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# THE RELATIONSHIP BETWEEN PRODUCT QUALITY, SERVICE QUALITY AND SATISFACTION IN BUILD THEN SELL (BTS) HOUSING PROJECT

Aziam Mustafa[1], Fatimah Bahari[2], Noor Suriani Nazruddin[3]
Department of Commerce
Politeknik Sultan Salahuddin Abdul Aziz Shah

aziam@psa.edu.my, fatimahb@psa.edu.my, noorsuriani@psa.edu.my

## ABSTRACT

Build Then Sell (BTS) is a new system implemented in Malaysia after a new number of complaints have been received from buyers in the Sell Then Build (STB) system. When the government announced the implementation of BTS in 2007, practitioners of BTS have affirmed that the new system will provide good quality of houses. Problems such as abandoned halfway project, late delivery houses, use of the inferior building materials, non compliance to building specification and higher building defects arise while using STB. Abandoned project and late delivery house obviously can be solved using BTS system as in BTS system the house can be sold only when the house is completed. However, can BTS system provide good quality of houses? Hence, this study is conducted are twofold: (1) to examine the direct effect of product quality on buyers's satisfaction; (2) to determine the direct effect of service quality on buyers' satisfaction. A cross-sectional survey was conducted among house buyers in the urban areas in Klang Valley using self-administered questionnaires. The significant effect of product quality and service quality on buyers' satisfaction was tested using Structural Equation Modelling (SEM) procedure. The findings illustrated that only service quality has positive relationship with buyers' satisfaction. The findings hold strong implications for governing bodies, industry practitioners and funding agencies as they magnify the need for new and holistic strategies to address buyers' expectations as well as the developers' intensity in developing innovative housing solutions.

**Keywords:** *Build Then Sell, Housing Delivery System, Product Quality, Service Quality, Satisfaction*

## 1.    Introduction

Improving customer satisfaction is recognized as a critical success factor to all companies. In this context, the Malaysian housing industry has had to address the major sources of house buyers' dissatisfaction in the wake an alarming incidence of abandoned projects, delays, defective houses and shoddy workmanship (Khalid, 2010). In the housing industry, delivery system form one of the cornerstones of customer satisfaction. Researchers argue that the prevalent Sell-Then-Build (STB) delivery system is a major source of late delivery and defects caused by shoddy workmanship besides inferior-quality building materials (Ministry of Housing and Local Government, 1999). In view of the persistent occurrence of unfavorable housing projects, the Build-Then-Sell (BTS) system was implemented to mitigate the problem. As the immediate aim of developers is to sell their houses, choosing effective delivery systems to impact sales and address customer satisfaction and others issues are of utmost importance.

## 2. Housing Delivery Systems in Malaysia

Two types of delivery systems currently prevail in Malaysia, the Sell-Then-Build (STB) and Build-Then-Sell (BTS). The STB is a more popular concept in many Asian countries such as Hong Kong, Singapore and Taiwan. Literature about STB reveals its existence in Malaysia for more than four decades (Yusof et al., 2007). Even though the STB system has successfully supplied houses in Malaysia, the increasing problems faced by STB house buyers have urged the government to identify a solution and initiate a more effective housing delivery system such as the novel Build-Then-Sell (BTS) approach.

### 2.1 Sell-then-Build

A critical feature of the Sell-Then-Build (STB) system is that it allows developers to sell the housing units and collect progress payments once they obtain advertisement permits from the Ministry of Housing and Local Government (MHLG) (Yusof et al., 2010a). These uncompleted houses might be sold at the planning or construction stage (Leung, et al., 2007c). An unbuilt house is promoted and sold when the potential buyer is shown a plan, an attractive brochure or a model house. Yet, the design and workmanship may not necessarily be the same as the actual house that is going to be completed in the future. In Malaysia, the STB system has been successful in meeting the housing needs for all income groups for over 40 years (Yusof et al., 2010a). In particular, this system is advantageous to the developer as it improves the cash flow of the housing development and the payments obtained in the presales can be used for reinvestment in other construction projects (Leung et al., 2007b; Ong, 1997). To the buyers, the system is believed to offer differing choices in terms of the desired location, size and facilities.

### 2.2 Build-then-Sell

Since STB receives many critics from customers, it was incumbent upon practitioners in the housing and construction industry to scale up provisions of the housing delivery systems. Consequently, the idea of implementing the BTS system was heavily debated over two decades (Yusof et al., 2010a) until the government announced that the new BTS system would run in parallel with the conventional STB system for a two-year trial period (ibid) in April 2007. This was an attempt to solve the problem of abandoned housing projects, improve the quality of housing and provide greater protection to house buyers (Yusof & Shafiei, 2011). In essence, the BTS system requires developers to sell the house only after it is completely built in the completed property market with the CCC readily issued (Yusof et al., 2010a; b; Leung et al., 2007c).

In Malaysia, there are two types of BTS, namely which are 100 percent BTS and Partial BTS (Yusof et al.,2007; 2010a). In 100 percent BTS, house-buyers are not required to pay any down payment or any progress payments. Developers can sell the house only after the house is completely built with the CCC issued. This system is advantageous to house-buyers who have the opportunity to evaluate the house before agreeing to buy it (Yusof et al., 2007). The 100 percent BTS differs slightly from Partial BTS whereby in Partial BTS, developers may sell the house with a certain sum charged as down payment and the rest to be paid when the house is completed. The government has approved the Partial BTS incorporating the 10:90 BTS model. The model stipulates that after the signing of SPA, house-buyers have to pay 10 percent of the contract price as a deposit which is placed in a stakeholder account to be released to developers once they have completed the houses (Yusof et al., 2007). The remaining 90 percent is to be paid after the house

is completed with the CCC released to the house-buyers (MHLG, 2007; Yusof et al., 2007). The 10:90 BTS model is a combination of the STB and the BTS model, with the 10 percent deposit functioning as the purchaser's bond to the contract.

## 3. Literature Review

This section provides a synthesis and analysis of previous published research related to the main theoretical concepts of this study including product quality, service quality and customer satisfaction.

### 3.1 Customer Satisfaction

In today's market, it is crucial to offer information technology services to market the products, services especially for suppliers for the purpose of economic networking (Gummesson, 2002). This reflects the shifting trend from consumption to information technology based services which not only provides in-depth information but also allows customers to bond with the products and services offered. Consequently, this study applies service providers' attributes to replace total offerings as formulated by Torbica (1997). Service providers' attributes refer to product quality, service quality, price and location that collectively determine buyers' satisfaction in housing industry. It involves before, during and after experiences in acquiring the housing unit. In this concept, the house is a physical product which is measured in terms of design and materials that leads to the purchasing process.

Two perennial questions remain in the bid to escalate the provision of housing systems; Are house buyers really satisfied? And do the private developers build to satisfy their house buyers? As more companies are starting to realize the importance of customer satisfaction, the impact of customer satisfaction on a company's operations has become a widely discussed topic (Matzler et al., 1996) and customer satisfaction is being highly prioritized (Johnson & Fornell, 1991). Yet, reports on abandoned housing projects, late delivery and poor quality are frequently highlighted in the local newspapers (House Buyer Association Malaysia, 2002). This may be attributed to several reasons such as unskilled construction workers, inexperienced site supervisors, substandard materials, disorganized and labour intensive construction works, rushed construction job and huge demand for the properties (Elias, 2003).

In the current competitive age where information is readily available, product quality and service quality have become increasingly important. This is because many companies now realize that satisfying customers are the key to long-term success. According to Kim et al., (2004) companies with goods and services perceived as being of high quality typically have greater market share, higher return on investment and higher asset turnover than firms which have goods and services perceived as being of low quality (Kim et al., 2004).

### 3.2 Product Quality

Product quality is one of the most important constructs in marketing. The term "quality" has no global definition. The American Society for Quality Control defines quality as the totality of features and characteristics of a product that bear on its ability to satisfy stated or implied needs (Miller, 1993). Product quality is viewed as significant to customers. Therefore, firms should be concern about their own perception or customers' perception on products' quality (Watson, 1998). Similarly, Fornell et al. (1996) claimed that customer satisfaction is more quality driven than value or price driven. Product quality is also found to be one of the antecedents to customer satisfaction

(example, Anderson & Sullivan, 1993; Churchill & Suprenant, 1982; Cronin & Taylor, 1992; Fornell, 1992). On the other hand, Bearden and Teel (1983) found that the perceptions of product quality are considered as determinants of attitudes that lead to intentions to purchase and use.

This study focuses on the buyers who generally, perceive their houses as a physical product that is well designed with details and specifications supplied by the developer. These designs consist of the progression including the foundation, structure, electrical, mechanical, and roofing that make up the physical development of the house. Buyers receive what is in the project location after all the work has been completed. In buying the house, the buyers deal with the private service providers before, during and after the purchasing process. Besides physical product (house), service comprising of service product, service environment, and service delivery should be provided by the service providers to satisfy customer needs and wants (Maloney, 2002). The tangible quality of service products should be part of the satisfaction model which is identified as an important factor for consumer decision making relating to product quality (Cronin, Brady, & Hult, 2000). As a result of these ongoing studies, the perceived quality construct of consumers' durable goods and perceived product quality had a major effect on purchasing choices (Brucks, Zeithaml, & Naylor's, 2000). This statement underlies that product quality has as much an effect on consumer satisfaction as service quality (Parasuraman, Zeithaml & Berry, 1994). Such discussions show that product quality is found to be an independent factor and therefore, this study aims to investigate its influence on consumer satisfaction. In sum, marketing academics and marketing practitioners believe that product quality influences customer satisfaction.

### 3.3 Service Quality

Service quality is a primary concern for most Malaysian companies today. In order to gain competitive advantage, companies need to gather information on market demands and process the details of customer satisfaction. Evidence from recent studies suggest that service quality is determined by the differences between customer's expectations of the performances of the service and their evaluation of the services they received (Parasuraman et al., 1985, 1988). Similarly, Asubonteng et al., (1996), defines service quality as the difference between customers' expectations for service performance prior to the service encounter and their perceptions of the service received. However, it must be noted that both concepts (service and quality) are intangible, abstract and complicated.

The success of the housing development project relies heavily on the quality of the house and quality of services. As highlighted their study by Parasuraman, Zeithaml & Berry, (1985), marketers must concern themselves with the quality of their goods and services to remain technologically competitive in the eyes of customers. The function of service quality has been acknowledged as being a vital determinant for the success of service providers in today's competitive environment in the housing industry. Researchers posit that customer satisfaction occurs when customers' expectations are met, or exceeded, and is thus highly dependent on the fulfilment of expectations (Fornell, 1992; Herrmann, Huber & Braunnstein, 2000; Matzler et Al., 1996; Torbica & Stroh, 2000; Johnson & Fornell, 2001). Housing developers are typically viewed as providing services to the buyers rather than manufacturing settings and as such, they are modelled as providing the whole range of services which are related to the actual product (Ozaki, 2003). With a focus on the whole offering, there is a higher possibility to satisfy customers and in so doing, to gain competitive advantage and compete successfully in the market in the long run (Torbica & Stroh, 2000). Based on the literatures review, the hypothesis and measurement model are formulated for the exogenous variable and the endogenous variables as shown in Figure 1 to explain the relationships among product quality, service quality and satisfaction.
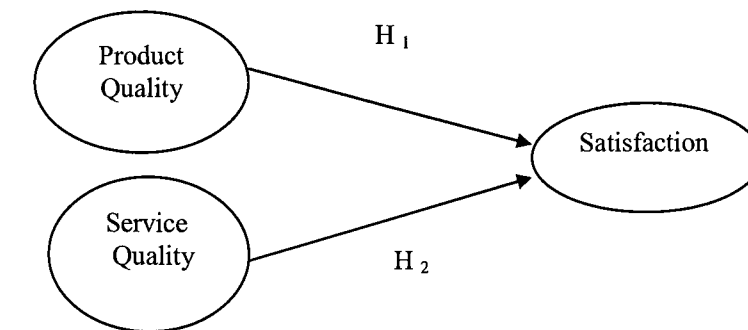
**Figure 1:** **Theoretical Model for this Study**

### 4. Research Method

This study employed the survey research method. The quantitative data collection technique that consists of closed ended questions was used to gather the data concerning satisfaction and preferences. The BTS system is still new in Malaysia. Therefore, there is still no record of developers who implement or who have had applied this system. Because of this reason, the researcher has to rely on the media such as the newspaper, banner or brochure to identify the BTS residential areas. In order to measure the effect of product quality and service quality on satisfaction BTS housing delivery system, two criteria have been recognized in selecting the residential areas; (1) the residential areas are built according to BTS systems; (2) BTS residential areas have been occupied within three years.

### 4.1 Respondents and Sampling Technique

The respondents for this study are the residents in BTS houses. The reason for selecting residents as respondents is because they are the end user of the 'product', in this case the house. They have more experience about the house condition which lies at the post-occupancy stage (Fernandes, 2007). Professionals will focus more on the technical aspects whereas the buyers would have their own personal perceptions towards the quality of their house (Auchterlounie, 2009). In most studies, typically the entire population of the target respondents is wide. It is impossible to approach them all as it will take time and also it will be costly. In this case, therefore, it is necessary that the sampling is done. In this study however, the population of BTS projects cannot be ascertained as the Malaysian government also does not have the list of developers who implement the BTS system. Only several residential areas were identified through the media.

### 4.2 Data Collection Procedures

The questionnaires were employed to gain generalization about the severity of dissatisfaction occurring in BTS houses. In all BTS residential areas, questionnaires were administered directly to the occupants during the door-to-door visits requesting if the questionnaire can be completed on the spot (Newman, 2000). Otherwise, the respondents would be told that the questionnaires would be left for awhile as suggested by Islam (2008) and Babbie (2002) in order to give room to the respondents to answer the questionnaire and it will be collected later ( Islam, 2008; Barbie, 1998). Hence, after the respondents had completed the questionnaires, taking advantage from the face-to-face survey where the researcher has asked an open-ended question to the respondents. It was done as an expansion to the questionnaire. The questionnaire was first evaluated to know the elements that were rated as severe or critical by the respondents. As suggested by Malterud

(2001) and Driscoll et al. (2007), the smaller group of respondents was asked to gain more understanding and obtain more detail about the topic.

### 4.3 Questionnaire Design

A structured questionnaire was used to collect data. For all variables of these researchers, the authors have used 5 point Likert scale. Service quality was measured by using 5 dimensions developed by Zeithaml, Berry, and Parasuraman (1996). Service quality has reported reliability is .827. Customer satisfaction was measured by using 3 items adopted from Cronin, Brady and Hult (2000) and Wang et al. (2004), and the reported reliability of this scale is above .886. To measure product quality five item scale developed by Torbica & Stroh (2001) was used, and the reported reliability of this scale is .824. The survey sought to determine the direct effect of product quality and service quality on satisfaction in BTS housing delivery system. House buyers were asked to indicate their perceptions on product quality, service quality. House buyers were asked that would be needed for future employment. Each item was measured using a seven-point Likert scale representing different levels of satisfactory and levels of important.

### 4.4 Data Analysis Procedures

To assess direct and indirect (mediated) relationships among the studied variables the researchers have performed confirmatory factor analysis and structural equation modeling (Anderson & Gerbing, 1988). SPSS and Amos had been used to perform these analyses. These analyses suppose to help us to understand which model fits the data best while presenting a credible assessment on the relationship between product quality, service quality and customer satisfaction.

### 5. Results

Statistical techniques were applied to assess the reliability and validity of the survey and to obtain more clarity regarding the influence of the selected variables on customer loyalty.

### 5.1 Reliability

Reliability is defined as the extent to which a questionnaire, test, observation or any measurement procedure produces the same results on repeated trials (Babbie, 2004). According to Du Plessis (2010), when calculating Cronbach's alpha, results exceeding 0.60 will reflect the lower level of acceptability. The reliability statistics for the questionnaire are presented in Table 1. It is evident from Table 1 that the reliability coefficient or alphas for the different constructs were computed using the reliability procedure in SPSS.

**Table 1: Reliability Statistics**

| Construct | Cronbach alpha |
|---|---|
| Product Quality | 0.857 |
| Service Quality | 0.813 |
| Satisfaction | 0.816 |

### 5.2 Confirmatory Factor Analysis (CFA)

Confirmatory factor analysis (CFA) was conducted to assess the construct validity of the model. Convergent validity is confirmation of the existence of a construct determined by the correlations exhibited by independent measures of the construct. To assess convergent validity, the loading

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estimates and construct reliability were investigated. In AMOS, convergent validity can be assessed and tested using the measurement model by determining the significant t value of each item's estimated pattern coefficient on its posited underlying construct factor. (Anderson & Gerbing,1988). Confirmatory factor analysis (CFA) was performed using AMOS to measure the unidimensionality, convergent and discriminant validity. Table 2 shows the fit statistics results for product quality, service quality and satisfaction models.

**Table 2: Fit Statistic Results**

| Model | $\chi^2$ | Pvalue | RMSEA | GFI | AGFI | NNFI | CFI |
|---|---|---|---|---|---|---|---|
| Product Quality | 35.898 | 0.001 | 0.069 | 0.964 | 0.927 | 0.972 | 0.972 |
| Service Quality | 93 | 0.001 | 0.067 | 0.920 | 0.886 | 0.955 | 0.952 |
| Satisfaction | 25 | 0.045 | 0.084 | 0.962 | 0.997 | 0.991 | 0.904 |

As it can be seen from Table 3, Goodness-of-fit of the final model indicated "reasonable or good fit" or RMSEA = 0.029. Hair et al., (2009) suggested 0.05 < RMSEA < 0.08 is for "good fit". In this study, CFI (comparative fit index) = 0.891 demonstrates reasonable fit in this study. Hu and Bentler (1999) suggested that a rule of thumb for the CFI and the incremental indexes is that values greater than roughly 0.90 may indicate reasonably good fit of the researcher's model. The GFI was the first standardized fit index (Joreskog & Sorbom, 1999). GFI = 1.0 indicates perfect model fit. Therefore, a GFI = >0.900 indicate reasonably good fit of the researcher's model in this study. The AGFI = > 0.800 indicate reasonably good fit of the researcher's model. The NNFI (nonnormed fit index) or Tucker-Lewis Index has been recommended by Bentler and Bonett (1980). Hair et al., (2009) recommended a value of 0.90 or better for good fit. Thus, an NNFI > .978 for this study implies good fit. From the above goodness-of-fit evaluation, confirmatory factor analysis for the final measurement model reasonably supported the model's fit.

### 6. Structural Equation Model (SEM)

Structural equation modelling (SEM) was used to test the hypothesized relationships in the proposed model shown in Figure 1. The structural equation modeling technique enables the simultaneous estimation of multiple regression equations in a single framework.

### 6.1 Goodness of Fit

A structural model is fit to the product quality, service quality and customer data according to the model structure given in Figure 2. Two paths (product quality to satisfaction and service quality to satisfaction, are found to have significant positive standardized path coefficients and not dropped sequentially based on Wald tests. The goodness of fit indices for the final structural model, shown in the bottom part of Table 3, suggest a good fit to the data: small ratio of chi-square to degree of freedom (< 2), great values of GFI, AGFI, CFI, NFI (> 0,9) and RMSEA values (< 0.05).
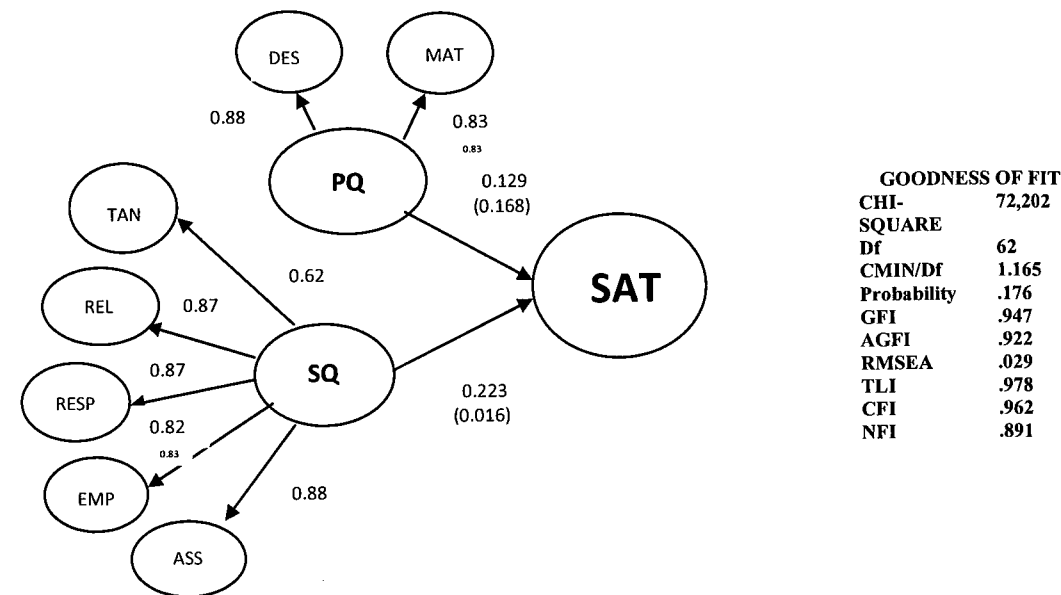
| | GOODNESS OF FIT |
|---|---|
| CHI-SQUARE | 72,202 |
| Df | 62 |
| CMIN/Df | 1.165 |
| Probability | .176 |
| GFI | .947 |
| AGFI | .922 |
| RMSEA | .029 |
| TLI | .978 |
| CFI | .962 |
| NFI | .891 |

**Figure 2:      Results of Structural Model – Path Analysis**

The model was estimated using maximum likelihood method. Browne and Cudeck (1992) specified that a model whose root mean square error approximation (RMSEA) is less than 0.05 has a close fit; an RMSEA of less than 0.08 has a good fit. Chin and Todd (1995) suggest that the GFI and NFI should be above 0.90 and the AGFI above 0.80 for a good fit. The CFI should also be above 0.90 (Bentler, 1990). Table 3 lists the recommended values of various measures of model fit.

**Table 3 : Goodness-of-Fit Results Of The Study**

| Goodness-of-fit statistics | | Values | Desired range of values for a good fit |
|---|---|---|---|
| Chi-square test | $\chi^2$ | 72.201 (p > .05) | p > .05 |
| **Absolute fit measures** Degrees of freedom | Df | 62 | $\geq 0$ |
| Chi-square / degrees of freedom ratio | $\chi^2$ / df | 1.165 | 2 to 5 |
| Goodness of fit index | GFI | .947 | > .90 |
| Root mean square error of approximation | RMSEA | .029 | < .08 |
| **Incremental fit measures** Adjusted good-of-fit index | AGFI | 0.922 | .922 |
| Tucker-Lewis index | TLI | .978 | > .90 |
| Comparative fit index | CFI | .982 | > .95 |
| Normed fit index (NFI) | NFI | .819 | > .90 |

### 6.2      The Hypothesized Causal Structure Model

In accordance with the parameter estimates shown in Figure 2 service quality yield positively and significantly related to satisfaction (coefficient=0.226, p(=0.016)<0.10), this finding as proposed in H1. In the same way, as proposed in H2, product quality has not  positive and significantly effect on satisfaction (coefficient=0.129, p(=0.168) >0.05). Table 4 also shown the regression weight of product quality and service quality  to satisfaction.

**Table 4:  Summary of Hypotheses Testing Results**

| Path | Estimate ($\beta$) | S.E | C.R. | P | Result |
|---|---|---|---|---|---|
| **Product Quality ➞ SAT** | 0.129 | 0.087 | 1.379 | 0.168 | **Unsupported** |
| **Service Quality ➞ SAT** | 0.223 | 0.153 | 2.402 | 0.016 | **Supported** |

*Standardised beta coefficients; S.E. = standard error; C.R. = critical ratio; *p< 0.01*

The research question of this study is related to the effect of product and service quality on buyers' satisfaction. At the 10% level of significance, there were positive relationship between service quality ($\beta$: 0.223) and satisfaction, thus $H_1$ were supported.  On the other hand, the relationship between product quality ($\beta$: 0.129) with satisfaction were not significant, and thus, $H_2$ was not supported. Table 5 summarises the hypothesised relationships between the variables.

**Table 5: Summarised results for Hypotheses $H_1 - H_2$**

| | Hypotheses Tested | *p*- value | Results |
|---|---|---|---|
| $H_1$ | There is a positive relationship between product quality (PQ) and buyers' satisfaction. | 0.168 | Unsupported |
| $H_2$ | There is a positive relationship between service quality (SQ) and buyers' satisfaction. | 0.016 | supported |

### 6.3      Discussion

$H_1$ states that there is a significant effect of buyers' perceived product quality (PQ) on their satisfaction (SAT).  $H_1$ was rejected. The findings reveal that there was no significant effect of product quality on satisfaction and failed to support such a relationship. It is  further evidence that results from empirical testing on the perceived product quality show that there was no impact on the level of satisfaction either in STB or BTS delivery systems. Surprisingly, the results contradict with the hypothesized outcome and also the findings from previous research such as Cronin et al. (2000) and Parasuraman et al. (1994). Even though the relationship between product quality and satisfaction was not significant, there is evidence that some association exists between product quality and service quality. This suggests that the higher the product quality, the higher

the service quality, which leads to higher satisfaction. Therefore, product quality might have an indirect relationship with satisfaction through service quality.

$H_2$ states that there is a significant effect of buyers' perceived service quality (SQ) on their satisfaction (SAT). The hypothesis was supported. Customer satisfaction and service quality are two important aspects that are closely related but conceptually different from each other (Jones & Sasser, 1995; Oh & Park, 1997; Zeithaml et al., 1993). Researchers of service quality suggest that high service quality results in high customer satisfaction (Parasuraman et al., 1985; 1988). Moreover, good service quality and perceived service lead to customer satisfaction which resulted in the increase in evaluation of service quality again (Bitner, 1990). Similarly, perceived service quality is the accretion of consumer satisfaction (Teas, 1993). The findings of this study provide further support to the numerous arguments in the literature that service quality is a major factor contributing to customer satisfaction.

## 7.    Conclusion

Importantly, the study adds to the existing, buyers' satisfaction in housing industry by focusing on the perspective of buyers regarding total offerings (product quality and service quality) in both BTS delivery system. The results from this study also provide further understanding of the complex interactions between service quality on buyers' satisfaction. The findings hold strong implications for governing bodies, industry practitioners and funding agencies as they magnify the need for new and holistic strategies to address buyers' expectations as well as the service providers' reluctance in developing innovative housing solutions. These results have both academic and practitioner implications.

## 8.    Recommendation for Future Research

This study offers a few suggestions for future research. First, additional research is needed to replicate this study as well as to extend the testing of the scale in other cities and countries, thus addressing the generalisability of the findings reported in this study. It should be analysed whether heterogeneity of the market imply changes in the interrelationship of the constructs. The BTS delivery system was proposed by the government to mitigate the incidence of late delivery of houses, poor housing quality and abandoned projects. In so doing, the government offered some incentives to encourage service providers to adopt BTS. Some developers were receptive to the proposition but a great majority of the developers were reluctant to implement it in view of the financial implications such as insufficient funding by the financial institutions. Additionally, there appears to be persistent delay in the housing projects which can be another source of financial burden to the developer. As such, future research should also look into elements of project management so that cost overruns and project delays can be minimised. In light of the risks faced by the service providers and the buyers, there is a need to establish insurance and warranty systems to protect the rights of housing industry players. A study on the applicability of insurance and warranty in the Malaysian housing industry would provide valuable input for the government as they formulate policy.

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