is created by defining function and utility. Designing an office building based on function will increase the coordination amongst people, increasing work efficiency and giving them privacy. For example, hospital design must be highly utilitarian for great coordination between doctors, nurses, administrative staff, and patients. The functional properties of the design depend on the building typology. Planning techniques help achieve single and mixed-mode functions and diversity in buildings (Generalov et al., 2018). Developing the concept of tall multifunctional buildings or complex buildings requires an adequate, user-friendly regulatory framework for all its functions, including (offices, residential, office, hotels, etc.). Functionalism will help review and revisit the social, economic, and design aspects holistically and creatively.

Resources

Architecture accentuates the appropriate use of resources. Resources include materials, manpower, time, and cost. Building resources determine the suitability for a particular construction type; in other words, they significantly affect sustainable construction. Resources must be used in a way that must not disturb the ecological balance in the ecosystem (Figure 12). For meeting sustainable development challenges,

green human resource management is taking place (Jabbour & De Sousa Jabbour, 2016). Materials should have a minimal detrimental effect on people, nature, and the environment during their use and final disposal. Architectural construction uses both natural and synthetic materials for construction. There are multiplicities of sustainable, acoustic, insulated, reflected, absorbed, paint, finish, polish, and raw materials. The use of each selection is based on the design challenge that needs to be addressed. The future challenges of the construction industry are met using smart, novel, and self-sufficient material innovation. The recent inventions of self-healing concrete with the ability to heal cracks, light-emitting concrete, lightweight 3D graphene for skyscraper construction, spider silk, prefabricated timber, modular bamboo, translucent wood, transparent aluminum, aluminum, foam, Nanocrystal, wool brick, Aerogel, Hempcrete, and hydro ceramic are just a few examples for smart construction.

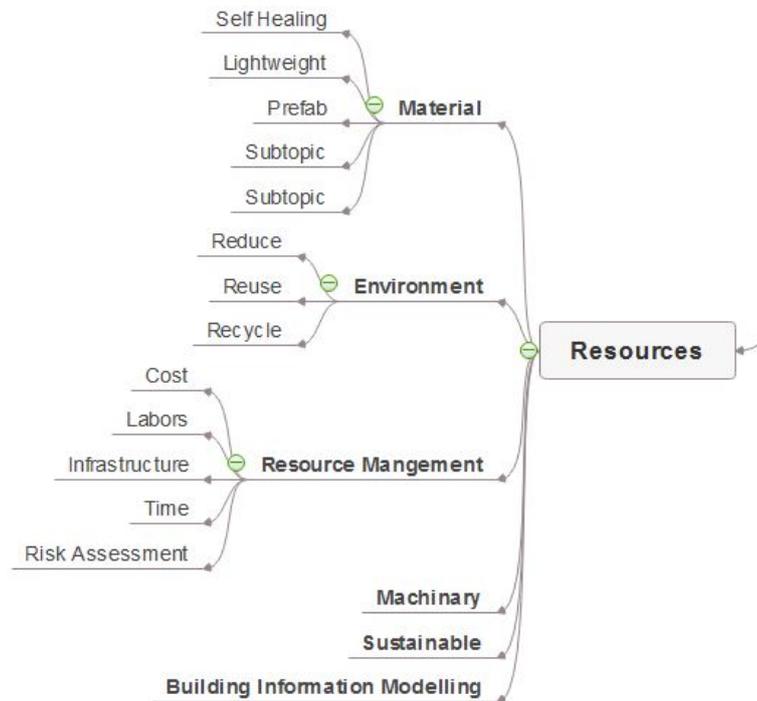


Figure 12. Mind map of R-Resources. Flowchart (Author)

Material and labor management and their productive utilization also require an innovative approach to resource consumption. Every task of construction activity is managed to increase productivity. The project life cycle gives priority to diversification in project delivery methods which are governed by Design-Build (DB), Construction Management at Risk (CMR), Design-Build Maintain (DBM), and Integrated Project Delivery (IPD). The optimum project cost, people interaction, and time management are integrated into one design through Building information modeling (BIM). To enhance the productivity and performance of labor, frequent supervision, leadership knowledge, skill of professional practices, the skill set of labor, and risk management are all necessary. Resource management has been addressed in building and urban design for the construction of smart cities. It has paved the way for

the intelligent management of digital technologies through the Internet of Things (IoT). The control system and building automation ensure the most valuable resource of energy usage. IoT will provide effectiveness, efficiency, and accuracy of the resources that are being used by the whole community through a centralized network.

Economy

The economy is one of the critical vital components of architectural design. The sustainable design pillars are incomplete without considering the economic attributes of profit. Architecture is a profitable business, and it encourages productivity. It localizes itself toward on-time project delivery, successful completion, good investment, and a reasonable payback period (Figure 13). The quest for an economical solution requires life cycle cost analysis. It accounts for design, construction, maintenance, and operation costs by looking at alternatives. The most economical option is based on a comparative study of various options. Some sustainable examples of architecture may have increased initial cost but less recoverability of cost overruns. The low-cost but optimal design is the choice of stakeholders, and money is a valuable resource in design. Buildings also can use an economic model that reduces consumption, the collapse of the ecosystem, and the waste of finite resources by continually reusing materials and energy. The product and services can be redefined in architectural design using the concept of circular economy (Valenzuela et al., 2018). Architectural enterprises have shifted from the traditional linear model to the circular economy by considering the end-life perspective (Laumann & Tambo, 2018). The buildings are designed for disassembly by keeping the given circular economy design perspective (Akanbi et al., 2019). The circular economy model also plays its role in replicating the idea at a sustainable urban development level. The novel interaction between the circular economy and the Internet of things has also revolutionized business models (Askoxylakis, 2018). Architecture also borrows the theory of sharing economy. It creates places based on the collaborative use of resources for an economical approach.



Figure 13. Mind map of E-Economy. Flowchart (Author)

The economy is manifested when making choices of design. The low-budget project requires cheap construction. It could be achieved in various ways through intelligent solutions—the use of cladding materials as an affordable solution without compromising on building structural stability and aesthetics. Corrugated metal or concrete sheets are structurally resistive with a low-cost solution. Temporary shipping

containers, prefabs, and portacabins also give the design economy. Vernacular construction based on locally available materials and construction techniques also leads to an economical design. Architecture is not only for the rich, but it also generates an economical solution for the poor, low-income people. For example, the economically sustainable models are the Khuda-Ki-Basti (KKB) and the Orangi pilot project, based on affordable housing for low-income people. Many such projects in other parts of the world strengthen the resilient infrastructure of low-cost housing through community participation methodology. Recently the work of Yasmeeen Lari BASA Architecture (Barefoot Social Architecture) is an exemplary work for marginalized communities providing people with social and economic justice. The project uses a participatory community approach to low-cost and zero-emission shelters using local materials and techniques (Ramzi, 2019).

CONCLUSIONS AND RECOMMENDATIONS

Based on the results and discussion as elaborated in the former section, the article interpreted and reflected the core terminologies in the field of Architecture. It has comprehensively covered the key development that has happened in the past, along with some current innovation that is revolutionizing the discipline and paving the way for futuristic innovation in architecture and cross-disciplinary fields. The article tends to conclude an archetypal that can be practiced as a studio methodology in design classes. The twelve keywords considered at every stage of the project will help to make a conscious consideration of all project aspects. The definitions of Architecture in literature do encompass the various aspects of design consideration, but the above-mentioned methodology will support a holistic perspective of its various sub-fields. In comparison defining Architecture is the art and science of planning and constructing a building to address humans' physiological and psychological needs. The archetypal "Architecture" has a deeper meaning, a message that designers replicate at every project stage (Figure 14). Designers are trained for, and practice with the presented concepts in the etymological root of "A-R-C-H-I-T-E-C-T-U-R-E." Architecture, as the term, has an in-depth meaning required to accomplish the design. It helps designers articulate how they think of the buildings and reflect their philosophy in the built structures. The twelve-letter combination proposes an archetypal design that encompasses design thinking, empathizing, and creativity (Figure 15). It is seen that the archetypal of this content analysis has or may have the potential to contribute to the holistic analysis of the components in the discipline of architecture, which has a very complex and comprehensive relationship network. Considering the concepts used in the etymological analysis of the word architecture and their relation, it is possible to say the following: Architecture celebrates individuality and a collective approach to design. Because individual emerging themes that have been developed celebrate

Also, the collective approach is being considered in projects, borrowing sub-themes from individual ideas. Buildings must be designed for their function, appearance, safety, reliability, durability, and quality. The building must be well designed, meeting user needs and desires. The standards are another way of optimizing a holistic design approach. The ease of construction using available technology will also determine the pace of architectural evolution. Architecture must last longer as a landmark for the design choices of stakeholders that they made throughout the architectural process.

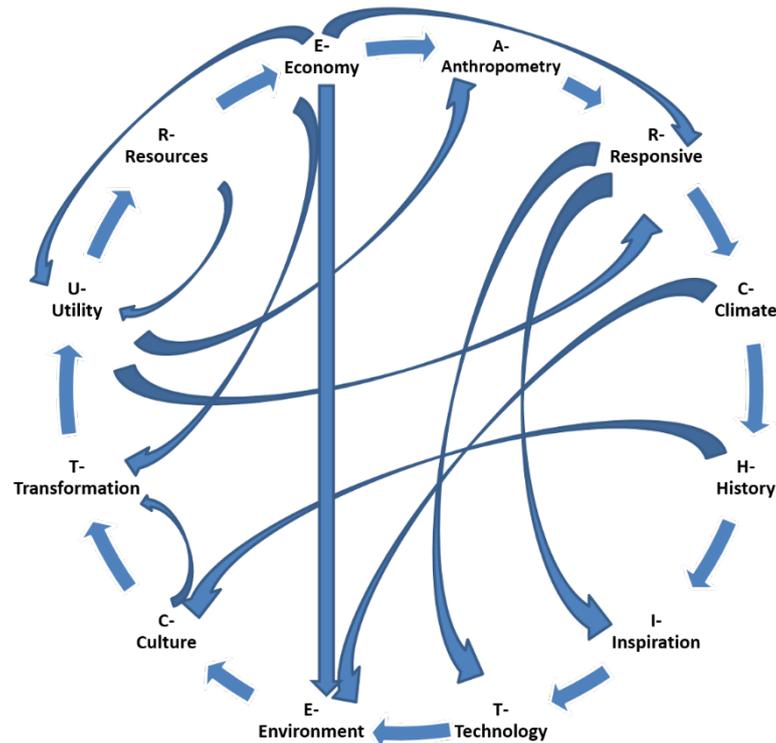


Figure 15. Archetype of Architecture. Flowchart (Author)

The analogy of Architecture is based on design thinking and creativity. The architectural design process requires an intricate cyclic relation of different parameters. It also depends on the nature of the project, whose function can be residential, commercial, industrial, institutional, community participatory, or religious. So, research explains a familiar and straightforward generic archetype based on the linkage of the closely related terminologies in architecture. The archetype also explains key terminologies' concept shift and hierarchy link (Figure 15).

Anthropometry is the beginning stage of design projects because it confines and provides fixed dimensional parameters of a design. Once the dimensions are realized, the design can shift to the next required hierarchy. It has also been observed that technology and environment form the core of the architecture discipline in the proposed archetype. This is because the use of software and its application in design has increased the freedom for the designers, where they can take early decisions at the various stages of planning, design, and final execution. Today software plays a significant role in engaging clients, measuring,

and enhancing energy performances, making aesthetic decisions, and coordinating the team in integrated project management.

Another core issue is the environment which has been widely debated in architecture literature and professional practices. Thereby the stakeholders are being sensitive to the sustainable environmental challenges of the future in design realms, where they are striving hard to provide a long-term solution to the climate problems. The environment-friendly design gives cost-effective and affordable solutions and has gained the attention of works of literature for decades for a sustainable future. The environment is shaped by the climate and depends on design functionality in a particular setting. Historic building commemorations are deeply rooted in the cultural practices of different regions that have the potential to bring transformation to the new digital age. The function requires minimum use of all available resources to achieve economy in design. Responsive architectural practices follow the footsteps of inspiration philosophy in design and adaptability. Similarly, the core nature of the project will determine the practical importance of different parameters and their sub-linkages. In the future, the expert response can be measured by a mixed method approach on 12 suggested acronyms. The responses on the expression of each referred term will also validate and refine its approach towards ARCHITECTURE. The author plans to conduct a more rigorous study in the future, using pictorial stimulus and expert responses to the content analysis's themes.

ACKNOWLEDGEMENTS/NOTES

The author acknowledges the methodological idea presented by Alex Milton & Paul Rodgers in his book on Product Design. It was a great inspiration for defining initial notes for this manuscript.

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Resume

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