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Managing Buildings' Facades Visual Pollution

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إدارة مشكلة التلوث البصرى لواجهات المبانى

ملخص البحث:

في القرن العشرين حيث التغيرات هائلة في مختلف العلوم والفنون الإنسانية ومن أهمها العمارة التي شهدت تغيرا بمعدلات كبيرة و يعد تقييم اداء ما بعد الاستخدام المباني فرعا منها و تساهم في تفهم افضل لإحتياجات المستعملين والإرتقاء بالعمارة سواء من الناحية الوظيفية أو من الناحية الجمالية. و يقوم الباحث خلال هذه الدراسة بعمل تقييم للواجهات حيث ان لها تأثير على الذوق العام و تعكس ناحية جمالية مهمة و بناء عليه وجد تغييرات نتجت عنها تشوهات بالواجهات (تلوث بصرى). يتم بذل مجهود من المصمم المعمارى لاخراج واجهة تليق بالعمل الذى يقوم بة، الا أن هذة الصورة الجمالية تتعرض للتشوية و للتلوث البصرى، مما يتطلب تحليل و توثيق للاسباب و عرض افكار لحل هذة المشكلة لعدم تكرارها فى المستقبل. و تعود اسباب التشوه البصرى الى اسباب مختلفة منها المستوى الفنى الغير جيد للتصميم، الى جانب ممارسات و سلوكيات خاطئة من المستخدم.

و هذه الورقة البحثية بنيت على خطة لزيارات مناطق متعددة لتجيمع و توثيق ذلك بصور و تدوين ملاحظات و التى تم تحليلها. و ينتهى البحث بمجموعة من النتائج التوصيات من اهمها:

1. تعديل الوائح و القوانين و إضافتها كإشتراطات معمارية ضمنإاشتراطات إستخراج رخصة البناء.

2. على المجتمع المدنى و الجهات الخاصة المعنية المساهمة فى عملية التشييد و البناء تحقيق إحتياجات مستخدم المبنى بتوفير تصميمات المعمارية تفى بالغرض.

ABSTACT

During the 20th century, great evolutions happened at different fields of scientific and human arts especially on the architecture science, which had seen an increased rate of change. The evaluation of the after use of buildings helps the designer to understand the user needs and to let him able to promote the functionality and the beauty aspect of the building. In this study, the researcher evaluates the effect of the architectural façades on the general taste of arts. Usually a special care in the design to let the facades appropriate for the usage of the building, however by doing changes on facades this picture of beauty exposed to distortion and visual pollution.

By the analyses of this phenomenon, the causes found due to low level of technical design, which does not fulfill the user needs as well as the bad behavioral practices from the users partly caused by the society weak awareness of the beauty sense and from the absence of control from the owners of the building and the governmental entities. Based on visits to different areas to collect the data documented with photos, suggestions presented to solve the problem and to prevent its repetition in the future.

Finally, the paper concludes with the following recommendations:

1- Modifying the regulations and laws to be included in the building license.

2- The civil society and the concerned authorities of building should consider on their designs the different needs of the users.

Keywords

Evaluation of the facades of the buildings - Visual pollution -Distortion of the facades

Research Summary
Vast improvements happened during the twentieth century in various science and human arts; one of the most important fields is engineering architect that has undergone significant rates of changes. The evaluation of after use stage of buildings considered one of the important branches as it contributes to a better understanding of the people needs and upgrading the architecture, for all its branches functional and aesthetic terms. In this study, the researcher undertakes an evaluation of the façades, as it reflects on the overall inhabitants' emotions that enhance the effectiveness of the architect to improve aesthetic aspect. Through the study, many changes that resulted in faults in the façades (visual pollution). Effort is is made by the architectural designer to bring out an interface worthy of the work he is doing, but this aesthetic image is subject to distortion and visual pollution, which requires analysis and documentation of the reasons and present ideas to solve this problem because it is not repeated in the future. The reasons for visual distortion are due to various reasons, including the technical level is not good for the design, as well as the wrong practices and behaviors of the user.
This research paper based on collecting data from multiple regions and document with pictures then analyze the data. The research reached a set of results recommendations, in which the most important of which are:

1. Amending of regulations and laws to add architectural requirements within the main requirements of obtaining a building permit.
2. The civil society and the concerned private sector that contribute to the construction process should fulfill the needs of the building user by providing architectural designs that meet the purpose.

Inference words
Facade assessment - visual pollution - deformation of architectural facades.

Research problem

1. Difference of the final shape of buildings' front façades reached the distortion affects the building aesthetically on the user in particular and on society in general.
2. The owner's interest in aesthetics is weak as well as the building users.
3. The designer concerns is to meets the needs of the owner without taking into consideration neither the building's aesthetic aspect nor the users' present or future service needs, leading the distortion of building facades.
4. The lack of legally binding regulations for the designer (building codes and licenses).

Research aims

1. Determine the problem results from the building facades distortion in general and the front façades of buildings in particular through field visits to multiple places in Greater Cairo.
2. Come up with a proposal for a suitable planning that prevents these distortions from recurring.

Methodology
The study focused on the importance of studying the impact of the aesthetic aspect on society, which has a role in creating a healthy climate. Also studying the reasons that prompted the user of the building to make these facades' architectural changes. This gives the signal to the designer engineer to take it into consideration as he design. The study focused on dividing distortions into categories, first before using the building and second after starting to use the building.

Category one “Before using the building”; the design contains some construction elements considered by the researcher to be visual pollution, but the design of the architectural facades has not been evaluated and did not take into account the extent of interest and methodology of the architect in directing the artistic work of the facades. Category two “After starting to use the building”, the changes that occurred in the facades were observed, which are considered by the researcher as visual pollution.

The study followed the theoretical way in theoretical describing and presenting the importance of the aesthetic aspect of the façades showing how they effects the general behavior of society and try to improve it. As for the practical part, field visits to residential areas in multiple neighborhoods and clusters was done, analyze and access to the results and recommendations. Hence, it was necessary to be acquainted with some details about the special design requirements that the building user needs, which allows forming an idea about these needs, which reflects the future by forming a clear vision for the architectural designer about these needs, and thus avoiding the changes that occur in the facades.

Introduction:

The architectural design is a reflection of human desires regarding the architecture of the place. In addition, a reflection of human crafts-man ship and it is a reflection of the existing natural material, which is the result of the contribution of many professional, ideological, cultural, social and behavioral aspects that affect human behavior, as well as literature, music, painting, and so on. The human being also affected also with the surrounding environment. Likewise, the architecture influences the human behavior. “Wadah 2005”.

The responsibility of architectural planning lies on everyone without exception, starting with the project’s owner, the authorities responsible for approving the project, the designer and implementer of the project.

During the twentieth century, as vast changes in various sciences and human arts happened, the most important of which is architecture, which has witnessed an accelerated change with great rates. The evaluation of the building performance after use is as a branch of it and contributes to a better understanding of the needs of users and the upgrading of architecture, both in functional and aesthetic terms. The concept of evaluation still interferes with many other concepts used in architecture and the most important of these concepts is architectural criticism. But the prevailing concept of the evaluation process means issuing judgments about the validity of the design output and its efficiency to meet the general requirements of the beneficiary according to the available resources and these judgments are often made after setting specific and clear criteria, whether these technical criteria relate to the profession itself or functional.

The term visual pollution means; all distortions resulting from architectural or organizational errors, in addition to the changes made by the user after the completion of construction works, which considered personal behavior and are negative manifestations that harm the architectural work and consequently often have a negative impact on society and the surrounding environment. The reasons for this architectural distortion are due to various causes, including economic, social or cultural reasons. The façade of the building considered the first mirror that reflects to the viewer the compatibility, harmony and sound thinking of building design, and represents an important work of building design. It is the visible part of the architectural work and therefore it is the first factor to judge the building as success or failure. “Qasim 2016”.

The buildings’ façades formed a wide area for development and study over the time, as architects embrace their decoration and sometimes they strip it. In ancient historical times, the design of buildings focused primarily on the facades and attention to their decoration.

Then the matter changed, the focus turned mainly on the horizontal projections, especially after the introduction of architectural education. The façades express the inherited civilization art and the outcome of creativity with modern architectural trends. Since the beginning of the twentieth century, the facades stripped of any decorations where the architectural belief prevailed on focusing on solving different design problems that considered more important than the façade decoration. The interest in freeing the facades became by canceling their structural and environmental role, leading to separating the facades from the structural system, and introduced modern glazing, as "Curtain Walls" with the usage of modern technologies of air conditioning and heating. The aesthetic evaluation of the façades that previously depended on the artistic decoration, turned out to depend on the economic, technical, cultural and environmental solutions for the facades' design, so that the external walls turned to be the facades of the buildings rather than their outer envelope. "Al-Saqqaf 2016".

The study "Qasim 2016" dealt with the impact of visual pollution on the architectural character of "Misr Al Gadida" area in general and "Roxy" area in particular, and contributing to put up the basics for preventing the development of visual pollution among buildings of distinct architectural character. The research recommended putting plans to prevent negative impacts repetition to preserve the distinctive architectural character of the area and remove the infringements to enhance this area and use it as a tourist and cultural attraction.

The research "Al-Saqqaf 2016" examined the types of visual pollution in the "Mukalla" city, illustrating its negative impact on the sense of aesthetic values and high-end images of establishments. It also study the causes of visual distortion and their classification, showing that among these reasons the negligence and failure to maintain public facilities, misuse, and poor planning, the decline in the design technical level, as well as the wrong behaviors practice. Discuss the official's role in the decline of visual distortion of the "Mukalla" city. An analysis and documentation of the status problems of the old visual image done, and the researcher contributed to find reasons, develop solutions and recommendations for this problem.

The research "Al-Hanakawi 2018" discusses the lack of the comprehensive perception that explains the impact of neglected buildings on the urban scene, and studies how treatment works by building a comprehensive framework for the concept of neglected buildings, and the most important causes and levels of abandonment and the type of neglect in general. One of the most important outputs in the research its impact on the quality of the urban scene in particular. The research reached the most important conclusions and recommendations to achieve and oblige the buildings 'owners to take measures to reduce their negative impact on the urban landscape. One of those conclusions is the reasons for the emergence of this neglect change is the use of buildings as well as economic reasons for their significant impact, as reflected in the loss of identity for the urban landscape.

The seriousness of visual pollution is its related closely to human sense of beauty loss, and the collapse of aesthetic considerations. The presence and spread of visual pollution has become a custom to the eye visible measure. Visual pollution effects on human psyche, and psychological problems, such as distress, tension and disruptive behavior. The psychological pressure leads to excess nervousness, and gets worse to reach physical diseases such as high pressure, heart and colon diseases, and breathing difficulty. Some specialized doctors diagnosed the nature of emotions result for feeling a visual effect of increasing the adrenaline secretion. The adrenaline is the hormonal substance produced by the gland Pituitary, that affected by the vision that the brain give the order to the gland

pituitary to secrete the hormone, which in turn raises the acidity of the stomach and raises the heartbeat level, thus results in irritability. Seeing a positive visual effect may lead to feel and sense beauty, thus increasing the secretion of cortisone in the body, which reduces the feeling of joint pain, especially those who suffer from rheumatic diseases, and therefore leads to a comfort feeling and psychological calm. This explains why the aggression and bad behaviors in societies increased especially in densely populated slums. "Qasim 2016".
This kind of studies, that are mostly field-based, can add positive additions to the development of general aesthetic taste, which the present society needs for the environment in which we live.

Analysis:

A plan was prepared for field visits to multiple regions, taking into consideration the different levels and segments of society that are appropriate for social, cultural and financial purposes, to collect and document this with pictures and note-taking, which are analyzed accordingly by devising special (requirements) that provide the necessary needs for the user of the building.

Selection of study areas: Several different regions chosen in the Greater Cairo region, including the regions (Heliopolis - Nasr City – "Hadaek el Zaytoon" - El Nozha - Ain Shams - Helmeya - El Mataria) for a number of buildings within the limits of 600 buildings. The areas were defined to include low social areas (Ain Shams - El Helmeya - El Mataria), and moderate social areas "Hadaek el Zaytoon", and considerably high social areas (Nasr City - El Nozha - Heliopolis). The areas are classified according to the level of buildings, the nature of the region differs from one region to another, as does the societal culture of the residential community for those areas, as well as the level of living that reflects the changing economic level. The shape and composition of the housing differed from buildings with low density in Heliopolis and Nasr City to a high density in "Hadaek el Zaytoon", Helmia and El Mataria, and Ain Shams.

Some forms of visual pollution monitored through the following points: Noting that those are example and not limited to, but common among them. Some elements identified and other elements added based on field visits, through which more points are monitored. The study dealt with the following changes and their prevalence (presence) in the buildings in relation to the buildings that were included in the research in Table No. 1 and the reason according to the researcher's analysis:

Table 1. Distortion spread percentage

No.	Problem & Distortion of Buildings Facade	%	Notes	Reason
1	Distortion before building usage as need for main elements that exist in design			
1.1	Tap water & Sanitary pipes, and gas pipes even on the Main facade	10	Special in low social areas	The design situation not allow a better solution
	Clothes hanger on the main facade	82	Supposed to forbid on the main façade for some areas as Heliopolis, so the percentage there are less.	The design situation not allow a better solution. Lack of enforcing the regulations and law.
1.2	Leave the façade without finishing	14	Specially on the low social areas	Personal attitude. Lack of enforcing the regulations and law.

2	Changes during the implementation phase of building			
2.1	Rain drainage pipes from the upper ceilings and balconies	28		Personal attitude. Lack of enforcing the regulations and law
2.2	Air Conditioners and all what they needs of pipes, wires & intercom	90	This is widespread even in simply and low social areas	Personal attitude. The design situation not allow a better solution
	Satellite dish	15	Started to spread specially after introducing the small dishes	Personal attitude. The design situation not allow a better solution
	Birds and dove nests	7		Personal economical attitude. Lack of enforcing the regulations and law
2.3	Enclose the balconies to the inner space, to gain more rooms.	5-90	Some areas reach 90%m as some others reach only 5%	Personal attitude. Lack of enforcing the regulations and law
	Do a wooden cantilever on steel I beams to increase the inner space.	8	Some special areas.	Personal attitude. Lack of enforcing the regulations and law
2.4	Distortion of the architectural style by the shops.	70	Note: Some areas at Heliopolis does not have shops.	economical
	Balconies sheds	8		Personal attitude.
2.5	Some units belongs to companies' make decorations differ than the original architectural style.	4	Some special areas	economical
	Advertise boards	75		Economical. Lack of enforcing the regulations and law
	The building Need restoration	25		Economical. Lack of enforcing the regulations and law
2.6	Facades paintings	10		Personal attitude.
	Painting some balconies with different colors not matching the overall building's façade.	15	Some special areas	Personal attitude.

Because of the analysis and the study, the cause of visual pollution. The reasons confined between personal behaviors, due to the economic aspect. Another reason, design does not permit for better solution, the main reason falls either the permissibility of laws, regulations and building requirements for this solution. This means deficiency in laws and Building Regulations This led to the community taking advantage of weaknesses to increase visual pollution or due to the absence of the law, which also led to the exploitation of society.

Taking into consideration the Building Law No. 119 of 2008, (Chapter three), concerned with regulation of construction works (Chapter Six) implementation of the licensed works,

Article (51). “The construction or licensed works must be carried out in accordance with the technical principles, in accordance with drawings and documents for the issuing of license. In addition, no substantial modification or change in the approved drawings may made unless after obtaining a license for this amendment or change in accordance with the rules for issuing the license.

The executive regulations of the Building Law issued by Law No. 119 of 2008 - Article 144 state the following:

“In case of committing violations after issuing the building validity certificate for occupancy of the owner or the occupants union, the administrative authority shall take the legal procedures prescribed from editing the violation record and the decision to correct or remove the violation works and notify the person responsible or whoever represents him legally on his residence in a letter recommended with the arrival note And in the event that the concerned parties did not correct or remove the violation, within a period not exceeding one month from the date of the announcement of the violation, and the administrative body through those who were entrusted with them to implement the decisions of correction or removal at the expense of the offender .... "laws and Regulations (4)

In the following tables, the distortions caused and recorded with pictures:

Table 2. Distortion before building usage – tap water, sanitary, and Gas pipes

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
1	Distortion before the building usage			
1.1	As reason of lack of main items exist in design	Gas, tap water, and drainage pipes	Some facades done to decrease the seeing pollution. Figure (A)	1

Figure (1) distortions before buildings usage

Table 3. Distortion before building usage – unfinished facades

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
1	Distortion before the building usage			
1.2	Not complying with the building specifications	The façade is not finished	In spite of finish exist in other buildings	2

Figure (2) distortions before buildings usage, unfinished façade

Table 4. Distortion during building usage – balconies drainage pipes

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
2	Deviation during the use of the building			
2.1	Essential requirements that didn't put in the design	Balconies drainage pipes		3



Figure (3) distortions during buildings usage, rain drainage pipes

Table 5. Distortion during building usage – Air conditions and satellite dish

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
2	Deviation during the use of the building			
2.2	The need of special technique that wasn't taken into consideration	Air Conditioners and all what they needs of pipes, wires & intercom	Vision pollution for facades (main or secondary)	4 & 5

Figure (4) distortions during buildings usage - Air conditions

Figure (5) distortions during buildings usage - Satellite dish

Table 6. Distortion during building usage – Balconies add to room space

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
2	Deviation during the use of the building			
2.3	Culture reasons (private attitude)	Including the balcony to the inner space		6 & 7

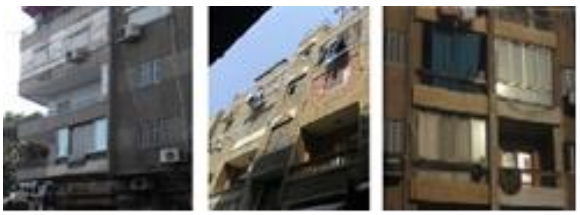

Figure (6) distortions during buildings usage - Balconies add to room space

Figure (7) distortions during buildings usage – windows openings

Table 7. Distortion during building usage – Shops, Balconies sheds

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
2	Deviation during the use of the building			
2.4	Due to Financial attitude	Pollute facades by shops, balcony's sheds.		8


Figure (8) distortions during buildings usage - Balconies add to room space

Figure (9) distortions during buildings usage - Balconies add to room space

Table 8. Distortion during building usage – Shops, Balconies sheds

No.	Pollution Category / Reason	Distortion Type	Notes	Figur No.
2	Deviation during the use of the building			
2.5	Due to economic reasons	Decoration variation than the original due to user and commercial banners		9

Table 9. Distortion during building usage – Façade's color changes

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
2	Deviation during the use of the building			
2.6	Due to changes in people taste	Façade's color changes		10

Figure (10) distortions during buildings usage - Façade's color changes

Examples of building before

Figure (11) and during use

Table 10. Distortion during building usage – Examples before and during usage

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
2	Deviation during the use of the building			
2.7	Examples of buildings before and during use	Commercial banners / need for buildings' restoration		11

Table 11. Distortion during building usage – Examples of buildings with minor distorsion

No.	Pollution Category / Reason	Distortion Type	Notes	Figure No.
3	Positive Examples			
	Some buildings the distortion was minor that it got back its original look after restoration	No distortion, or restoration is done		12& 13

Figure (12) distortions during buildings usage - Façade's color changes

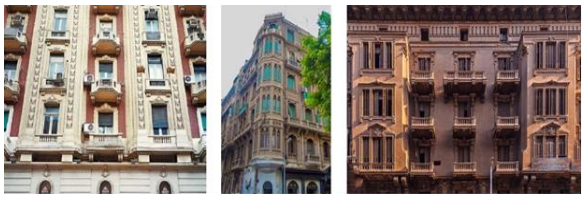

Figure (13) distortions during buildings usage - Façade's color changes

Results:

In spite of the clear law stipulation that no substantial modification or change on the approved drawings should be made except by obtaining a license for this amendment or change in accordance with the rules for issuing the license. In addition, in the case of committing violations, the administrative authority is obliged to take the legal procedures prescribed by editing a violation record and a decision to correct or remove the violation works at the expense of the one who made them. However, due to the lack of response of the relevant agencies to play their role in enforcing the law, which leads to wasting the inherent right of the community to eliminate this visual pollution resulting from these violations. This is in addition to other items that the research proposes for disposal. Accordingly, the result of the research and analysis divided the resulting distortions in terms of their negative impact on the aesthetic side, and Table No. (12) Presents the proposed solutions and procedures for the study, whether introducing this proposal as a requirement of building requirements to get the license or adhering to regulations and laws in the case of covering building requirements to this standard:

No.	Distortion Category / Reason	Type of distortion	Proposed solution	Proposed routine
1	Distortion before the building usage			
1.1	As a result of the need of main items exists in design	Tap water, sanitary, gas pipes	Design "outside ducts" to hide the pipes, with maintenance ease.	Add this routine as require for license & building permit.

1.2	Violating the construction requirements	Facades with cemented pre-painting or just left on bricks façade.	Complete the facades' painting	To comply with the regulations and law
2	Distortion during the building usage, categorized as follows:			
2.1	Main requirements that was not take into consideration on design.	Rain drainage pipes, for roof and balconies	Make routes to drain rainwater.	Add this routine as require for license & building permit.
2.2	Need of special techniques that was not take into account.	Air conditions with all their requirements of pipes and electric wires, satellite dishes, intercom, etc.	Mark places for air conditions. Mark places for all electric wiring, pipes, etc	Add this routine as require for license & building permit.
2.3	Personal attitude (personal taste/ matter)	Combine balconies space to the inner space. Make balconies by wooden beams on steel beams space.	The designer should consider the users real needs of balconies and façade's openings.	To comply with the regulations and law.
2.4	Financial reasons	Distort the architect type for stores and balconies' sheds.	Mark their places on design	To comply with the regulations and law.
2.5	Economic reasons	Facades' Paint differ than the original color and type.	To not allow any architectural type difference.	To comply with the regulations and law.
2.6	Due to different of public sense.	Different facades colors.	Imply special colors for facades in the regulations of construction	Specify facades' special colors in the regulations of construction
2.7	Examples of building before and during their use.	Commercial banners/ need to building restoration		To comply with the regulations and law.

Recommendations:

1. The state must amend the regulations and laws that help in achieving the preservation of architectural ethics, and add these laws and architectural requirements within the requirements of obtaining a building permit.
2. The concerned authorities with the Egyptian codes for architectural design should make the addition to guarantees that the facades is not going to be changed.
3. The concerned authorities should play their role in implementing the law in order not to allow the inherent right of society to be lost in the presence of this visual pollution resulting from these violations.
4. The civil society and the concerned private sector that contribute to the construction process should fulfill the needs of the building user by providing architectural designs that meet the purpose. In addition to preventing the buyer of any part of the

building from introducing any modification of the facades through the presence of a contract clause obligating to do so.

5. Encouraging the architect to achieve the requirements of the buildings user through an integrated work that includes various specializations that enrich the design and help produce a design meets all the technical needs.
6. Change the thinking to understand the needs in a positive and necessary way, and work to find an appropriate solution that serves the aesthetic and functional design.
7. Universities and educational authorities should document, confirm and clarify the extent of the problem, its importance and its impact on the general taste of society, and explain the architectural tools that prevent the availability of these distortions.

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