DESIGN FACTORS' INFLUENCE ON VALUE CREATION WHEN BUILDING HOUSES OF CULTURE

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Public clients have an interest in understanding how a public building can be developed into a successful landmark and perhaps also an iconic building. An explorative case study has been undertaken, studying strategic briefing processes when building 'houses of culture', i.e. public buildings with a cultural content. Within the case study, a survey of end-users has been conducted, with the aim of exploring design factors' influence on end-users' evaluation of a house of culture. The survey was responded to by 452 people visiting a house of culture. A questionnaire was handed out randomly on seven different occasions when different cultural activities in the building were performed. A factor analysis was conducted resulting in four design factors describing end-user evaluation of a house of culture: (1 technical design (2) multifunctional design regarding spaces for experiences (3) multifunctional design regarding spaces for consumption (4) experience of activities. Multiple hierarchical regression analyses revealed that technical and multifunctional design factors have an impact on end-users' experience of the activity. However, the relation between design factors and visiting frequency is slight and almost negligible. The visiting frequency is thus not a useful measure of describing how a public building attracts its visitors. More interesting is the number of visitors coming to building. These different types of design factors contribute to the understanding of how clients and construction professionals can develop public buildings for cultural activities creating landmarks in small cities.

Keywords: architecture, briefing, client, design, end-user evaluation.

INTRODUCTION

Construction clients have to consider organizational objectives and needs when making decisions about a construction project (Atkin and Flanagan 1995). Clients, developers and facility managers have an economic interest in their private houses, commercial offices and buildings for retailing and businesses. Still, there are other values that a building offers that are difficult to measure in monetary terms.

What is driving municipalities to invest tax money into public buildings with a cultural content? One reason is that customer needs create market demands for certain products. However, public buildings involve political decisions. Public buildings are open to people in society as a whole, such as libraries, museums, theatres, stadiums, etc. even though these buildings are not of direct use for all citizens, when charging an entrance fee. Still, public buildings are generally supported by government funds, which mean that public clients invest tax money in public construction projects with an interest that is more related to developing the city and fulfilling their political

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obligations than pure financial interests. Public clients may require that an investment in a public building for art performances also should become a successful landmark in the city. Successful landmarks or iconic buildings of today express ideas in their architecture differently from traditional, monumental buildings. They are driven by social forces and create instant fame and economic growth (Jencks 2005). In some cases, public buildings for art performances, sports events and other cultural activities become landmarks, icons or monumental buildings, having a special impact on their cities (Jencks 2005, Short *et al.* 2007, Bröchner 2009).

The first time the concept 'houses of culture', with the definition of combining different cultural activities, was mentioned in Sweden was when architect Peter Celsing gave Kulturhuset, The House of Culture in Stockholm, its name in the 70s (Laurell Stenlund 2010). Kulturhuset was built as a cultural complement to the new down town shopping district, since the politicians argued that shopping should be complemented with people's education by giving citizens an opportunity to an easy visit in the public library or in a museum. Today, the arguments instead are focusing the effects of the public building, i.e. a building with an artistic design attracts people to the city and its shopping, restaurants and hotels (Laurell Stenlund 2010).

Construction professionals need to understand the public client's requirements as well as end-user needs when designing and constructing the public building (Ryd 2004). It is thus of interest for public clients and construction professionals to understand the impact of design factors on end-users' perceptions of the value of a building with a cultural content. The word 'evaluation' is adopted hereafter to mean value as perceived by users.

Developing and designing houses of culture include the development of functionalities and technical solutions for different activities, e.g. a concert hall is combined with a library, an art gallery, and a restaurant in the same building (Laurell Stenlund 2010). However, not only when constructed, but also when managed, the citizens' use of the building will not only depend on the cultural policies but also on the citizens' values as well as on their own evaluation of the building and its activities. The influence of underlying design variables, describing the quality of the project to the public client, and the quality of the building to end-users, has motivated the study presented in this paper.

A systematic feedback and evaluation during every phase of building delivery, ranging from strategic planning to occupancy, throughout the building's life cycle is suggested by Preizer and Vischer (2005). Client needs and goals that arise out of end-users' interaction with a range of settings in the built environment are redefined as performance levels. Hence, building performance evaluation systematically compares the actual performance of buildings, places, and systems to explicitly evaluate expected performances as it relates to pre-determined criteria. Criteria for briefing, designing, and building new environments should be based on the evaluation of existing ones; however, these assessments are seldom done (Ryd 2005).

When evaluating the performance of a house of culture the end-users' perceptions of the building and its internal activities are vital. The aim of this paper is to investigate how design factors influence value creation when building houses of culture. More specifically, we are interested in analysing how different design related factors affect how visitors experience the activities performed in a house of culture and how this affects their visiting frequency.

First a theoretical framework is presented, ending up in the formulation of three testable hypotheses. Second the hypotheses are empirically tested based on data collected through a survey among visitors and their evaluation of the house of culture. Finally, conclusions are drawn and discussed.

THEORETICAL FRAMEWORK

The theoretical framework is based on the assumption that public buildings with a cultural content and an architecture based on artistic design create value to stakeholders as well as to society by attracting visitors to the building.

Design factors' impact on experience of activity

Previous research stipulate that design and construction of arts buildings are both different to other building types and uniquely complex due to exacting technical demands and the accommodation of various and sometimes conflicting stakeholder needs (Short *et al.* 2007). The artistic design with its functionality and technical solutions should signal innate qualities of the cities, devised to attract temporary visitors or more permanent settling firms and individuals, when developing a landmark or iconic building (Bröchner 2009:21). The architecture, articulating something enigmatic and expressive, is commonly known as the artistic force behind the creation of landmarks or iconic buildings.

Artefacts for power and ideologies changes over time, as shown by studies of social and economic benefits associated with famous iconic buildings and the activities performed within them. The Sidney Opera is, for example, a building for Opera performances, but it is also used for commercial purposes such as conferences and business. The Guggenheim Museum in northern Spain is another example having become a symbol for urban revival, which is commonly known as the Bilbao effect (Anon 2007). Today, public clients are aware of these social and economic benefits when planning and investing in new public buildings. Although it is difficult to know in advance if a building will become an iconic building or not, design related factors are proposed to affect how end-users perceive a building and its content when using it (Preizer and Vischer 2005). Accordingly, the following hypothesis is formulated.

Hypothesis 1: The higher citizens evaluate the artistic design, based on functionality and technical solutions, the more satisfied they will be with the experience of the activity.

Impact of experiences of activities on visiting frequency

Research on strategic briefing, where all the players are responsible for adopting the operation's overall goals and where they are developing them and realizing them in the best possible way in the individual project, has an important role when managing end-user needs in the early phases of the building process (Ryd 2004, Ryd and Fristedt 2007). When construction professionals develop a well-designed built environment end-user needs should be identified together with different types of values delivered by the built environment (Spencer and Winch 2002, Saxon 2005, Macmillan 2006).

Strategic briefing was an important activity related to the success of the investigated construction project (Stenlund *et al.* 2009). The public client's requirements were described in the architecture programme, in terms of citizens' desires and needs in terms of a house for multiple cultural activities, such as a library, concert performances, art exhibitions but also spaces for public meetings and facilities for refreshment and food (Stenlund *et al.* 2009). The functionality with building a house

for everybody has been in focus. Thus the functionality of the house of culture is also related to its activities described in the written programme. A broad spectrum of activities, tailored to different end-user interests and requirements is proposed to enhance visitors' satisfaction and make them want to come back and experience the activities again. This argument generates the following hypothesis.

Hypothesis 2: The better the visitor experience the activities, the more frequent the visitor will come to the building.

Mediating effect of visitors experience of activity

When we juxtapose the two hypotheses above, a full mediating model emerges. That is, the end-users' visiting frequency in the house of culture will indirectly be affected by the design factors when the visitors experience the activity. Visitors' experience of the activities performed within the building then works as a mediator, transmitting the effects of design factors on visiting frequency, generating the third hypothesis.

Hypothesis 3: Experiences of activities mediates the positive relationship between design factors and visiting frequency.

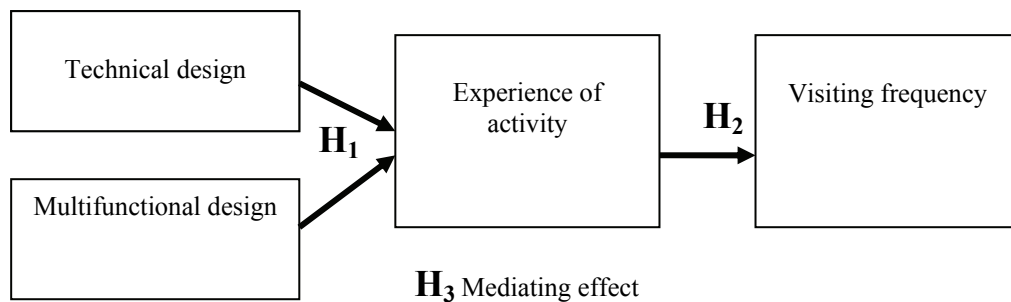In Figure 1 we illustrated the proposed relationships in a mediating model.

Figure 1: The proposed mediating model of relationships between design factors, experience of activity and visiting frequency.

METHOD

A case study of houses of culture and the effects for the public client, stakeholders and citizens have been undertaken with focus on the public client's decision process, strategic briefing, stakeholder values and citizens evaluation of the building. The specific case has been chosen due to the researchers' possibilities to make a broad and open data collection. A case study creates possibilities to build theories by multiple data collection methods and data triangulation (Yin 1994, Barrett and Sutrisna 2009). The data collection is based on several methods, i.e. integrative focus groups, participatory observations, document analysis, semi-structured interviews and a survey. In this paper we focus on analysing the survey results.

Sample and data collection

The purpose of the survey study, which was conducted two years after the building opened to the public, was to investigate how visitors evaluate the building and its design. The development of the questionnaire is based on the theoretical argument that buildings with an artistic design, where functionality and technical solutions signal innate qualities of the cities, attract temporary visitors or more permanent settling firms and individuals. Questions were initially tested with a few visitors, as a pilot. After that the pilot test the questionnaire was further developed and handed out to 565 visitors on seven different occasions (activities) over a period of two weeks. Activities

were performed in different rooms and halls within the building and were selected to obtain a broad picture of the visitors to different cultural activities. The response rate was 80 %, equating to 452 respondents in seven groups (see Table 1).

Table 1: Sample profile (n=452)

Visitors activities	Handed in No	Handed in %	Handed out to visitors No	Response rate %	Age participant Mean value	Female %	Man %	Residence in city %
Youth festival	155	34	177	88	22	33	30	55
Orchestra performance	61	13	70	87	62	66	25	97
Library visit	43	9	80	53	36	58	35	93
Jazz performance	26	6	43	60	66	73	27	100
After work	87	19	94	92	54	55	33	77
Visiting building	59	13	80	73	52	54	44	68
Art exhibition	21	5	21	100	45	48	52	81
Total	452	100	565	80	43	60	40	75

Measurement

Questions regarding respondents' gender (nominal scale), age (interval scale) and place of residence (nominal scale), have been used as control variables.

Three questions were initially asked about the respondents' visiting frequency to a) the house of culture, b) to an activity in the Main Concert Hall and c) to an activity in the Small Concert Hall. These three variables have been measured through 5-point interval scales: never visit before=0, visit once a year=1, visit 2-4 times per year=2, visit 5-8 times per year=3, 9 or more times per year=4.

Four questions were asked regarding end-users' evaluation of technical design variables for a specific room or hall. The questions asked were: What was your experience of the hall/room that you have visited regarding: 1) in general (the visitors general feeling/experience of the hall/room), 2) sound (acoustic feelings), 3) scene picture/decoration (visible experience of the room) and 4) personal convenience (seating space, the design of the chairs, auditorium, comfortable)? A further question 5) was about the visitors' experience of the show/performance/ activity performed in the room visited. Finally, seven questions asked visitors about their experience of the buildings multifunctional design regarding the library, art hall, tourist office, reception, the restaurant, café and bar.

The twelve design related variables were measured in a four-graded interval scale: not at all good=1, less good=2, good=3, very good=4. The choice of a four-graded interval scale was to force participants to grade the variables as negative or positive and to avoid answers from some people that might be undecided.

Data analysis

The twelve different design related variables: 1) in general, 2) sound, 3) scene picture/decoration 4) personal convenience, 5) show/performance/ activity, 6) library, 7) art hall, 8) tourist office, 9) reception, 10) restaurant, 11) café and 12) bar were subjected to a principal component factor analysis (PCFA) with varimax rotation using SPSS (Statistical Package for the Social Sciences) Version 17.0. The twelve

items are theoretically related to the functional and technical solutions when building a house of culture.

The be able to address H1 and H2 the experience of activity factor is used first as a dependent variable affected by design factors and subsequently as an independent variable, potentially affecting the visiting frequency. A hierarchical multiple regression analysis was performed to test H1, assessing the ability of technical and multiple design factors to predict levels of experience of activity, after controlling for the influence of the three control variables. In order to test H2, a second hierarchical multiple regression analysis was performed assessing the ability of the experience of activity factor to predict levels of visiting frequency, after controlling for the influence of the three control variables. Additionally, we followed the three-step approach specified by Baron and Kenny (1986) to test for the mediating effect proposed in H3. When a variable has a mediating role it is (1) caused by the independent variable and it (2) causes the dependent variable, while it (3) weakens the direct relationship between the independent and dependent variable (Baron and Kenny, 1986).

PRESENTATION AND ANALYSIS OF EMPIRICAL RESULTS

Visiting frequency

Most of the visitors, 67 %, have been to the House of Culture nine or more times per year. Only 5 % were visiting the building for the first time and 2 % have been there once before. The citizens' visits of the house of culture (mean 3.0) and different activities in the Main Concert Hall (mean 1.7) and Small Concert Hall (mean 1.4) have been reduced into a factor describing visiting frequency of permanent and temporary visitors during a year. The PCFA resulted in KMO=0.70 and the Bartlett's Test of Sphericity reached statistical significance (0.00).The analysis of visiting frequency resulted in a one-dimensional factor with factor loading between 0.67 and 0.77 and with a Cronbach's Alpha (CA) of 0.81.

Design factors

The PCFA for the design variables resulted in KMO=0.80 and the Bartlett's Test of Sphericity reached statistical significance (0.00). This supports the four-factor solution explaining 27.0 %, 13.4 %, 9.7 % and 8.4 % of the variance respectively, see Table 2.

The identified factors are; 1) technical design (CA=0.76, MV=3.25),
2) multifunctional design, spaces for experience (CA=0.67, MV=2.96),
3) multifunctional design, spaces for consumption (CA=0.71, MV=3.37) and
4) experience of activity (one item with MV=3.40).

From the factor analysis we can draw the conclusion that the item visitors' experiences of the performed show/exhibitions/activities in a public building is not a part of the technical and multifunctional design factors, which supports our proposed theoretical framework consisting of design factors, experience of activity and visiting frequency. The multifunctional design construct is however divided into two factors, distinguishing between a) spaces for activities related to experiences and b) spaces for activities related to eating and drinking, i.e. consumption.

Table 2: Principal component factor analysis of design factors

	Item Mean	Factor 1 Technical design	Factor 2 Multi-functional design (experiences)	Factor 3 Multi-functional design (consumption)	Factor 4 Experience of activity
Scene picture/decoration	3.26	0.77	0.05	0.10	0.07
Personal convenience	3.17	0.72	0.16	0.07	0.01
Audience surroundings	3.17	0.64	0.26	0.08	-0.06
In general	3.37	0.64	0.07	0.05	0.44
Sound	3.21	0.54	-0.02	0.00	0.50
Art hall	3.22	0.01	0.73	0.10	0.09
Tourist office	3.15	0.24	0.65	0.27	-.012
Reception	3.29	0.15	0.60	0.16	0.05
Library	3.58	0.12	0.57	-0.23	0.36
Restaurant	2.88	0.07	0.07	0.81	0.09
Café	2.97	0.02	0.06	0.74	0.14
Bar	2.97	0.14	0.19	0.62	-0.10
Show/exhibitions/activity	3.40	0.04	0.14	0.15	0.81
Percentage of variance		27.0	13.4	9.7	8.4
Cronbach's alpha (CA)		0.76	0.67	0.71	NA
Factor mean value (MV)		3.25	2.96	3.37	3.40

Design factors' impact on experience of activity

The control variables were entered in Model 1, and the technical and multifunctional design variables were entered in Model 2, see Table 3. Both solutions are statistically significant ($p < 0.05$). The effects that technical and multifunctional design factors have on visitors' experience of the performed activities in a house of culture (R Square Change =.051) are small but definite (Hair *et al.* 2008). H1 is thus confirmed with a weak but positive relationship between technical and multifunctional design variables and the experience of the activity.

Table 3: Hierarchical regression analysis testing Hypothesis 1

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	,182a	,033	,027	,525	,033	5,019	3	439	,002
2	,290b	,084	,071	,512	,051	8,057	3	436	,000

Impact of experiences of activities on visiting frequency

In the next analysis, see Table 4, the control variables were entered in Model 1, and the experience of activity variable was entered in Model 2. Both solutions are statistically significant ($p < 0.05$). However, the control variable accounts for a higher degree of variance and has thus a stronger effect on visiting frequency than the visitors' experiences of the activities performed. Although it is statistically significant, the impact from visitors' experience (R Square Change =.027) is slight and almost negligible (Hair *et al.* 2008), giving very limited support to H2.

Table 4: Hierarchical regression analysis testing Hypothesis 2

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics R Square Change	F Change	df1	df2	Sig. F Change
1	,524a	,274	,270	,947	,274	55,985	3	444	,000
2	,549b	,302	,296	,930	,027	17,445	1	443	,000

Mediating effect of experience of activity

Of the three steps suggested by Baron and Kenny (1986) to test for the mediating effect proposed in H3 we have already addressed two. (1) The mediator variable experience of activity is caused by the independent variables technical and multifunctional design for experience and multifunctional design for consumption and it (2) causes the dependent visiting frequency variable. Hence, it remains to analyze if it (3) weakens the direct relationship between the independent and dependent variables. To test for a potential direct relationship we conducted a regression analysis with the three design factors as independent variables and the visiting frequency variable as dependent variable. These analysis verifies that there is no statistically significant direct relationship between the three design variables and visiting frequency (p >0.05). Due to the lack of direct relationship between design variables and visiting frequency, experience of activity can not work as a mediating variable. Hence, H3 is not supported.

RESULTS AND CONCLUSIONS

When investigating how visitors evaluate a building and its design a proposed mediating model of the relationships between design factors, the visitors experience of the activities in the building and the end-users' visiting frequency has been tested.

A factor analysis has resulted in four main design factors with influence on visitors' valuation of a house of culture: 1) Technical design, 2) Multifunctional design, with spaces for experience 3) Multifunctional design, with spaces for consumption and 4) Experience of activity.

The regression analyses present a weak but positive relationship between technical and multifunctional design variables and the end-users' experience of the activity in the house of culture. This result of a positive relationship is expected, thus clients' requirements should be fulfilled by the development of functional and technical solutions during briefing (Ryd 2004). The public client had in this case a focus on developing a public building for everybody, i.e. all the citizens. However, the relatively weak relationship was not expected. One explanation could be the validity and reliability of the selected and measured design variables. The questionnaire has been developed in accordance with results from the qualitative analysis performed within the case study both from interviews and from analysis of the results of the pilot study. The broad data collection, with visitors between 13 and 81 years, with different interests and purposes for visiting the building, resulted in questions being relatively short and to the point (which indeed they should be). It could be a problem when questions are developed to everybody and therefore not usable to anybody. The number of different design variables was also kept to the minimum. The different cultural activities performed in various rooms and halls were also a concern in terms of the physical distribution of the questionnaire.

A statistically significant relationship between experiences of activities and visiting frequency is also identified, but it is very weak. Furthermore, the lack of direct relationship between technical and functional design variables and visiting frequency is interesting. It has been argued that buildings with different cultural activities as well as an architecture attracting visitors, should influence on visitors satisfaction and the visiting frequency.

One explanation of these results can be that the visitors of the house of culture are both permanent citizens and temporary visitors. Interesting is that the house of culture had many temporary visitors, 30 %, from different regions and cities. The building is thus also attracting people not having the possibilities to frequently come back even though they would like to. The visiting frequency is thus not a useful measure of describing how a public building attracts its visitors. More interesting is the number of visitors coming to building. These results are also supporting the arguments that successful landmarks or iconic buildings are driven by social forces and that these buildings have a special impact on their cities in terms of articulating something enigmatic and expressive, common known as the artistic force behind the creation of the landmark or iconic building (Jencks 2005, Short *et al.* 2007, Bröchner 2009).

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