

## ARTICLES

# EXPLORATION OF SCALED PHOTOGRAPHY IN DOCUMENTATION OF HERITAGE MURAL: CASE STUDY OF MURAL IN KEDAI MULONG OLD MOSQUE

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### ABSTRACT

Scaled Photography is an image-based documentation technique that has been practiced in conservation of heritage building in Malaysia. It is a combination of an image recording technology using camera and an image scaling process through AutoCAD application prior publication of final documentation report. The current development in digital camera technology has significant impact on the documentation process of Scaled Photograph compared to the previous technique using analogue camera. Nowadays, the Scaled Photography is synonymous with the documentation work for large scale of heritage building particularly for conservation purpose. However, little is known that Scaled Photography has ever used to record and document smaller elements such as ornaments and interior decoration especially those located inside a building with limited light. Through an exploration approach, this study was carried out to record and document one of the murals located at the Old Mosque of Kedai Mulong as a case study with the implementation of Scaled Photography method. This study aims and focuses on the processes and procedures needed to record and document the mural located on the internal walls of the mosque. The outcomes of the documentation were subsequently evaluated and discussed in term of its effectiveness based on the documentation principles recommended by ICOMOS in the 'Principles For Recording of Monuments, Groups Of Building and Site' - Sofia, Bulgaria, 1996. The results showed that the documentation using the Scale Photography method complies with four (4) recommended principles namely illustrating significance, quality and accuracy, accessibility and clarity.

### ABSTRAK

Fotografi Berskala merupakan satu kaedah pendokumentasian berasaskan imej yang diamalkan di dalam pemuliharaan bangunan warisan di Malaysia. Ianya menggabungkan teknologi merakam imej menggunakan kamera dan proses menskala imej menggunakan aplikasi AutoCAD sebelum dicetak sebagai laporan akhir pendokumentasian. Perkembangan semasa teknologi kamera digital telah mempengaruhi keberkesanan proses pendokumentasian Fotografi Berskala berbanding penggunaan kamera analog sepertimana sebelumnya. Pada masa kini, penggunaan Fotografi Berskala lebih sinonim digunakan untuk mendokumentasi bangunan warisan yang bersaiz besar khususnya bagi kerja-kerja pemuliharaan. Namun begitu Fotografi Berskala tidak diketahui pernah digunakan untuk merekod dan mendokumentasi elemen yang lebih kecil seperti ragamhias terutamanya yang berada di ruang dalam bangunan dengan pencahayaan yang terhad. Menggunakan pendekatan eksplorasi, kajian ini telah dijalankan dengan mengaplikasi kaedah Fotografi Berskala untuk merekod dan mendokumentasi salah satu mural yang terdapat pada Masjid Lama Kedai Mulong yang dipilih sebagai kajian kes. Kajian menumpukan kepada proses dan prosedur yang diperlukan dalam merekod dan mendokumentasi mural yang terdapat pada dinding dalam masjid. Hasil dokumentasi seterusnya di nilai dan dibincang keberkesananannya berpandu kepada prinsip-prinsip amalan pendokumentasian yang baik oleh ICOMOS seperti yang terkandung di dalam 'Principles for recording of monuments, groups of building and site' - Sofia, Bulgaria, 1996. Hasil penilaian mendapati pendokumentasi menggunakan kaedah Fotografi Berskala memenuhi empat (4) prinsip penting yang disarankan iaitu; Illustrating Significance, Quality and accuracy, Accessibility and Clarity

## 1.0 INTRODUCTION

**W**e lost our heritage and cultural heritage faster than we could document it. The main contributor to such significant loss is human themselves through wars and

uncontrolled developments. Not just that, the diminishing of cultural heritage are also due to natural disaster, human neglect and wrong conservation approach (Fracois LeBlanch and Rand Eppich, 2005). Realizing the consequences, many discussions regarding the effort to document the cultural heritage have been observed at international level. In the discussions, one of the focused issues is about the existence

of gap in the documentation approach between information provider and information user. Information provider sometimes too obsessed with the technological advance in the documentation while the information users on the other hand are exposed to excessive data or having difficulties in utilizing the provided information (Robin Letellier, 2007). As a result, there are too many data available that became wasted or the conservators unable to use the provided data due to lack of knowledge in handling the technology.

Currently, there is no standard framework or guideline exclusive to the documentation approach for the cultural heritage in Malaysia. The closest documents of reference available is the Guideline On Heritage Building Conservation published by Jabatan Warisan Negara (JWN). However, its content is limited to types of official documents needed by JWN for particular preservation and conservation project on the heritage building (JWN, 2017). In preservation of mural, there is no guideline related to its documentation. Hence, this research aims to focus on the effectiveness of the scaled photography approach in documenting the cultural heritage which is in a form of mural. With the increase in mural preservation and conservation projects on some buildings such as on Dewan bahasa dan Pustaka (2016), Royal Mosque of Sultan Sulaiman, Kelang (2017) and the Old Mosque of Tok Machap in Malacca (2006), this situation implicitly asking for the requirement in identifying proper and suitable documentation approach. Using mural located in the Old Mosque of Kedai Mulong as the case study, this exploration of documentation through scaled photography approach has been carried out by focusing on the processes and procedures needed as well as the evaluation on the final outcome of the documentation method.

## 2.0 DOCUMENTATION OF MURAL CONSERVATION

Documentation can be understood as a process of recording and collecting information either in a graphic or written form explaining and showing main characteristic, base, structures and heritage objects (Divay Gupta, 2007). Role of documentation in providing information related to the research subject such as mural has been helping in identifying its value and condition that serve as significant basic information in the preservation of the mural. A good conservation approach is a type of conservation that based on a precise data and information provided. Meanwhile, some informations required for such decision was collected through particular techniques in documentation. However, in the implementation of method and technique in documentation of conservation work, there is a gap existed between assigned documentation team and team that responsible to make a decision regarding conservation plan such as conservators (Robin Letellier; 2007). There are many of the conservators who are lack in knowledge, confidence and understanding about the benefits of certain

documentation techniques. Besides, some of them also misunderstood the practicality of documentation equipment as well as feel inferior with the terms used (Rand Eppich, 2007).

To preserve mural, documentation is one of the significant steps that need to be taken. Analysis related to motifs, drawing style, materials and damage level obtained from the documentation process are considered as vital information required for the preservation purpose. Before the digital camera exist, the documentation process has taken place for the cultural heritage used analogue photography and drawing. The analogue photography has its weaknesses in term of limited numbers of photo that can be captured as well as its physical feature that is quite heavy especially the one with high quality performance (Ryo Higuchi et al, 2016). Not just it takes longer to complete, the mural image produced also lack of scale that make it difficult to estimate the real measurement of the painting.

Documentation process with a drawing approach also has its own advantages and disadvantages. Drawing-based documentation can be carried out either through computer application or manual. Documentation through a drawing approach is a low-cost method with no complicated and sophisticated equipment. However, this approach's weakness is it cannot convey and produce a precise representation of the mural image.

The development in the digital photography technology nowadays has brought its potential to be utilized in the documentation method of cultural heritage digitally. Digital camera has shown that it can fit perfectly for this purpose and in some cases, produced higher quality images with high-resolution compared to analogue camera (Allen & Triantapholodou, 2010, ms 279-280). Plus, images from the digital camera can also be manipulated and edited with the computer where this editing process cannot be run with analogue camera. Besides, the images in the digital camera can exhibit various kinds of data available to the user while the analogue camera's images are permanent and cannot be modified at all.

## 3.0 DOCUMENTATION PRINCIPLES

Along with the importance of record and documentation processes in preservation purpose, ICOMOS has provided principles that need to be referred as a guideline in any documentation process for cultural heritage; - 'principles for recording of monuments, groups of building and site'. This standard of principles was ratified on October 1996 during their official gathering in Sofia, Bulgaria. The outlined frameworks served as a support to strengthen recommendations in the Article 16 of Vanice Act 1964 that emphasizes on carrying out documentation in all projects involving the heritage sites (ICOMOS, 2008). Besides their emphasize on the principles of recording and documenting the cultural heritage, this document also focusing on party

who responsible in recording, managing and sharing the recorded information. The gathering then summarized that in any documentation of the cultural heritage, there are four principles that need to be focused on;

- a) Principle 1- Illustrating Significance
- b) Principle 2 – Quality and accuracy
- c) Principle 3- Accessibility
- d) Principle 4 – Clarity & Concise

#### 4.0 SCALED PHOTOGRAPHY

Scaled photography is a type of documentation approach used in Malaysia. Its implementation was recognized as a proper and good method in documentation work by Museum Department and Antiquity (JMA) which at that time responsible in standardizing the preservation works on heritage building in Malaysia. However, with the establishment of JWN in year 2006, there was an exchange of power and task where the JMA changed into Malaysia Museum Department (JMM). The scaled photography as a mean of documentation in cultural heritage preservation is still being practiced even under JWN that then fell into Historical Architectural Building Survey (HABS). Despite that, the documentation method with the scaled photography approach has been implemented only in the preservation work of cultural heritage up until today. Until some of the preservation works on heritage value mural used the scaled photography such as mural on Royal mosque of Sultan Suleiman, there is no scaled photography documentation had been used yet..

Scaling photography combines the recording and documentation techniques together by applying the size modification technology on the camera images. Before the invention of digital camera, the recorded images by analogue camera usually in pieces of parts of the building image based on the fixed grid on the original building. Because of the captured images do not have any scale or measurement, the enlargement or minimizing process for the image was done with Photostat machine until the image meets its desired scale. However, with the introduction of digital camera, the image scaling process becomes easier. The digital images will be transferred into computer and by using certain application such as Photoshop, the combination process known as ‘photo mosaic’ can be carried out to create a complete image of the building. The complete image of the building then will be transferred to another type of application usually AutoCAD for the scaling purposes by applying original grid lines based on the original photography session. Not just that, any information related to the image can also be inserted into the documentation format or title block before printed as the final documentation outcome showing a complete image of the building with its information data.

#### 5.0 OVERVIEW ON THE OLD MOSQUE OF KEDAI MULONG

#### 5.1 Location and Background

The Old Mosque of Kedai Mulong also known as Ar Rahman Mosque is located at the district of Kedai Mulong, 11km away from Kota Bharu city centre. This mosque was built around 1900s which is during Sultan Muhamad IV rule. This mosque originally was a royal hall (Balairong Seri) owned by Raja Dewa which is a known title for Tuan Zainal Abidin, one of Sultan Muhamad III’s princes who is also a brother to Sultan Muhammad IV (Sahrudin MS, 2018). The original location of this mosque was within the royal settlement in Kota Bharu nearby Istana Jahar, Istana Balai Besar and Muhammadi mosque. After the World War II, this building was under utilised and was abandoned until year 1958 where the villagers of Kedai Mulong had an agreement to buy the building with MYR1000 and then later was transformed into a mosque for the villagers.

The structure of the old mosque of Kedai Mulong exhibits a very prestigious and high Malay traditional architectural value suits its original function as the royal hall. It highlights the beauty of east coast Malay traditional architecture that often associated with influences from the ancient Langkasuka and Patani. The whole structure of this mosque building is made up with wood material except its roof component which was covered by Singgora tiles. Its main structured frame was built with ‘alang and tiang’ technique which is a typical construction method for wooden buildings in Southeast Asia region. Its floor was constructed on stilts where it was separated from the ground level by the presence of ‘kolong’ and produced a space below it. The walls were constructed using wooden panels also known as *janda berhias* wall. One thing that interestingly unusual is, there is no single window present on its walls except three doors with two planes each located at the entrance, left and right of the building. This distinguished feature is believed to be related to its original function as the royal hall that prioritized privacy and secrecy. However, to make it more comfortable, there are beautiful wooden grilled opening at the upper part of the walls built with geometric motif wood crust that allow ventilation as well as to provide natural lighting.

In the initial inspection by JWN in year 2006, it is found that some modifications were done on the original structures by the villagers. This modification was made for its new purpose as a mosque instead of royal hall. Some of the modifications identified are the construction of new *mihrab* space located at the end of the wall facing *qiblah*, the installation of ceiling at the roof part, ablution area built at the left and right sides of the mosque. This mosque’s roof was no longer covered by Singgora tiles instead has been using corrugated asbestos sheet since and the walls also painted in white (JWN, 2009). This condition has obliterated part of its original architectural beauty and art because some of its original structures were replaced with new elements and different materials.



**Figure 1:** The Old Mosque of Kedai Mulong after conservation project (source: JWN 2009)

## 5.2 Mosque's Murals

In year 2009, JWN has carried out conservation works on this mosque for the first time. One of the important findings during the conservation work is the mural element existence on the internal part of its wooden paneled wall. There are various patterns and motifs on the mural made of gold paint known as 'air emas' (gold water) by the locals. This mural existence was unnoticed until the conservation work was taken place whenever workers were scrapping away the paint layer off the walls. Because of the mural existence was unknown back then, hence the mural conservation was not part of the project scope. After it was found, the conservation work was continued with more precautions especially involving the paint scrapping on the walls to avoid further damage to the existing mural underneath the paint layer. It is estimated around 24 mural panels with different sizes based on the wall panel sizes. The mural condition also varied with some of them displaying their original motifs and colors meanwhile some of them look almost washed out and faded might be due to the paint scratching work or natural causes.

Based on JWN, there is no documentation record ever been done up until today. Furthermore, there is limited information known regarding the elements of the mural or the paintings on the Old Mosque of Kedai Mulong. This is because the typical decorative elements in Malay architecture mostly based on wood carving. Towards an effort to conserve this valuable mural, documentation with a proper method and approach is very important. This documentation needs to be carried out as soon as possible because the murals have been exposed and therefore at risk of further damages caused by human and natural factors. The outcomes of the documentation then can be a source of information and reference to the conservators to make a good decision for the restoration work. This documentation also could encourage and provide opportunity for further researches to be carried out upon the murals and subsequently contribute to new knowledge related to the

Malay's art and cultural in this region. Thus, these murals have been used as the case study to explore the implementation of Scaled Photography as an effective documentation method.



**Figure 2:** Mural painting made of 'air emas' discovered on the wooden paneled wall during paints scrapping work (source: JWN 2009)

## 6.0 METHODOLOGY OF DOCUMENTATION

This research is focusing on the potential of Scaled Photography in documenting the murals on the mosque's walls as part of the important processes in its conservation and preservation. The documentation of the murals through scaled photography method involves four main processes which are; -

- a. Photo shooting
- b. Photo processing
- c. Photo scaling
- d. Photo printing

### 6.1 Photo Shooting

Scaled Photograph is an image-based documentation method that provides a measureable photographic documentation which helps further study on the subject matter. The quality of image plays a major role in helping visual research, either the purpose of the study is on stylistic and conceptual aspects or as an embedded part of dimensional inquiries. At the end of the process of obtaining an acceptable quality of pictures for these purposes, a model method of photo taking that can be established in an applicable visual study and conservatory context is proposed. In this case, the subject matter is a wall mounted flat surfaced mural painting on the interior paneled wall of The Old Mosque of Kedai Mulong.

The feature of picture quality should be very important due to the nature of the visual research preferences that the detail of an image might give the researchers a significant extent of importance and awareness on a specific subject matter

(Gonzales, 2008; Davies, 2010). For this reason, a set of photographic pictures produced must be on a high-resolution quality. Therefore, a high-resolution camera must be used in order to provide a suitable characteristic of high-resolution photographs for visual research purposes.

**Equipment and Instrument:**



a) Camera: Mirrorless 42 Mega Pixel resolution Sony Alpha 7R mark III (One set)



b) Lens: 50mm F: 1.8 (with Optical Stabilization)



c) Filter: Marumi fine contrast, knurling 52mm diameter Circular Polarization



d) Lighting: 8 (eight) inches Continuous Portable Light Emitting Diode (One set)



e) Tripod: Velbon 645 carbon fiber tripod with Multi Angle Head (Two set)

f) Software: Adobe Photoshop CS6

g) Smartphone (Apple iPhone Xs) with Sony camera remote control application.

h) Laptop Computer (Apple MacBook Air, macOS Catalina version 13.5.2 with 8GB of RAM, 4-core Intel i5 processor and Intel HD Graphics 5000 1536 MB)

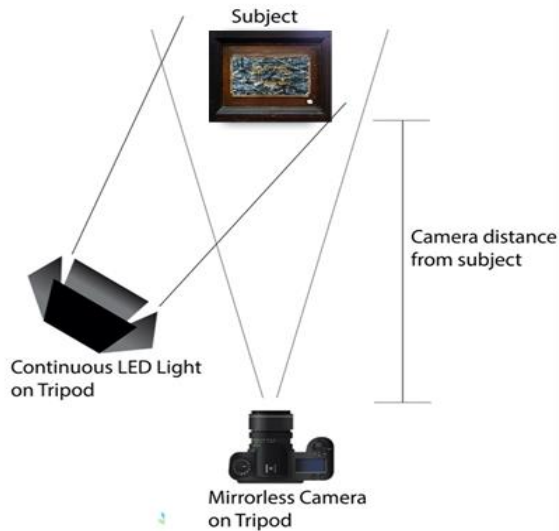


Figure 3: The shooting setup

In undertaking the photo-session stage, the equipment arrangement is highly dependent on the condition of the subject matter. On most of the photographs taken, this setup on Diagram 1 was prepared within the interior photo session of the subject matter at The Old Mosque of Kedai Mulong. The camera is mounted on a tripod with perpendicular angle to the subject matter at approximately 1 to 2 meters distance then fixed to a manual exposure to gain the most compatible settings to the lighting condition. The knurling polarizing filter is attached on the lens in order to reduce and prevent the light reflection coming from the subject matter as well as to provide vivid color rendition of the subject matter while picture taking is in turn.

The smartphone camera remote control application is also applied during the session to reduce the vibration during the exposure. This is prepared because the use of index finger to push the shutter button on the camera will eventually contribute some movement that results in unfocused picture or blur image. The controllable continuous LED light is applied during the session to give the subject matter a sense of capacity that will determine and produce high quality in its color distinction. The LED light is positioned on the frontside of the subject matter to deliver a significant amount of light that will enhance the quality of the exposure especially in the condition where the intensity of room light is not adequate. The LED light must be positioned properly to align better lighting prearrangement.

There are three different exposures taken on every subject matter in a bracketed mode that will create a normal exposure picture, an under-exposure picture, and an over exposure picture.

## 6.2 Photo Processing

This picture is selected in this case because of the contrast quality and detail is obviously displayed. The selected picture then will be processed in Adobe Photoshop CS6 using color correction, perspective correction and level adjustment facilities of the software as followings:

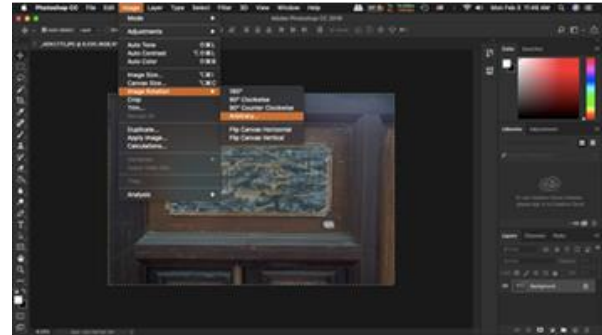


Figure 4: Picture rotation correction through arbitrary adjustment



Figure 5: Picture color correction through level adjustment

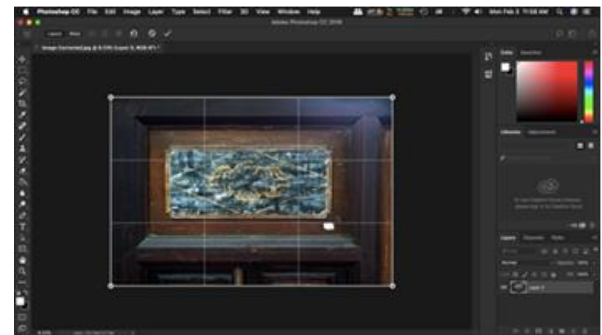


Figure 6: Perspective correction through Perspective Warping



Figure 6: Final photo, cropped and corrected



Figure 8: Photo rescaled into its original dimension

### 6.3 Photo Scaling

This is the process, where the final photo will undergo scaling process using AutoCAD application. AutoCAD is commonly used in drafting process such as in Architectural Drawing and Engineering Drawing. The final photo which is in JPEG format or any compatible format is imported into AutoCAD file as a 'raster image'. In order to rescale the photo into 1:1 scale, two lines were drawn with the same distance of each other equivalent to the original length of the mural. These lines were established as reference lines that helped to rescale the photo to its original size. Using the scale command, the photo was rescaled into its original size using prior established reference lines. As a result, the photo of mural now is in scale 1:1 which represents the original measurement of the mural and ready to be printed out in any preferred scale. To make a hard copy of the documentation, the rescaled photo must be included into document format or a title block which contains all related information particularly the value of the scale.



Figure 9: Final product of Scaled Photograph where rescaled photo was put in a formatted document

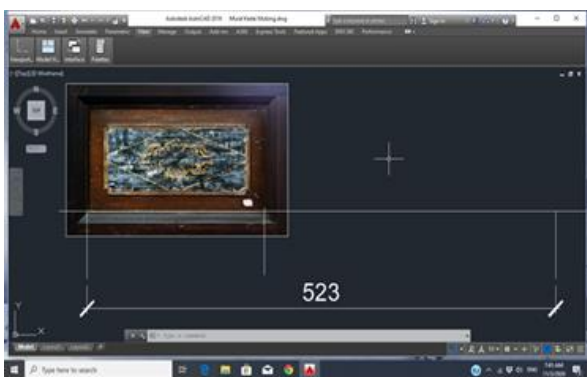


Figure 7: Scaling process using reference lines

## 7.0 EVALUATION AND DISCUSSIONS

Just like other cultural heritage, documentation plays an important role in the conservation of mural with heritage value. Documentation serves as a reference to help the conservators to understand and getting insights towards the condition and characteristics of the mural to be conserved. To ensure the information is sufficient in facilitating the decision-making process for the conservational work, the documentation method that will be used must adhere the principles of good practice in documentation. In the 'Principles for recording of monuments, groups of building and site, ICOMOS has laid out 4 principles of documentation to guide practitioners in recording and documenting cultural heritage. Therefore, in order to evaluate and discuss the effectiveness of Scale Photography in documenting the mural at the Old Mosque of Kedai Mulong, these 4 principles have been used as the basis of assessment and discussion.

### 7.1 Principle 1- Illustrating Significance

Documentation using Scaled photography is an images-based recording capable in representing a precise measurement towards the mural paintings in the Old Mosque

of Kedai Mulong. The practice of documentation that based on imaging method capable in producing and recording the available physical features of the mural paintings such as colors, materials, patterns, styles and designs which also act as important information and data required in identifying the mural typology. Through the captured images, the damage signs and deterioration could also be identified such as the scratch marks, discoloration, paint exfoliation, fade away and disintegrated images. Those valuable data and information recorded by photography technique are very significant in helping the conservators to analyze the condition and then suggest a suitable treatment for conservation.

### 7.2 Principle 2 – Quality and accuracy

The photo quality is crucial factor and plays a major role in documenting mural using Scaled Photography method. Camera position, compatible lens and additional lighting are important in producing such high-quality photos. In a re-scaling process of photos in AutoCAD application, it is important to use point or reference line to ensure the size modification of the photo parallel with the original measurement of the mural as well as to ensure the precision of mural documentation. Besides, the image will be fixed in 1:1 scale to enable a whole measurement of the mural image precisely to assist in estimating the quantity of the materials for conservation purpose. The final product of this documentation with the implementation of Scaled Photography is recommended to be printed out using a laser printer machine, high quality papers and compiled with a hard cover. This is to ensure a high quality and durable report of Scaled Photography.

### 7.3 Principle 3- Accessibility

The outcomes of the Scaled Photography documentation will be published and recorded in a form of A3 sized report for referencing, recording and copying. These are the important characteristic for accessibility in the documentation principles. Since the main purpose of documentation is to provide a reference for future use, hence the products of a documentation should be user friendly, easy to share and transfer with no requirement for the users to have special technologies or sophisticated equipment. The report of the Scaled Photography documentation on mural paintings in Old Mosque of Kedai Mulong has a potential to be published as a public reading due to its visually appealing informative content presented mostly in image form. Therefore, it is easy to be understood as well as attracting more people to learn and know further about one of the cultural heritages that once not really being known.

### 7.4 Principle 4 – Clarity & Concise

High quality image play a crucial role in documentation with the implementation of Scaled Photography. It needs a series of photo shoots with different levels of lighting to identify and finalize a perfect camera setting for high-

resolution and complete photo. The usage of digital camera has been providing images with high-resolution quality together with its important data for research purpose. The final report of Scaled Photography will also be included with related information such as location, date, scale, item number and the people responsible preparing the report. The additional information included gives a better understanding to the users either about to the mural painting or the documentation background.

## 8.0 CONCLUSION

This research is focusing on the implementation of Scaled Photography technique and involved procedures in recording and documenting the elements of mural painting in the Old Mosque of Kedai Mulong. Every process was explained in detail that covers the photo shooting, photo processing, and photo scaling, including the usage of computer equipment and applications. This form of documentation on mural paintings can be considered as low-cost method plus with no expensive equipment and special expertise. The usage of AutoCAD and Photoshop applications are commonly used nowadays to manipulate the images into scaled photos. The products of documentation resulted from the implementation of Scaled Photography also meet the criteria of a good documentation practice based on standard principles established by ICOMOS. However, the Scaled Photography also has its own disadvantages and limitations especially when documenting the mural paintings that mounted on uneven or curved surface. Nevertheless, the potential in Scaled Photography should be expanded and continued especially in recording and documenting mural paintings with heritage value as well as providing reliable information to facilitate the preservation and conservation purpose.

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