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A Perspective on the 15th Century
Melaka Sultanate Bridge: A Reconstruction Studies

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ABSTRACT

This study investigates traces of Sultanate Melaka Bridge before Melaka was taken over by the Portuguese post-1511 war; a study that leads to an interpretative reconstruction of the historic bridge that neither exists nor visually available. Thus, the study seeks historical clues about the bridge. This includes traces of the Sultanate Melaka municipality with the historic bridge at the central. Data collection involves archival materials with descriptive clues from historical text contemporary to the Sultanate period and archival visual almost all of which were produced after the Sultanate period. The researcher cross-references his analysis on archival visuals which includes cartographic materials, municipal plans and artist impressions with narrative accounts from the ancient China, Malays and Portuguese. The method of the study includes narrative analysis, visual anthropological analysis and design process. The narrative and visual anthropological analysis in this study put forward a set of criteria of the Sultanate Bridge to be considered in the design process. As a result, a three-dimensional interpretative historical reconstruction of the bridge was proposed that best fits the idealism of the study. The study also proposes a perspective in regard to the phenomena at the river mouth facing the Straits of Melaka at that time.

Keywords: Sultanate Melaka, Sultanate Melaka Bridge, Historical Reconstruction, Creative Interpretation.

1. INTRODUCTION TO THE SULTANATE MELAKA BRIDGE

The historical capital administration of Sultanate Melaka roughly approximates the modern geographical parameter of the state of Melaka, Malaysia. The maritime civilization of Sultanate Melaka has put up centuries of outstanding legacy in political and cultural tradition which remains an influential subject in Malaysia until today [1]. At the peak of the Sultanate period, Melaka has grown as one of the world's most important entrepots; the same league with Canton, Cairo, and Venice [2]. It represents the golden age of Sultanates in the Malay Archipelago where classical Malay language was practised as the medium (lingua franca) for intellectual, cultural, religious and economic exchange in its cosmopolitan city [1].

A bridge at the center of the Melaka Sultanate city was mentioned in a glance in several ancient texts [3],[4],[5],[6],[7],[8]. The Melaka Sultanate bridge in this study refers to the one built under the instruction of Sultan Mansur Syah, the sixth ruler of Melaka (1456-1477). Although not comprehensive, partial description about the bridge from ancient texts seemingly suggest that the Bridge reflects a somewhat an architectural marvel of the ancient native of Melaka Sultanate; for instance, the bridge was accommodating "20 pavilions

selling all kinds of commodities" [5] and the fact that the bridge was used as a fortress in 1511 war and the placement of a hundred cannons on it [3]. The bridge was described as 'richly elaborated' [9]. Correia and Castanheda mentioned that the Melaka Sultanate Bridge was timber made or using 'heavy wood' [9]. However, there are neither insufficient direct ancient descriptions nor direct modern academic research specifically to build a rather complete perspective of it.

There is simply not enough information to reconstruct the bridge based on direct descriptive view from literature. Therefore, this research took a broader scope of the investigation to enlighten the bridge by understanding the dynamics of the city surrounding the Bridge; for instance, enlightening new apprehension about the bridge by understanding what it was bridging for. An appreciation of the idea of a bridge will trigger socio-cultural and economic context which is imperative in the interaction between two of lands involving the bridge. The character of the lands will greatly depend on the living nature of humans and institutions inside it. Thus, the research is compelled to carefully investigate traces and consequences of socio-cultural and economic factors of the city that in some ways interacted with the bridge and brings to a light new understanding about it. This research primarily relies on 2 types of data; i) historical textual data and ii) historical visual data.

2. RESEARCH STRATEGY

The study deals with textual data collection from credible sources involving related government official documents; be it legislative documents, travelog from emperor's envoy, government official reports and Sultanate hereditary literature. Textual data used in this study came from writers that either originated from or visited Melaka, or lived contemporary or close to the Sultanate Melaka period. The study also looks into the biography of writers as a means to evaluate textual sources and make structural evidence to be established as the foundation of design criteria to reconstruct the Sultanate Melaka bridge. Textual data was chosen from accounts either during or close to the Sultanate period; a strategy to get to the most authentic direct or indirect description of the bridge. Ancient data collection was taken from three distinct/separate accounts; i) Sultanate Melaka Account (local perspective), ii) China Account (eastern perspective) and iii) Portuguese Account (western perspective).

Historical visual data collection was mainly gathered from three distinct/separate administration periods; i) Portuguese period, ii) Dutch period and iii) British period. The visual data collection is from credible sources; museum exhibits, museum-related publications and reliable online portal. Each artist was evaluated

before analysis. Specifically, on artist impression or municipal plan where the artist is unknown, the credibility of the visual data relies on either the writer or the publisher. The principal visual data used in this study was largely created by Portuguese cartographers who either grew-up or were in Melaka or lived close to the period of Sultanate Melaka. Dutch and British Melaka municipal plans were employed in the study as their measures were comparable to the modern-day accuracy. The proposition of Sultanate Melaka Bridge is also backed-up by precedences of the evolution of Melaka Bridges at the location throughout Portuguese, Dutch and British periods.

3. ANALYSIS FRAMEWORKS EMPLOYED IN THE STUDIES

The study is shaped by the nature of exploratory research; a study which obtains its understanding by collecting, examining, analysing and assembling 'relevant puzzles' into the mix based on the historical record as underlying reasons to build the case of the leftover tradition of Sultanate Melaka municipality that has a direct or indirect relationship with the bridge. The study is also characterised by its investigative nature in looking at the big picture of the Melaka Sultanate city in the context of socio-cultural-economic factors and specific data which has implications on the idea, form, and measure of the bridge.

There are three types of analysis framework involved in the study; i) Narrative analysis by Czarniawska [10], ii) Visual Anthropological framework by Collier [12] and iii) Design process framework from Victorian Curriculum & Assessment Authority, Australia [13].

3.1. Historical Text - Narrative Analysis Framework

The segment of textual analysis in the study employs Czarniawska 'hermeneutic triad' [10]. This triadic framework is subdivided into three phases namely i) Explication, ii) Explanation and iii) Exploration. Each of the phases has its concern and character as detailed out in Table 1 below:

Table 1 Narrative Analysis Framework

Explication	Explanation	Exploration
Standing Under	Standing Over	Standing in for
Reproductive Translation	Inferential Detection	Existential Enactment
Reconstruction	Deconstruction	Construction

3.1.1. Explication Phase

Firstly, in the 'explication' phase, as emphasized by the framework, researcher took the role of a 'naïve' or 'semantic reader' with the ambition to understand those texts. Notes were taken in building the researcher's worldview surrounding the subject matter; the Sultanate bridge. At this stage, researcher was only concerned about the collection of descriptive views about the condition of Melaka Sultanate especially those which imply the Sultanate bridge. This was regardless of some discrepancies that occurred as comparison of different text. This process includes capturing specific quotes, simplifying and putting them into a specific perspective and recognising the consistent pattern as opposed to the disintegrated, contradicting, or incomplete ones. It is important to note that those collected descriptive views gained in the study largely depend on the mercy of narratives which do not have the intention to describe the bridge in the first place. The nature of those descriptive views is fragmented and not necessarily touching the same parts of the bridge. However, they have the potentials to provide different angles of the perspective in looking at the bridge through the big picture. The big picture meant in the study was largely in view of the case of the social-cultural-economic aspect of the Melaka Sultanate.

3.1.2. Explanation Phase

Secondly, in the 'explanation' phase this study took the objectivist approach [10] by studying the text in regard to their 'external structures'. Researcher views this aspect of the narrative study as aligned with 'external criticism' as required in the historical research method. Czarniawska [10] regarded this aspect as the search for 'why does the text say what it does?' or Silverman and Torode (1980), 'how does it say it?'. This puts the study in the position of what Eco [11] regarded it as critical or 'semiotic reader'. At this stage, this study was looking into the background of each selected text, the writers' biographies and the authorship or rhetorical analysis of their text. In this case, authors are viewed as 'the children of their times' and thus, their accounts appreciated as 'products of their times' [10]. It is an aspect of 'critical reading' that Habermas [14] considered as "…to unmask interests that underlie the enterprise of knowledge…".

3.1.3. Exploration Phase

Thirdly, in the 'exploration' phase, researcher makes his stand on selected texts implicitly and explicitly. At this point, researcher has carefully read the selected texts at least three times and revisited them to familiarise with the collected historiographical aspects in the study. There were also extended reading lists especially from Portuguese accounts to gain more fundamental ground to stand on. Given the big picture obtained, researcher began the narrative analysis, in 'connecting the dots'. The writing of narrative analysis was cross-referenced with aspects of visual anthropological analysis in making its case. At this stage, the researcher took the role in what was regarded as 'stand-in for' the author with question; 'what do I, the reader, think of all this?'[10]. This is done with the supports of references and precedents especially in gaining various aspects of measures.

3.2. Historical Visual Archive - Visual Anthropological Analysis

The objective of historical visual analysis in the study is to investigate traces of how Sultanate of Melaka city has been put to work with the Sultanate bridge as the central subject. This research adopted the visual anthropological analysis framework of Malcom Collier [12] in handling and analysing historical visual archives involved in the study. Close to a hundred illustrated visuals of post Sultanate periods in various framings and angles of the central Melaka city were gathered; reflecting various degree of data quality which were subjected to the filtering process.

Majority of the historical visual archives selected in this research are municipal plans, maps and artist impressions that largely represent the Portuguese and Dutch periods. In the absence of legitimate historical visual picturing the Melaka city produced during Sultanate period, the Portuguese and Dutch visuals were selected as an alternative for the objective.

As a whole, all these archival visuals also served in the study of the evolution of a series of bridges at the river mouth of Melaka and its surroundings. It is important to note the amount of historical visuals subjected in the study did not come at once. There was a significant number of visuals at the first stage to begin with, especially the more popular municipal plans of the Portuguese and Dutch Melaka periods. However, more historical archival visuals were obtained at a later stage which include some rare collections adopted in the study.

3.2.1. The Visual Anthropological Framework and Activities

Collier [12] outlined the fundamentals of visual anthropological analysis framework which consisted of four stages as shown in Table 2 below:

Table 2 A Simplified Framework of Visual Anthropological Analysis

Stage	Activities	Concerning
Stage 1	1. Observe	overtones and subtleties
	2. Discover	connecting and contrasting patterns based on feelings and impressions
	3. Make Notes	(carefullly) identifying the images which considered data
	4. Write all questions	Triggered in the mind may provide important direction for further analysis
Stage 2	1. Make Inventory	or a log of all your images
	2. Design Inventory	that reflect and assist your research goals
Stage 3	1. Structure the Analysis	based on specific questions; measure distance, count, compare, information may be plotted on graphs, listed in tables, or entered into a computation
	2. Produce Detailed Descriptions	connecting and contrasting patterns based on feelings and impressions
Stage 4	1. Search Meaningful Significance	by returning to the complete visual record to the data in an open manner. Write details from structured analysis in context
	2. Respond Again	to the data in an open manner. details from structured analysis in context
	3. Re-Establish Context	view images in entirely, then write the conclusions as influenced by this final exposure to the whole

In the first stage, as emphasised in the framework, visuals brought into the study were carefully examined as individual and as a whole. At this point, researcher already has the fundamental knowledge, curiosity and certain markers about the Melaka Sultanate city based on the reading and partial narrative analysis done earlier. At this preliminary stage, the involvement of archival visuals has put into light the intangible textual understanding into something tangible. Although this stage offers certain enlightenment, it also arouses certain curiosities, put to test certain assumptions and triggers a lot of fundamental questions. In this stage, it is important to note again, the study was geared to trace the leftover structural elements of Melaka Sultanate city within municipal plans of the Portuguese's and the Dutch's. It is amazing to see images that hold certain data help to enlighten the study of other images and vice versa. For instance, some municipal plans are accompanied by labels but fewer elements, some are rich in elements but no labels; likewise, in other contexts, some plans use accurate measures and the others are sketchy. As such, the relationship between individual and the whole visuals were established. However, the process at this stage reflects more of an evolution of perspective and assumptions rather than a concrete certainty of understanding. As defined by Colliers's framework, in this first stage, those 'overtones and subtleties' contributed in connecting points of contrasting patterns were carefully noted. More importantly, all questions were recorded and became the driving factors for further analysis.

In the second stage, researcher was gearing his effort to make a digital inventory of those historical visuals understudy as outlined by the visual anthropological analysis framework. Images in the inventory were titled based on the periods and chronological sequence of years those visuals were produced; and where applicable, the names of the creators were also included. This is to make easy on inter-visuals observation in the evolution of the Melaka city; as derived by research goals.

In the third stage, the study reflects a more structured analysis in progressing research activities which were derived by the specific question prior to it. At this point, element of measures was also put into consideration. Wherever applicable, estimation of measures was put into place which can be the basis for comparison of information in between elements of different visuals. Numbers of section within a visual were enlarged to form a diagrammatic presentation to emphasise highlighted points on that visual. In this stage, more concrete stands were put based on 'connecting the contrasting patterns' as triggered earlier on. Thus, more focused and detailed description can be given on the specific visual.

Given the fourth stage of the framework, the study was geared to search for meaningful significance based on a relatively more complete visual record. In this stage, researcher responded again to the data in an open manner. Therefore, substance from the structured analysis can be seen within context which reflects their significance. The process of re-establishment of context was put to cycle when a new batch of relevant archival visuals was decided to be put into the mix.

3.2.2. Nature of Investigation

The nature of the investigation of this study reflects a cyclical journey. This cycle happened especially in the presence of new factors triggered in the process of investigation; which comes as a result from a particular question, assumption or upon receiving new batch archival visuals. It began with an open-ended process with a more structured investigation towards the middle. As proposed by Collier [12], this approach provides an opportunity for responding to larger patterns, constantly feeding significant meaning to the big picture and to avoid chaotic detail. The investigation process cycle of historical visual data is as shown in Figure 1 below:
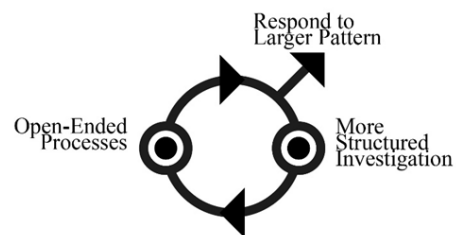

Figure 1 The Cycle of Investigation Process
(Simplified from Collier, 2004)

3.2.1. The Visual Contextual Data

The collection of archival visuals in the study possesses different strengths regarding their contextual data. Each visual was investigated as an individual and is used in responding to collective assessment to allow emerging patterns in a larger context. According to Collier [12], images with good strength of contextual data can stand on their own, therefore, capable to be angled to

different contexts. As such, those images are subjected to both direct and indirect analysis. On the other hand, images without good contextual data should be re-emphasised in support of other visuals. As such, those visuals can only be subjected to indirect analysis. This process is reflected in a simplified diagram shown in Figure 2 below [12]:
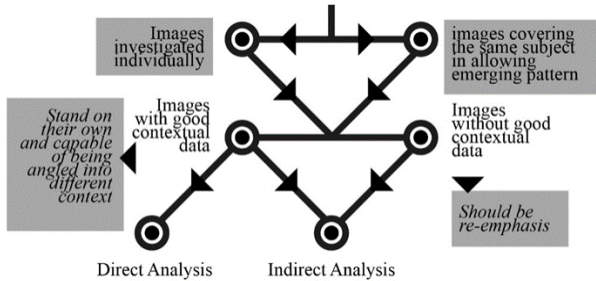

Figure 2 Investigation Process in Relation to Different Quality of Image Contextual Data
(Simplified from Collier, 2004)

3.4. Design Process Framework

In the process of data analysis to complete this study, the research used the following design process activities as shown in Table 3 below:

Table 3 Design Process Activities

Stages	Activities	Concerning
Stage 1	Development of Brief	A relook into literature review
Stage 2	Research Knowledge	Evaluating narrative analysis and visual anthropological analysis
Stage 3	Development of Concepts	i) Synthesising criteria of the bridge (set of 13 criteria)
		ii) In support of precedences (Common denomination of bridges at the location throughout edges and number of other necessary precedences)
Stage 4	Generation of Ideas	Translating textual ideas into a number of possible visuals/ forms of the bridge (2D)
Stage 5	Refinement	Deductive approach and improvisation of the bridge after consulting with experts/ historians
Stage 6	Resolution of Presentation	3D Historical visual reconstruction of the Sultanate Melaka bridge with justification in compliance to a set of 13 criteria

This study employed the design process framework by Victorian Curriculum & Assessment Authority, Australia [13] to synthesise the reconstruction of the Melaka Sultanate Bridge especially based on narrative and visual anthropological analysis. This segment of analysis requires the study to reflect the fundamental research elements and the background of the study. A set of design criteria, a 'product' from the fusion of findings of narrative and visual anthropological analysis will be further discussed in order to translate the 'core' textual idea of Melaka Sultanate Bridge into visual representation with certain measures. This process is backed up by a set of precedences to provide perspectives as a basis of interpretation and to support its cases. The most important component of the process is the idea

generation aspect which brings into possible two dimensional (2D) visual interpretations of the Melaka Sultanate Bridge. Ten visual interpretations of the bridge will be further discussed in a deductive approach which leads to the final improvisation that best represents the idealism of the study in a three-dimensional (3D) proposition.

5. KEY FINDINGS ON NARRATIVE AND VISUAL ANTHROPOLOGICAL STUDIES

There are numbers of key factors based on narrative and visual anthropological findings in seeing how the Melaka Sultanate City was put to work; and provides perspective on the Melaka Sultanate Bridge. Figure 3 below features municipal elements and human movements contributing to the dynamic of Melaka Sultanate City resulted in socio-cultural-economic activities with the Sultanate Bridge at the centre.
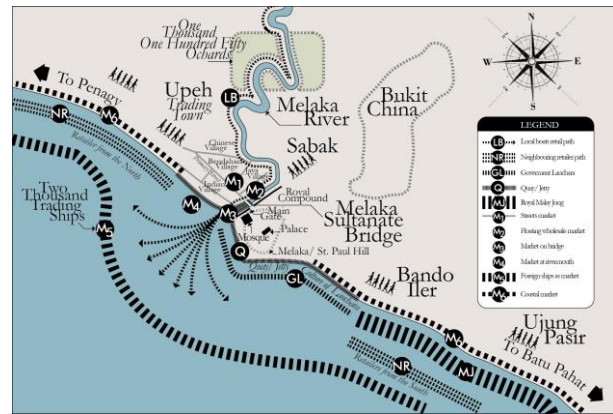

Figure 3 Dynamic of Socio-Cultural-Economic of Melaka Sultanate City

The magnitude of the Sultanate city's population (one hundred and ninety thousand inhabitants of Melaka towards the end of Sultanate period) [8] with intensely populated areas of Upeh (Tranquerah), Iler (Bandar Hilir), Tanjopacer (Ujong Pasir) and Sabak [1] is a major factor to the bridge. This is especially in view of the spread of population in their interaction to six identified markets on both sides of the land including the 20 pavilions on the bridge itself. This leads the analysis of the magnitude of pedestrians on a regular basis and provides clues of measurement on the width of the bridge.

The existence of 20 pavilions on the Sultanate bridge sparked by the description of Ma Huan selling "…all sorts of commodities…" [7] provides strong clues regarding the length and width of the bridge.

The culture of Lanchara at the river mouth of Melaka Sultanate period has a strong case of impacting the bridge design. Lancharas which was a small size ship or a large

size boat [8] has the case of passing through underneath the Sultanate bridge because it was also designed to navigate along the river with 2 rows at the rear. Further analysis was made based on measures provided by Melaka Museum Corporation. This sparked the case that the Sultanate bridge was just merely connecting the two lands; the bridge deck needed to be elevated to accommodate Lancaras passing through underneath it.

The case of the intense flow of water vehicles traffic is included in the analysis based on an account written by Tome Pires [4]. This contributed to the proposition of wide gaps between the structural pillars underneath the bridge. Pires specifically declared that there were one thousand one hundred and fifty orchards of various kinds at the inland of Melaka River [4]. A careful analysis suggested that there were activities of supplying agricultural goods in central Melaka through a floating market very near to the bridge and retail activities on the trading ships; which required retailers passing through underneath the bridge to reach the Straits of Melaka.

There is no doubt that Sultanate Bridge was made stockade that was reinforced by artilleries described in the 1511 war narrative [3]. Estimation of a hundred cannons with a recorded size was installed by the Sultanate's armies on the bridge in facing the Portuguese [3]. Based on the limited length of the bridge, it appears that the bridge was unable to accommodate the magnitude of cannons, otherwise the bridge was a two-storeys building.

The case of the upper deck of the two-storey bridge reinforced by the event of Jong fight in the 1511 war narrative; where the Portuguese used a Malay Jong to elevate their troops against the Sultanate's archers on the bridge [3]. This type of Malay vessel was described as 'very lofty' [3] and 'Leviathan' (or 'sea monster')[15]. Further analysis of the height of Jong that was conducted found there is a strong case that the Sultanate bridge was a two-storey building.

A thirty wheeler ceremonial vehicle was included in building the case of the Sultanate bridge as it was detected of passing through the bridge in a royal parade at the side of the town, but was burnt at the royal compound at the other side of the Melaka river during 1511 war [3]. After deliberate consideration, the study proposes that the bridge was not merely a pedestrian bridge; and the bridge was unlikely elevated too high in accommodating a wheeled vehicle passing through. This vehicle contributed to providing clues regarding the practical angle of the diagonal deck, the transition between the slope and horizontal peak, and the height of the ceiling.

The structural strength of the Sultanate bridge was also understudied to suggest the structural look of the bridge. It is a part of the customary law of Melaka Sultanate that the Sultans mounted on an elephant especially in royal parades [1] as a part of the traces of the Sultans of Melaka were having business when visiting the town.

Based on the 1511 war narrative, the Melaka Sultanate Bridge was reported been furnished with the Melaka flag [4]. The study proposes that the flag pole was a permanent feature of the bridge design during the Sultanate period. The blazing sun of Melaka's tropical climate is a significant factor that suggested the roofing factor of the Sultanate bridge. The Bridge was described as 'richly elaborated' [4] and thus, factored to the bridge. The idea of 'royalness' is emphasised in an expression by Pires, that pairing it with a grand mosque was 'ordered' by the Sultans and therefore had to gratify the 'King' [4].

6. CONCLUSION

First of all, it is inconceivable for the researcher to imagine the characteristics of the Sultanate Bridge without a critical look into the historical record. This bridge was indeed not an ordinary one even at the level of direct description. In the actual studies, each of these thirteen characteristics was brought into deeper and detailed analysis case by case; and in many cases, cross-referenced to each other. These characteristics later became 'design criteria' in the design process phase which also has a fairly large stake in evaluation and analysis involving the determination of form and measures.

As such the study recalls the concept and function of 'historical artist' in 'imagining' historical reconstruction undertakings. Although the reconstruction proposition of the Sultanate Bridge is still termed as 'creative interpretation', it was critically designed and refined in response to findings of the narrative and visual anthropological analysis. At this stage, the examined characteristics of the bridge indeed already suggested strong clues of an architectural marvel of the ancient native of Melaka Sultanate.

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