The Impacts of Architectural Models in Public Environment

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Abstract— **Models are one of the oldest mediums used for creating, communicating and representing ideas throughout the ages, whether these ideas are based on dogmatic, intellectual, ideological, or architectural thought (belief). Whatever their purpose, models, embody a value that reflects their worth to their makers/owners; but this value is not easy to quantify as it may be based on implicit considerations that are difficult to define and measure. On the other hand, it is possible to add measurable value to human endeavors by the use of models. The purpose of this study is, therefore, to investigate the impacts and importance of models in public domain; and to determine the value added to a project by model making.**

Data in this domain was gathered from interviews and local officials. In the public domain, the value added due to the impact of architectural models was measured by conducting a survey amongst the visitors to the Miniaturk Park in Istanbul. It was determined that model making can be used as a tool to add value to architectural projects and edifices. It was also seen that the value-added impact of architectural models in the public domains could be accurately measured. In this study, it is asserted that it not always true that the impacts of architectural models in public domain can be considered as qualitative data, but it can be most of the time be converted into quantitative data. These impacts and implications are of importance in several aspects: economic, heritage, cultural and historical.

Index Terms: **Model-making, Physical models, Digital models, Impacts of models, Value-added**

I. INTRODUCTION

Modeling has an evolving history since ancient times. In his book titled "Designing with Models", Mills (2005) went over a brief introduction about "model history". He tried to highlight the importance of models in general, through the historical narrative summary by addressing the role of models in ancient civilizations to the present day. Accordingly, models were made primarily as symbols during Egyptian and Greco-Roman times, whereas builders during the Middles Ages "with the advent of cathedrals" were carrying and presenting their individual expertise through the making of mock-up models, such as arches for buildings. Additionally, models during the Renaissance were used as "a means to attract the support of patrons", as mentioned by Mills [2005] and Dunn [2010] in the case of the "*Duomo* in Florence", Italy.

After the domination of architectural education by Beaux Arts training, models were replaced almost completely by drawings (elevation & plans studies). However, by the late 1800s, the use of models as an explorative tool began to be implemented in architectural design, as seen in the work of Antonio Gaudi, to explore structural ideas and developing an architectural language, for example in his design of *the Sagrada Família* "Figure. 1, 2". After that period, a shift to modern architecture had begun to be noticed, where the role of "orthographic and perspective" drawings had a limited usage as a method of exploration, giving priority to the model as "a design tool" [Mills 2005 & Mills 2011 & Dunn 2010].

Between the 1920s-1930s, during the Bauhaus period, the use of model making took the core of architectural education and practice. Criss Mills pointed out that during the period of modernity, i.e. the 1950s; the 'role of modeling in architecture began to decline due to the embodiment of platonic solids (cube, cylinder, etc.) as a reductive and unsophisticated design approach'. Until the late 1970s when the modernism thought was weakened, the 'model regained its position again as a powerful tool' for design exploration "Figure. 3" [Mills 2005].

Figure 1. Antonio Gaudi, Reproduced Model of "La Sagrada Familia", 1983-1926. Up Side down Structural Analysis Made from Strings and Weighted Sacks.
(Source:https://www.flickr.com/photos/tillnm/3209875667/in/photostream/)

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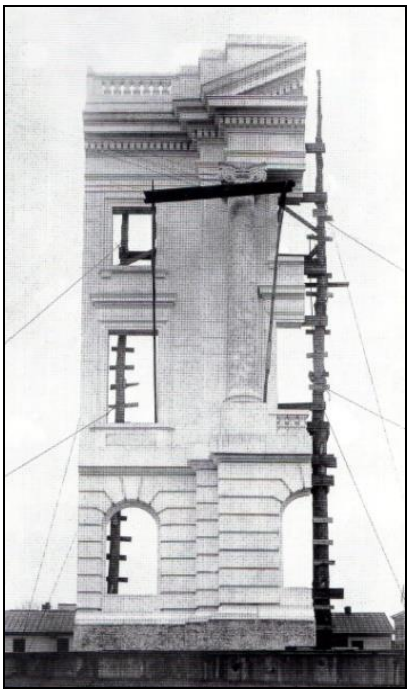

Figure 2. Department of Agriculture Building, 1905. Modelled by James Parrington for Full-Size Mock-up. [Dunn 2010]

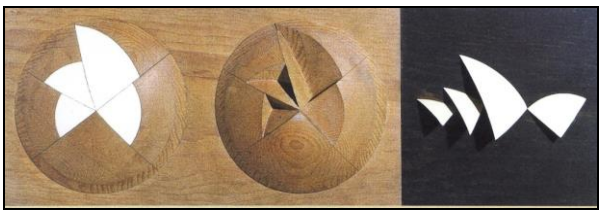

Figure 3. Wooden Concept Model of Sydney Opera House by Danish Architect Jørn Utzon, 1958. This Model Represents the Geometrical Solution for the Pre-cast Concrete Shells. [Dunn 2010]

During the 1990s, there was a challenge between the "model's role and the shift in technology" that was seen in the substitution of CAD and modeling programs as digital simulations for all experiences. Even though, the emergence and implementation of new technologies and "digital media" proved to offer positive benefits, the "immediacy and direct relationship" that can be offered by the making of physical models still play a crucial role in design process. According to Criss Mills, this claim was approved by Ben Damon, an architect with Morphosis (a pioneering office in rapid prototyping), when he stated that "Physical models will never go away" [Mills 2005]. Likewise, James Glymph who works for Frank Gehry Partners, has pointed out that it is misleading to think that digital modeling could entirely replace the role of drawing and physical models. Therefore, with this realization, incorporating both techniques each in its right place during the design progress would help to 'reduce the gap between design and production'/crafting by interconnecting physical design (traditional) and digital modeling methods "Figure. 4". [Moon 2005].

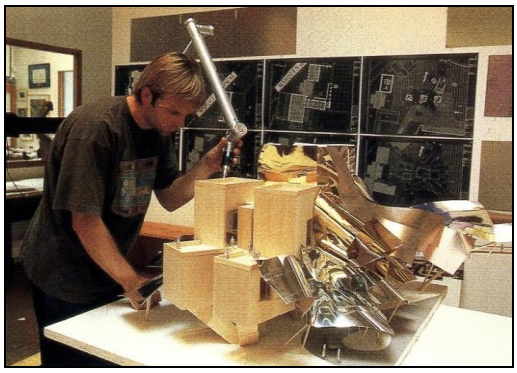

Figure 4. Final Design Model for Marques de Riscal Winery, 2000 Spain, Being Digitized by a Gehry Partners. [Moon 2005]

For comprehending the importance of 'scale models' to the design process, Albert Smith offered a chronological narrative for the development and the roles of models in architecture since the Egyptian scale models [Smith 2004]. Smith points out to the importance of models as a basic tool for the coexistence and adaptation of mankind to their environment, by going back to almost the very beginnings of human life, even before the appearance of housing. Here, he tried to focus on this phenomenon because of its active role in the lives of human beings in general. It should be mentioned that many researchers might ignore this role, while it is considered the core of the exploration, discovery, and communication processes in design creativity. Smith takes up the idea of a "stick" and its appearance in ancient human life, where it was the tool that could be used in all kinds of activities, such as walking, hunting, exploring, and also as a "scaling" tool "Figure. 5".

Figure 5. The idea of "stick" represented the appearance of models as a tool in ancient human life. [Smith 2004]

Therefore, the value and importance of "the stick" is that it offered the ancient people the ability to begin formulating an understandable measurement for defining the "invisible unknown". Consequently, the author tried to link several similarities between the stick and the architectural model in terms of their primary use, asserting that architectural models should be used typically as "thinking mechanisms", not only as a means to represent or design. Thus, architectural models served as "measuring mechanisms expanding the architect's intellectual capacity" to understand, create and express the complexity of the unknown or the undefined things.

In short, it can be inferred that models, since ancient times were not just a tool for representation or simulation, but also a tool for thinking and creating in order to cope with the environmental conditions of all constraints [Smith 2004]. This study highlighted that physical models do have significant impacts on public when they are used to represent actual buildings/projects to increase exposure (history, architecture, culture).

II. MATERIALS OF THE STUDY

Since the major concern of this study is to investigate the phenomena and impacts brought by the presence and the making of architectural models within the public domain, so the study will comprise the following materials:

1) Interviews with Miniaturk visitors & local authority officials:

a. Seventy visitors in Miniaturk (tourists & visitors) were interviewed.
b. Statistics regarding the number of foreign and Turkish visitors were obtained for the period 2003-2012 (from local officials).
c. Three local officials were interviewed in Miniaturk and two were interviewed in Sultan-Ahmet and Suleymaniye mosques and one in Haghia Sophia.

2) Number of visitors before and after the establishment of Miniaturk:

a. Statistics from Ministry of Culture-Turkey.
b. Number of foreign visitors from 2003-2012 and number of Turkish citizens visitors from 2003-2012.

3) Data of visitors from each historic building (density of visitors in each chosen building)/Visitors of Miniaturk.

4) Photographs of popular models and buildings (the most visited ones):

a. One hundred and seven physical models were photographed
b. Forty six models from Anatolian period were photographed.
c. Forty five models within and around Istanbul were photographed.
d. Twelve models abroad were photographed.
e. Four models of mobile machines, trains, and transportation systems were also photographed.
f. Sixteen of the most popular historic monuments of Istanbul were re-created in crystal (models) by means of laser technology.

III. METHOD OF THE STUDY

For the material collections (models' photographs, identifying the number of visitors, ages, sex, nationality, interview with visitors, statistics from authority) Miniaturk was visited several times (1st and 2nd visits on 15 October 2013 and 3rd the visit was from 26 April to 28 April 2014). At first, permission from Miniaturk authority was taken for touring and examining the contents of exhibition**.** This park contains 107 physical models made in 1/25 scale. Forty eight of the models are for buildings that exist within the territory of Istanbul, forty seven are from Anatolia, and 12 are from the Ottoman territories that today lie outside of Turkey. Additionally, four models of mobile machines, trains, and transportation systems are also presented. Each historic building's model was photographed and classified with its related information such as location of the actual building, brief history, construction date, etc. and physical models "Figure. 6-9". To investigate the impacts of models in public domain, Miniaturk was visited during the high season from the period between 26 April to 28 April 2014 in order to conduct as many **face-to-face interviews** as possible with the visitors to the park. These interviews have been made with randomly selected visitors. "Table. 1" presents the interview questions and answers to these questions are given in "Table 2".

TABLE 1. Interview Questions Used for "Miniatürk" Visitors. [Hatem 2015]

No	Type of questions
1-3	Nationality, Gender and Age
4.	Have you ever been to "Miniatürk" before? (Number of visits)
5.	Which of the models did you appreciate most? (selection of buildings from models)
6.	Do you have any historical information about the model(s) you appreciated? (How they appreciate the information offered by the model)
7.	Have you already visited or intend to visit the actual building of the chosen model? (before or after Miniatürk)
8.	If not, do you have any plan to visit the real building after visiting "Miniatürk"? (exploring the impacts of models)

Based on what has been mentioned so far, the historic buildings identified by tourists (from the models) as the most remarkable ones, corresponding real buildings were visited to collect data on the number of annual visitors. Therefore, these buildings and their models have also been photographed. As a result, interviewing visitors determined information on the advantages and disadvantages of models as well as the impacts of models as a motivational factor for visiting the historic buildings. To illustrate, visitors are asked whether they may decide to visit the real building after seeing its model at Miniatürk exhibition. They may already have been there or visited other buildings; this information determines the motivation and impacts of the models.

TABLE 2. Sample Data Obtained Through Interviews with Miniatürk Park Visitors. [Hatem 2015]

NO	NATIONALITY	Gender	AGE	NUMBER OF VISIT	SELECTED BUILDING	Planning to visit the real building	NOTES
1					Haghia Sophia	Yes	
	CANADA	M	50	1st	The Blue Mosque (Sultan Ahmet)	Yes	They are Canadian couple. They have already planned to visit both buildings
2					Haghia Sophia	Yes	
	CANADA	F	46	1st	The Blue Mosque (Sultan Ahmet)	Yes	
3					Haghia Sophia	Yes	
	IRAQ	M	26	1st	The Blue Mosque (Sultan Ahmet)	Yes	Translation is highly appreciated
4	TURKEY	M	47	2nd	Yerebatan Cistern (SARNICI)	Yes	They has already visited most of the monuments in Istanbul territory
5	TURKEY	F	40	1st	Yerebatan Cistern (SARNICI)	Yes	
6	IRAN	F	54	1st	Suleymaniye Mosque	Yes	These are an Iranian family. Miniaturk was hard for them to reach, not well advertised for assisting visitors and tourists.
7	IRAN	F	50	1st	Suleymaniye Mosque	Yes	
8	IRAN	M	13	1st	Suleymaniye Mosque	Yes	
9					Haghia Sophia	Yes	
	RUSSIA	M	24	1st	The Blue Mosque (Sultan Ahmet)	Yes	
10					Haghia Sophia	Yes	Russian couple. They were impressed by the "valuable" history offered by the models. They learned too much historical information for the 1st time. They decided to visit both buildings after Miniaturk.
					The Blue Mosque (Sultan Ahmet)	Yes	
	RUSSIA	F	22	1st	Aspendos Amphitheatre	Depends on time	
					Fairy Chimneys (Cappadocia)	Yes	
					Suleymaniye Mosque	Yes	

Figure 6. PhotoGraphed Models of Miniaturk, Sample-A. [Hatem 2015]

Figure 7. Photographed models of Miniaturk, Sample-B. [Hatem 2015]

Figure 8. Haghia Sophia, Istanbul (Built in 537). [Hatem 2015]

Figure 9. The Blue Mosque (Sultan Ahmet), Istanbul (Built in 1609). [Hatem 2015]

The data obtained from the visitors determined the most visited and/or planned to visit (selected) building(s), which were visited to find out the annual increase and decrease in the number of visitors. Concerning the interview with local authority officers, when these buildings were visited the aim was to obtain data that could identify the number of visitors before and after the establishment of Miniaturk that would show the annual increase and decrease in the number of visitors for each building "Tables 3 & 4". However, the interviews with local authority officers (Sultan-Ahmet and Suleymaniye mosques, Haghia Sophia and Topkapi Palace) yielded that it is very difficult if not impossible to identify whether or not the visitors came after they had visited Miniaturk. Thus, data gathered from interviews made with Miniaturk visitors could determine the impacts of models on public much more accurately (from the most chosen models) than the statistics obtained from the ministry. Consequently, based on data acquired from interviews, 6 buildings were identified as the most popular ones to be visited were, in order of preference: Haghia Sophia, Topkapı Palace, The Blue Mosque (Sultan Ahmet), Aspendos Amphitheatre, Fairy Chimneys (Cappadocia), and Suleymaniye mosque. The interview findings reflected a clear and significant impact of the models in motivating tourists to visit the real buildings.

IV. RESULTS OF SURVEY AND DISCUSSION

One of the challenges of this study was to investigate whether or not there is a significant impact of architectural models on the public, and what kind of impact might be brought about by a building model? Also, how an architectural model may affect the public at large, whether positively or negatively. Therefore, it was proposed to conduct a field study to obtain data that would provide an answer to these questions.

Not only in Turkey but also in many other countries architectural models have become the focus of public attention, and many countries tend to rely on models as a way to display their historical legacy, in dedicated parks. For example "Madurodam" which is the first miniature park in the world, is located in the Scheveningen district of The Hague in the Netherlands. Others may be identified as Walcheren Park in Middelburg city, Holland, "Minieurope" Located in Belgium's capital Brussels and Miniatur "Wunderland" in Hamburg, Germany, the largest model railway in the world. Besides Miniaturk which is situated at the north-eastern shore of the Golden Horn in Istanbul, there are two other miniature parks in Turkey that have adopted the idea of attracting tourists and public through architectural models: Minicity in Antalya and 80 Gün'de Devr-I Alem Park, in Konya.

Miniaturk was chosen to investigate the related questions because it is amongst the world's largest miniature parks and it attracts many local and foreign tourists. Consequently, it offered an opportunity to interview many visitors from different countries. Miniaturk park contains 122 models (including crystal models) done in 1:25 scale. It contains structures mainly from Turkey, a few religious buildings abroad, as well as interpretations of historic structures.

At first, statistics were obtained from Miniaturk authority concerning the annual increase and decrease in the number of visitors "Tables 3 & 4".

TABLE 3. Raw Data on the Number of Foreign Visitors to Miniatürk Since 2003-2012 (Source: Miniatürk Authority)

Date	Number of foreign visitors	Note
2003-2005	No recorded data	No accurate data recorded during this period
2006	10 000	
2007	16 000	Number of visitors increased by 60%
2008	23 000	Number of visitors increased by 43.75%
2009	35 000	Number of visitors increased by 52.17%
2010	61 000	Number of visitors increased by 74.29%
2011	111 000	Number of visitors increased by 81.97%
2012	168 000	Number of visitors increased by 51.35%

TABLE 4. Raw data on the Number of Turkish Citizens' Visitors (to Miniatürk) Since 2003-2012. (Source: Miniatürk Authority)

Date	Number of Turkish citizens visitors	Note
2003	700 000	
2004	750 000	Number of visitors increased by 7.14%
2005	500 000	Number of visitors decreased by 33.33%
2006	500 000	Number of visitors remains at Constant rate
2007	500 000	Number of visitors remains at Constant rate
2008	500 000	Number of visitors remains at Constant rate
2009	500 000	Number of visitors remains at Constant rate
2010	550 000	Number of visitors increased by 10%
2011	600 000	Number of visitors increased by 9.09%
2012	500 000	Number of visitors decreased by 16.67%

However, these statistics only gave the total number of visitors who had visited the Miniaturk Park annually, and could not be used to signify any impacts of the models on the visitors. Subsequently, it was intended to find out the number of tourists before and after the establishment of Miniaturk that might provide any significant sign to relate as a factor that caused any increase or decrease in the number of visitors. Hence demographic data on tourists were obtained from the Ministry of Culture in Turkey.

Unfortunately, these data were very general and could not represent any correlation with the impacts of models in any way. To achieve this aim, Miniaturk Park was visited during the high season, between 26 April to 28 April 2014, and 70 visitors were interviewed; the raw data was mentioned in "Table 2". These data were obtained from two days of survey in Miniaturk. The interviewed visitors were asked whether they had decided to visit any of the buildings after seeing their models in Miniaturk. Also, they were asked to choose models of the buildings they would like to visit. Twenty-six out of the 107 models were selected by the various responders, and among these six were identified as the most popular ones with the visitors "Table 5".

TABLE 5. Data on Buildings Selected from the Models by the Visitors at Miniatürk, [Hatem 2015]

No	Selected models by visitors	Frequency of selection	Definite plans to visit		Indefinite plans	
			No of plans	(%)	No of plans	(%)
1	**Haghia Sophia**	**27**	**25**	92%	**2**	8%
2	**The Blue Mosque (Sultan Ahmet)**	**24**	**24**	100	**0**	0%
3	YEREBATAN Cistern (SARNICI)	4	4	100	0	0%
4	**Suleymaniye MOSQUE**	**17**	**17**	100	**0**	0%
5	The Ruins of MT. Nemrud	6	6	100	0	0%
6	Amasya Yaliboyu Houses	1	1	100	0	0%
7	**Fairy Chimneys (Cappadocia)**	**18**	**18**	100	**0**	0%
8	Bursa Grand Mosque	2	2	100	0	0%
9	The great Mosque of Diyarbakir	3	3	100	0	0%
10	Twin minaret Medrese	1	0	0%	1	100%
11	Sumela Monastery	11	6	55%	5	45%
12	**Aspendos Amphitheatre**	**20**	**13**	65%	**7**	35%
13	Houses of Safranbolu	8	8	100	0	0%
14	TEM- trans European Motorway	5	0	0%	5	100%
15	The Chamfered Minaret Mosque	1	0	0%	1	100%
16	The Halil-ür Rahman Mosque	2	2	100	0	0%
17	Pamukkale	4	4	100	0	0%
18	**TOPKAPI Palace**	**25**	**25**	100	**0**	0%
19	Bosphorus Bridge	1	1	100	0	0%
20	Temple of Artemis (Artemision)	3	3	100	0	0%
21	Al Aqsa Mosque	1	0	0%	1	100%
22	The Dome of the Rock	1	1	100	0	0%
23	Ataturk Olympic Stadium	2	0	0%	2	100%
24	Istanbul Ramparts and Yedikule	11	11	100	0	0%
25	Rock houses of Mardin	1	1	100	0	0%
26	The Anatolian Fortress	5	5	100	0	0%
	Total	**204**	**180**	**24**		

Three officials in Miniaturk were interviewed to gather further information: e.g could they identify any touristic programs for directing the visitors to the original buildings of the presented models. This interview yielded that such tourism programs are generally organized independently by tourism companies, in other words, Miniaturk authority are not responsible for directing tourists to any areas outside their authority. The buildings represented by the models selected by the Miniaturk visitors were visited. Three local authorities officers were interviewed, two in Sultan-Ahmet & Suleymaniye mosques and one in Haghia Sophia. These interviews also confirmed that it is not possible to define the destinations from which the visitors of each building came from; all that can be determined is the daily, monthly and annual visit rates (by counting the number of shoe bags provided to visitors in Sultan Ahmet and Suleymaniye mosques, and the tickets sold at Hagia Sophia).

According to the department of research and evaluation in the Ministry of Culture in Turkey, it has been confirmed that distribution of foreigners' arrival in Turkey as well as for the Turkish citizens can be identified only by the increase and decrease according to daily, monthly, and annual visits. Statistical data are recorded only according to nationality, most visited cities, means of transport, borders and airports, arrivals and departures. Therefore, no correlation can be attributed to these statistical data to find out any positive or negative impacts of models on the public (number of visits). Nevertheless, these data are too large to be included in in this paper due to the limitation restrictions, while photographs of some samples of "Miniaturk" models, are already mentioned in "Figure. 6 and 7" and samples of the real buildings that were visited are also mentioned in "Figure. 8 and 9". Photographs of the 26 buildings selected by the visitors (listed in Table 5) are presented in "Figure. 10" below.

Figure 10. Photographs of Models of the Most Appreciated Building in Miniatürk, as Chosen by the Interviewed Visitors. [Hatem 2015].

V. DISCUSSION OF THE RESULTS

The field study showed that models do have a significant impact on the cultural heritage of societies. "Table 6" below represents the number of visitors who decided to visit the real buildings after seeing the presented models. When these visitors are classified according to their nationalities, it is seen that the great majority are from Turkey, as can be expected.

TABLE 6. Data on Buildings Selected by the Visitors at Miniatürk According to their Nationality and Certainty of their Plans to Visit them. [Hatem 2015]

No	NATIONALITY	No of visitors	No of buildings chosen	Plans to visit the selected buildings (204)		% Of Certainty
				Certain	Uncertain	
1	CANADA	4	6	12	0	100%
2	TURKEY	29	18	45	8	84.91%
3	IRAQ	1	2	2	0	100%
4	IRAN	6	4	15	0	100%
5	RUSSIA	6	4	12	2	85.71%
6	BOLIVIA	1	1	1	0	100%
7	SYRIA	2	2	4	0	100%
8	KUWAIT	2	7	5	2	71.43%
9	BAHRAIN	1	3	2	1	66.66%
10	LIBYA	1	5	5	0	100%
11	SAUDI ARABIA	2	3	6	0	100%
12	INDIA	5	6	25	5	83.33%
13	GERMANY	6	6	30	6	83.33%
14	NORWAY	2	4	8	0	100%
15	SPAIN	2	4	8	0	100%
	Totals	70	26	180	24	88.24%

In addition to the impact of the models on the public, who were appreciative of the opportunity to see 3-D representations of important buildings located all over the country, in the same place, a trend can be seen based on the comparison between the number of visitors who definitely planned to visit the real buildings and with visitors who were "uncertain" due to time constraints to make their visit. There is a clear indication that architectural models do have a significant impact on increasing the motivation of public to decide and make their plans for visiting and appreciating their cultural legacy and heritage. Overall, 15 nationalities participated in the interview and are listed in "Table 6". Also included in the table are the number of respondents from each country and their responses classified into two categories, namely definite and indefinite, according to the certainty of their plans for visiting the real building after they had seen the Miniatürk models. It was also noted that visitors with Turkish nationality appreciated the value added by the models to their cultural heritage, and were keen to visit many buildings after seeing their models also.

Among the important and effective procedures in providing the historical overview and definition of the architectural legacy of the presented buildings is the use of barcode scanner technology. The barcode machine works when a visitor passes the entry card over the machine scanner for providing brief information about the building, history, designer, location, materials used, technique of construction and the current status of the building as well. This technique offers the possibility of translation into more than 12 languages.

In public domains, the issue of identifying the impacts of the models on visitors (public) as an absolute value that can be measured was one of the challenges faced this study. On the one hand, none of the acquired statistical data could determine a reasonable increase or decrease in the number of visitors by the representative models in Miniaturk. On the other hand, the interview survey results showed that the impacts of models on public became much more definable (from the most chosen models) than the statistics obtained from the ministry. From the frequency of selection and definite/indefinite plans to visit, it becomes possible to determine the degree of certainty among the visitors who made their plans to visit the real building, after having seen the models.

Accordingly, such certainty is an indication of the extent to which the models encouraged the visitors to visit the real building. This degree of certainty can be regarded as a measurable value that can only be achieved by the physical representation of the building (product). Although the inquiry on public domain was based initially on qualitative data, it was possible to convert these into quantitative "measurable results". Therefore, it is not always true that value in design is hard to measure.

VI. CONCLUSION

Based on the field study, it is revealed that models do have a significant impact on the cultural heritage of societies. Visitors interviewed at the Minaturk Park were appreciative of the opportunity to see 3-D representations of important buildings that were located all over the country, in one place. These models had also made them realize how rich their culture was and how varied the architecture. Consequently, most of the visitors were "certain" of their plans to visit the real buildings after seeing the models and those who were "uncertain" declared the reason to be lack of time to make their visit.

This data on the visitors' impressions and decisions effectively measures the "value" of models in the public domain. Accordingly, this value reflected a clear indication that architectural models do have a significant impact on increasing the motivation of public to decide and make their plans for visiting and appreciating their cultural legacy and heritage. The obtained results can be treated as value-added that can only be estimated subjectively since it is based on qualitative data. On the other hand, value-added as a result of impacts of model making on public domain is an absolute value that can be measured accurately, that is; it is based on quantitative data. Hence, it true that the measurement of the value of design is a problematic matter involving complex subjective judgments only if the design evaluation criteria relied on qualitative data.

VII. RECOMMENDATION FOR FURTHER STUDIES

Although the study could identify the impacts of models in the public domain as a measurable value, this domain is not limited (confined) only to Miniaturk. What has been discussed in this study was only one of the aspects that reflected the impacts of models and how they can be measured. There are many other aspects in the public domain that the physical models can play important roles in identifying the types of impacts on people. Because of the time constraints in this study, only certain types of value resulting from the impact of the models in the public domain has been defined. That is, increasing the motivation of public to decide and make their plans for visiting and appreciating their cultural legacy and heritage certainty in making plan visit. Therefore, it is advisable that further studies be dedicated in this aspect to develop and determine more ways of how to measure the value-added as a result of the representation of architectural products (buildings).

This study approved that the models can be used as a tool that assists the evaluation and determining the design value, which was only measured subjectively. Thus, now it becomes possible to measure the value-added design by the use of models in various occasions. It is recommended that further investigations in this area be made to provide several solutions to various controversial issues, including how to deal with the issue of value-added in architecture design as an absolute value that can be measured objectively not subjectively.

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