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The Influence of the Cultural Aspect on Built Environment of Traditional Villages

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Abstract

The paper explores re-thinking designing traditional villages. It focuses on the cultural aspects that form traditional villages and their different architectural and urban design qualities. Several questionnaires are distributed to assess the relation between the cultural aspect and the qualities of the physical built environment to suggest an assessment tool for investigating and quantifying the cultural aspect and physical built environment qualities of future traditional villages' designs.
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Keywords: Traditional architecture, traditional communities, architectural and urban design qualities, physical built environment, cultural aspect, heritage cities.

1. Introduction

The term traditional architecture is used to categorize a method of construction which uses locally available resources to address local needs. It tends to evolve over time to reflect the environmental, cultural, and social context in which it exists. (Abd Ellah, 2009) It reflects cultural expressions with its programmed spaces and urban configurations. (Hamza, N., 2019) Rapaport and Oliver tried to identify the fundamental principles that characterize traditional architecture. They emphasized the role of the cultural aspect as the basic aspect while the others are modifying aspects. (Rapaport, A., 2006) Local and traditional construction products are derived from the connection between human and the built environment which reflect the culture of human life. As for the cultural aspects, beyond the physical structure there are levels of significance that are not materially evident, and which may be comprehended through the language by which a culture expresses the conceptual realities of its environment. So, the traditional meaning as in other aspects of the built environment is communicated through the forms, configurations, and details of the buildings, and through the behavioral patterns of their users. Hence a problem appears when the architect is required to design traditional communities: What could the effect of urban areas' design on people be? Designers may have challenges in developing a better urban environment and improved quality of life for traditional communities due to a lack of awareness of what they require for their areas. The goal of this study is to gain a deeper and more practical understanding of how traditional villages may be developed and built by experts to be more successful, meet people's diverse needs, and not interfere with their natural responses. This aim will be achieved by discussing the built environment of traditional villages and the cultural aspect forming these types of villages. This leads to the description of a set of dimensions of the cultural aspect and to determine the relation between them and their architectural and urban qualities to achieve an assessment for investigating and quantifying the architectural and urban qualities of the physical built environment of traditional villages and their cultural aspect, as shown in figure (1).

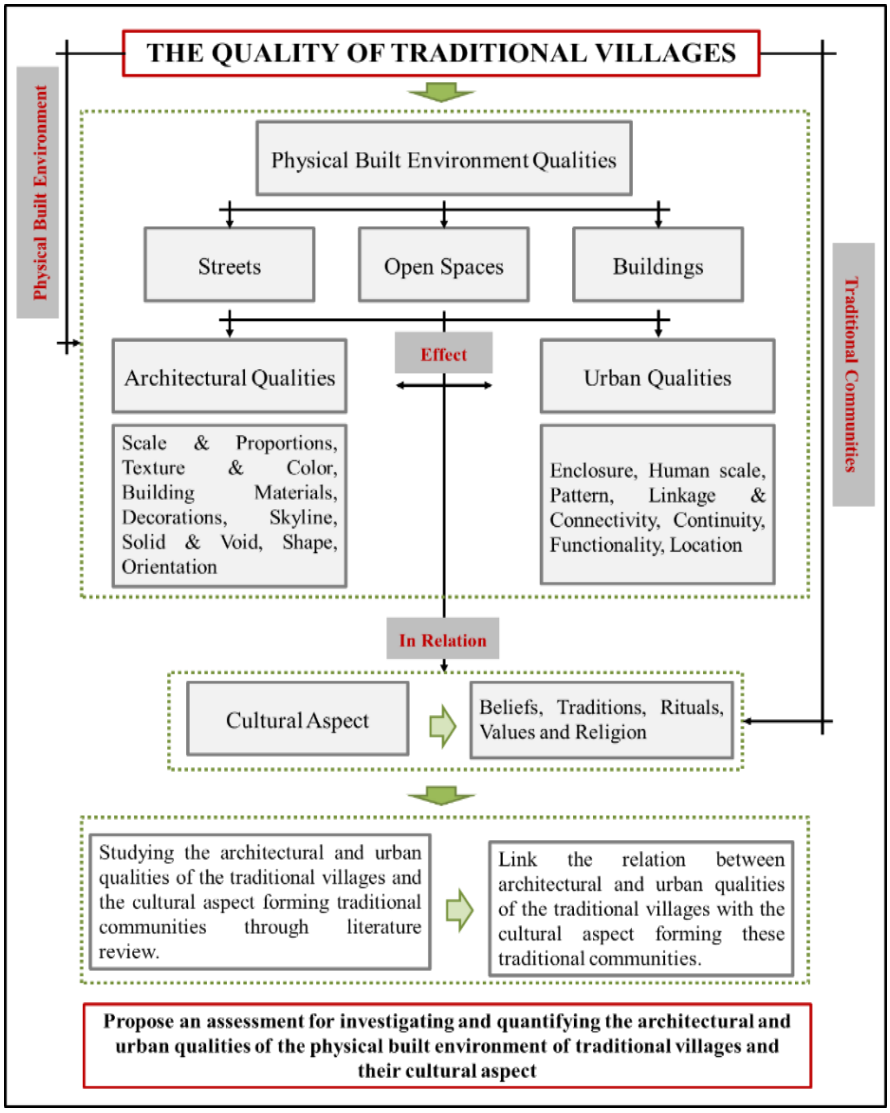

Figure 2. The Research Detailed Scope

2. Architecture, Urban Design Qualities And The Physical Environment Of Traditional Villages

Quality in design is connected to a set of values. The fact that the perception of quality connotes values, varies with time and is different among individuals. In addition, it does not free professional judges from taking a stand on essential quality questions.

Therefore, quality in architecture and urban design appears to be a fundamentally arguable concept that is subject to a wide range of interpretations. (Rönn, 2010).

2.1. The Perception of Architectural Design Qualities

Throughout history, societies have developed unique types of architecture, reflecting local cultural, social, and geographic forces. (Warnaby, 2009) (Oppong, R.A., Marful, A.B., Sarbeng, Y.K., 2018). These forces give buildings their unique character. Character is a function of visual perception: Seeing a building is seeing its constituent parts and features which impart the sense of a unique ambiance or the observed character. (Elwazani, S., Katara, P., 2019) It alludes to all of the aesthetic and physical characteristics that make up a building's look. The orientation, overall shape of the building, decorative features, texture & color, solid, void and skyline, as well as many factors of its site and environment, are all character elements. There are several approaches of comprehending unusual structures. They can be used to illustrate particular building kinds, architectural styles, or materials. Aside from its functional kind, materials, construction, and style, there are many other aspects of a building that contribute to its unique features or significance. Scale, proportions, texture, building materials, colors, decorations, skyline, and solid & void are some of these qualities.

2.2. Concept of Urban Design Qualities

Physical characteristics influence urban design qualities, although they are separate from them. They reflect how people see and interact with their surroundings in general. These aspects of urban planning, such as continuity, pattern, enclosure, human scale, linkage, functionality, location, and connectivity are separate from attributes such as comfort, safety, and degree of interest, which reflect how an individual reacts to a place and how they perceive the conditions there, given their own attitudes and preferences. (Mahmoud I., El Sayary S., El Hagla K., 2013)(Shedid M., Hefnawy N., 2021) Various people have different reactions to different perceptions. Individual reactions, on the other hand, cannot be examined objectively by outside observers. Individual reactions to the environment as a location to stroll, stay, enjoy, live, and sit may be influenced by all of these variables, including physical features, urban design aspects, and individual reactions. (Ewing and Handy 2009).

2.3. The Physical Environment of Traditional Villages

The many elements that contribute to the physical shape of traditional villages are isolated from their surroundings, allowing more effective examination and comprehension. Traditional villages are morphologically extremely complex objects. In other words, they are items made up of various pieces or sections. (Oliveira V., 2016). It is possible to recognize a hierarchy in these connections and to distinguish different relationships between these items "from the portion to the whole." (Oliveira V, Monteiro C, Partanen J (2015). To meet the high demands of traditional villages, urban morphology employs a hierarchical picture of the village, which is organized around a set of basic physical characteristics. The village is made up of urban tissues on a broad scale, as shown in figure (2).

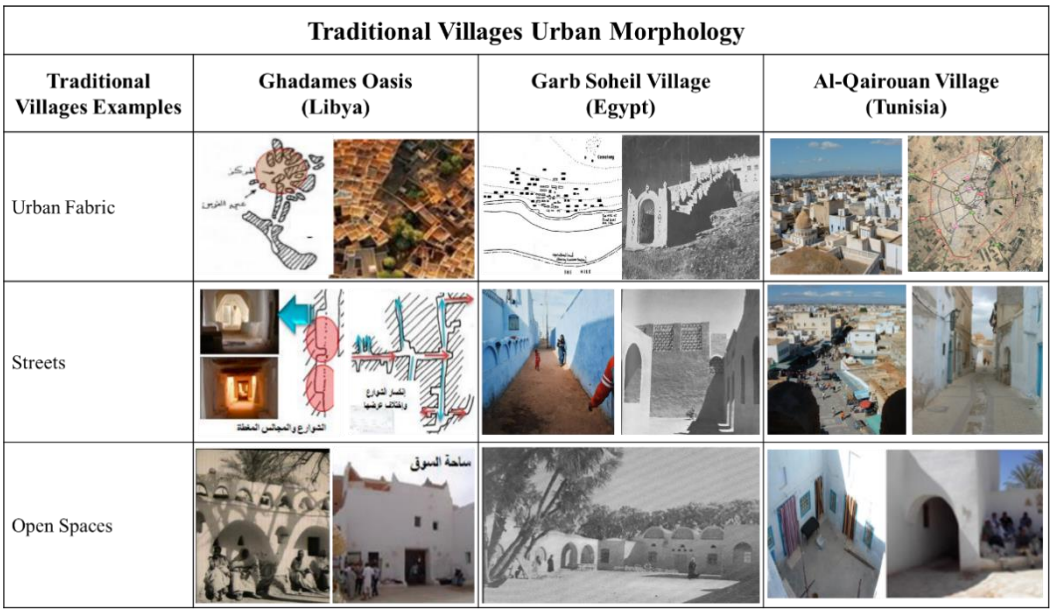

Figure 2. Different examples of the physical environment of traditional villages

Different levels of resolution can be detected in these urban tissues. These levels correspond to various aspects of urban form. The higher the level of resolution, the more information is exhibited and the more specific the morphological description becomes. The tissue could be made up of various pieces with a high level of precision, such as the construction materials of an open space or building. (Kropf 1996) Streets, open spaces, and buildings are the elements of urban form that make up all villages and their tissues. However, these streets, street blocks, plots, and buildings are joined in a certain way in each traditional town, resulting in diverse sorts of tissues.

3. Studying Traditional Architecture From A Cultural Perspective

Traditional architecture fulfils the fundamental demands of consumers. It is determined by and reflects the cultural elements passed down from generation to generation. Rapaport identified the cultural influence in flouncing the built form of traditional surroundings in his book "House Form and Culture." Beliefs, traditions, rituals, values, and religion are all part of the cultural component. The cultural component-according to a variety of academics, scholars, and practitioners from many academic disciplines and professions – is a complex surrounding environment that encompasses beliefs, practices,

rituals, beliefs, and religion. (Samovar, Porter, 2001) Traditional cultures must value notions of location, identity, evolution, ownership and lastly, community as they compete. This is to underline that cultural legacy is not just a result of traditional groups; it is also about the unique settings where they reside. This was always visible in the shifting habits, dialects, languages, conventions, and other characteristics of the same traditional society living in different regions. (Shetawy, El-Shafie, 2013) (Shedid, 2019).

4. Methods

This analytical study was divided into two phases as following, as shown in Fig.3.

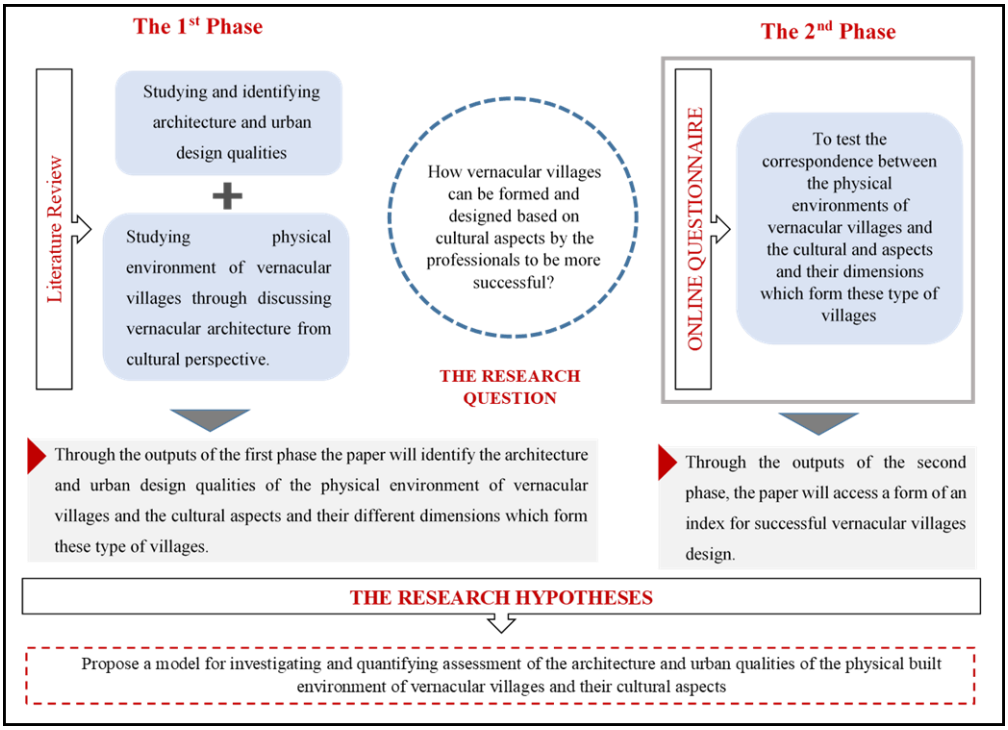

Figure 3. Formation of the research methodology.

4.1. The First Phase

The first step consists of reading the literary and theoretical foundations of architecture and urban design aspects, followed by a study of the physical built environment of traditional villages through discussions of traditional architecture from a cultural standpoint. The paper will define the architectural and urban design aspects of traditional villages' physical environment, as well as the cultural component and its various dimensions that make up these sorts of villages, using the outputs of the first phase.

4.2. The Second Phase

An online questionnaire was conducted to examine the relationship between the physical settings of traditional villages and the cultural feature and dimensions composing these sorts of villages. Through the outputs of the second phase, the paper will determine the significant between the architectural and urban design qualities and the most important dimensions that impact the cultural aspects.

4.2.1. Participants

The sample was instructed to target 25 participants in each study subgroup with the title “urban design, and architect". The final sample consisted of 63 participants, including 31 men and 32 women. Some of the sample participants have a background in architecture and urban planning. The sample represented 5 age groups: from 20-35 years "n = 45", from 36-45 years "n = 15", from 46-55 years "n = 3", from 55-65 years "n = 0 “and over 65 years" n = 0 ". The sample fulfilled several criteria including fitting in range of age groups with different marital status, working conditions and understanding of the urban valuable physical and non-physical qualities.

4.2.2. Stimuli

The empirical study was based on an online questionnaire for architects and urban designers, with the main purpose of grading the many dimensions of cultural aspects forming traditional villages in terms of their impact on the design principles of streets, open spaces, and buildings from the perspective of the urban designer and architect. To achieve this goal, the previous literature review's questionnaire design had to be taken into account. There were two components in each questionnaire.

- **The first one** concerning participants’ age, gender, and job.
- **The second one** was a grading system. Questions were used to evaluate the multiple facets of the cultural aspect in terms of their impact on the architecture and urban design qualities of traditional villages' external structures, as well as the correspondence between traditional villages' physical environments and this aspect and its dimensions constituting these forms of villages. All participants agreed to take part in the survey.

4.2.3. Procedures

The required data was collected using an online questionnaire method. The questionnaire form had two sections as following:

- **The first section**: Participants were asked to provide basic details (age, gender, and job) in response to multiple choice (single answer) questions, which enable respondents to choose only one answer from a list using circular radio buttons.
- **The second section**: Participants were requested to rate the different dimensions of the cultural to their impact on architecture and urban design qualities of the physical environment of traditional villages. The participants were asked to rank the aspects using 5-points rating scale questions (1 “the lowest rating” to 5“the highest rating”).

5. Results and Discussion

This part was divided into two phases:

5.1. The first phase: analyzing and displaying the methods and statistics used

This was achieved through studying the following:

1. Statistical description of the data captured in Mean, Measure of Tendency, Coefficient of Variation, and Measures of Dispersion.
2. The Friedman test and this test is used in analyzing K-related.
3. The Wilcoxon test and this test is used in studying 2-related.

5.2. The second phase: sorting the questionnaire results

Raw data obtained from the questionnaire was entered into an excel file. The data included opinions taken from architects, and urban designers. A total of 63 samples were taken, divided equally between each specialization.

To study the relation between the different dimensions of the cultural aspect and their impact on the physical built environment (streets, buildings, and open spaces) of traditional villages, the obtained data was rearranged in a form that could be easily analyzed through:

1- A code was generated for every dimension of the cultural aspect, as shown in table1

The following table shows the encoding of the dimensions of the cultural factor influencing the physical built environment (streets, open spaces, and buildings).

Table 1: Codes for the dimensions of the cultural aspect that effect the physical built environment according to their input into the computer

Different dimensions of the cultural aspect	**Codes of Street Urban Qualities**				
	Street pattern	Human scale	Enclosure	Linkage & connectivity	Continuity
Beliefs	X13-1	X13-2	X13-3	X13-4	X13-5
Values	X14-1	X14-2	X14-3	X14-4	X14-5
Traditions	X15-1	X15-2	X15-3	X15-4	X15-5
Rituals	X16-1	X16-2	X16-3	X16-4	X16-5
Religion	X17-1	X17-2	X17-3	X17-4	X17-5

Different dimensions of the cultural	**Codes of Open Spaces Urban Qualities**					
	Street pattern	Functionality	Human scale	Enclosure	Location	Linkage & connectivity

aspect						
Beliefs	X25-1	X25-2	X25-3	X25-4	X25-5	X25-6
Values	X26-1	X26-2	X26-3	X26-4	X26-5	X26-6
Traditions	X27-1	X27-2	X27-3	X27-4	X27-5	X27-6
Rituals	X28-1	X28-2	X28-3	X28-4	X28-5	X28-6
Religion	X29-1	X29-2	X29-3	X29-4	X29-5	X29-6

Different dimensions of the cultural aspect	**Codes of Building Architectural Qualities**					
	Orientation	Shape	Skyline	Texture & Color	Decorations	Solid & Void
Beliefs	X37-1	X37-2	X37-3	X37-5	X37-6	X37-4
Values	X38-1	X38-2	X38-3	X38-5	X38-6	X38-4
Traditions	X39-1	X39-2	X39-3	X39-5	X39-6	X39-4
Rituals	X40-1	X40-2	X40-3	X40-5	X40-6	X40-4
Religion	X41-1	X41-2	X41-3	X41-5	X41-6	X41-4

2- The results of Friedman test: Table (2) displays the results of the statistical description, as well as the Friedman test to determine the significance between the different urban and architectural qualities of the physical environment of traditional villages. If there was no significance between the different urban and architectural qualities, these qualities were ranked according to its relative importance.

Table 2: The results of the statistical description and Friedman test

Built Environment	Urban & Arch. Qualities	Variables	Some of Descriptive Statistics			Test Statistics		Arrange
			Mean	Std. Dev	C.V%	Mean Rank	F Test	
Streets	Human scale	X13-2	3.17	1.326	41.782	3.06	Chi-sq =0.286 d.f = 4 sig = 0.99 p > 0.05,N.S	4
		X14-2	3.16	1.066	33.737	2.96		5
		X15-2	3.27	1.050	32.125	3.01		1
		X16-2	3.24	1.160	35.823	2.94		3
		X17-2	3.25	1.448	44.489	3.02		2
	Linkage & connectivity	X13-4	3.11	1.345	43.24	2.98	Chi-sq =0.730 d.f = 4	3
		X14-4	3.11	1.049	33.72	3.05		2
		X15-4	3.10	1.118	36.10	2.98		4

		X16-4	3.08	1.112	36.10	2.90	sig = 0.948	5
		X17-4	3.19	1.424	44.63	3.10	p >0.05,N.S	1
Open Spaces	Pattern	X25-1	2.90	1.478	50.88	2.87	Chi-sq = 2.508 d.f = 4 sig = 0.643 p > 0.05,N.S	5
		X26-1	2.98	1.100	36.85	2.90		4
		X27-1	3.32	1.029	31.01	3.17		1
		X28-1	3.13	1.129	36.09	2.90		3
		X29-1	3.27	1.382	42.26	3.14		2
	Functionality	X25-2	3.06	1.585	51.73	2.93	Chi-sq = 3.264 d.f = 4 sig = 0.515 p >0.05,N.S	4
		X26-2	2.97	1.204	40.58	2.82		5
		X27-2	3.17	1.071	33.72	2.92		3
		X28-2	3.38	1.084	32.06	3.23		1
		X29-2	3.21	1.370	42.72	3.10		2
	Enclosure	X25-4	3.16	1.472	46.61	2.89	Chi-sq = 0.852 d.f = 4 sig = 0.931 p >0.05,N.S	5
		X26-4	3.29	1.099	33.44	3.02		4
		X27-4	3.37	0.972	28.89	3.02		2
		X28-4	3.32	1.229	37.04	2.96		3
		X29-4	3.41	1.477	43.28	3.11		1
	Location	X25-5	3.14	1.435	45.67	3.01	Chi-sq = 4.233 d.f = 4 sig = 0.373 p >0.05,N.S	2
		X26-5	3.06	1.216	39.71	2.98		5
		X27-5	3.11	1.049	33.71	2.54		4
		X28-5	3.13	1.085	34.70	2.57		3
		X29-5	3.43	1.329	38.74	3.30		1
Buildings	Skyline	X37-3	2.73	1.578	57.80	2.67	Chi-sq = 8.800 d.f = 4 sig = 0.066 p >0.05,N.S	5
		X38-3	2.86	1.255	43.93	2.85		4
		X39-3	3.10	1.118	36.11	306		2
Buildings	Skyline	X40-3	3.03	1.282	42.29	3.06		3
		X41-3	3.25	1.545	47.47	3.36		1
	Texture & Color	X37-5	3.06	1.615	52.72	3.00	Chi-sq = 6.450 d.f = 4 sig = 0.16 p >0.05,N.S	3
		X38-5	3.03	1.218	40.17	2.97		4
		X39-5	3.3	1.087	32.93	3.21		1
		X40-5	3.03	1.288	42.26	2.58		5
		X41-5	3.40	1.519	44.72	3.24		2
	Decorations	X37-6	3.22	1.419	44.04	3.00	Chi-sq = 8.846 d.f = 4 sig = 0.64 p >0.05,N.S	3
		X38-6	3.14	1.268	40.35	2.97		4
		X39-6	3.44	1.028	29.85	3.21		1
		X40-6	2.89	1.233	42.68	2.58		5
		X41-6	3.35	1.504	44.92	3.24		2
	Solid & Void	X37-4	3.03	1.365	54.63	3.03	Chi-sq = 4.981 sig = 0.289 p >0.05,N.S	3
		X38-4	3.02	1.301	43.24	2.98		4
		X39-4	3.10	1.043	33.69	2.98		2
		X40-4	2.89	1.220	42.21	2.73		5
		X41-4	3.35	1.472	43.95	3.29		1

3- The results of Wilcoxon test: The following tables display the results of the Wilcoxon test to determine the most important dimensions that impact the cultural aspects.

(1) Is the value of Wilcoxon test and (2) is the significant difference of Wilcoxon test.

Table 3: The results of Wilcoxon test between the different dimensions of the cultural aspect and street pattern.

Different dimensions of the cultural aspect	X13-1	X14-1	X15-1	X16-1	X17-1
X13-1	-	1.037(1) 0.300(2)	1.797(1) 0.072(2)	0.567(1) 0.571(2)	0.260(1) 0.795(2)
X14-1		-	1.187(1) 0.235(2)	1.705(1) 0.088(2)	0.189(1) 0.850(2)
X15-1			-	3.129(1) 0.002(2)	1.350(1) 0.177(2)
X16-1				-	1.707(1) 0.088(2)
X17-1					-

It is clear from the table above that there was a significant difference between the traditions and rituals dimensions. The statistical description in table (2) confirmed that these significant differences are proved to traditions.

Table 4: The results of Wilcoxon test between the different dimensions of the cultural aspect and street linkage & connectivity.

Different dimensions of the cultural aspect	X13-3	X14-3	X15-3	X16-3	X17-3
X13-3	-	1.987(1) 0.047(2)	2.036(1) 0.042(2)	1.775(1) 0.076(2)	0.226(1) 0.829(2)
X14-3		-	0.226(1) 0.821(2)	0.511(1) 0.610(2)	1.926(1) 0.054(2)
X15-3			-	0.547(1) 0.547(2)	1.810(1) 0.070(2)
X16-3				-	1.989(1) 0.045(2)
X17-3					-

In table (4) there was a significant difference between the beliefs dimension and between the traditions and value dimensions. The statistical description in table (2) confirmed that the significant difference is in favour to traditions and value. There was another significant difference between rituals and religion dimensions and according to table (2) the significant difference was agreeable to religion dimension.

Table 5: The results of Wilcoxon test between the different dimensions of the cultural aspect and street continuity.

Different dimensions of the cultural aspect	X13-5	X14-5	X15-5	X16-5	X17-5
X13-5	-	$0.980^{(1)}$ $0.327^{(2)}$	$1.540^{(1)}$ $0.123^{(2)}$	$0.948^{(1)}$ $0.343^{(2)}$	$0.948^{(1)}$ $0.344^{(2)}$
X14-5		-	$1.469^{(1)}$ $0.142^{(2)}$	$1.752^{(1)}$ $0.080^{(2)}$	$0.699^{(1)}$ 0.485
X15-5			-	$3.134^{(1)}$ $0.002^{(2)}$	$0.556^{(1)}$ 0.578
X16-5				-	$2.766^{(1)}$ $0.006^{(2)}$
X17-5					-

In table (5) there was a significant difference between the rituals dimension and also between the traditions and religious dimensions. The statistical description in table (2) confirmed that the significant difference was agreeable to tradition and religion dimensions.

Table 6: The results of Wilcoxon test between the different dimensions of the cultural aspect and human scale of open spaces

Different dimensions of the cultural aspect	X25-3	X26-3	X27-3	X28-3	X29-3
X25-3	-	$2.259^{(1)}$ $0.024^{(2)}$	$2.539^{(1)}$ $0.011^{(2)}$	$2.140^{(1)}$ $0.032^{(2)}$	$1.860^{(1)}$ $0.060^{(2)}$
X26-3		-	$0.612^{(1)}$ $0.541^{(2)}$	$0.512^{(1)}$ $0.608^{(2)}$	$0.866^{(1)}$ $0.375^{(2)}$
X27-3			-	$0.033^{(1)}$ $0.973^{(2)}$	$0.239^{(1)}$ $0.811^{(2)}$
X28-3				-	$0.763^{(1)}$ $0.446^{(2)}$
X29-3					-

From the table above it is evident that there was a significant difference between the beliefs dimension and the value, traditions, and rituals, but the statistical description from table (2) proved that the significant difference were to value, traditions, and rituals dimensions.

Table 7: The results of Wilcoxon test between the different of the cultural aspect and the building shape.

Different dimensions of the cultural aspect	X37-2	X38-2	X39-2	X40-2	X41-2
X37-2	-	$1.428^{(1)}$ $0.153^{(2)}$	$0.005^{(1)}$ $0.996^{(2)}$	$0.300^{(1)}$ $0.764^{(2)}$	$1.324^{(1)}$ $0.125^{(2)}$
X38-2		-	$1.232^{(1)}$ $0.218^{(2)}$	$1.194^{(1)}$ $0.232^{(2)}$	$2.410^{(1)}$ $0.016^{(2)}$
X39-2			-	$0.397^{(1)}$ $0.691^{(2)}$	$1.304^{(1)}$ $0.190^{(2)}$
X40-2				-	$1.339^{(1)}$ $0.180^{(2)}$
X41-2					-

From the table above that there was a significant difference between the value and religion dimensions and the statistical description from table (2) proved that the significant difference was to religion dimension.

6. Conclusion

The paper answered the research question “How can traditional villages be formed and designed by professionals to be more successful and provide the different needs of people and not conflict with people’s natural responses?” through determining the significant between the architectural and urban design qualities and the most important dimensions that impact the cultural aspects. The following charts illustrate the findings of the applied study presented in the results of the online questionnaire, which lead us to know what the most important dimensions and fundamentals of the urban and architecture design qualities are and also the dimensions of the cultural aspects to be considered in designing traditional villages.

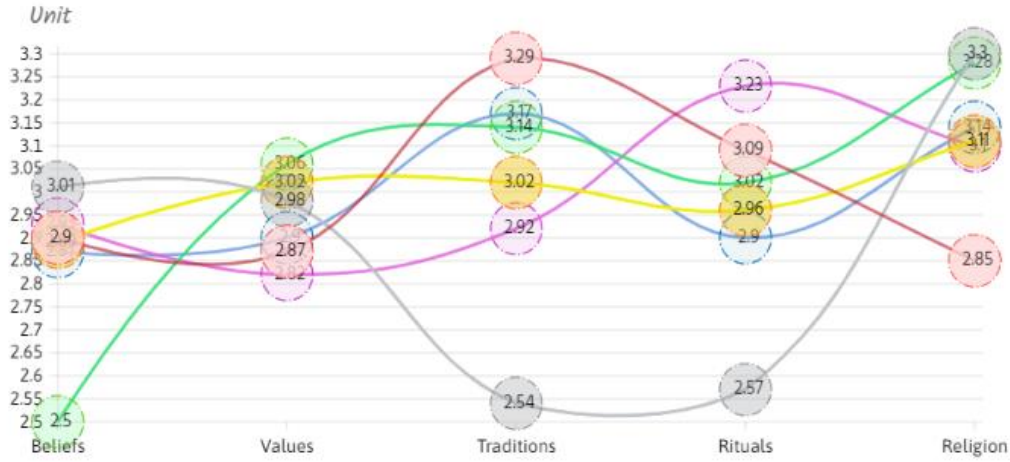

Chart 1: The results of the statistical description of Friedman test, the relation between open spaces and cultural dimensions.

Components with the heights score are the relation between pattern and tradition, functionality and rituals, enclosure and location and religion. Components with the least score are the relation between pattern and enclosure and beliefs, functionality and location and value.

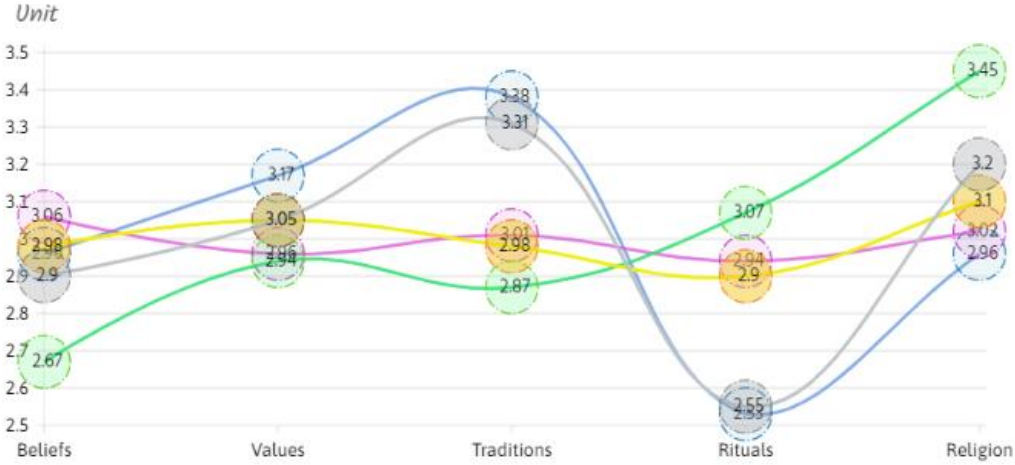

Chart 2: The results of the statistical description of Friedman test, the relation between streets and cultural dimensions.

Components with the heights score are the relation between human scale and tradition, and linkage & connectivity and religion. Components with the least score are the relation between human scale and value, and linkage & connectivity and rituals.

Chart 3: The results of the statistical description of Friedman test, the relation between buildings and cultural dimensions

Components with the heights score are the relation between the shape and religion, and the relation between the orientation and religion. Components with the least score are the relation between the values and the shape, and the relation between the beliefs and orientation.

Ethical Approval and Consent to Participate

The study was conducted within the tenets of the declaration of Helsinki.

Consent for publication

The manuscript does not contain any individual personal data and all participants were over 20 years of age.

Availability of data and material

All relevant data concerning the paper can be supplied by the first author (Mona Shedid, Associated Professor, Department of Architecture, Faculty of Engineering-Benha, Benha University, E mail: monashedid@bhit.bu.edu.eg), upon request.

Competing interests

The Authors declare no competing interest regarding the subject of the study.

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Authors' Contributions

Both MS and AS conceived of the presented idea, developed the theoretical formalism through collecting and analyzing data. They designed and constructed the questionnaire then analyzing the data and results. All authors read and approved the final manuscript.

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