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COLOUR USAGE REGULATIONS FOR THE CITYSCAPE OF OLD MOSUL CITY/ IRAQ

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Abstract

Old cities around the world have special features, which form the mental image for their users. Architectural and urban elements and the relations that combine them produce this image. Colour is one of the most important elements that give users the mental image of the city. Traditional buildings were built basically by using available natural materials. Before the usage of paints, these materials were the main source of colours on the buildings. Hence, the old city of Mosul/ Iraq had its colour scheme. From the middle of 2014 until its liberation in the last quarter of 2017, Mosul City had faced a crisis of terrorism. The old city had the largest ratio of destruction among the rest of the city, and lose many of its historic structures. As they needed to settle down as soon as possible, refuge people began to return, repair, and rebuild their damaged buildings by spontaneous efforts. However, their actions were not following any historical regulations. Aside from many uncontrolled efforts, painting the repaired building with new (bizarre) pigments, that differed from the original colours, lead to composite a new mental image for the cityscape. This paper aims to explore the impact of facilitating new colours on the cityscape of the old city of Mosul, by studying international cases of using colours in forming cityscape, as well as to suggest regulations for using paint, by extracting the original colours of the traditional urban scene from the related photos.

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Keywords: Old City of Mosul, cityscape, colours, mental image.



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1. Introduction

Many urban design variables contribute forming the mental image of the city (Artemenko & Artemenko, 2018). Colour has a pivotal role in the perception process of any urban cityscape. Thus, colours are the fundamental elements for building the mental image of the city. However, local authorities have no clear regulations for using colours on buildings painting for the cityscape of Mosul City in general or the private identity of the old city of Mosul. This lead to the lack of a clear colour identity in the city.

1.1. Major types of the colour theme in the cityscape around the world

Cities with colourful identity have two major types of colour themes: Some cities or their parts have a multiple colour theme, which became a recognisable feature that defines the mental image of these cities (Clarke, 2019). For example, the Favelas of Rio de Janeiro (Brazil) have a multi-colour theme (Telegraph, 2019). Jeroen Koolhaas and Dre Urhahn initiated a painting campaign in 2005. These two Dutch artists wanted to help local people by changing their lifestyle. They provided the locals with painting buckets to participate in the process. Another case, the Mexican government urged street artists to enhance the aesthetic scene of Pachuca town (Mexico) by painting 209 facades of the houses. Moreover, the local youth organisation cooperated by painting graffiti (The Guardian, 2015). In Europe, a small marina town called Vernazza (Italy) has a historical colourful cityscape. Each building in it has its different bright colour. When these colours reflect on beach water, they increase the aesthetic impact. Figure 1. illustrates multi-colour themed cityscape examples



Rio de Janeiro in Brazil



Pachuca town, Mexico



Vernazza of Italy

Figure 01. Examples of a multi-colour themed cityscape

On the other hand, there are many examples of cities and regions that have unified colour theme (Figure 2). One of them is the Chefchaouen City in Morocco (also known as the small Granada). This city has blue-washed buildings and houses. The Moroccan Jewish have their religious motivations of using the blue pigment. As the Old Testament mentioned, this colour is a symbol of serenity and balance. Also, from Morocco, Marrakech City is named The Red City, as most of its buildings were painted in red clay colour. It is noticeable that most of the southern cities of Morocco have the same red colour theme. On the opposite, blue and white colours are most common in the northern cities of Morocco. Moroccan official regulation protects the identity of the cities, as "Section eight" titled: "Cleaning, restoration, and

fixing building façade/ Act 153" which issued: "premises that built by stone or brick have to be painted by the nearest red tone to the original red brick and clay". The last example is the coastal town of Santorini, Greece. This town is flushed with a white colour. Its relatively hot summer has an indoor environmental impact on the local by decreasing the indoor temperature by reflecting the sun rays (Al-Ali, 2016).



Chefchaouen, Morocco



Marrakech, Morocco



Santorini, Greece

Figure 02. Examples of a unified-colour themed cityscape

1.2. Colour usage impact on the cityscape

The effect of colour usage is distinguishable on all aspects of the cityscape. The correct colour usage has a positive impact on both symbolic and psychological aspects of the cityscape. For example, dense multi-colour usage in major intersections and public squares gives the impression of over facilitating for these urban spaces. Next, a brief list of colour impact on different aspects of the cityscape (Hoseinion, 2001):

- Colour impact on the identity of the cityscape: Identity of the cityscape is the special characteristic that makes a place recognisable among other places. Society, culture, history, along with other natural and artificial elements are forming this identity. Forming the identity of a cityscape is one of the most important goals of urban design, in which colour is an essential factor in the process. Historic cities have a harmonic impression that is a direct effect of the natural colours on their buildings. This theme is compatible with the private heritage and culture of the local people. Thus, each historic city has special colour features, that make it unique among other cities (Rezghi, 2013; Anter & Weilguni, 2018).
- Colour impact on the visual induction of the cityscape: Enforcing the visual legibility is a vital goal in urban management and design. Lynch (1964) identifies visual induction as a feature that gives a better understanding of the urban environment components. Colour is a pivotal visual element that unifies space and gives it a recognisable impression.
- Colour impact on the variety and vitality of the cityscape: Variety is a desirable characteristic in the cityscape. However, a balance between unity and variety is a necessity in the urban design process. Overwhelming colour vibrancy might lead to visual distraction, and poor colour usage makes users feel boredom and aversion. Variety colour usage builds a vibrant and joyful environment, as in commercial spaces or playground design (Mikellides, 2017).

2. Problem Statement

The old city of Mosul (Iraq) has a unique colour theme of its cityscape. This theme is the result of using natural materials for the construction of its buildings. These materials are the local marble stone, local limestone, as well as plaster as bondage and finishing material. Figure 3 shows sample photos of the old city of Mosul building and alleys, taken by the researcher in 2004 (before the crisis of the city).

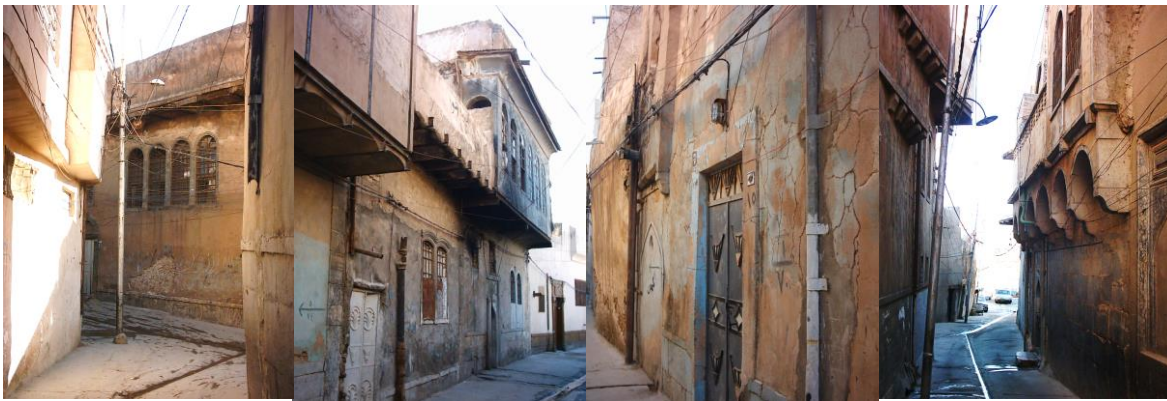


Figure 03. Sample photos from the old city of Mosul taken in 2004

After the war ended in the middle of 2017, local people began to return, established a campaign of restoration, and rebuilt their houses, shops, and other buildings. Private efforts, as well as the assistance of some local and international non-profit organisations, did the main work. As a result of official regulations absence, locals used new pigments randomly, that are not matching the original colours of the restored buildings (Figure 4).



Figure 04. Examples of using new colours in the old Mosul

The study determines these points (i.e. the implementation of a new colour scheme) to be addressed as the main problem.

2.1. Absence of proper regulations and legislations on using colours

Two interviews with local authorities were held between the researcher team and the Head Manager of building authorisation in Mosul City Hall, and the dean of the Heritage and Artefacts Institute

of Nineveh Governorate (Mosul City is the capital of Nineveh). They clarified the absence of proper regulations upon the point of colour usage in painting buildings even before the war.

2.2. Non-clear attempts to establish colour regulations

Some international organisations tried to set some legislation regarding heritage building restoration. One of these organisations is UN-HABITAT, which worked with locals to help people returning to their houses. UN-HABITAT held a conference on 22nd of October 2018 in the old city of Mosul to establish a primary framework to rebuild heritage buildings. The conference recommended some regulations to determine rebuilding recommendations. One of the important elements is the original colour. A guideline of what are the allowed and prohibited colours was developed by foreigners working in this organisation (Figure 5). However, this list is imprecise, and it needs to be revoked, or at least to be re-established with a proper colour list based on local research.



Figure 05. A proposal by UN-HABITAT on the list of allowed and prohibited colours to be implemented in the old city of Mosul

3. Research Questions

The research determines questions that are pivotal to understand the research problem, these are:

- What is the original colour theme of the cityscape of the old city of Mosul?
- What are the reason(s) behind the use of new colours in the painting of building's exterior?

4. Purpose of the Study

The study aims to establish a guideline for a colour plan that should be used for the future painting work on the heritage buildings in the old city of Mosul. The research aims:

- To identify the original colour theme of the cityscape of the old city of Mosul by reading colours from original materials of the building's exterior.

- To List possible colours that can be used, that do not affect negatively on the original cityscape colour theme of the old city of Mosul.
- Discover the reason(s) behind using new colours, therefore to allow or prevent them in the future.

5. Research Methods

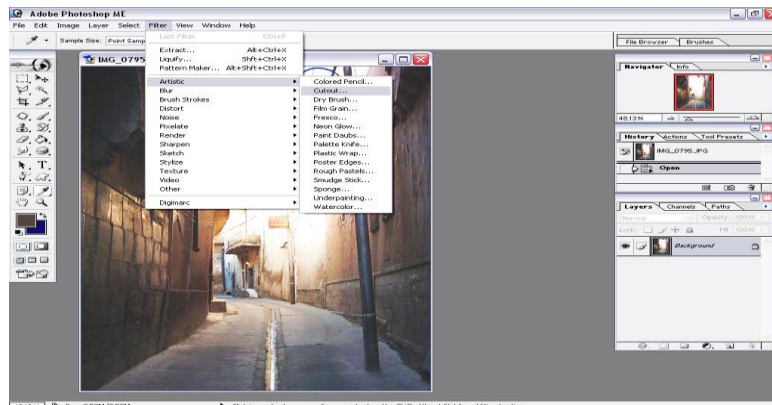
The research adopts more than one method regarding data collection and results analysis, i.e., the use of mixed-method strategies. Researchers selected methods depending on the different aims of the study, as well as data availability, reliability, and validity. The data varied according to their purpose. These are:

- Visual data, represented by digital photos of the original state of the cityscape of the old city of Mosul. The researcher took these photos in the year 2004, under daylight conditions (direct sunlight or reflective skylight), without any previous or later image process. Thus, to avoid any colour manipulation that can affect the results. The researcher selected 223 digital photos taken from different alleys in the old city of Mosul, and performed analysis on them later.
- Interviews with local habitats as well as note recording were necessary to understand the motives for the change to the new colours.

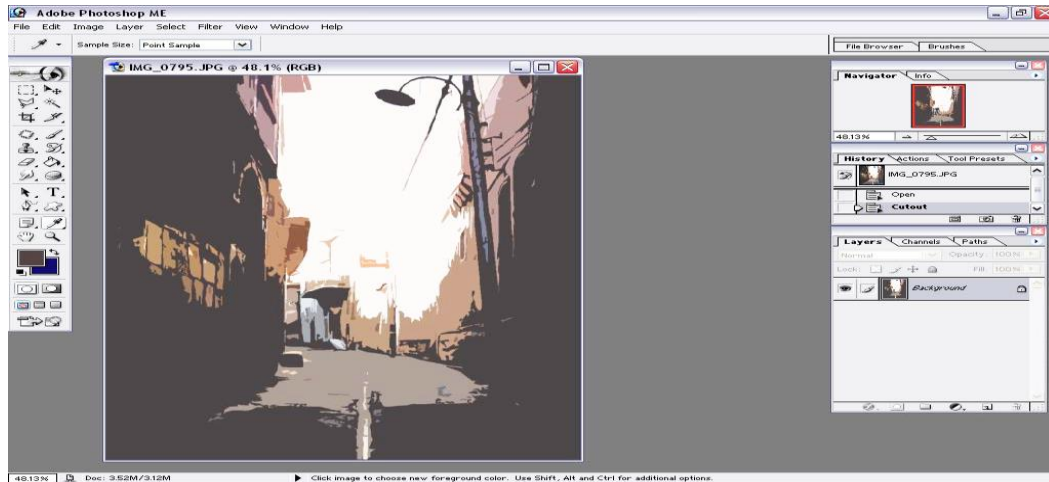
5.1. Analysis of data

The researcher performed the analysis process as following:

The researcher adopted narrative analysis for interview data, field notes, and literature information. About 40 local persons were interviewed to achieve their answers about colour changing motives. Digital photos acquire an efficient tool for photo analysis. The study of Al-Haialy (2006) proposed a methodical approach for extracting the original colours from digital photos, using the Photoshop software. A digital photo is a combination of a huge number of tiny units called pixels. Each pixel carries colour information, which can be separated and analysed in different methods. However, it is a very prolonged process to analyse every single-pixel individually. Thus, the researcher employed a tool named **Cut-out Filter** for combining nearby similar pixels, to lower the samples encounter. This tool takes the average information of the nearby pixels and creates regions of the same properties (Figure 6).



Original photo



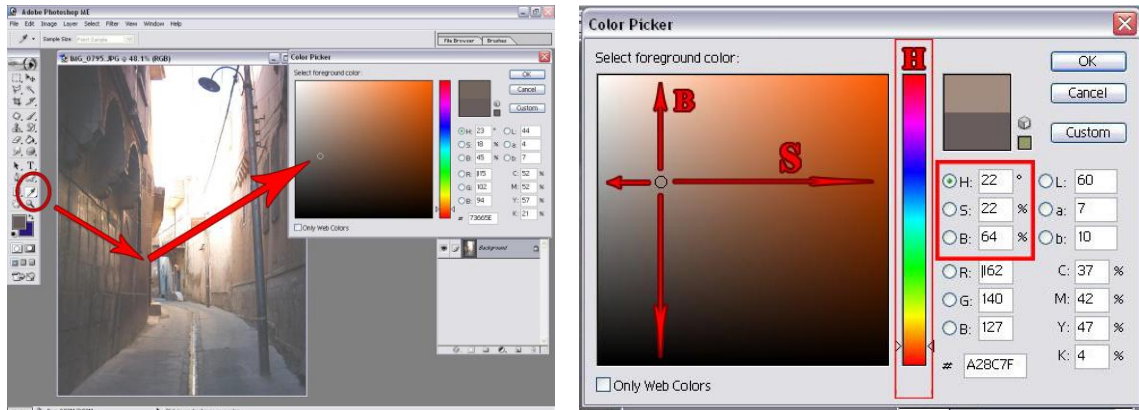
The same photo after the **Cut-out filter** effect is applied

Figure 06. One attempt of using Cut-out filter effect in one of the alleys inspected in the Photoshop software

Next, another Photoshop tool named the "**Eyedropper**" was used to pick pixels and open their colour information. The colour information of a pixel is included in the "**Color Picker**" window which assists in measuring colour properties. The study employed the "**HSB**" separation method, which is a contraction for these three variables (Figure 7):

- **H** stands for **Hue**, which is the main feature of the colour origin. Colour hue is divided into 360 different degrees in the Photoshop software, to simulate the degrees in a circle. The vertical column in the Color Picker window represents the Hue degree.
- **S** stands for **Saturation**, which refers to the purity level of the colour. It consists of 100 levels in the Photoshop software (100 = Fully saturated colour, Zero = totally unsaturated colour). The horizontal position of the point in the Color Picker window determines the Saturation level.
- **B** stands for **Brightness**. This feature determines the amount of white light in colour. The Photoshop software contains 100 levels of brightness (100 = full brightness, zero = total darkness). The vertical position of the point in the Color Picker window represents the brightness level of colour. The researcher excluded the brightness variable from the analysis, as it depends on many uncontrollable factors like shaded areas, shadow effect, time of the day, and the settings of the camera.

Figure 7 illustrates the Eyedropper tool and the HSB elements on the Color Picker window.



The Eyedropper tool

Color Picker window, where H=Hue, S=Saturation, and B=Brightness.

Figure 07. The Eyedropper tool and the Color Picker window as in the Photoshop software

6. Findings

Research findings varies regarding their type of analysis, as they are separated into two groups of results:

6.1. Quantitative data results

The researcher analysed 223 photos by taking five colour picking points randomly from each. This process produced 1,115 values for each variable (Hue, Saturation, but the research excluded Brightness as mentioned before).

- For the variable of Hue (**H**), the average degree value was 41° , and the most repeated degrees were 25° , 28° , 29° , 50° , 64° , and 207° .
- Where the variable of Saturation (**S**), average level value was 25%, and the most repeated levels were 22%, 24%, 25%, 28%, 29%, and 33%.

Figure 8 shows the average colour values (Hue = 41° , Saturation = 25%) with different brightness levels. Although the squares in Figure 8 have the same Hue and Saturation values, the brightness value gives the impression that the squares have different values of hue and saturation.







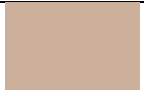
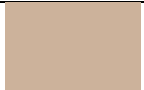
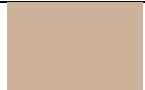
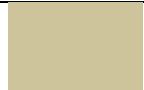



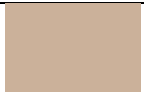
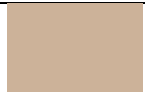
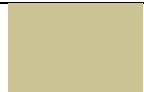
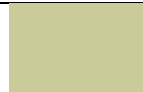


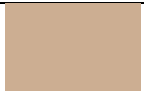
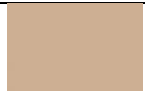
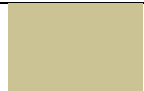
















Figure 08. Average colour theme of the cityscape in the old city of Mosul (Iraq) (Hue = 41° , Saturation = 25%), that can have different brightness according to many factors.

Nevertheless, this colour determines the average theme, but it does not represent the variety of colours, thus, the researcher adopts the most repeated values. Table 1 illustrates the most repeated colours

of the cityscape in the old city of Mosul. The columns are the most repeated values of the Hue variable, while the rows are the most repeated values of the Saturation variable.

Table 01. The most repeated colours identified in the cityscape of the old city of Mosul (Iraq).

		The Value of the Hue (H)					
		25°	28°	29°	50°	64°	207°
Saturation level (S)	22%						
	24%						
	25%						
	28%						
	29%						
	33%						

6.2. Interview results

Interviews with the local people clarified the main reasons behind the changing of the building exterior colours. Most of them (75%) answer that they are trying to change the dull moods resulted by crisis aftermath, into a more joyful atmosphere. Hence, choosing brighter colourful pigments was their experiment to create a happy mood. However, less than 30% said that it was because of the availability of paint colours in the local markets.

7. Conclusion

The research concludes some important points, which are:

It is important to determine the public policy of dealing with the colour theme of the cityscape. It can be either a preservative or changing strategy. Cities with a recognisable colour theme have it for one or more of these reasons:

- Aesthetic reasons: Mostly to change a dull situation into a joyful and bright mode, as in Rio de Janeiro (Brazil) and Pachuca (Mexico).
- Economics: to increase the tourism by enhancing the general impression of the visitors, as in Vernazza (Italy).
- Spiritual expressions: as in Chefchaouen (Morocco), where the blue colour has its obvious presence of the religious motivations.

- Identity preservation: Authorities put legislations to determine the colour scheme of the cityscape, as in the Red city (Morocco).
- Environmental reasons: because some colours have more reflective ability than other colours. Hence, it reflects more sun rays and provides a comfortable indoor environment, as in the beach town of Santorini (Greece).

Most of the historical cities have a Unified-colour themed cityscape because their buildings were built with local materials. The old city of Mosul (Iraq) has to preserve the colour theme of its original cityscape. Adequate regulations have to be set as soon as possible to avoid the cityscape change made by random colour usage. Also, providing governmental assistance and guidance will help local people to rebuild their historical environment in an enhanced way. Furthermore, the use of the right colour theme will increase the city's value, and then, that can encourage tourists to visit Mosul City.

The study clarifies that the current problem of using random colours on the cityscape of the old city of Mosul can cause the change of its original identity. Although, the results of the initial study still at its early stage. However, this research provides an effort to suggest an alternative list of colours that can be adopted to preserve the cityscape.

Acknowledgments

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