Engaging Across Difference in the Academy (EADA) Project Final Draft

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How to Access the Value of the Priceless Architectural Heritages?

Evaluation of architectural heritages is always regarded necessary since we cannot give equal priority to the conservation of millions of ancient buildings. The fire of the Notre Dame in Paris warns people that unexpected disasters could happen anytime, therefore deciding the priority of the ancient buildings is an exigent issue. Experts and scholars widely agree that "comprehensive appraisal of the value of ancient architecture can provide a more scientific basis for the conversation and utilization of ancient architecture" (Wang, 2016, p.16), therefore finding quantitative, scientific and applicable ways is necessary for the better conservation of architectural heritages. In this article my goal is to present a systematic way that probably works to evaluate the value of ancient buildings. In the first part, I'll present the specific systematic way in detail. Then, I'll discuss theories about assessing an ancient building to support that my systematic way probably works. Finally, I'll talk about some reminders when assessing an ancient building using this method. Notice that the word"way" in this article refers to a series of "methods".

There are already many ways to assess the ancient buildings, developed by scholars in this field, for example Zhang, Xu, Virtudes and Maya. They did a great job developing their own ways, proved the workability of their ways, and call for their ways. After reading their essays and learning their ways, I developed a systematic way that combines the strength by synthesizing their ideas. I'll present the specific method in detail. To help readers understand, let me use a simplified flow chart as a rough introduction:
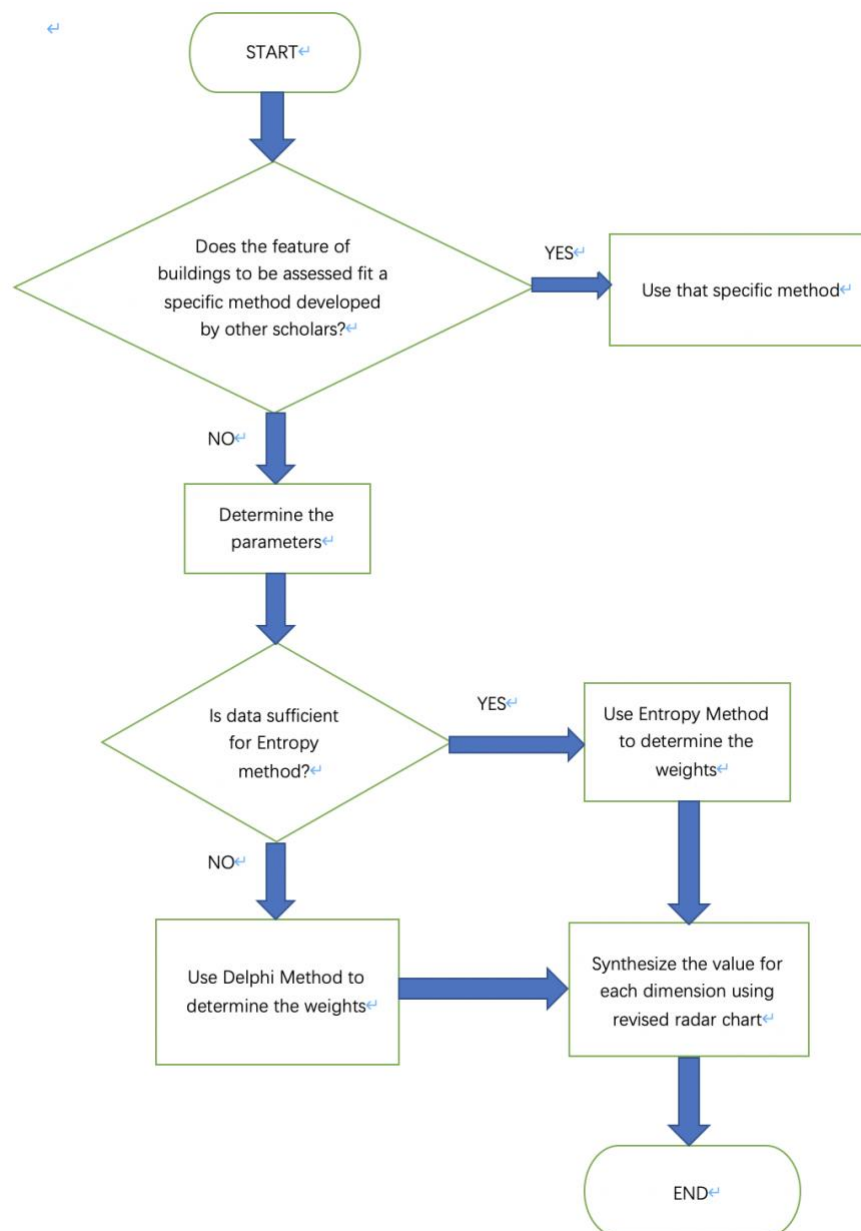
Fig. 1. the Flow Chart of the Systematic Way to Assess ancient buildings

To start with, I should say that my purpose of developing this systematic way is to help scholars better assessing, not forcing scholars to use my way. Therefore, if the ancient buildings can be assessed by another way with more accuracy, I'll be glad if the assessor choose that more accurate way instead of mine. For instance, if the assessor is going to assess some ancient villages, it's recommended to use Yang's (2013) way instead of mine, since Yang developed her way "from the perspective of protection and development of ancient villages" (pp.112) in her article. Yang's way will be more suitable to evaluate the ancient villages since she realizes the characteristics of ancient villages more than I do.

If it's hard to find any other way targeting at the building to be assessed, then the assessor can use mine. The first part is to determine the parameters. Parameters can be classified as level 1,2,3 and so on. Each level n parameter consists of level (n+1) parameters. Notice that the final choice of parameters probably varies because of the characteristics of the buildings to be assessed. For example, on the one hand, considering the feature of ancient villages, Yang's (2017) essay determined the level 2 parameters as architectural value, environment value and basic conditions for conservation and utilization (pp.113). On the other hand, considering the characteristics of la Huerta de Valencia as territories, Maya's (2019) essay determined the level 2 parameters as intrinsic value, patrimonial value and potential value with viability (p. 8-9). Though the determination seems complex, the process is mainly completed by experts with a lot of experiences of determining parameters.

The final choice should be checked by Yang's 5 rules raised in 2013, which are comparability, comprehensiveness， quantification， feasibility and hierarchy (p.113) to make sure that the final choice is reliable.

After determining the parameters, we come to the part of determine the weight of each parameter. "Weight" means the importance of a parameter. There are two main methods to determine the weight, which are the Delphi Method and the Entropy Method. The conclusion is that the amount of data available will determine which method is appropriate. Before discussing deeper, I need to introduce the Delphi Method, the Entropy Method and their advantages as well as disadvantages. The Delphi Method is a traditional method to determine the weight. For the Delphi method, *Wikipedi*a (2020) gives the following introduction: "The experts answer questionnaires in two or more rounds. After each round, a facilitator or change agent provides an anonymized summary of the experts' forecasts from the previous round as well as the reasons they provided for their judgments. Thus, experts are encouraged to revise their earlier answers in light of the replies of other members of their panel". It is evident that the Delphi method requires a subjective approach.

The Entropy Method is explained in *Baidu encyclopedia*: "Entropy is a measure of uncertainty. We can judge the degree of dispersion of an index by calculating the entropy. The greater the degree of dispersion of the index, the greater the weight of the index. Therefore, the weight of the index can be calculated according to its entropy" (*Baidu encyclopedia*, 2020). In other words, the Entropy Method is a totally quantitative one, which means the subjectivity can be reduced. However, a

successful usage of Entropy Method requires abundant data to calculate, therefore when we do not have that much data, we'd better use the traditional Delphi Method. But if we do have that much data, why don't we use Entropy Method to obtain more accuracy?

The last part of my systematic way is to synthesize to get the result. We can do this part just by calculating numbers, but in order to make the synthesize visible and clear, I recommend using a revised radar chart when synthesizing since the area represents the final value. However, the traditional radar chart has a severe shortcoming. According to the work done by Wang in 2017, the synthesizing result is influenced by the position where the parameters are assigned in a traditional radar chart. For instance, these two traditional radar charts below have the same values of parameters but different position assignments of parameters, thus their areas are different:
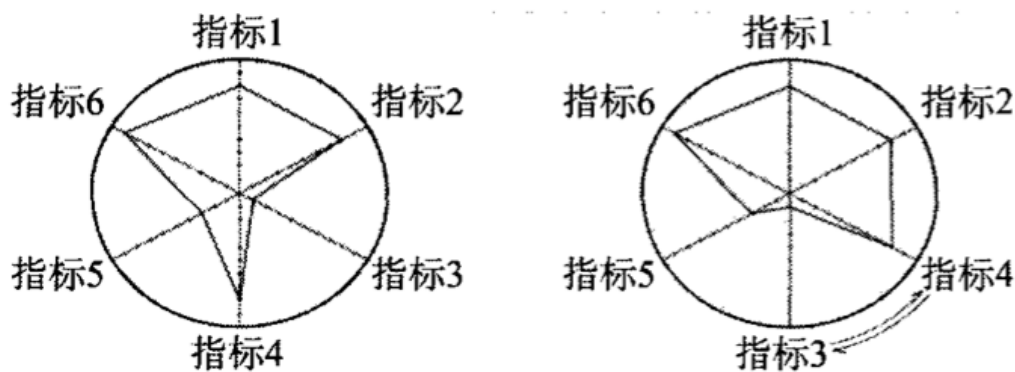

Fig. 2. Different parameter position assignments result in different areas. ("指标" means "parameter")

(Wang, 2017, p.1663)

Wang's 2017 essay gives a comparison of the traditional radar chart and a revised radar chart:
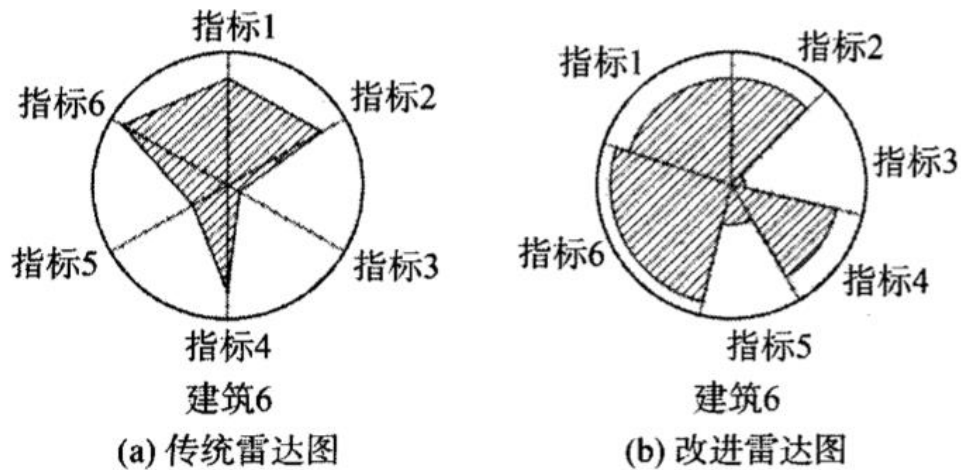
Fig. 3. (a) the traditional radar chart; (b) the revised radar chart. ("指标" means "parameter", "建筑"

means "architecture") (Zhang, 2017, p.1663)

In a revised radar chart, the angles between each parameter are no longer average, but are calculated based on the weight. For instance, decided either by the Delphi Method or the Entropy Method, the weight of parameter 6 is greater than the weight of parameter 5, therefore the angle of parameter 6 is greater than the angle of parameter 5 in a revised radar chart. Such a radar chart can avoid the disadvantage of shape-affected area, and therefore reduce the subjectivity. By now the assessment of an ancient building is completed.

After presenting the systematic way in detail, I'm going to theoretically support that my way works. When developing ways to assess, some rules, which will be introduced later, need to be followed. I'll explain respectively why each rule is important and how my systematic way obeys it to support my systematic way.

The first rule is being aware of the characteristics of the assessing buildings. The Entropy Method is an example that if the data collected of the building is not that much, the methods that requires a lot of data will not work well. Xu, Doctor of real

estate evaluation in Nanjing Agricultural University wrote in his article that "each valuation method has its scope of application, advantages and disadvantages" (Xu, 2017, p.32). Even for Xu's (2017) own methods, he states that "these methods have their own characteristics, technical route and applicable scope" (p.22). The importance of the awareness of the building's characteristics can be seen from his words.

The second rule is to do multi-dimensional evaluation. It's a fact that the methods which refer to only few dimensions always fail to measure the value of a complex site. Theoretically analyzing, this is because the composition of the value of the architectural heritage itself is multi-dimensional. Ancient buildings are a kind of relics. From Lyu's words that "cultural relics refer to the material which are made 100 years ago with historical, artistic and scientific values" (Lyu, 2016), the value of the ancient buildings are at least 3 aspects: historical, artistic and scientific. Each aspect contains many dimensions. Therefore, we need to use multi-dimensional evaluation on multi-dimensionally valuable buildings.

The third rule is avoiding subjectivity as much as possible. After all, we want a result that everyone admits. If subjectivity exists, then there may be someone opposing to the result. For example, in the appraisal of a site such as the former residence of the first president of China, my own opinion that "the historical, artistic, and scientific values of the site should have equal weight" might be opposed by those who argue that "the historical value should be most important". To avoid such situation, the best way is to avoid subjectivity as much as possible, using

mathematical methods or facts.

Why each rule is important has been analyzed as above. Now I'm going to show how my systematic way obeys all the three rules. First, being aware of the characteristics of buildings, I designed conditional structures in my systematic way, where different features of buildings lead to different branches of methods. In the first part of my way (determining parameters), the final choices will be different according to the features of the ancient buildings. When this systematic way is going to be applied, I would allow the users to adjust this systematic way to better suit the buildings that are to be assessed. Second, my systematic way was designed strictly obeying the multi-dimensional rule since the first part of my way is to decide which parameters to choose, where a multi-dimensional choice can be guaranteed. Third, in order to reduce subjectivity as much as possible, I brought in the Entropy Method and revised radar chart which were discussed in Zhang's 2017 article. These two are both great tools to help reduce subjectivity. Considering all the 3 rules, my systematic method obeys all of them, therefore my systematic method probably works.

To help you better understand and use my systematic way, I'll discuss some reminders about my systematic way. First, what I introduced is a single way, but on the contrary some people do not think it's enough. They believe that different classes of ancient buildings should be treated differently according to their features. For instance, Xu may oppose to my single way since he wrote "Each valuation method has its scope of application, advantages and disadvantages" (Xu, 2017, p. 32). I'm of two minds of his words. On the one hand, what he wrote is definitely right, but on the

other hand he ignored one thing, that several "methods" can be synthesized into a "way" with conditional structures to enlarge the scope. In his (2017) essay, he introduced 4 methods to assess buildings, and he listed each method's scope respectively. However, his 4 methods can be actually synthesized into a way as the flow chart below:
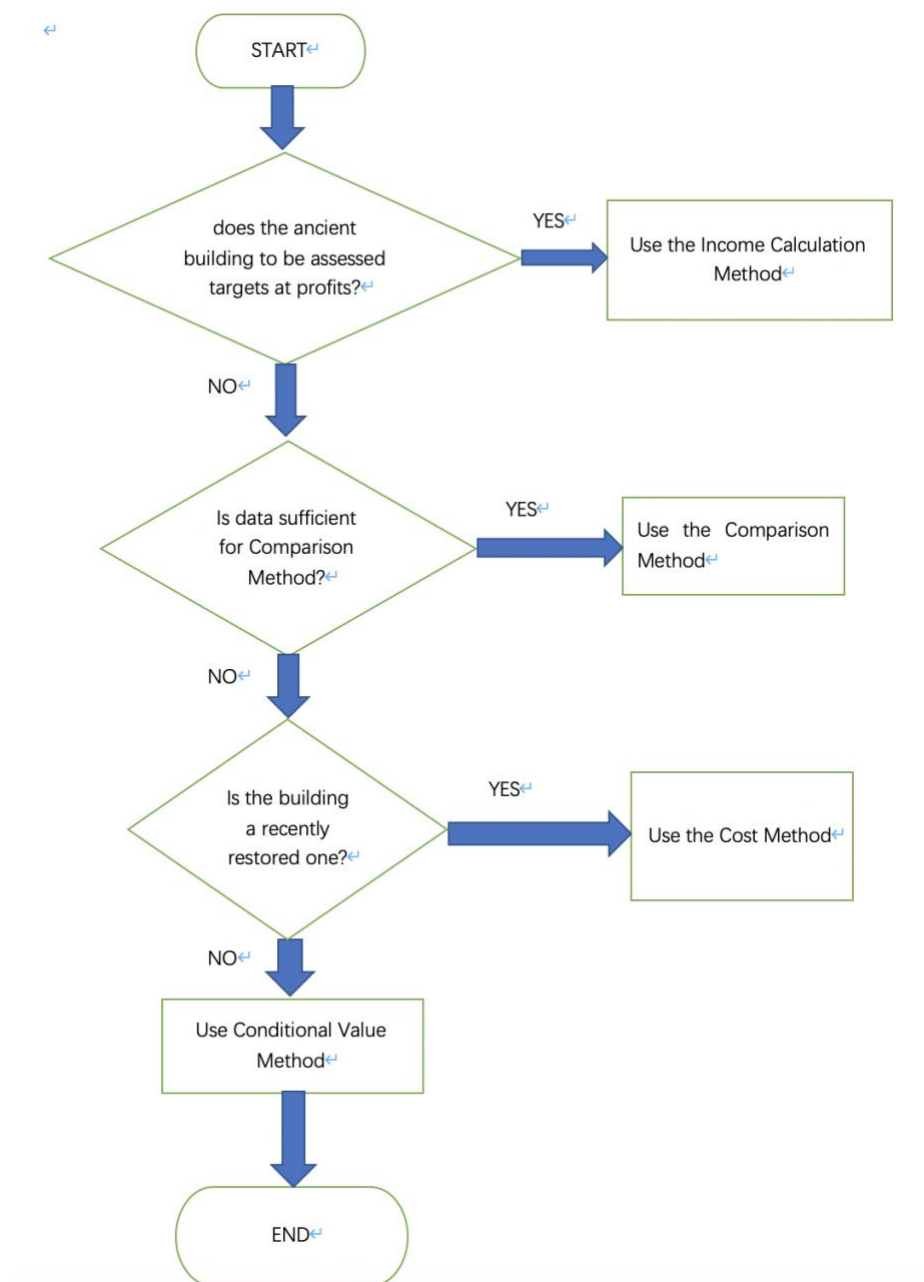

Fig. 4. The Flow Chart for the "way" consists of Xu's 4 Methods

Second, scholars may notice that the part "determine the parameters" is mainly

completed by experts, which will cause subjectivity. Zhang may oppose to me at this point. As Zhang's (2017) words, the result choice of parameters "has a direct relationship with the evaluation tendency of the selected evaluation subjects" (p. 1662). Though I concede that this method of determine the parameter remains much subjectivity, I still insist my method and I'll write about why. I understand that scholars are trying their best to avoid subjectivity. However, avoiding subjectivity requires abundant data. When we use the Entropy Method to avoid subjectivity, we need to get abundant data about one single building; but when we try to avoid subjectivity in the process of choosing parameters, we need to get abundant data about many buildings to compare different buildings and get the result of the parameter choice. Therefore, though the data may be sufficient to use the Entropy Method, it's always insufficient to avoid subjectivity in the process of determining parameters. Since we cannot obtain that much data using the technology we have now, we'd better trust the experts' experiences.

Third, I'll be glad if scholars can improve my systematic way using modern technologies. Combining modern techs, usually whether the accuracy is increased or the process is simplified. There are already many scholars studying the possibility of modern technologies being used in the field of the assessment of ancient buildings, for example Huang and Virtudes. Huang's (2013) essay inported the knowledge from digitization technology to set up databases to moniter the condition of the ancient buildings and get data: "The exploration and research in this aspect can provide fine, accurate and engineering basic data for the work of ancient buildings" (p.273).

Similarly, Virtudes's (2016) essay talked an assessing way combined with computer science. Both of them imported high techs to get a more accurate result of assessment. Even if the "tech" is not a mature tech, but a theory, I'll still be glad since the accuracy will be increased or the process can be simplified because of the awareness of the feature of buildings that are to be assessed. For instance, when assessing ancient temples, we can combine my systematic way with the Gray Clustering Method as Wang introduced in 2016. She applied such a way on the Dai Temples, China, and the result turned that "the calculation is relatively simple but can basically meet the requirements of engineering application" (Wang, 2016, p. 17). This means Wang's attempt is successful. To sum up, do not simply imply my systematic way without thinking.

In the last, I would like to admit that though my systematic way is theoretically workable, it hasn't been applied to any assessment task. Hopefully whether it works ultimately will be checked by scholars. Conservation of ancient buildings has become a global issue, as Yu wrote that "what is preserved is the building, while what remains is the ancient civilization, culture and wisdom" (Yu, 2016, p. 224). A good assessment of the ancient buildings does matter a lot to decide the priority of conservation. I hope my research can contribute to the field of conserving ancient buildings, as well as conserving human treasures.

Word count: 2397 words, excluding title and references.

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Among them, source [8] and source [11] has some argument that I do not

agree with or oppose to me.