

“The Effect of Corona-virus “Covid-19”, New Regulations for Architectural Design Required in Buildings to Fulfill the Term of Sustainability”

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Abstract

Through the global crisis of Corona Virus, which it started at the last fort quarter of 2019's, upon the life requirements and continuity, therefore a lot of conditions and rules was taken place in a different places, such as a public and official places to avoid the effect and spread of the virus disease, most of these buildings at that places were designed and built upon to the common design method, the construction was based on the regulations, conditions and laws used in that areas concerning theory and rules of architecture design, with some considerations to infectious diseases. So value of this study is to alert and to focus the highlight on the new rules and considerations that must be taken through the designing process of buildings later to be comfortable and ready against any kind of diseases, for the continuity of life, without any loses of humanity or economical.

Key Words: Corona Virus and Architecture, Architectural Design.

INTRODUCTION

The history of architecture and the infrastructure of cities is inextricably should be linked to diseases, especially the infectious disease and other health issues in general. At the last quarter of the year 2019's and at the beginning of the new year 2020. The world was shocked by a new infectious virus, which is called (Corona Virus "Covid-19"), since this virus affected negatively at the whole life activities in general, and the life cycle was semi stopped, because of that small virus, who does not see even with the naked eye. When this crisis started in Wuhan province in China, then invaded at the most of the countries in the world, and spread rapidly at all over the world. The entire world is still suffering from the tragedy of this virus, which caused a lot of different negative problems to societies in general, people still suffering a lot of problems, communications & transportation as shown in photo No. (1).



Transportation, Photo No. (1)

Economic situation, labors & employments, education, even the places of worship were affected by these disturbing decisions and closed their doors for a period of time as shown in photo No. (2).



Places of worship, Photo No. (2).

In addition to the biggest issue which is health and safety problem, even daily life in general faced a big problem, how to avoid the infection of disease? as shown in photo No. (3).



Daily life, Photo No. (3).

Then how to deal with these problems? Which still right now had a bad and confused effect at the community life in different countries of the world, they still don't have or finding the right vaccine and treatment for such disease of virus. Where the isolation and quarantine process was practiced and applied for the injured and those who were coming from outside of the country.

There is no vaccine against this virus right now. Many people were still unaware of the causes of this event, whether it was political cause, or it was a fact caused by normal coronavirus in our circumstance that we live. "Covid-19" is significantly impacting societies and businesses in general, and it brings us along many challenges and forces all of us to adapt to a new situation, but the houses and its architectural design is the basic of the game. This is triggered some officials and academic people to search and to develop a new methods and curriculums to fitting with the current situation of coronavirus this is called the "Design Rethinking", this will help to provide online lectures and some special design courses by specialist people, participants in this courses will have knowledge and experience about design for social impact, such courses will help how can we use design thinking methodologies to solve such urgent societal challenges. Which is especially used in times of crisis that we need to adapt with new situation, and find new ways of working. Participant's students and others they need to some experience, such as the basic knowledge of architectural design and so on.

2- RESEARCH OBJECTIVS

This research has some objectives. The objective of this study is highlighting on the new designing processes that should be taken in our considerations as a designer, and that by getting rid from all the problems have been mentioned, and to be taken in account. Health and safety of people considered the basic and very important requirement, and educate professionals and engineers how to prepare and design for any construction plan, and the healthy specific details are the first important requirements need in basic design process, so most of countries were improving new and special parameters focusing on health-oriented approaches, with new standards were sets to reduce the effects of coronavirus. Even new design and material are rethought according to the current situation, generating new forms of living. While notions of modular design, prefabricated elements, flexible partitions, and lightweight structures will keep on growing to achieve the new criteria needs in architectural design, Therefore, it is necessary to take in consideration the dimensions of the design shapes known to engineers which represent the following. Context (C), Need (N), and Form (F), To produce new design requirements will suit the health and safety requirements in buildings which is Health requirement's (R_H), this will appear as the result of understanding the design of architecture depends on some issues such as. To discusses and knowing the importance of awareness and culture for architecture design when offer a definition of what designing culture is need to, describing the purpose of architectural design, and providing a description to the field of environment-behavior in the design area, and cultural characteristics of human beings which influence the characteristics of architecture at the buildings environment? What effects do which effect on architectural environment, if it's a group of people, under what circumstance, when, why, and how? Focusing on answers to these and other questions to achieve the goal of study, the culture architecture, and design discusses the relationship between culture, the built environment, and design by showing that the purpose of design is to create healthy environments that suit use and users and is thus user oriented. Design should also be based on knowledge of how people deal with built environments interact. Therefore, design needs to respond to culture. shapes in general. as shown in fig. (1).

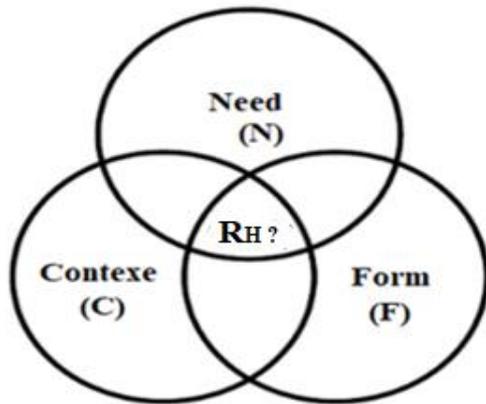


Fig. 1 Design Requirements R_H

The design problem has multiple dimensions, and it is rare to design something with only one goal. As for the design problem, the designer deals with the design to perform a specific function that is aesthetically pleasing and the performance of the task, at a reasonable cost, is doable, with the availability of the capabilities and available materials, by using a new innovation design suitable to the health conditions we live, a certain situation may arise in which you feel that the design has a certain weakness, which is considered important for the design process. This is what happened as a result of the coronavirus pandemic that swept most countries of the world, caused a lot of health problems and other tragedies, making engineers, professionals and officials rethinking and their view of points about design processes, so the importance of understanding culture for design is to offers a definition of what is the culture of design for health is? of diseases, virus, and so on? of diseases, virus, and so on. which mean that knowing the purpose of design, providing with a description of the field of the environment behavior of the place is very important, and it's uses. government, architects and designer started planning new configurations with social distancing measures in mind in public utilities in general. Surfaces covered with special materials that prevent the proliferation of diseases, even learning at schools and universities were applied e-learning online methods. it means new methods of communication will be design by architect for such processes, the design is oriented towards eliminating risks of coronavirus and other disease for the Individuals, meanwhile the impact of "COVID-19" continues to evolve, even job market for recent graduate's engineers and young professionals will changed. Yes, there will be a new job, with new classification.

Therefore, it is certain to make some adjustments to the educational curriculum in general in order to meet the requirements need of the new labor market within the current circumstances that we are going through. in this case, some results will carry out a negative effect because a lot employees and workers will lose their job, a lot of jobs and professions still suffered abnormal recession.

New graduated Architectural engineers and young professionals can adapt by understanding that architecture builds critical thinking, which is applicable across a lot of fields, and should leverage their interests and talents to explore what avenues are available, to fulfill the market needs upon to new health requirements, even if they fall outside traditional practices of designing, since engineering offices begin to pivot and take a deeper look at their existing service offerings convenient to market needs they should also look to how their office is structured to take on work, through a new qualified engineering working staff, to deal with the new rules of the architectural design that achieve the market requirements, this can help increase profits and reduce risk, as well as identify actions that reduce vulnerability, and minimize disruption. Since cities consider the epicenters of transmission of diseases more than the countryside, so most of utilities of cities have been hit the hardest by effect of the coronavirus, so they should be adapting with the new realities, even

innovating and to find the right solutions for such problem, through experimenting as a new design capable to avoid such diseases.

Architectural engineers, and designer cannot foresee what will happen in the future, sometimes, taking a decision it's very difficult, but they can create logical analogies that are based on the current situation and our first responses.

So they are required to put their knowledge as simulation to use in the fight against the coronavirus and to created innovative solutions that might stick around for a while. Some are designing facilities, while others are rethinking the city and the public utilities used in general, in United States. The American Institute of Architects (AIA) released the "Architect's Guide" to business continuity to assist firms in trying to manage their business. Aiming to help offices continue providing services and generating revenue, the guide provides firm leaders with insights into managing staff, premises, technology, information, supply chains, stakeholders, and reputation. It builds on best practices and incorporates lessons learned from firms impacted during previous events, helping life continuity as normal without any constraints.

Even for students, "COVID-19" will have a different impact. New students should focus on the long term, as economic recovery is likely, especially within the next four or five years. As more schools transition to online learning, this will also shape how education is delivered, and students will likely need to adapt to new learning modalities. For a recent architectures graduates, it's important to have a strong portfolio that showcases diverse talents and skill sets suitable to the new requirements of the market needs. These may also apply to other fields outside of architecture, but the architects, professionals, and designer are invited to search and update their education to improve their knowledge related to "COVID-19", and other infectious diseases, so they should have a special kind of criteria, through designing process to avoid problems later, through reading and understanding the rules, regulations, tips and articles on productivity that use in the area when working from home, and learn about technical recommendations for healthy design in future projects. Also, it's important to review and follow the latest advice and information offered on "COVID-19" from the local health organizations and the World Health Organization (WHO) website.

The important thing that coronavirus "COVID-19" pandemic has taught us is that architecture cannot save the world, but it might be help in solving some health and safety problems. and we should think deeply, more and more about different issues which we may face through the design process, for sure the ratio of victims will be reducing, at least not on its own. As the life resumes, our take on the built environment will become different. In fact, interdisciplinary approaches are already building up, bringing new expertise and views to the practice, to address more efficiently these urgent global issues. The collaborative take on "shared" world-wide challenges, will integrate notions of public and personal health, mobility and transportation, and agriculture, to name a few. most of new future projects should be, emergency architecture and crisis architecture are topics that will start taking center stage from earlier times, these themes will be more focused in the near future on mitigation and to reduce of diseases and natural incidents, even sustainability in general, will further consolidate to its status as an integral part of every approach, and projects will become more self-sufficient. On the other hand, we were looking to establish fast responding architectural structures, also we are transforming existing underused spaces. Adaptive reuse approaches are becoming vital in our emergency responses allowing for rapid action, considered the most effective form of sustainability, this field will improve furthermore, as the world economy is suffering. This is due to the prohibition that the competent authorities have required of citizens, in addition to continuous of curfew in some places, this is caused the most problems that mentioned in this paper.

3- METHODOLOGY

This study was completed by using special kind of questionnaires, in addition to personal interviews, meetings with different categories of people, both public or officially in different positions. According to the random surveys, the majority of people in Jordan are satisfied with the government's achievements and performance. As a result of the statistical analysis for the random questionnaire in which some of people participated with their opinions, since the results shown that 75% satisfied, 18% not satisfied, and the others of 7% were confused and have no answer, against the government's performance in the required prevention measures. But the question that arises for architects, specialists and officials, what are the measures that can be taken into consideration now in order to overcome the problems mentioned by designing and equipping buildings, or in developing the engineering education, and curriculum in schools through the different of social media and so on. the result of analyzing appears in the following pie chart as shown in fig. (2).

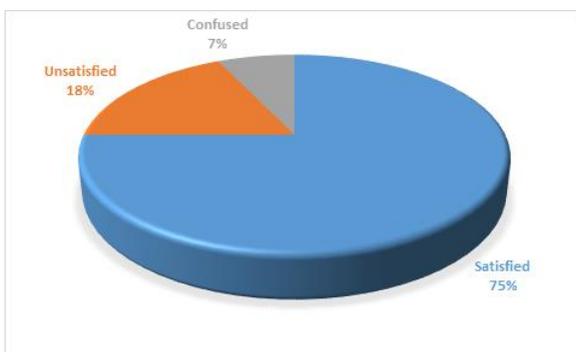


Fig. 2 Pie Chart Analyzing

4- LETRETURE REVIEW & GIVING FEEDBACK

Literature review, through reviewing to some papers, textbooks, articles and references, what we got that most of these articles has same point view, as mentioned in the references, and text, in general the results we got, we can say that most of these studies were very close, but it may have a small gap between them, which is related to the culture of people in some places. And all of them mentioned to the effect of architects in solve such problems, how to deal well with case of virus or disease later. Upon to the directions of Richard Sennett, The American Institute of Architects (AIA), Kourosh Salehi, and World Health Organization (WHO).

Therefore, we notice that engineering sciences in general, and architecture in special has a special impact and it has its fingerprints in contributing to finding and developing solutions that can contribute to solving these problems later, even if it's in relatively. Starting by transportation, mobility between cities was one of the biggest challenges during the period of this pandemic. because of the high density of people, and the limitation of awareness of people in their education, and their collaborations sometimes, these public networks do not conform to the new social distancing norm, so they should have a special permission issued from the official authority. In fact, many cities around the world were already planning for finding an alternatives to overcome those problems, by starting looking for new architectural standards design, different, and fit with new design requirements in the nearest future, by reducing the traffic jam, when they starting using the system of odd and even numbering system of vehicle and car plates to avoid the crowds of vehicles movement in general, the use of odd and even numbering system of vehicle and car plates in general day after day, and so on, even they controlled the pedestrian paths, and, ensuring social distancing and reducing reliance on cars and public transport, as far as citizens are encouraged to walk and cycle.

All of these procedures will take to reduce a lot of things, the main important one is pollution, Infectious diseases, with less of pollution and more physical movements, cities will be pushing their residents to develop a healthier lifestyle, essential in fighting diseases. they are planning to make “Open streets” the repurpose of roads, over the summer, transforming them into people-friendly streets. So we will see the efforts of urban planner engineers, and architects, trying and doing their best in finding the solutions in order to overcome those problems

Opening the streets to people, can also mean opening the realm for their businesses. While the economy is hit hard by the coronavirus pandemic, cities are mobilizing their creativity in order to prevent further damages and help business owners bounce back, in order to support bar and restaurant owners and guarantee that physical distancing and safety measures are respected, all of these necessary precautions should be in the account and considerations of architects and urban planners later, to help these businesses reopen safely and vibrantly, based on the committee world health recommendations, and ministry of health, by following the instructions of the responsible official authorities. For a while now, architects and urban designers and policymakers have been advocating for densification as a sustainable process to expand the city, rather than relying on devastating urban sprawls. but with the pandemic hitting crowded cities the hardest, these strategies are re-questioned, looking for healthy and safety situation for people who live around the area. Richard Sennett raises the issue of the architecture of density in *Domus*, stating that “concentration of people is also a good ecological principle in dealing with climate change, by saving on infrastructure resources yet to prevent or inhibit future pandemics, we may need to find different physical forms for density, permitting people to communicate, to see neighbors, to participate in street life even as they temporarily separate”. So what can be these alternatives?

As architects after rethinking the concept of home, and concentrating our attention in the new healthy situation, as we move forward in the different phases of the pandemic, we will focus again on our intimate spaces. In fact, new configurations and new plans are starting to emerge. The quality and comfort of our homes will become at the top of the list. While we are confined in our houses, based on the health daily situation, and the directions of official people in the area, we are rethinking our requirements and needs, along with the “new normal”: from green areas and gardens, exploitable rooftops, natural light, and ventilation, balconies, and terraces, minimal and wholesome indoor environments, transitional and filtered entrances, as the basic of architectural design, in addition to the new health considerations, etc. What “COVID-19” has demonstrated is that we are interconnected more than ever, and that appear diseases and disasters do not discriminate between haves and have nots (rich or poor), but the advantage we got, it made people more awareness about their own health, care about communications with each other, in addition to how to deal with the new constructions? And building design in general? Taking in considerations the issue of Clean, safe and livable places, it should form the basis of a basic living condition. The planet is linked through many strands of connectivity and one affected part could infect and compromise everyone. Therefore, people must respect the regulations, laws, and instructions required by public safety, through the optimal use of buildings for which new designs have been developed according to modern health requirements. Upon to the concepts about design rethinking the concept of home. Upon to the concepts about design rethinking the concept of home, and as we move forward in the different phases of the pandemic, we will focus again on our intimate spaces, which is mean the house. In fact, new configurations and new plans are starting to emerge. The quality and comfort of our homes will become at the top of the list. While we are confined in our houses, we are rethinking our requirements and design needs, along with the “new normal”, from green areas and gardens, exploitable rooftops, natural light, and ventilation, balconies, and terraces, minimal and wholesome indoor environments, transitional and filtered entrances, etc.

One of the outcomes of this recent outbreak of panic, and despair is the slowdown of our pace of life and the reflection many seem to be doing as they reassess, what is being done in the name of progress. The speed of travel and global exchanges of goods, data, politics and commerce One of the outcomes of this recent outbreak of panic, and despair is the slowdown of our pace of life and the reflection many seem to be doing as they reassess, what is being done in the name of progress. The speed of rethinking and global exchanges of ideas related to architecture design of new buildings, and trying to find a solution for the problems found in the old buildings, in addition to new global architectural data, that must-produce, must-run, must-run-faster, must-jump-more than any other thing.

Architecture and urban design, like most forms of arts, it's the representation of hope, the wish for a better more valid alternative proposal. Whether like other major disasters, "Covid-19" will leave an enduring marks on urban standards, it has already highlighted the urgency of real action. After businesses, and the firms began reopening, upon to the new regulations, architecture firms are start looking at how to manage their offices while students and recent graduates take their first steps into a new job market. There are a number of resources for firms as they consider business continuity, as well as new office structures and work models. So as urbanists we can appeal for a wider dialogue about how global cities are perceived, sustained and regulated. We need to participate in a greater debate and help to redefine the possible. taking in mind the future design of building, the future of our healthy community and safely life, and communities depends on it. Most architects and architectural engineers knows the based design methods, rules, basics which is considered as design requirements, as shown in the following diagram, Fig (3). The last one which it represents the design (D), that should concern about everything that improve the human being life, even the health considerations, in addition to the learn the basic of design, learning thinking principles of design to become a trainer of the design later, and so on.

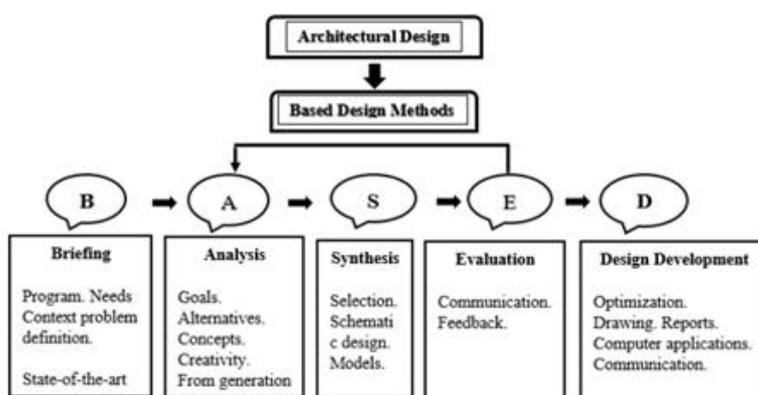


Fig. 3 Based Design Methods

Coronavirus Disease 2019 "COVID-19" is a respiratory illness caused by a novel coronavirus named SARS-CoV-2 which is a new strain of a large family of viruses called Coronaviruses (CoV). Therefore, the spacing between individuals is very important to avoid infections. So It is very important that in times like this we show solidarity and come forward to help each other, and the ones in need as shown in photo No. (4). In India the "Child Help Foundation" (CHF) is on a mission to make citizens more aware of and ready to fight the pandemic, so this is considering a good indicator, means that people more aware to avoid such problem. The government requested all institutions for financial support to contribute proportionately to help those affected by the forced closure of their stores, in order to compensate them for some of the losses that they faced at the beginning of the crises.



Solidarity, Photo No. (4)

5- FINDING & RECOMMUNDATIONS

So the ball now in the official's playground, and the responsible of this game now are the engineers, professionals, officials, and universities, even citizens and people who is trying to find the best solutions. What we what was reached in this study. That means all of the citizens are responsible to protect themselves by following all of the directions, rules and regulations issued by government, and officials, as shown in the following instructions. Even the architects and planners when they start on their design, and they should also follow all of these rules. And we also have to learn how deal with design thinking as the way of working in the different possibilities instead of solely dealing with the current problems. This could be, for example, finding new solutions in times of the "COVID-19" crisis

1- In general, we found that most of these studies, carefully examined, were concerned about the health and safety of humanity, and it confirmed that houses and the other facilities that they use, need to special architecture considerations through the designing processes, which design by architects or professional specialists.

2- Reconsidering the special educational curricula in university education, specifically with architectural department, which it should be matched with the learning outcomes, and the requirements of the labor market in general, by using new teaching methods more advance such as special virtual technology convenient with the outcomes of learning, even by using the simulation system of design.

3- There should have an educational an awareness programs for all segments of society, through which to clarify the optimal health use of the public utilities of the private a public building.

4- Of course, there are a lot of instructions and observations imposed by architects, government and official agencies to avoid health problems through how to deal with the surroundings areas, such as available public facilities, and so on. that means architectural engineers considered as partners in making decision.

5- Even, with the regard to the means of transportation in general and others, it has been subject to special procedures and instructions for safety of citizens. The goal of mentioning to this note here is, to clarify such issue for implanting and confirming citizen's awareness with values of how to deal with public utilities in general. Planner engineers they were one of those shared in making such decision. Based to all the aforementioned, some official and government bodies have taken and activated some issues, including the following.

1- Activate the defense law.

2- Launching electronic platforms.

3- Suspension of air flights, and transportation.

4- Isolating some governorates from each other, in addition to implementing the curfew for a period of time in some towns.

Once again, it means that architectural science is very important in our daily life. and this is to confirm the information about the important of architecture design.

6- CONCLUSIONS

Based on a review of the aforementioned studies, all the studies and instructions issued by some official bodies and international organizations indicate that the results are almost uniform. But there may be a slight difference caused by either the customs and traditions or the available capabilities and official justifications. Even some official bodies sometimes were confused in decision-making, because of the lack of control over the health situation and its exit out from the cycle of control and control this was caused confused for a lot of people during the daily life. Therefore, universities, architects and professionals they are required in contribute to find out the solutions that contribute in solving or alleviation of these problems which are exacerbated and increasing the difficulties of daily life. So all what we need now is to search for the missing link, which means that we must review the standards of architectural design, whether at the universities curriculum or even in the standards of official bodies. Time frames and strategies to impact larger social and Environmental change. Designers have unique skills that can be scaled up from initial actions – such as reviewing of streets infrastructures design, to reconfigure wider infrastructures based to the new rules and regulations.

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