Customer Satisfaction in Apartment Buildings: The Case of Jordan

Ghaleb J. Sweis[1] (Corresponding Author), Rana M. Imam [2], Ghaith M. Kassab [3], Rateb Sweis[4]

1- Department of Civil Engineering, The University of Jordan, Amman, Jordan 11942
2- Department of Civil Engineering, The University of Jordan, Amman, Jordan 11942
3- Department of Civil Engineering, The University of Jordan, Amman, Jordan 11942
4- Department of Business Administration, The University of Jordan, Amman, Jordan 11942
E-mail: gsweis@ju.edu.jo

Abstract: Service quality is a critical element of customer loyalty. To ensure customer loyalty, firms must satisfy their customers with the products or services they provide. In recent years, the Jordanian housing industry has witnessed a rapid rise in the number of constructed residential apartment buildings. Hence, this paper focuses on apartments in Amman (the Jordanian capital) to identify, describe, and measure factors contributing to customer satisfaction with apartment housing. Four zones were chosen to incorporate significant variation in the apartments' materials, finishes, amenities, and budgets into the data. We developed a survey to explore customer satisfaction with apartment housing in Amman. Residents in zone A were found to be the most satisfied with their apartments. In addition to identifying the zone which contained the most satisfied inhabitants, we identified variables that significantly affect residents' satisfaction with their housing. Apartment building developers can utilize these results to attend to those features that apartment inhabitants value, thereby increasing their competitive advantage in the marketplace. Future research could replicate the adopted methodology on apartment residents in other countries.
[Sweis G, Imam R, Kassab G, Sweis R. **Customer Satisfaction in Apartment Buildings: The Case of Jordan**. *Life Sci J* 2013;10(12s):237-245] (ISSN:1097-8135). http://www.lifesciencesite.com. 42

Keywords: Customer satisfaction; Apartment buildings; Housing; Construction.

1. Introduction

Service quality has long-been a subject of interest to management scholars, and has therefore been prioritized in academic discourse in the management domain. Service quality is also of great importance to industry practitioners, as it is believed to result in both organizational success and company growth. All firms must strive to meet the demands of their customers to engender customer satisfaction and loyalty, thereby ensuring their survival. This can be interpreted easily—the ultimate aim of any firm must be to serve its customers' needs.

Although there are many definitions of service quality in the management and marketing literature, they are all quite similar. Taken together, these definitions collectively assert that service quality involves the determination of whether a customer's perceptions related to the delivery of a service meets, exceeds, or fails short of customer expectations (Cronin and Taylor 1992; Oliver 1993; Zeithaml et al. 1993). Accordingly, Parasuraman (1988) defines service quality as "the degree and direction of discrepancy between the consumer's perceptions and expectations, or the extent to which a service meets or exceeds customer expectations." By identifying differences between customer expectations and perceptions of service, management personnel would be able to remedy shortcomings in the products or services they offer.

As a result of competitive nature of the current business environment, the delivery of high quality service has become integral for sustaining competitive advantage (Angelova 2011, Gharakhani et al 2013). Jones and Sasser (1995) and Amir Atarodian (2013) conclude that achieving customer satisfaction is the key to securing customer loyalty and generating positive, long-term financial gains. Furthermore, customer satisfaction strengthens the relationship between a company and its customers. The sense of collaboration that results from this relationship has been found to translate to profits for the company (Storbacka et al. 1994).

Although customer satisfaction is critical in all industrial sectors, customer satisfaction with apartment buildings may have implications that transcend those experienced with standard consumer products. Satisfaction with one's housing is a vital component of overall life satisfaction. It has been studied extensively in several disciplines, including sociology, psychology, planning, civil engineering, marketing, and geography (Lu 1999).

Ojo (2010) argued that a number of researchers have explored service quality and customer satisfaction (e.g., Choi et al. 2004; Coyles and Gokey 2002; Cronin and Taylor 1992; Jones and Suh 2000; Ranaweera and Prabhu 2003; Spreng and Mackoy 1996). Though abundant, most of these studies utilized samples from industrialized countries. As such, there is a shortage of research on service

quality and customer satisfaction in developing countries like Jordan. In addition, research focused on customer satisfaction with the construction industry, particularly apartment buildings, remains limited.

As a result of an influx of immigrants from its troubled neighbors (i.e., the Palestinian territories, Iraq, Syria), coupled with a growth in the population of its own residents, Jordan has experienced a rapid growth in housing construction in recent years. As such, analyses related to customer satisfaction with housing are critical. In this vein, this research aims to measure customer satisfaction with apartment buildings in Amman, Jordan to guide new home-buyers when entering the property market. The results of the current study are also useful for developers of residential apartment building projects, as they will identify those features of apartment housing that will engender the greatest satisfaction from their customers.

2. Literature Review

Cardozo's (1965) seminal study represented the first comprehensive treatment of customer satisfaction, causing the topic to gain in popularity among marketing scholars and practitioners. Kotler (2003) defined customer satisfaction as "the result of intellectual and affective evaluation, where some comparison standard is compared to the actually perceived performance." Multiple authors have suggested that the primary antecedents of satisfaction are a customer's expectations regarding product and service performance and actual product or service performance provided by the firm (Anderson et al. 1994; Barsky and Labagh 1992; Johnson and Fornell 1991; Swan and Combs 1976). Zjelko and Robert (2001) similarly stated that when purchasing an item, a customer forms expectations concerning the future performance of that item. As the item is consumed, the customer compares the quality of its performance to his/her expectations. If the item performs as well as (or better than) the customer's expectations, then the customer will be satisfied. If the item falls short of performance expectations, then the customer will be dissatisfied.

According to customer satisfaction studies performed by Dimitriades (2006), Olorunniwo et al. (2006), Chi and Qu (2008), Faullant et al. (2008), and Luo and Homburg (2007), customer satisfaction has both direct and indirect effects on business-related outcomes. This past research has revealed a positive relationship between customer loyalty and customer repurchase intention and positive word-of-mouth. In contrast to the positive outcomes associated with customer satisfaction, customer dissatisfaction may lead to negative outcomes, such as customer backlash.

To ensure the long-term success of a company, management personnel must guarantee and periodically measure customer satisfaction with the company's products and/or services. Given that companies have faced increased competition within the construction sector, greater attention to customer relations and satisfaction is critical for distinguishing a firm from its competitors, and achieving sustainable development. Development of effective strategy to this end enables construction companies to tailor their activities to the changing environment and provide their customers with superior products and/or services (Tan 2011).

Relative to other industries, the degree to which customers are satisfied in the construction industry is only known late in the project when both the customer and developer have spent a great deal of money. When companies ultimately learn which product or service attributes influence customer satisfaction, they must modify those attributes accordingly. In comparison to other industries, modifications in the construction industry (which occur following delivery) are difficult and costly endeavors.

As a result, extant models of customer satisfaction in the production industry are not readily applicable to satisfaction with construction services. Similarly, the results of studies related to customer satisfaction with construction projects are not generalizable to other types of projects. In the construction industry, each project is unique and has its own complex, intrinsic set of constraints.

Researchers in the past have used different ways to measure customer satisfaction in the construction industry. The Home Builders Federation HBF (2012) published a national new home customer satisfaction survey in England. The results reveal that house builders have reached new heights of customer satisfaction as 90% of respondents were satisfied with the overall quality of their new homes. Additionally, 90% also stated that they would recommend their home builder to a friend; 86% of buyers were very happy or fairly happy with the service they received during the buying process, while 88% were happy with the condition of their home when they moved in. The results also showed that 85% regarded their home builder as very good or fairly good with regards to completing the home on time, whilst 86% were also happy with the standard of finish of their homes.Torbica and Stroh (1999a) used data from the housing industry in Florida to measure customer satisfaction on the basis of service and product quality. In addition, Torbica and Stroh (1999b) examined customer satisfaction in the context of total quality management by comparing worker quality with customer quality. The customer satisfaction

approach represents a more robust view of quality (Torbica, 1997; Forsythe, 2007, 2008). In this approach, product design, product quality, and service drive customer satisfaction among home-buyers. Torbica and Stroh (2001) discovered that of these three components of the home-buying process, service is the most critical for shaping overall satisfaction.

Although there has been substantial research concerning customer satisfaction construction projects elsewhere, there have been no attempts to empirically investigate customer satisfaction with housing in Jordan. This oversight is especially problematic given that purchasing a house is considered to be the single most important financial transaction performed by individuals in all countries. Given this gap in the literature, this study seeks to identify, describe, and measure the factors that affect customer satisfaction with apartment housing in Amman, Jordan. Results of our analyses and the recommendations made thereof can aid new home-buyers and housing developers in making evaluations related to satisfaction with apartment housing.

3. Research Methodology

We adopted a quantitative approach to gauging customer satisfaction. Specifically, we developed a survey to measure customer satisfaction with the buildings in which they live (see Table 1). The survey was designed to be completed by apartment owners in Amman to allow for the determination of those variables that significantly affect residents' satisfaction with their form of housing. Although there are numerous types of domiciles in Amman, this study focuses on apartment buildings.

For this study, we operationally define an apartment as a unit within a building. Further, we define a building as an integration of components, systems, and site and building facilities. The act of living in an apartment can be conceptualized as an experience of all of these elements in concert. Building components include foundation systems, building envelopes (especially insulation), and exterior and interior finishes. Building systems include mechanical systems (HVAC and plumbing), electrical systems, vertical transportation, and fire suppression systems. Site facilities include drainage systems, access to public transportation, and other amenities. Finally, building services refer to car parking availability, shared storage space, water wells, solar heating systems, and diesel tanks. Questions that comprise the survey addressed each of these elements.

The survey was constructed such that many items were responded to via a five-point, Likert scale ranging from 1 (poor) to 5 (excellent) or via a simple choice between "Yes" and "No". Several other items employed the five-point Likert scale, but ranged from 1 (highly changed) to 5 (not changed at all). Finally, one item question was designed to glean information related to the availability of four specific apartment facilities. If a facility was present, it was given a score of 1. Otherwise, it was given a score of 0. As such, the total score for this one item could be as low as 0 or as high as 4. The highest possible score for the survey is 81.

According to the annual report of the Ministry of Public Works and Housing (2011), 89% of all apartment buildings in Jordan are located in Amman. To effectively represent all income groups living in the city, as well as the quality of all apartment finishes and construction materials, surveys were administered to apartment owners in four distinct regions in Amman, respectively referred to as Zones A (highest quality) through D (lowest quality). It was expected that apartments within Zones A, B, C, and D would respectively rank first, second, third, and fourth in terms of customer satisfaction. This expectation is derived from differences in the respective prices and qualities of apartments. In addition, the financial status and socio-economic conditions of the customers that purchase apartments differ from one zone to another.

The apartments included in Zone A were located in Abdoun, Swefieh, Der Ghbar, Al-Rabieh, Um Al-Summaq and Khalda. Apartments in Zone B apartments were located in Wasfi Al Tal Street (Gardens), the Al Rashid suburb, Jubieha, Tela' Al-Ali, Shmeisany, the University of Jordan region, and Marj Al-Hamam. Apartments in Zone C were located in Sports City, Sweileh, the Al Rawda suburb, Arjan, and the Al Yasmeen neighborhood. Finally, apartments in Zone D were located in Al Nuzha mountain, Al Hussien mountain, Al Muhajereen, the Al Hashmy neighborhood, Al Qwaismeh, the Al Aqsa suburb, Tabarbour, the Nazzal suburb, Marka, and the Prince Hasan suburb.

Because it was impossible to administer surveys to all apartment owners in the four zones, it was necessary to employ deliberate sampling techniques to obtain a representative proportion of all residents living in apartment buildings in those zones. Specifically, we engaged in simple random sampling to ensure that each potential respondent within the target population stood an equal chance of being included in the sample. Seventy-five questionnaires were distributed in each of the four regions; 66 of them were returned from Zone A; 61 from Zone B; 69 from Zone C; and 58 from Zone D.

Table 1. The survey

Q1. Was there any problem in your house since you lived there?				
Yes	No			
Q2. Is your house provided with central heating system? If yes answer the next question, if no go to question number 4.				
Yes	No			
Q3. How would you rate the efficiency of the central heating system?				
Excellent	Very good	Good	Fair	Poor
Q4. How would you rate the aluminum work based on its insulation and window locking tightness?				
Excellent	Very good	Good	Fair	Poor
Q5. Have you observed any problem in the wooden doors such as cracking or expansion?				
Yes	No			
Q6. How would you rate the quality of key locks used in the doors?				
Excellent	Very good	Good	Fair	Poor
Q7. How would you rate the overall envelope of the apartment?				
Excellent	Very good	Good	Fair	Poor
Q8. Have you observed any sign of moisture in the house?				
Yes	No			
Q9. Are there any cracks in the plastering or the painting?				
Yes	No			
Q10. What is the level of change in the exterior's bricks color?				
Highly changed	Intermediate	Low	Not observed	Not changed at all
Q11. How would you rate the efficiency of the heating and aqueous insulation systems during the year in your house?				
Excellent	Very good	Good	Fair	Poor
Q12. How would you rate the efficiency of the sanitary system in your house?				
Excellent	Very good	Good	Fair	Poor
Q13. How would you rate the quality of bathroom fixtures?				
Excellent	Very good	Good	Fair	Poor
Q14. How would you rate the quality of electrical sockets and its distribution in the house?				
Excellent	Very good	Good	Fair	Poor
Q15. How would you rate the type and quality of tiles used in your house?				
Excellent	Very good	Good	Fair	Poor
Q16. How would you rate the efficiency and capacity of the elevator?				
Excellent	Very good	Good	Fair	Poor
Q17. Is the building provided with these facilities?				
Stores	Water well	Diesel tanks	Solar thermal system	
Q18. How would you rate the ease of parking and usage of the parking in the apartment?				
Excellent	Very good	Good	Fair	Poor
Q19. How would you rate the efficiency of the sewage system in your region?				
Excellent	Very good	Good	Fair	Poor
Q20. How would you rate the accessibility of getting to the nearest public transportation system?				
Excellent	Very good	Good	Fair	Poor
Q21. Did the contractor provide after buying warranty on factory malfunction?				
Yes	No			
Q22. Overall, are you satisfied with your house area and interior finishes?				
Yes	No			
Q23. Do you think the amount you paid meets with overall quality and finishing of your house?				
Yes	No			

To analyze the data derived from survey responses, we ranked the different responses in accordance with their frequency in each region. Furthermore, we performed a one-way analysis of variance (ANOVA) on the response means for each satisfaction criterion in each of the four zones to test for significant differences among respondents' perceptions. Following the ANOVA, a multiple comparison test was performed to identify the real differences between the response means across the four zones.

4. Data Analysis and Results

This section outlines the analyses that were conducted on the data obtained from the survey and the results derived from those analyses. The data were statistically analyzed and the results for every question are illustrated in Table 2 by zone.

Table 2. Questionnaire Average Results in the Four Zones.

Question no.	Zones			
	A	B	C	D
1	0.60	0.35	0.50	0.40
2	0.85	0.85	0.75	0.55
3	4.65	4.00	3.27	3.73
4	4.4	3.45	3.20	3.30
5	0.75	0.60	0.60	0.45
6	4.00	3.70	3.35	2.85
7	4.25	3.75	3.65	3.10
8	0.55	0.30	0.45	0.35
9	0.50	0.35	0.35	0.30
10	3.00	2.40	2.45	2.45
11	3.85	3.15	3.35	3.05
12	4.15	3.50	3.40	3.15
13	4.35	3.60	3.45	3.00
14	4.00	3.70	3.45	3.30
15	4.15	3.60	3.55	3.00
16	4.10	3.25	3.15	2.50
17	2.65	2.10	2.00	1.50
18	4.35	3.65	2.95	2.30
19	4.20	3.75	3.55	3.15
20	4.10	3.80	3.90	3.60
21	0.55	0.50	0.30	0.25
22	0.85	0.80	0.75	0.55
23	0.90	0.75	0.60	0.5
Total /81	**65.75**	**55.90**	**53.00**	**46.38**

Following their overall aggregation, survey responses in each zone were classified into mechanical systems, electrical systems, insulation, exterior finishes, interior finishes, region facilities, and building services categories. The average grades for each of these categories are depicted in Figure 1.
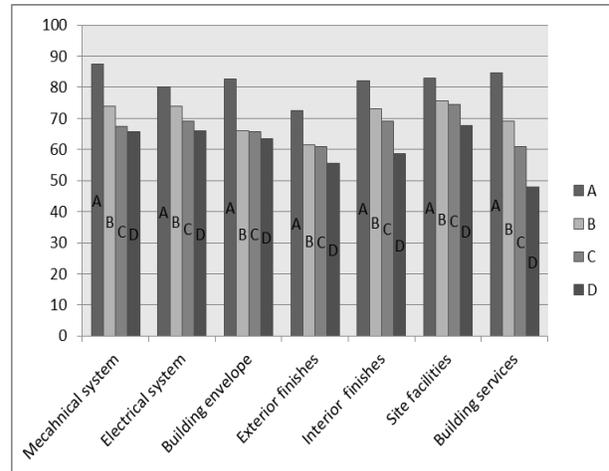

Fig. 1. Average grades for each category

4.1 One-way ANOVA

An ANOVA is a statistical test for heterogeneity among means through an analysis of group variances. Because two groups can be compared using an independent-samples t-test, the one-way ANOVA is largely used to compare means of at least three groups (using the F distribution). We performed a one-way ANOVA on those survey questions that measured customer satisfaction directly. Results of these analyses are shown in Table 3.

Table 3. ANOVA results.

Question no.	Zones				P-Values
	A	B	C	D	
3	4.65	4.00	3.27	3.73	0.001
4	4.4	3.45	3.20	3.30	0.005
6	4.00	3.70	3.35	2.85	0.005
7	4.25	3.75	3.65	3.10	0.001
10	3.00	2.40	2.45	2.45	0.147
11	3.85	3.15	3.35	3.05	0.070
12	4.15	3.50	3.40	3.15	0.002
13	4.35	3.60	3.45	3.00	0.000
14	4.00	3.70	3.45	3.30	0.067
15	4.15	3.60	3.55	3.00	0.007
16	4.10	3.25	3.15	2.50	0.000
18	4.35	3.65	2.95	2.30	0.000
19	4.20	3.75	3.55	3.15	0.021
20	4.10	3.80	3.90	3.60	0.586

The series of one-way ANOVA analyses presented in Table 3 reveals two notable results. First, there is an agreement among the four zones that the efficiency of the central heating system, the drainage system, aluminum work, sanitary systems, overall appearance of the exterior finishes, quality of bathroom fixtures, quality of tiles used, quality of door locks, ease of parking in the building, and efficiency and capacity of lifts contribute significantly to

customer satisfaction. In contrast, the quality of the electrical sockets and their distribution throughout the apartment, the efficiency of insulation, and the changes in the color of exterior bricks were found to have little (if any) effect on customer satisfaction.

Second, despite the fact that the access to the nearest transportation system was the second-most favorably rated feature in the four zones, it was not found to affect overall customer satisfaction. This may be attributable to the high rate of private car ownership and auto-dependency in Amman or the lack of public transport systems in the city. The transit mode share in Amman is 14%; meaning that only 14% of journeys are made by public transport in Amman (GAM 2012). The majority of public transport trips in Amman are facilitated by car-based services, such as shared taxis or regular taxis.

Because the one-way ANOVA only identifies which features significantly affect customer satisfaction overall, it was necessary to perform Multiple Comparisons Tests (MCT) to indicate if there are differences among the four different zones in terms of which features affect their respective customer satisfactions.

4.2 Multiple Comparisons Tests

Multiple Comparison Tests (MCTs) typically follow a one-way or two-factor ANOVA if significant differences among the comparison groups emerge. An ANOVA can only indicate whether a difference exists between two or more of groups, but is unable to identify which groups are significantly different from one another. MCTs, by contrast, can identify which groups are different, as they are designed to investigate differences between pairs of means or linear combinations of means. Although it would appear that MCTs can be used independently, they are not as powerful as ANOVAs and occasionally fail to find differences between groups that would be revealed by analyses of variance.

Typically, two formulae can be used to calculate a confidence interval for the difference between two population means. The choice of which formula to use is contingent upon whether the standard deviations are assumed to be equal or unequal. Let the means of the two populations be respectively represented by μ_1 and μ_2, and let the standard deviations of these two populations be respectively represented as σ_1 and σ_2.

Assuming the standard deviations are unequal ($\sigma_1 \neq \sigma_2$) and are unknown, the appropriate two-sided confidence interval for ($\mu_1-\mu_2$) can be determined by using Equation 1. To accurately apply this equation, the degrees of freedom (ν) is calculated using Equation 2, known as the Welch-Satterthwaite equation.

$$\bar{X}_1 - \bar{X}_2 \pm t_{1-\alpha/2,\nu}\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}} \qquad (1)$$

$$\nu = \frac{\left(\frac{s_1^2}{n_1}+\frac{s_2^2}{n_2}\right)^2}{\frac{s_1^4}{n_1^2(n_1-1)}+\frac{s_2^4}{n_2^2(n_2-1)}} \qquad (2)$$

Where:

$\bar{X}_{1,2}$ = means of groups 1 and 2 respectively.

$s_{1,2}$ = standard deviations of the means of groups 1 and 2, respectively.

$n_{1,2}$ = number of treatments in groups 1 and 2, respectively.

$t_{1-\alpha/2,\nu}$ = t-distribution.

α = confidence interval (taken as 95%).

In this case, t is approximated and the upper and lower one-sided confidence intervals can be obtained by replacing $\alpha/2$ with α.

We performed the MCTs on the means obtained for each question in each zone by constructing a confidence interval for questions that were shown to generate significant (p < .05) differences among the means. Results of these MCTs are shown in Tables 4-8.

4.3 Multiple Comparisons Test Results

Results of the MCTs are shown in Tables 4-8.

The simultaneous pair-wise comparisons indicate that the differences in the means of some questions are not significantly different from 0 (i.e., their confidence intervals include 0). However, the pair-wise comparisons for other questions in which the signs of the lower and upper limits of the interval did not change indicated that the differences between their means are significant.

These analyses revealed a number of significant findings. Of these findings, there were two that were especially notable. First, the quality of Zone A's central heating systems was perceived to be significantly better than that in Zones B, C and D. Differences in the quality of the heating systems for Zones B, C, and D were not significantly different from each other. These findings can be explained the significantly higher prices of apartments in Zone A relative to the other zones. Given the higher prices paid by tenants of apartments in Zone A, it is reasonable to expect quality of the features in Zone A to be higher.

Second, there is wide variation in the quality of bathroom fixtures and the quality of tiles used in the apartments in each zone. Only Zones B and C were shown to have similar bathroom fixtures in terms of quality. This result is largely attributable to the

substantial variety of designs, models, types of tiles, and bathroom fixtures available to building contractors. Because these apartment components are characterized by a wide range of prices, contractors have significant autonomy in choosing these components on the basis of their prices. Interestingly, relative to Zones A and D, there appear to be little correlation between the prices of apartment components and customer satisfaction in Zones B and C.

5. Discussion and Conclusion

This paper has proposed a methodology for exploring customer satisfaction in Jordanian apartment buildings. Specifically, apartments were classified into four zones on the basis of the quality of the finishing and materials used to construct the buildings in each zone.

We found that residents in Zone A are generally more satisfied with their apartments than residents in Zones B, C, and D. In addition, apartment prices differ in each zone, causing the overall quality of apartments and their finishing to differ according to the zones in which they are classified. Moreover, results demonstrate that overall, respondents were most satisfied with the mechanical systems in their apartments (87.6%). 55% of contractors provided warranties on factory malfunctions for apartments in Zone A; this was a substantially greater proportion than in Zones B (50%), C (30%), and D (25%). Finally, 90% of the residents were overall satisfied with the amount of money they paid for their apartments in Zone A; this was also higher than in zones B (75%), C (60%), and D (50%).

Table 4. MCTs Results of Mechanical System questions

Question	Lower limit	$\mu_1 - \mu_2$	Upper limit
Q3. How would you rate the efficiency of the central heating system?	0.05	$\mu_A - \mu_B$	1.25
	0.84	$\mu_A - \mu_C$	1.92
	0.48	$\mu_A - \mu_D$	1.36
	-0.02	$\mu_B - \mu_C$	1.48
	-0.49	$\mu_B - \mu_D$	1.03
	-1.15	$\mu_C - \mu_D$	0.23
Q12. How would you rate the quality of bathroom fixtures?	0.4	$\mu_A - \mu_B$	1.08
	0.55	$\mu_A - \mu_C$	1.25
	0.99	$\mu_A - \mu_D$	1.71
	-0.22	$\mu_B - \mu_C$	0.52
	0.23	$\mu_B - \mu_D$	0.97
	0.06	$\mu_C - \mu_D$	0.84
Q13. How would you rate the efficiency of the sanitary system in your house?	0.2	$\mu_A - \mu_B$	1.02
	0.43	$\mu_A - \mu_C$	1.07
	0.64	$\mu_A - \mu_D$	1.36
	-0.27	$\mu_B - \mu_C$	0.47
	-0.06	$\mu_B - \mu_D$	0.76
	-0.11	$\mu_C - \mu_D$	0.61

Table 5. MCTs Results of Interior Finishes questions

Question	Lower limit	$\mu_1 - \mu_2$	Upper limit
Q7. How would you rate the overall envelope of the apartment?	0.18	$\mu_A - \mu_B$	0.92
	0.22	$\mu_A - \mu_C$	0.98
	0.74	$\mu_A - \mu_D$	1.56
	-0.51	$\mu_B - \mu_C$	0.31
	0.16	$\mu_B - \mu_D$	1.04
	0.10	$\mu_C - \mu_D$	1.00

Table 6. MCTs Results of Exterior Finishes questions

Question	Lower limit	$\mu_1 - \mu_2$	Upper limit
Q4. How would you rate the aluminum work based on its insulation and window locking tightness?	0.50	$\mu_A - \mu_B$	1.31
	0.71	$\mu_A - \mu_C$	1.69
	0.65	$\mu_A - \mu_D$	1.55
	-0.27	$\mu_B - \mu_C$	0.77
	-0.37	$\mu_B - \mu_D$	0.67
	-0.68	$\mu_C - \mu_D$	0.48
Q6. How would you rate the quality of key locks used in the doors?	-0.11	$\mu_A - \mu_B$	0.71
	0.23	$\mu_A - \mu_C$	1.07
	0.62	$\mu_A - \mu_D$	1.68
	-0.09	$\mu_B - \mu_C$	0.79
	0.30	$\mu_B - \mu_D$	1.40
	-0.05	$\mu_C - \mu_D$	1.05
Q15. How would you rate the type and quality of tiles used in your house?	0.15	$\mu_A - \mu_B$	0.95
	0.24	$\mu_A - \mu_C$	0.96
	0.69	$\mu_A - \mu_D$	1.61
	-0.38	$\mu_B - \mu_C$	0.48
	0.08	$\mu_B - \mu_D$	1.12
	0.06	$\mu_C - \mu_D$	1.04

Table 7. MCTs Results of Site Facilities questions

Question	Lower limit	$\mu_1 - \mu_2$	Upper limit
Q19. How would you rate the efficiency of the drainage system in your region?	0.15	$\mu_A - \mu_B$	0.75
	0.20	$\mu_A - \mu_C$	1.10
	0.62	$\mu_A - \mu_D$	1.48
	-0.23	$\mu_B - \mu_C$	0.63
	0.18	$\mu_B - \mu_D$	1.08
	-0.13	$\mu_C - \mu_D$	0.93

Table 8. MCTs Results of Building Services questions

Question	Lower limit	$\mu_1 - \mu_2$	Upper limit
Q16. How would you rate the efficiency and capacity of the elevator?	0.40	$\mu_A - \mu_B$	1.24
	0.52	$\mu_A - \mu_C$	1.38
	1.11	$\mu_A - \mu_D$	2.09
	-0.38	$\mu_B - \mu_C$	0.58
	0.21	$\mu_B - \mu_D$	1.29
	0.08	$\mu_C - \mu_D$	1.22
Q18. How would you rate the ease of parking and usage of the parking in the apartment?	0.30	$\mu_A - \mu_B$	1.06
	0.93	$\mu_A - \mu_C$	1.87
	1.55	$\mu_A - \mu_D$	2.55
	0.18	$\mu_B - \mu_C$	1.22
	0.80	$\mu_B - \mu_D$	1.90
	0.03	$\mu_C - \mu_D$	1.27

6. Implications and Future Research

This study identified, described, and measured factors that contribute to customer satisfaction in apartment buildings in Amman. The results have clear implications for the residential construction sector in Jordan. The most critical implication of this paper is the identification of areas that influence apartment buyers' overall satisfaction with their homes. These findings allow apartment building developers to reinforce their competitive advantage in the marketplace by focusing their efforts on improving those features of the apartment building that were shown to be critical by our analyses. Still, further research in this domain would be beneficial is encouraged. In particular, it may be useful to examine other areas in Amman that were not explored in this study. In addition, it may be useful to administer a survey to the same sample used in this paper that is specifically geared towards gauging tenants' views, opinions, and attitudes, rather than the presence or absence of certain features of their apartments.

Although Jordan is a small country, it shares many cultural and economic characteristics of developing countries that utilize similar construction practices: poor infrastructure, fraudulent practices, and government influence. Given this, it may prove useful to perform research in these underprivileged countries, as the results will provide benefits not only for the residents of those countries examined, but also for developing countries in general. As such, this research could effectively be expanded by applying the methodology used in the current study to other developing countries.

In the past few years, the tendency for investment funds and businesses to become involved with international markets has increased, thereby increasing the degree to which these international markets are connected. In addition, conflicts in the Middle East have caused significant damage to housing there, which are likely to result in the implementation of international rehabilitation programs to construct new housing. Given the expected increase in housing construction in the Middle East, this study may help to identify the nature of housing in the Middle East and provide insights on which investors can make educated decisions.

Corresponding Author:
Dr. Ghaleb J. Sweis
Department of Civil Engineering
The University of Jordan
Amman, Jordan 11942
E-mail: gsweis@ju.edu.jo

References
1. AL-Momani A.H., (2000) "Structuring information on residential building: a model of preference", *Engineering, Construction and Architectural Management*, 7(2), pp.179 - 190

2. Anderson, E. W., Fornell, C., and Lehmann, D. R. (1994). ''Customer satisfaction, market share, and profitability: Findings from Sweden.''*J. Marketing*, 58(July), 53–66.

3. Atarodian A. (2013). "The impact of brand credibility on customer satisfaction in the banking industry in the North West of Iran", *Life Science Journal,* 10(6), 203-210.

4. Barrett, P. (2000). "Systems and relationships for construction quality. *"International Journal of Quality & Reliability Management.* 17(4/5), 377-392.

5. Barsky, J., and Labagh, R. (1992).''A strategy for customer satisfaction.''*The Cornell H.R.A. Quarterly*, 2(Oct.), 32–40.

6. Cardozo**,** R. N. (1965), "An Experimental Study of Customer Effort**,** Expectation, and Satisfaction." *Journal of Marketing Research*, 2 (3), 244-249.

7. Chi, C.G.-Q.&Qu, H. (2008). "Examining the structural relationships of destination image, tourist satisfaction and destination loyalty: An integrated approach." *Tourism Management*, 29(4), 624-636.

8. Choi, K. S., Cho, W. H., Lee, S. H., Lee, H. J., and Kim, C. K. (2004). "The Relationships among Quality, Value, Satisfaction and Behavioral Intention in Health Care Provider Choice: A South Korean Study." *Journal of Business Research*, 57(8), 913–921.

9. Coyles, S. and Gokey, T. C. (2002). Customer Retention is not Enough. *The McKinsey Quarterly*. 2(2), 80-89.

10. Cronin, J. J., and Taylor, S. A. (1992).Measuring Service Quality: A Re-examination and Extension.*Journal of Marketing*, 56(3), 55–68.

11. Dimitriades, Z.S. (2006) "Customer satisfaction, loyalty and commitment in service organizations-Some evidence from Greece." *Management Research News*, 29(12), 782-800.

12. Faullant, R. &Matzler, K. (2008). "The impact of satisfaction and image on loyalty: the case of Alpineski resorts." *Managing Service Quality*, 18(2), 163-178.

13. Forsythe, P.J. (2007), "A conceptual framework for studying customer satisfaction in residential construction." *Construction Management and Economics*, 25(2), 171–182.

14. Forsythe, P.J. (2008), "Modeling customer perceived service quality in housing construction." *Engineering Construction and Architectural Management*, 15(5), 485–496.

15. Gharakhani D, Sinaki M, Dobakhshari M, Rahmati H (2013) "The Relationship of Customer orientation, customer Satisfaction, customer loyalty and innovation in Small and medium enterprises" *Life Science Journal,* 10(6), 684-689.

16. Giese, J.L. & Cote, J. A. (2000), "Defining Customer Satisfaction." *Academy of Marketing Science Review*, 2000(1), 1-24.

17. Greater Amman Municipality (2012), Transport and Mobility Master Plan, Amman, Jordan.

18. Johnson, M. D., and Fornell, C. (1991).''A framework for comparing customer satisfaction across individuals

and product categories.''*J. Economic Psychology*, 12(2), 267–286.

19. Jones T.O. and W.E. Sasser (1995)."Why Satisfied Customers Defect."*Harvard Business Review.* 73(6), 88-99.

20. Kärnä, S., (2004)."Analysing customer satisfaction and quality in construction – the case of public and private customers."*Nordic Journal of Surveying and Real Estate Research.* Special Series 2(1), 67-80.

21. Kärnä, S., Junnonen, J. M., and Kankainen, J. (2004) "Customer satisfaction in Construction."*In Proceedings of the 12th Annual Conference on Lean Construction*, 476-488.

22. Liu Huiqun and Zhao Xin (2009), "A Literature Review and Critique on Customer Satisfaction." *Marketing Science Innovations and Economic Development- Proceedings of 2009 Summit International Marketing Science and Management Technology Conference.*359-364.

23. Lu M (2002). "Determinants of Residential Satisfaction: Ordered Logit vs. Regression Models ", *Growth and Change*, 30(2), 264-287.

24. Luo, X. & Homburg, C (2007)."Neglected Outcomes of Customer Satisfaction."*Journal of Marketing*, 71(2): 133-149.

25. Maloney, W.F. (2002). "Construction product/service and customer satisfaction."*Journal of Construction Engineering and Management,* 138(10), 522-529.

26. Maloney, W. (2003)."Labor-Management Cooperation and Customer Satisfaction."*J. Constr. Eng. Manage.*, 129(2), 165–172.

27. Ministry of Public Works and Housings Annual report (2011), Amman-Jordan.

28. National new home customer satisfaction survey (2012). Home Builders Federation. United Kingdom.

29. Ojo. (2010). The relationship between service quality and customer satisfaction in the telecommunication industry: Evidence from Nigeria. *Broad Research in Accounting, Negotiation, and Distribution,* 1(1), 88.

30. Oliver, R. L. (1993). Cognitive, Affective, and Attribute Bases of the Satisfaction Response. *Journal of Consumer Research,* 20(3), 418–430.

31. Olorunniwo, F. & Hsu, (2006) "Service quality, customer satisfaction and behavioral intentions in the service factory."*Journal of Services Marketing*, 20(1): 59-72.

32. Parasuraman, A, V A Zeithaml and L L Berry (1988), "SERVQUAL: A Multi-item Scale Measuring Consumer Perceptions of Service Quality", *Journal of Retailing*, 64(1), 12-37.

33. Perry Forsythe (2008), "Modelling customer perceived service quality in housing construction." *Engineering*

Construction & Architectural Management, 15(5), 485-496.

34. Ranaweera, C., and Prabhu, J. (2003)."On the Relative Importance of Customer Satisfaction and Trust as Determinants of Customer Retention and Positive Word of Mouth."*Journal of Targeting, Measurement and Analysis for Marketing,* 12(1), 82–90.

35. Spreng, R. A., and Mackoy, R. D. (1996).An Empirical Examination of a Model of Perceived Service Quality and Satisfaction. *Journal of Retailing*, 72(2), 201–214.

36. Storbacka, K., T. Strandvik and C. Grönroos (1994). "Managing Customer Relationship for Profit: The Dynamics of Relationship Quality." *International Journal of Service Industry Management*, 5(5), 21-38.

37. Swan, J. E., and Combs, L. J. (1976).''Product performance and consumer satisfaction: A new concept.''*J. Marketing*, 40(Apr.), 25–33.

38. Tan, Y., Shen, L., and Langston, C. (2012). "Competition Environment, Strategy, and Performance in the Hong Kong Construction Industry." *J. Constr. Eng. Manage.*, 138(3), 352–360.

39. Torbica, Z. (1997), "Total quality management and customer satisfaction in home building." PhD. Dissertation. University of Florida, Gainesville, Florida.

40. Torbica, Z.M. and Stoh, R.C. (1999a), "Impact of total quality management on home buyer satisfaction." *Journal of Construction Engineering and Management* 125(3), 198-203.

41. Torbica, Z.M. and Stoh, R.C. (1999b), "An assessment of quality performance control in residential construction", *ASC proceedings of the 35th Annual Conference, California Polytechnic State University.* 7(10).

42. Torbica Z.M. and Stroh R.C. (2001)."Customer Satisfaction in Home Building."*Journal of Construction Engineering and Management*, 127(1), 82-86.

43. Yasamis, F., Arditi, D. and Mohammadi, J. (2002). "Assessing contractor quality performance." *Construction Management and Economics.*20(3), 211-223.

44. Zadkarim S., Emari H., Sanatkar S. and Barghlame H. (2011). "Environmental quality as an important dimension of customer satisfaction in apartment industry." *African Journal of Business Management*, 5(17), 7272-7283.

45. Zeithaml, V. A., Berry, L. L. and Parasuraman, A., (1993). *Delivering quality service: Balancing customer perceptions and expectations*. New York: New York Free Press.

11/12/2013