Ascertaining the Business Sustainability of Heritage Properties in Malaysia

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The city of Georgetown, Malaysia was listed as a World Heritage Site by the United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 2008 due to the diverse cultural and tourism activities. The listing has brought about an impact to the heritage properties in Malaysia. Since then, the volume of business activities has increased dramatically with a positive demand for heritage properties. This scenario has increased competition in commercial activities and business owners have struggled to offer their best products to tourists, both local and foreign. However, while investors and traders thrive to locate their businesses in heritage properties, some restrictions and externalities have influenced their activities. Among the significant factors that have influenced such activities, there is the Special Area Plan which restricts renovations and conservations, building condition and building price. Therefore, the purpose of this paper is to assess the sustainability of businesses located in the heritage properties. Eighteen criteria (factors) are identified and assessed to determine the best

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sustainable areas in the city and the Complex Proportional Analysis (COPRAS) is utilised as the best method to assess the issue. The findings show that each alternative has its unique characteristics that support the sustainability of businesses that occupy the heritage properties. This is the first paper of its kind to assess the sustainability of business activities that are occupying the heritage properties in Malaysia.

Keywords

Heritage, Business, Sustainability, COPRAS, Multiple-criteria decision making, UNESCO

1.   Introduction

Prior to its designation as a World Heritage Site, the pre-war properties in the city of Georgetown, Malaysia had very low marketability due to several restrictions such as Rent Control Act in 1966, a management plan that designated the Five Conservation Zones in 1987, the 21st Century Penang Strategic Plan in 1991, and Penang Preservation and Heritage Policy in 1996. According to Yusof et al. (2007), the total number of pre-war property transactions from 1974 to 1996 was less than 20. However, after the repealing of the Rent Control Act, the marketability of Georgetown began to increase as the rental income appealed to local investors to buy the property.

When the World Heritage designation came into effect, foreign investors entered and participated in the market which finally resulted in rentals that exceeded RM 1,000 (USD248) per month. The value of properties in the historical areas, especially within the World Heritage Sites, often increases due to cultural pride and historical significance. The increase in property value will also escalate tax revenues (Warner, 1978). Transactions of heritage properties in Georgetown started to increase in 1999 and by 2015, there was an increase in capital appreciation from RM 1,800 per sq. ft. (USD446) to RM 2,300 per sq. ft. (USD570) (Henry Butcher Malaysia (Penang), 2016). As the capital value of heritage property hikes, the rental fees follow suit. This scenario is more blatant, especially after the repealing of the Rent Control Act of 1966 in 1997. However, due to the sharp inflation of the heritage properties, the state government considered re-introducing the Rent Control Act again. According to Tan (2016), the re-introduction of the Rent Control Act is one of the measures to curb the high increases in rent in the heritage properties, especially properties that are purchased by foreign investors.

As a result of the World Heritage Site listing, the number of tourists to Penang increased significantly and the city flooded with cultural visitors. This increase

gave rise to many boutique hotels and high-end cafes that cater to the demand of tourists. As the demand for hotels and restaurants increased, the price of the heritage properties also escalated. However, in lieu of the increasing capital appreciation and volume of commercial activities, the economy of Georgetown still suffers from the so-called "Disneyfication". The term "Disneyfication" refers to the transformation (of something real or unsettling) into carefully controlled and safe entertainment or an environment with similar qualities (Merriam Webster, 2020). There is an increasing number of souvenirs stalls, high-end cafes and novelty shops that lure more tourists. Fancy and luxuriously themed cafes were set up in the core zone which were the opposite of the outstanding universal value that Georgetown used to offer. This, in fact, attracted more "excursionists" (day-trippers) more than cultural tourists who normally stayed longer. In the long run, cultural tourists benefit the local economy more than the excursionists (Mok, 2017). The change in trend of tourist preferences has forced locals to find innovative, high-end and expensive products to boost their sales.

Although much attention has been given to heritage properties, none of the local studies have focused on the sustainable aspect of businesses in heritage properties. Therefore, the main objective of this paper is to bridge the existing gap in determining the sustainability aspect of business in heritage properties by employing a multi-criteria decision making framework known as the "Multi-attribute Complex Proportional Assessment (COPRAS)" to establish a set of criteria for sustainable businesses in heritage properties. This paper aims to gain more insights into the sustainable aspects of businesses in heritage properties and is therefore organised as follows. First, the relevant studies that have incorporated the concept of heritage properties, business sustainability and factors that influence them are discussed. Then, a discussion follows on the criteria for sustainable businesses in heritage properties and the tools used to assess sustainability. Thereafter, the analysis and conclusion of the paper are presented and discussed.

2.   Literature Review

Today, many Georgetown businesses are traditional businesses known as living or intangible heritages. These businesses are one of the core factors that contribute to the significance of the World Heritage Site. Hence, these living heritages need to be sustained in order to educate the younger generation. "Sustainability" comes with three distinct definitions as stated in Bird (1995) and include: the sustained yield of resources that derive from the exploitation of populations and ecosystems; the sustained abundance and genotypic diversity of individual species in ecosystems subject to human exploitation or, more generally, intervention; and sustained economic development, without compromising the existing resources for future generations.

The sustainability of heritage buildings is realized through conservation/ preservation practices and the heritage property maintenance management to safeguard the property against deterioration and also increase the functionality for increased property values. Heritage property plays a notable role in the economic development of a nation especially in the tourism sector by providing accommodations for human beings (tourists) and businesses. It generates income and profit for the well being of the immediate community and the country at large (Yusof et al., 2007; Necissa, 2011; and Mat Zin et al., 2018). In addition, heritage property generates income from historic property assets, creates jobs and employment opportunities, facilitates entrepreneurship development and attracts private investment (Baycan and Girard, 2011). Consequently, the sustainability of businesses in heritage properties is worthwhile of further investigation in response to Guzman et al. (2017) who claim that there is a lack of attention in this area.

A survey of the available literature on the subject has identified several indicators to measure the contribution of heritage properties to sustainable economic activities and classified them into four categories, namely (i) job/employment creation; (ii) property value; (iii) tourism; and (iv) city centre or main street revitalisation. For heritage sites or buildings to attract tourists, there are services that need to be offered, such as site tour guiding and monument visitations, and small businesses that provide local crafting, local cuisine vending, etc. Such activities create jobs for the locals through government regulatory institutions. Heritage buildings address the demand for leisure tourism with cultural remnants and may have little value as a standing property but a much higher value due to the hosted tourism events or supporting services that are accommodated thereby generating higher rental income and meeting the need for high occupancy levels (Mat Zin et al., 2018). Heritage properties are a tourist destination where the number of tourist arrivals and their spending boost the business of the local area/community and also the state/nation itself. As a result of the benefits from tourism, the city centre (Georgetown) and the main street (Lorong Love) experience revitalisation which provides urban scenery to tourists for a satisfying experience. The conservation policy and Special Area Plan of public authorities shape the city centre.

Factors that affect the sustainability of businesses in heritage properties in Penang, among others, are the number of arrival tourists (since the World Heritage listing of Georgetown in 2008) and the volume of tourists to Penang which has increased drastically. Nevertheless, tourists play an important role in the sustainability of businesses in the heritage zone. Hence, more tourists visiting Penang results in a higher (potential) business volume for traders. Shida (2013) suggests that more tourists who visit a community can improve the local economy in the area.

Image of Penang - the title of the World Heritage site in Georgetown, brings up the image of Penang as a cultural state. Thus, the cultural state status is one of

the main factors that brings in tourists and business opportunities to Georgetown. Shariff (2008) states that the preservation of heritage food provides a comparative advantage in maintaining the local food culture. Hence, the local traditional cuisine of Penang complements the World Heritage Site brand which further attracts visitors to Penang. The expenditure/spending of tourists points to the volume of business that local traders can expect to secure. As Georgetown is viewed as a tourist attraction and the centre of Penang local cuisine, it is expected that tourists will spend money there. Market expenditure and tourist patterns in Penang show that the majority of tourists spend between RM 821 (USD203) and RM 1,924 per visit (USD477; Sustainable Tourism Research Cluster and Universiti Sains Malaysia, 2016). The conservation policy – that is, the conservation of heritage property, is a challenge to traders, especially those who have private ownership of the property. Upkeeping and restoring heritage property are costly and time-consuming endeavours. This is due to the need to use traditional methods to conserve the property (Kamal, 2008). According to Chow (2016), the cost of restoration of heritage properties has increased by 40% since 2008. Hence, the conservation factor will affect the business income of traders who still need to abide to the conservation of their heritage property.

Heritage properties are unique. Other than the value of the property itself, heritage has a value beyond the price of the property (Garrod and Fyall, 2000). This is especially evident for properties that are classified within the UNESCO World Heritage Zone such as Georgetown itself. For instance, a shophouse along Lebuh Pantai in Georgetown was sold for RM 4,000,000 (USD991,968) or RM 2,000 per square feet (USD496) in 2014 which was above the market value at the time (Henry Butcher Malaysia (Penang), 2014). The transaction was able to take place because Lebuh Pantai is considered to be one of the prime heritage areas in Georgetown. The cost approach in the Malaysian Valuation Standards (MVS) states that the depreciation allowance needs to be reflected by the physical, functional and economic obsolescences. However, heritage properties are one of the exceptions in which "old is gold". They are priced above market value as compared to conventional commercial properties due to their aesthetic and cultural values. Besides, buildings suffer from ageing as time passes by, so property obsolescence increases and this is one of the reasons why property owners have to maintain their property on an ongoing basis. Meanwhile, heritage properties in Georgetown are often built between the 1790s to 1970s. The heritage properties that are targeted in this research are shown in Figure 1 along with their architectural styles, physical appearance and building materials.

Figure 1   Architectural Styles of Heritage Shophouses in Georgetown

Early "Penang" Style 1790s-1850s	"Southern Chinese" Eclectic Style 1840s-1900s	Early "Straits" Eclectic Style 1890s-1910s	Late "Straits" Eclectic Style 1910s-1940s	Art Deco Style 1930s-1960s	Early Modernism Style 1950s-1970s
Physical Appearance - 1 storey - simple facade - colour in fashion: light indigo blue, ocre, white	**Physical Appearance** - 1-2 storey - simple facade - colour in fashion: light indigo blue, ocre, white	**Physical Appearance** - 2-3 storey - decorative facade mixture of Malay, Chinese & European ornaments - colour in fashion: light: indigo blue, ocre, white	**Physical Appearance** - 2-3 storey - decorative facade mixture of Malay, Chinese & European ornaments - colour in fashion: light indigo blue, ocre, white, opel green	**Physical Appearance** - 2-3 storey - decorative facade geometrical designs - colour in fashion: grey of Shanghai plaster walls	**Physical Appearance** - 2-3 storey - simple and clean facade designs - colour in fashion: white
Building Materials - Timber - Clay bricks - Lime	**Building Materials** - Timber - Clay bricks - Lime	**Building Materials** - Timber - Clay bricks - Lime	**Building Materials** - Timber - Clay bricks - Lime	**Building Materials** - Shanghai plaster - clay bricks - reinforced concrete - glass	**Building Materials** - clay bricks - reinforced concrete glass

Source: Georgetown Special Area Plan (GTWHI, 2020)

According to the Penang Special Area Plan (GTWHI, 2020), some heritage properties suffer from structural defects which arise due to their age, method of construction and past use. However, they can still adequately be used if the building will not cause any major disturbances to the activities. Figure 1 shows that heritage properties are found in a wide range of cultural and historical contexts. People would often seek older but functional buildings to renovate them and run businesses. This is to provide their customers with a heritage vibe and attract foreign tourists to explore the interior of these buildings from the past. Therefore, there is always a high demand for older heritage properties in Georgetown where it is believed to be one of the factors that raised the prices of heritage properties. Property maintenance is one of the main factors that affect business operations. Morris (1877) emphasises the significance of maintenance in protecting historical buildings. The maintenance of heritage properties, especially those inside the World Heritage Site, requires traditional techniques and materials to retain their authenticity. Hence, the amount of work and skills required to maintain heritage properties can be quite discouraging, not to mention the costs involved to do so. As the age of heritage properties are directly related to physical obsolescence, the conditions of heritage properties must be taken into account. Heritage property owners have to assess the conditions of their properties in order to carry out business. A lack of knowledge in assessing the building conditions especially heritage properties is a costly mistake. It will lead to problems such as unnecessary exposure to legal and social risks due to non-compliance or deteriorated facilities, short asset life and high repair and maintenance costs (Queensland Government, 2017).

The other factors that influence businesses in heritage properties are proximity to health services (Ministry of Health Malaysia, 2017), public transport (Prideaux, 2000; Martinez, 2015), school (Neill, 2000; Thibodeau, 1998), mural paintings (may increase the market value of heritage properties due to its limited supply, and ability to attract new richer tenants while preventing graffiti that usually deters such tenants; Seyedehelham et al., 2015(a), 2015(b); Bierre, 2006), open space and recreational areas (Eysenbach, 2008; Thompson, 2013), topography (Craig-Smith, 1995), traffic congestion (Giuliano, 2003), and crime rate (Boakye, 2010; Dimanche and Lepetic, 1999). Therefore, the criteria for consideration in this study cuts across the four categories as shown in Figure 2.

Figure 2   Categories of Sustainability Indicators

Job Creation	Tourism	Property Value	City Centre
• Mural Painting • Tourist Guide • Hotel Business (Lodging, Restaurant, Bar)	• No. of Arrival • Image of Penang • Cuisine • Tourist Spending • Open Space	• Maintenance • Property Value • Closeness to Services (Health, school, transport, etc.)	• Special Area Plan • Renovation Restriction • Conservation Policy • Topography

3.   Methodology

The principle of multiple-criteria decision making (MCDM) is applied to assess the sustainability of businesses in Georgetown. Some of the MCDM methods include Complex Proportional Analysis (COPRAS), Simple Additive Weighting (SAW), Technique for Order Preference by Similarity to an Ideal Solution (TOPSIS), Visekriterijumsko Kompromisino Ragiranje (VIKOR), Sum of Ranks (SR), Geometric Mean (GR) and Preference Ranking Organisation Method for Enrichment Evaluation (PROMETHEE).

According to Podvezko (2011), COPRAS is the most common multi-criteria evaluation method which involves making complex decisions by using weights and priority analyses (Said and Majid, 2016). Therefore, the COPRAS method is used for the data analysis of this paper. As the case study of this research work is Georgetown, Penang, hence data collection was only done in Georgetown. Quantitative data from the traders within Georgetown are used in the analysis to gauge the sustainability of the businesses. In order to collect the primary data for this research, a survey questionnaire was designed for distribution to the target population (Georgetown traders) as a mode of data collection. The questions include the demographics of the respondents and also factors that affect the stability of businesses in heritage properties.

MCDM research studies usually collect qualitative data and convert them into quantitative information in order to analyse the opinions of the respondents. Hence, the best way of turning the opinions of the respondents into quantitative data is to apply a scale of importance to the criteria. In this research study, the scale of importance ranges from 1 to 5, where "1" means "not important at all" and "5" being the "most important" criterion. Based on the scale of importance, we determine the weight of each criterion by finding the mean ranking. The weight of the criteria is calculated by dividing the mean scores with the overall mean score.

Since this research is based on a quantitative data analysis, the respondents need to complete the questionnaire sheets. However, the research target is not the general public but limited to business owners of heritage properties. This is because the owners have experience in operating their business in Georgetown. Therefore, they are the ones who know the actual factors that affect their business and provide informative answers to the questionnaire. Mat Zin et al. (2018) conduct a study on the role of heritage properties on economic sustainability. The study considers the property value (changes in value) from a sale transaction analysis. Yusof et al. (2007) investigate the impact of urban conservation on the Georgetown heritage property market preceding the declaration of Georgetown as a UNESCO designated heritage city.

Also, Georgetown is selected as the area of study for this research due to the fact that it is one of the prime heritage areas of Malaysia which makes it a

suitable study area. Georgetown itself is separated into two distinct heritage zones known as the Core Zone and Buffer Zone which have 2569 and 2444 buildings, respectively.

3.1   Assessment of Business Sustainability in Heritage Properties

MCDM research work involves the evaluation of multiple criteria in decision making. These multiple criteria often conflict with each other to create a pros and cons situation to determine the optimal choice. COPRAS is an evaluation method in MCDM research work. In COPRAS, these conflicting criteria are known as a criterion and enables the study to determine the areas that have the best business sustainability in Georgetown.

In this research study, there are 18 criteria which are classified into two criteria: one positive criterion which has a positive impact on business sustainability and a negative criterion which has a negative impact on business sustainability. Table 1 outlines the list of criteria and their classification. These criteria are used in the questionnaire design to obtain data for evaluation purposes. They are selected based on the perspective of the property itself, distance from any public facility, attractions and several other external factors.

Table 1   Criteria Used for COPRAS Method

No.	Criterion	Positive / Negative
1	Price of Heritage Property	-
2	Rent of Heritage Property	-
3	Conservation of Heritage Property	-
4	Maintenance of Heritage Property	-
5	Age of Heritage Property	+
6	Condition of Heritage Property	+
7	Nearest Health Services	+
8	Nearest Public Transport Services	+
9	Nearest Open Space and Recreational Areas	+
10	Nearest Schools	+
11	Nearest Mural Paintings	+
12	Topography	-
13	Number of Tourist Arrivals	+
14	Image of Penang	+
15	Tourist Expenditures	+
16	Traffic Congestion	-
17	Environmental Quality	+
18	Crime Rate	-

Alternatives are also known as "choices" in MCDM research. In the case of this research, the alternatives are "regions" within the vicinity of Georgetown. Hence, this research will determine which region in Georgetown has the best

business sustainability with the given criteria. In this research, eight streets which are found within the UNESCO World Heritage Zone are used as the alternatives. These alternatives will serve a common purpose in determining the part of Georgetown's World Heritage Zone with the best business sustainability (Table 2).

Table 2   Alternatives Used in COPRAS Method

Alternative	Street Name
1	Lebuh Armenian
2	Lebuh Carnarvon
3	Jalan Majlis Kapitan Keling
4	Lebuh Chulia
5	Lebuh Pantai
6	Lorong Love
7	Jalan Burma
8	Lebuh King

3.2   Data Evaluation

In order to establish an analysis by using COPRAS, six steps are required which are discussed as follows (Tomić et al., 2014).

Step 1: Set Up Initial Decision Matrix
A decision matrix is created in the form of a table to outline the criteria and alternatives. In this case, the criteria are the factors listed in Table 1 and the alternatives are listed in Table 2. The initial decision matrix of the research is provided in Table 3.

Table 3   Initial Decision Matrix.

Alternative Criterion	Alternative 1	Alternative 2
Criterion 1	x_{11}	x_{21}
Criterion 2	x_{12}	x_{22}
Criterion 3	x_{13}	x_{23}

Step 2: Normalisation of Decision Matrix
The decision matrix is normalised by using:

$$P = p_{ij} = x_{iji} = 1mx_{ij} \qquad (1)$$

where

i	is the alternative (the street name under study),
j	is the criterion (the factors listed as per Table 1),
m	is the number of alternatives, and

x_{ij} is the assessment value of the ith alternative and jth criterion (e.g. x_{11} refers to : Value Lebuh Armenian * Price of Heritage Property).

The normalisation of the decision matrix is an important step as the process converts the dimensional measurement units of every criterion such as percentage, metre, currency and other into a dimensionless unit. When the criteria are dimensionless, they are then allowed to be compared between one and another. This is why the COPRAS method is one of the most efficient methods used to compare multiple criteria with different measurement units.

Step 3: Determine the Weighted Normalized Decision Matrix
The weighted normalized decision matrix is calculated with:

$$Q = p_{ij} * w_j \qquad (2)$$

where,
p_{ij} is the normalized performance value of the ith alternative and jth criterion
w_j is the weight of the jth criterion which is determined by using:

$$W = [w_j] = A_{jj} = 1nA_j \qquad (3)$$

where,
n   is the number of criteria, and
A_j is the mean score of the jth criterion.

Weight is determined to establish the significance of each criterion. A criterion with the highest weight is the most important criterion which in this research is a criterion that affects the sustainability of the business. The sum of the weight is either 100% or 1.0.

Step 4: Sum of Weighted Normalized Value for Positive and Negative Criteria
The sum of the weighted normalized value of both the positive and negative criteria is calculated with:

$S+_i = j = 1np+_{ij}$ (positive impact) and $S-_i = j = 1np-_{ij}$ (negative impact), where:

$p+_{ij}$ is the weighted normalized value for the positive criterion.
$p-_{ij}$ is the weighted normalized value for the negative criterion.

Step 5: Determine the Relative Significance of Alternatives
The relative significance of each alternative is determined by using:

$$Q_i = S+_i + S-_{min} *_I = 1mS-_iS-_i *_I = 1m(S-_{min}S-_i) \qquad (4)$$

where, $S\text{-}_{min}$ is the minimum value of the $S\text{-}_i$ of an alternative.

Step 6: Calculation of Quantitative Utility
The quantitative utility is calculated by using:

$$U_i = Q_i Q_{max} * 100\% \tag{5}$$

where the U value is the degree of utility. Based on the degree of utility, one could determine which alternatives are the best or worst. Also, a higher degree of utility means better characteristics of the alternative.

4.   Results and Discussion

The questionnaire results are listed in Table 4. Using these results, we set up the initial decision matrix or Step 1 of the COPRAS method. The values in Table 4 comprise the mean scores of the respondent towards the selected criteria based on the scale of importance, overall mean scores of the respondents and weight of the criteria. An overall mean score is calculated for each criterion based on the mean scores from the eight alternatives. After that, the overall mean score is used to determine the weight of each criterion. The purpose of weighting is to determine the views of the respondents of the significance of the criteria. We could determine this by looking at the values of the weight where a higher value denotes higher importance.

In this study, the criterion which has the highest value is F13, Number of Tourist Arrivals with a weight of 7.08 followed by F11, Nearest Mural Paintings. On the other hand, F12, Topography, has the lowest weight compared to the 16 other criteria with a weight of 4.34. This allows us to deduce that business owners think that F11 and F13 have huge impacts on the sustainability of their business. However, this ranking does not conclude on the actual ranking between the alternatives which will be subsequently discussed.

Different criteria may come in different measurement units such as percentage, currency, scale and points. Hence, Step 2 of the COPRAS method applies $P = p_{ij} = x_{iji} = 1mx_{ij}$, to normalise these measurement units. In this study, the mean scores from the scale of importance are converted into normalised values.

Table 5 shows the normalised values of the decision matrix where the normalised values are weighted by using the weights from Step 1 to arrive at a weighted normalised decision matrix. A criterion with "-" impact should have a lower value while a "+" impact is better off with a higher value.

Table 4   Mean Scores

Factor	Impact	Alternative Criterion	Lebuh Armenian	Lebuh Carnavon	Jalan Majlis Kapitan Keling	Lebuh Chulia	Lebuh Pantai	Lorong Love	Jalan Burma	Lebuh King	Overall Mean Scores	Weight	Rank by Weight
F1	-	Price of Heritage Property	4.67	3.86	4.00	3.50	4.20	4.00	4.00	4.00	4.03	6.72	4
F2	-	Rent of Heritage Property	4.67	4.29	3.40	4.25	4.00	4.33	4.20	4.25	4.17	6.97	3
F3	-	Conservation of Heritage Property	3.33	2.71	3.00	3.25	3.40	3.67	3.20	3.75	3.29	5.49	11
F4	-	Maintenance of Heritage Property	3.67	3.29	3.40	3.25	3.00	3.33	3.40	3.25	3.32	5.55	10
F5	+	Age of Heritage Property	4.00	4.14	3.60	4.00	3.36	4.67	3.80	3.25	3.85	6.43	5
F6	+	Condition of Heritage Property	3.33	3.29	3.20	3.25	4.00	3.67	3.40	3.50	3.45	5.77	9
F7	+	Nearest Health Services	2.67	3.14	3.00	3.00	3.40	3.67	3.40	3.25	3.19	5.33	14
F8	+	Nearest Public Transport Services	3.67	3.43	3.80	3.00	3.80	3.33	3.60	3.50	3.52	5.87	8
F9	+	Nearest Open Space and Recreational Areas	3.33	3.43	3.20	2.75	3.20	3.33	3.20	3.25	3.21	5.36	13
F10	+	Nearest Schools	3.00	2.71	3.00	2.75	2.80	3.00	2.60	3.25	2.89	4.82	15
F11	+	Nearest Mural Paintings	4.33	4.29	4.20	3.50	4.40	4.67	4.00	4.25	4.20	7.02	2
F12	-	Topography	2.00	2.57	2.40	2.50	2.40	2.67	3.00	3.25	2.60	4.34	16
F13	+	Number of Tourist Arrivals	4.33	4.43	4.20	4.00	3.80	4.67	4.00	4.50	4.24	7.08	1
F14	+	Image of Penang	3.67	4.00	3.40	3.25	4.00	4.33	3.40	4.25	3.79	6.32	7
F15	+	Tourist Expenditures	4.33	3.86	3.40	3.25	3.80	4.67	3.40	3.75	3.81	6.35	6
F16	-	Traffic Congestion	4.00	3.29	2.80	3.50	3.20	2.00	3.20	3.00	3.12	5.21	15
F17	-	Crime Rate	3.67	2.86	3.00	3.25	3.40	3.33	3.00	3.25	3.22	5.37	12

Note: *Maximum value of score is 5.

Table 5   Normalised Decision Matrix

Alternative Criterion	Lebuh Armenian	Lebuh Carnavon	Jalan Majlis Kapitan Keling	Lebuh Chulia	Lebuh Pantai	Lorong Love	Jalan Burma	Lebuh King
Price of Heritage Property	0.1448	0.1197	0.1241	0.1086	0.1303	0.1241	0.1241	0.1241
Rent of Heritage Property	0.1398	0.1284	0.1018	0.1273	0.1198	0.1298	0.1258	0.1273
Conservation of Heritage Property	0.1267	0.1031	0.1140	0.1235	0.1292	0.1393	0.1216	0.1425
Maintenance of Heritage Property	0.1379	0.1236	0.1279	0.1222	0.1128	0.1254	0.1279	0.1222
Age of Heritage Property	0.1298	0.1344	0.1168	0.1298	0.1090	0.1514	0.1233	0.1055
Condition of Heritage Property	0.1206	0.1189	0.1158	0.1176	0.1447	0.1327	0.1230	0.1266
Nearest Health Services	0.1045	0.1231	0.1175	0.1175	0.1332	0.1436	0.1332	0.1273
Nearest Public Transport Services	0.1304	0.1219	0.1351	0.1067	0.1351	0.1185	0.1280	0.1244
Nearest Open Space and Recreational Areas	0.1297	0.1334	0.1245	0.1070	0.1245	0.1297	0.1245	0.1265
Nearest Schools	0.1298	0.1174	0.1298	0.1190	0.1211	0.1298	0.1125	0.1406
Nearest Mural Paintings	0.1288	0.1274	0.1249	0.1041	0.1308	0.1387	0.1189	0.1264
Topography	0.0962	0.1237	0.1155	0.1203	0.1155	0.1283	0.1443	0.1563
Number of Tourist Arrivals	0.1277	0.1305	0.1238	0.1179	0.1120	0.1375	0.1179	0.1326
Image of Penang	0.1210	0.1320	0.1122	0.1073	0.1320	0.1430	0.1122	0.1403
Tourist Expenditures	0.1423	0.1266	0.1116	0.1067	0.1248	0.1532	0.1116	0.1231
Traffic Congestion	0.1601	0.1315	0.1121	0.1401	0.1281	0.0800	0.1281	0.1201
Crime Rate	0.1424	0.1109	0.1165	0.1262	0.1320	0.1294	0.1165	0.1262

Based on the previous interpretation and Table 5, we can determine that every separate alternative has its own unique characteristics that support the sustainability of the business in Georgetown. For example, Lorong Love can be considered as the most sustainable alternative as it has the most preferred characteristics or 6 out of 17 of the characteristics. Meanwhile, Jalan Burma does not excel in any of the criteria which makes it one of the less favourable alternatives.

Also, Step 3 states that the sum of the weighted normalised values of a criterion will be equal to its own weight, so a column of "Summation" is added to the table to verify the validity of the values. Finally, the total of the "Summation" column has to be 100 if the weight is not calculated in percentage form (Table 6). The bolded values in Table 6 are considered to be criteria on a preferred site.

Based on the values derived in Table 6, we are able to apply these values into $S+_i=_j=1np+_{ij}$ (positive impact) and $S-_i=_j=1np-_{ij}$ (negative impact), as mentioned in Step 4. After that, we will arrive at the S+ and S- values of each alternative in which these values will be used to calculate the relative significance of the alternatives in Step 5. Step 5 adopts Equation 4 which is provided again below:

$Q_i=S+_i+S-_{min}*_i=1mS-_iS-_i*_i=1m(S-_{min}S-_i)$

which allows us to calculate the significant value of each alternative. Also, a higher Q value denotes higher significance. The results from the calculations are shown in Table 7.

Finally, we refer to the Q value or prioritisation value in Table 7 to rank the alternatives that best sustain businesses in Georgetown. Also, based on the Q value ,we are able to identify the degree of utility between each alternative and compare them. The degree of utility is calculated by using Equation 5 as follows: $U_i=Q_iQ_{max}*100\%$

Table 8 shows the final results. According to Table 8, Lorong Love best sustains businesses in Georgetown, which is reflected by the 100% degree of utility. This is followed by Lebuh Carnavon with a utility degree of 95.66%. The next suitable alternative is Jalan Masjid Kapitan Keling with a utility degree of 94.48%, followed by Lebuh Pantai with 94.21%. Lebuh King is the 5th most suitable alternative with 92.78% and Lebuh Armenian with 90.94%. Jalan Burma is in the 7th place of the ranking with a utility degree of 90.85% and finally, Lebuh Chulia has the lowest ranking with the utility degree of 88.43%. It is clear that Lorong Love is the most sustainable alternative for businesses in Georgetown. This can be verified as it has the most preferred traits among the seven other alternatives. Although Jalan Burma does not have the highest score for any criterion, it still has a higher utility degree than Lebuh Chulia by 2.42%. Hence, we can also conclude that although some of the alternatives that have the best characteristic in one criterion may still be affected by other criteria which make it a less sustainable alternative.

Table 6   Weighted Normalised Decision Matrix

Alternative Criterion	Weight	Impact	Lebuh Armenian	Lebuh Carnavon	Jalan Majlis Kapitan Keling	Lebuh Chulia	Lebuh Pantai	Lorong Love	Jalan Burma	Lebuh King	Summation
Price of Heritage Property	6.72	-	0.97	0.80	0.83	**0.73**	0.88	0.83	0.83	0.83	6.72
Rent of Heritage Property	6.97	-	0.97	0.89	**0.71**	0.89	0.83	0.90	0.88	0.89	6.97
Conservation of Heritage Property	5.49	-	0.70	**0.57**	0.62	0.68	0.71	0.77	0.67	0.78	5.49
Maintenance of Heritage Property	5.55	-	0.77	0.69	0.71	0.68	**0.63**	0.70	0.71	0.68	5.55
Age of Heritage Property	6.43	+	0.83	0.86	0.75	0.83	0.70	**0.97**	0.79	0.68	6.43
Condition of Heritage Property	5.77	+	0.70	0.69	0.67	0.68	**0.83**	0.77	0.71	0.73	5.77
Nearest Health Services	5.33	+	0.56	0.66	0.63	0.63	0.71	**0.77**	0.71	0.68	5.33
Nearest Public Transport Services	5.87	+	0.77	0.72	**0.80**	0.63	0.79	0.70	0.75	0.73	5.87
Nearest Open Space and Recreational Areas	5.36	+	0.70	**0.72**	0.67	0.57	0.67	0.70	0.67	0.68	5.36
Nearest Schools	4.82	+	0.63	0.57	0.63	0.57	0.58	0.63	0.54	**0.68**	4.82
Nearest Mural Paintings	7.02	+	0.90	0.89	0.88	0.73	0.92	**0.97**	0.83	0.89	7.02
Topography	4.34	-	**0.42**	0.54	0.50	0.52	0.50	0.56	0.63	0.68	4.34
Number of Tourist Arrivals	7.08	+	0.90	0.92	0.88	0.83	0.79	**0.97**	0.83	0.94	7.08
Image of Penang	6.32	+	0.77	0.83	0.71	0.68	0.83	**0.90**	0.71	0.89	6.32
Tourist Expenditures	6.35	+	0.90	0.80	0.71	0.68	0.79	**0.97**	0.71	0.78	6.35
Traffic Congestion	5.21	-	0.83	0.69	0.58	0.73	0.67	**0.42**	0.67	0.63	5.21
Crime Rate	5.37	-	0.77	**0.60**	0.63	0.68	0.71	0.70	0.63	0.68	5.37
Total	100	-	13.08	12.43	11.89	11.74	12.55	13.21	12.27	12.83	100

Table 7   Relative Significance of Alternatives

	Lebuh Armenian	Lebuh Carnavon	Jalan Majlis Kapitan Keling	Lebuh Chulia	Lebuh Pantai	Lorong Love	Jalan Burma	Lebuh King
S+	7.6504	7.6604	7.3026	6.8331	7.6281	8.3459	7.2608	7.6677
S-	5.4248	4.7690	4.5902	4.9032	4.9240	4.8684	5.0075	5.1640
1/S-	0.1843	0.2097	0.2179	0.2040	0.2031	0.2054	0.1997	0.1936
Q	12.1687	12.8001	12.6425	11.8322	12.6059	13.3806	12.1557	12.4143

Table 8   Final Results of Sustainability of Business in Georgetown

	Lorong Love	Lebuh Carnavon	Jalan Masjid Kapitan Keling	Lebuh Pantai	Lebuh King	Lebuh Armenian	Jalan Burma	Lebuh Chulia
Priority	1	2	3	4	5	6	7	8
U (%)	100.00	95.66	94.48	94.21	92.78	90.94	90.85	88.43

Based on the weights of each criterion, the study also finds that the Number of Tourist Arrivals is the leading criterion for the sustainability of a business, while Topography is often overlooked as one of the least influential criteria. Lorong Love scores very high in criteria such as "Age of Heritage Property", "Nearest Mural Paintings", "Number of Tourist Arrivals" and "Tourist Expenditures". These criteria also seem to be related to each other as mural paintings and pre-war properties in Georgetown are some of the most iconic attractions for tourists. Also, there are several criteria deemed to be less impactful towards business sustainability such as "Topography", "Traffic Congestion", "Conditions of Heritage Property" and "Nearest Open Space and Recreational Areas". While conducting the questionnaire survey, some of the respondents are of the opinion that topography does not help them to attract customers or visitors and they cannot renovate the buildings to improve their conditions due to the Special Area Plan of Georgetown. Besides that, Lorong Love has a greater advantage over Lebuh Chulia with a difference of 11.57% over the scale of the degree of utility. On the other hand, Lebuh Carnavon shows only a minor difference in the utility degree of 4.34%, which is a slight disadvantage as compared to Lorong Love.

5.   Conclusion

The COPRAS method is a more transparent and simpler MCDM method as compared to the Analytic Hierarchy Process (AHP) or TOPSIS (Chatterjee et al., 2011). The use of this method clearly shows the difference between contradicting factors and provides a ranking alternative. COPRAS can also be applied in other research works and studies to help researchers determine the best alternatives.

The initial aim of this research is to study the sustainability of businesses in heritage properties in Georgetown. Based on the given criteria and alternatives analysed by using the COPRAS method, the most sustainable alternative has been determined. However, it is still too early to determine which areas in Georgetown offer the best sustainability for business. Lorong Love is the most sustainable area in Georgetown in terms of business. This is due to the fact that it has scored well in 7 out of 18 conflicting criteria. This means that Lorong Love has the best characteristics or elements that suit business operations.

The concept of the scale of importance is adopted in the questionnaire of this research work to gauge the weight of each criterion. Although the criteria of the COPRAS method may conflict with one another, the degree to which they will affect a business still varies. The most influential factor that affects business sustainability in Georgetown is "Number of Tourist Arrivals". This shows that more tourist arrivals will increase the sustainability of a historical area. As tourists are the main source of income to businesses in tourism areas, many business owners in this survey feel that it is the most important criterion that

will significantly affect their business sustainability. Despite the high rental and property price of heritage properties, business owners still choose to run their business in an area with a high volume of tourists as a trade-off over the negative influence of rent and property price. This may be due to the increased sales revenue which can offset the high rental fees and at the same time, offer a lucrative profit.

The business sustainability of heritage properties contributes as a small measure to the economy as a constituent of the tourism sector. The impact on the local economy in terms of job creation, property value, income and profit remittance has uplifted the Penang tourism sector. The UNESCO status of Georgetown city has made Penang the foremost heritage and tourism destination in Malaysia. The property value appreciation has also stimulated the local property market as shown in Table 8 where 88% to 100% of businesses in heritage properties can be sustained in various districts of Georgetown. Lorong Love is a busy business street in Penang which has attracted infrastructure for tourist enjoyment. The city of Georgetown will continue to impact positively on the tourism sector of Malaysia, its GDP and economic development.

The recent property market overview of commercial property transactions in Malaysia shows a 75% occupancy rate in Georgetown (Napic-JPPH, 2020). The volume and value of commercial property transactions showed stable growth from 15,862 (RM 6.1 bn/USD1.51 bn) in 2001 to 23,936 (RM 29.51 bn/USD7.32 bn) in 2018. Current transactions at the end of Q1 2020 stand at 8118 (RM 8.5 bn/USD2.01 bn) with the Georgetown property index experiencing a slight slide from 128.5 to 127 basic points (1.1%) between Q2 2019 and Q2 2020 (NAPIC-JPPH, 2020). Therefore, the continuous sustainability of the heritage property businesses and the contribution of this sector to the Malaysian economy will remain a concern in the face of the global coronavirus (Covid-19) pandemic which has impacted all economies especially travel and tourism.

The results also suggest that policy implications on businesses in heritage properties are complex in nature due to its dependency on tourist arrivals. In fact, this suggests that any policy implementation for heritage properties cannot be taken separately from modern urban development. As such, policymakers should be aware that the expected impacts of economic activities could vary from the traditional perspective. Hence, the businesses in heritage properties should have an interrelationship with other businesses in the surrounding modern buildings which remain to be explored.

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