TRANSIT SYSTEM SERVICE QUALITY
OF TOURISM-EDUCATION CITY AND BUSINESS CITY
(CASE STUDY: TRANSJOGJA AND TRANSMUSI INDONESIA)

Aleksander Purba[1], Fumihiko Nakamura[2], Dwi Herianto[1] , I Wayan Diana[1], M Jafri[1], Ch Niken DWSBU[1]

[1]*Civil Engineering Department, the University of Lampung, Bandar Lampung, 35145, Indonesia*
[2]*Graduate School of Urban Innovation, Yokohama National University, 79-5 Tokiwadai, Hodogaya-ku, Yokohama, 240-8501, Japan*

ABSTRACT

Quality service is a key performance indicator of a system. There are a lot of elements that define the transport system service quality. Customer point of view is at the center of policy, planning and delivery decisions. As an education city, Jogjakarta's customers comes from all over Indonesia and as an international tourism, Jogjakarta has world guest. As a business city, customers in Palembang have a different character to Jogjakarta. The aim of this research is to obtain the main aspect of transit system service quality of international-education city and business city.

Keywords: Business city; Service quality; Tourism-Education city, Transit system.

1. INTRODUCTION

Technological development is a significant key effort to gain product and project competitive advance (Berawi, 2015). The continuity of long-term strategies and development plans is required to achieve the targets (Berawi, 2016). The new system of transportation has been applied in Jogjakarta and Palembang Indonesia as a long-term strategy to achieve good service quality. Service quality is a key performance indicator. Even Hensher, 2015, mentioned that public transport services increase in sophistication. The sophistication is a growing focus on an increasing number of key performance indicator that emphasis service quality (Hensher, 2015). There are a lot of elements that define the transport system quality. Purba et al, 2014, have mentioned that satisfaction is different for different city. The influence a service employee has on customer perception of service quality. Interaction performed during the service encounter influences customer perception of the service delivered (Kennedey, 2011). Transport system customer has a specific perception of service quality, as an indicator of transport system. Attitude of the employee, and system of transportation affects the interaction. Incoherent service delivery that may result in unfavorable customer experiences (Ragnhild et al., 2017). Many service firms fail in delivering service quality to their customers (Kennedey, 2011).

In order to increase the level of service quality from transport system users (public transport users and non-users) point of view, service quality elements that should be primary acted on must be identify (Grujičić, 2014). Putting the customer at the center of policy, planning and delivery decisions requires a measure of customer satisfaction that is robust, capable of benchmarking customer satisfaction inform policy and planning of

service (Hensher, 2015). A frame work based on customer journeys for a structured portrayal of service delivery from customer point of view, was also studied (Ragnhild et al., 2017).

Eboli and Mazzula, 2007, have been obtained a structural equation model that explore the impact of the relationship between global customer satisfaction and service quality (SQ) attributes for bus service. The research based on bus service habitually used by University of Calabria students to reach the campus. Customers in Jogjakarta different to Palembang. As an education city, Jogjakarta's customers comes from all over Indonesia and as an international tourism, Jogjakarta has world guest. As a business city, customer in Palembang have a different character to Jogjakarta. This research was emphasis to the difference of the both type of city related to service quality.

Purba et al, (2014) have studied service performance of both TransJogja and TransMusi from users point of view and found both local government of Jogjakarta and Palembang should starting improve the subsidy and fare aspect following to service quality and satisfaction in order to maintain user satisfactions and loyalty. This paper, by using the same data and method, would explore in more detail which factor is the most important in determining service quality. The aim of this research is to obtain the main aspect of service quality of international education city and business city.

2. EXPERIMENTAL PROGRAMME

Service quality of public transport poses formidable challenges: how to deal with such complex, fuzzy and abstract concept as service quality. Whether we should use performance perception only or also customer expectation. Expectation should be considered: ideal, desired, adequate or tolerable quality. How to identify the most relevant attribute that affect service quality how to deal with subjective, quality, and fuzzy (de Ofia J., and de Ofia, R., 2014).

3. RESULTS AND DISCUSSION
3.1. Descriptive Statistics

According to Central Agency on Statistics's data population of Jogjakarta is 510,108 with a density 15,695 people/km^2, while Palembang, whose growth relied on natural resources is higher more than three times (1,708,413) and is less dense than Jogjakarta with a density only 4,765 people/km^2 (2013). For Jogjakarta the actual number of people living in the city area is probably higher than registered number as there are many students living in the city who are still registered at their parents' address. Jogjakarta started to operate a new transit system of TransJogja in 2008 while TransMusi started running in 2010. Average daily ridership of TransJogja is about 16,000 and the average ridership of TransMusi stood at 22,000 (2013). Table 1 provides a more detailed comparison between Trans buses.

The gross regional domestic product per capita shows both cities are much smaller than Jakarta as the capital of Indonesia during the period of 2011 to 2012 (Figure 1). It is inevitable that the high gap of incomes among regions is the cause of continuing massive urbanization to Jakarta from surroundings provinces, municipalities and regencies in addition to the matter of availability of employment. The Gross Regional Domestic Product (GRDP) or gross domestic product of region is a sub-national gross domestic product for

measuring the size of that region's economy. It is the aggregate of gross value added of all resident producer units in the region. The GRDP includes regional estimates on the three major sectors including their sub-sectors namely:

- Agriculture, fishery and forestry (primary)
- Industrial sector, including mining and quarrying, manufacturing, construction, electricity and water (secondary)
- Service sector, including transport, communication and storage, trade, finance, renting and business services and other private services (tertiary).

Table 1 Profile of the Trans bus

	TransJogja	TransMusi
Urban Area Characteristics		
Area (km^2)	32.5	358.5
Population (people), 2013	510,108	1,708,413
Province	Jogjakarta Special Region	South Sumatera
Provincial capital	Jogjakarta	Palembang
Physical Measures		
Year of implementation	2008	2010
Number of fleets	54	120
Number of routes	3	8
Bus capacity	40	40-55
Average length/route	34	37
Number of bus stop/route	17	32
Dedicated lane available	No	No
Regulatory Framework		
Regulator	UPTD	Dishub
Bus operator	Consortium	BUMD
Bus provider	MoT, province, consortium	MoT, municipality
Approach to competition	gross cost	net cost
Other modes within the city	bus, PT, rickshaw	bus, PT, rickshaw, river bus
Way of payment	cash/card at bus stop	cash/card on the bus
Multimodal integration	Airport	Airport, river bus
Operational Performance		
Average daily ridership	16,000	22,000
Average load factor (%)	40	42
Headway (minutes)	5-10	5-10
Average speed (km/h)	20-30	20-35
% Fare subsidy (2013/2014)	36.4	28.6
% Fare box revenue*	35	41

*Dirgahayani (2012) NA/P: not available/partial; PT: para-transit
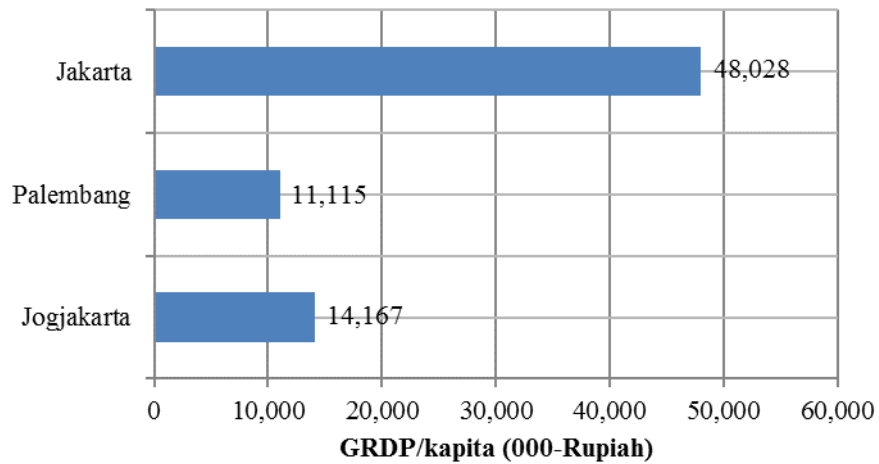
Figure 1 GRDP/capita of selected cities and Jakarta

During 2011-2012, the driving force of cities' economics is totally structured by both secondary and tertiary sectors (Figure 2); in Jogjakarta the secondary and tertiary sectors contributed with 31% and 68%, respectively, and in Palembang the contribution was 44% and 55%, respectively. The lesser presence of the primary sector means agriculture is no longer attractive to most urban communities.
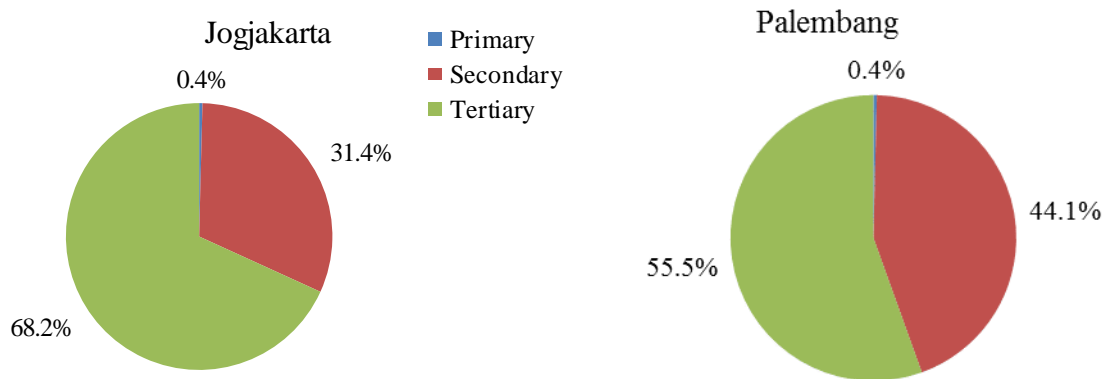

Figure 2 Forming of structure economic, by sector

3.2. Socio-economic of Respondents

Of the 265 questionnaires returned by TransJogja users, only 242 questionnaires could be used for further analysis, while of the 370 questionnaires returned by TransMusi users, only 334 questionnaires could be used in the next stages of the model analysis. The descriptive statistics of the respondents are reported in Table 2. As shown in the table below, more than a half of Trans users of both Jogjakarta and Palembang cities are students. Another striking

characteristic of respondent is the age of the majority of users is under 40 years old and single status. The possible impact of this high percentage of the subsample is that perception of students and young users possibly dominates the perception of the users as a whole.

Table 2 Socio-economic characteristics of respondents

No	Characteristics	TransJogja's users (n= 242)	TransMusi's users (n= 334)
1	Sex	Male (48%); Female (52%)	Male (56%); Female (44%)
2	Marital status	Married (34%); Single (66%)	Married (38%); Single (62%)
3	Age	≤20 (42%); 21-30 (30%); 31-40 (21%); >40 (7%)	≤20 (39%); 21-30 (33%); 31-40 (24%); >40 (4%)
4	Place of living	Municipality area (62%); Outside the municipality (38%)	Municipality area (74%); Outside the municipality (26%)
5	Family members	1 (11%); 2 (16%); ≥3 (73%)	1 (14%); 2 (19%); ≥3 (67%)
6	Job	Student (60%); civil servant (15%); private employee (16%); entrepreneur (6%); others (3%)	Student (51%); civil servant (22%); private employee (20%); entrepreneur (3%); others (4%)
7	Education	Junior high school or less (16%); Senior high school (48%); Diploma or higher (36%)	Junior high school or less (15%); Senior high school (56%); Diploma or higher (29%)
8	Income (IDR)	<1 million (41%); 1-2.5 million (39%); 2.5-5 million (12%); >5 million (8%)	<1 million (43%); 1-2.5 million (35%); 2.5-5 million (9%); >5 million (13%)
9	Motorized vehicle ownership	Did not own any car (37%); motorcycle (48%); automobile (15%)	Did not own any car (29%); motorcycle (52%); automobile (19%)
10	The reason for using Trans buses	Did not own any car (35%); prefer to make use of new transit (49%); unable to drive (16%)	Did not own any car (28%); prefer to make use of new transit (51%); unable to drive (21%)
11	Trip purpose	School/university (57%); work (27%); recreation (10%); social activity (4%); others (2%)	School/university (48%); work (35%); recreation (8%); social activity (6%); others (3%)
12	The way to reach bus stop	Walking (78%); park and ride (4%); others (18%)	Walking (81%); park and ride (2%); others (17%)
13	Number of trip using Trans bus per day	Once (31%); twice (48%); three time or more (21%)	Once (38%); twice (43%); three time or more (19%)
14	Overall satisfaction	Very dissatisfied (9%); dissatisfied (18%); neutral (43%); satisfied (21%); very satisfied (9%)	Very dissatisfied (13%); dissatisfied (14%); neutral (39%); satisfied (29%); very satisfied (5%)

Note: ***significant at 1%; **significant at 5%; *significant at 10%

Furthermore, the women constitute as the largest portion of TransJogja user, while the males are the primary user of TransMusi. Nearly 40 percent of TransJogja users residing outside the municipality indicate nearly half of the traveler to travel across the region. At the same time, the proportion is 26 percent in Palembang. These percentages potentially continue to grow, since the population of both cities is increasing. In terms of income, about 80 percent of Trans users are from lower-class households and about 10 percent are from the wealthiest class.

3.2. Model Results

In this paper, path analysis was employed to reveal the relationship among variables.

Table 3 Standardized factor loading estimates

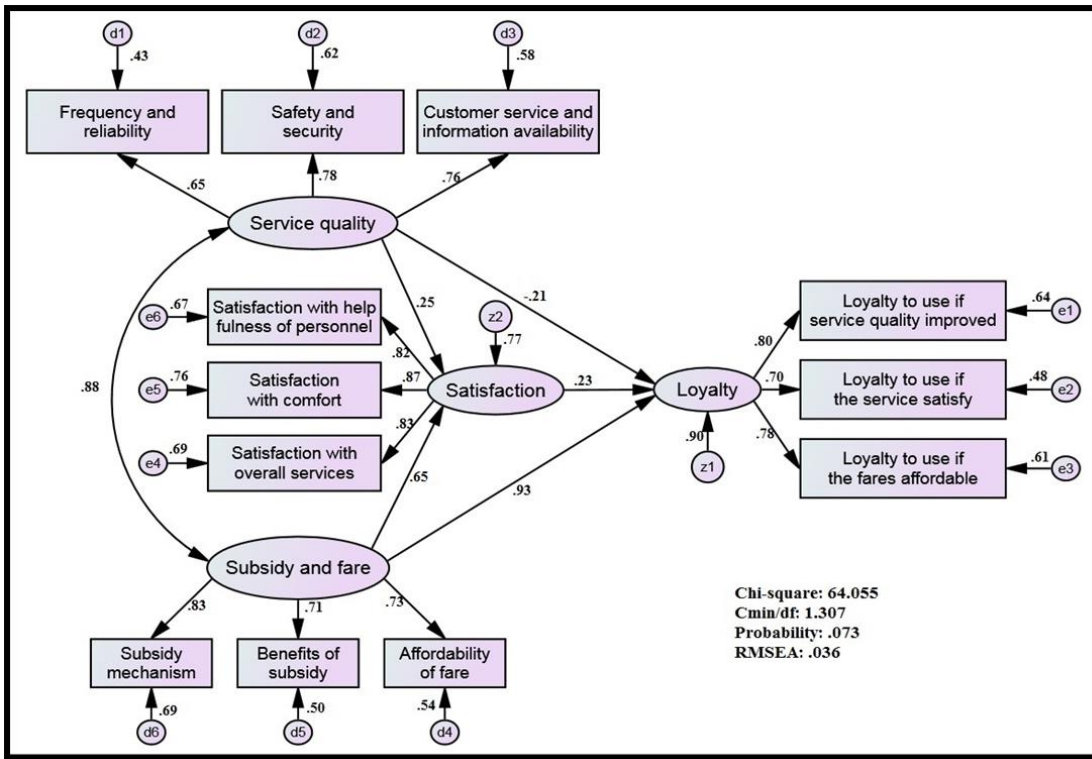| Latent variables or factors	Observed variables	Structural relationship/Co-relationship	Standardized estimates-Significance level	
			TransJogja	TransMusi
Service quality	Frequency and reliability	Service quality → Satisfaction	0.247**	-0.084**
	Safety and security	Service quality → Loyalty	-0.213**	0.016**
	Customer service & information availability	Service quality → Frequency and reliability	0.652*	0.822*
		Service quality → Safety and security	0.784***	0.834***
		Service quality → Customer service & information availability	0.764***	0.514***
		Service quality ↔ Subsidy and fare	0.881***	-0.091**
Subsidy and fare	Affordability of fare	Subsidy and fare → Satisfaction	0.651***	0.004**
	Effect of subsidization	Subsidy and fare → loyalty	0.930***	0.392***
	Distribution of subsidies	Subsidy and fare → Affordability of fare	0.734*	--
		Subsidy and fare → Effect of subsidization	0.708***	0.641***
		Subsidy and fare → Distribution of subsidies	0.833***	0.954*
Satisfaction	Satisfaction with overall services	Satisfaction → Loyalty	0.226**	0.002**
	Satisfaction with comfort	Satisfaction → Satisfaction with comfort	0.873***	--
	Satisfaction with helpfulness of personnel	Satisfaction → Satisfaction with helpfulness of personnel	0.816***	--
		Satisfaction→ Satisfaction with overall services	0.832*	0.996*
Loyalty	Loyalty to use if service quality improved	Loyalty → Loyalty to use if service quality improved	0.799*	0.793*
	Loyalty to use if the service satisfy	Loyalty → Loyalty to use if the services satisfy	0.695***	0.725***
	Loyalty to use if the fare is affordable	Loyalty → Loyalty to use if the fare is affordable	0.779***	--
Indices of goodness-of-fit parameters				
Chi-square/DF			1.307	0.637
CFI			0.991	1.000
NFI			0.963	0.985
IFI			0.991	1.009
GFI			0.957	0.993
AGFI			0.932	0.983

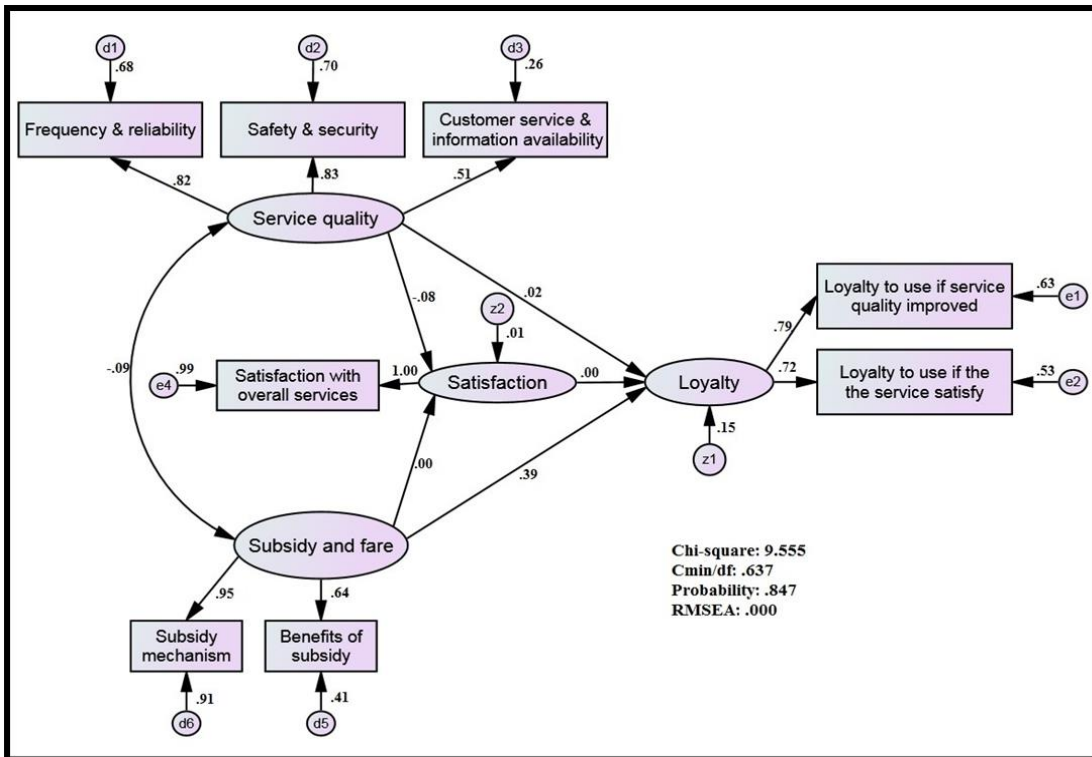Figure 3 Relationship among variables of TransJogja model

Figure 4 Relationship among variables of TransMusi model

The model was calibrated using AMOS 22 package from SmallWaters Corporation (Arbuckle and Wothke, 1999). Model results of TransJogja users and TransMusi users are shown in Table 3 and Figures 3 and 4.

3.2. Discussion

The minimum value of the discrepancy function in TransJogja and TransMusi models are 64.055 and 9.555 (Figures 3 and 4), indicating that they are statistically significant according to the chi-square test. The values of GFI, AGFI, NFI, IFI, and CFI for the TransJogja model are 0.957, 0.932, 0.963, 0.991, and 0.991, respectively, close to unity, meaning that the model is a perfect fit. Based on this result, it is clear that the TransJogja model has a good fitness, since all the parameters obtained imply a good fit model. On the other hand, the values of GFI, AGFI, NFI, IFI, and CFI for the TransMusi model are 0.993, 0.983, 0.985, 1.009, and 1.000, respectively. Some of the parameter fit values of the TransMusi model exceed one, implying a marginal fit model. As can be seen in Table 4, only two from six determinants of service quality and none from five determinants of subsidy and fare, are significant at 5 percent in the TransJogja model, while three from six determinants of service quality and one from five determinants of subsidy and fare, are significant at 5 percent in the TransMusi model. Further, only one from four determinants of satisfaction is significant at 5 percent in the TransJogja model as well as in TransMusi model. Three from six determinants of service quality and four from five determinants of subsidy and fare, are significant at 1 percent in the TransJogja model, while two from six determinants of service quality and two from five determinants of subsidy and fare, are significant at 1 percent in the TransMusi model. Moreover, two from four determinants of satisfaction and two from three determinants of loyalty, are significant at 1 percent in the TransJogja model, while none from four determinants of satisfaction and one from three determinants of loyalty, is significant at 1 percent in the TransMusi model. Referring to the standardized regression weights in Table 4, it is clear that all latent variables of service quality, subsidy and fare, satisfaction, and loyalty are valid (values greater than 0.5) in the TransJogja model. Meanwhile in the TransMusi model, a number of observed latent variable except in service quality had to be removed since their regression weight values are less than 0.5. According to the level of significance and regression weight, the safety and security (0.784/0.834), and customer service and information availability (0.764/0.514) are the two most important attributes for improving the quality of service of TransJogja as well as TransMusi models, in addition to the subsidy and fare (0.881) attribute in TransJogja model alone. In regards to subsidy and fare policy, the distribution of subsidies (0.833), and effect of subsidization (0.708) attributes are the two most willing to pay attention the local government in the TransJogja model, while the effect of subsidization (0.641) attribute is the one with the highest priority in the TransMusi model which could lead to increase the effectiveness of transport subsidies. In terms of satisfaction, the

satisfaction with comfort (0.873), and satisfaction with helpfulness of personnel (0.816) attributes are the two most recommended aspects for the improvement of customer satisfaction in the TransJogja model, as well as loyalty to use if the fare is affordable (0.779), and loyalty to use if the services is satisfactory (0.695) attributes, which are necessary elements for maintaining customer loyalty. Additionally, loyalty to use if the service is satisfactory (0.725) attribute is the one with the highest priority element for maintaining customer loyalty in the TransMusi model. As shown in Table 4, the estimated coefficient of satisfaction from service quality is smaller than that of satisfaction from subsidy and fare as well as coefficient of loyalty from satisfaction than that of loyalty from subsidy and fare. These results indicate that the transport subsidies and permanently available in case study cities are the most important measures for maintaining customer satisfaction and loyalty rather than efforts to improve the quality of service and satisfaction as well. Since the funding for urban bus subsidies are provided from a public budget, bus subsidy and it political support plays a crucial role in supporting new urban bus services.

There are three hypotheses in TransJogja model and one hypothesis in TransMusi model with all regression weights significant at 1 percent. Other hypotheses are less statistically significant (level of significance 5%). The first hypothesis, which positively correlates quality of service with subsidy and fare, is statistically significant, supported by the positive value (TransJogja model). This implies that the higher the quality of service, more subsidy is required, or vice versa, the higher the subsidy level, higher quality of service could be provided. This result looks natural and reasonable. The second hypothesis, regarding positive relationship between subsidy and fare, and loyalty, is also statistically supported (TransJogja and TransMusi models). It stands to reason that the higher the subsidy, the more loyal the users are likely to be. The third hypothesis, the relationship between subsidy and fare, and satisfaction, is also statistically supported (TransJogja model). This implies that higher amount of subsidy shall also increase TransJogja users' satisfaction. The fourth hypothesis, the relationship between service quality and satisfaction (TransJogja model), the fifth, the relationship between service quality and loyalty (TransMusi model), and the sixth, the relationship between satisfaction and loyalty (TransJogja and TransMusi models) all have positive values but are statistically less significant. These show that the higher the quality of service provided does not directly increase user satisfaction and loyalty, as well as the increase users' satisfaction does not directly increase user loyalty, since both satisfaction and loyalty are influenced by other aspects and possibly causing valuable information to be left out. The seventh hypothesis, the co-relationship between service quality and subsidy and fare (TransMusi model), the eighth, the relationship between service quality and satisfaction (TransMusi model), and the ninth, the relationship between service quality and loyalty (TransJogja model) were confirmed by less significant negative values. Additionally, the models show that the service quality construct influences loyalty (-0.213) more strongly than it does to subsidy and fare (-0.091), and also satisfaction (-

0.084). The last three hypotheses support the finding that Trans bus users do not perceive loyalty, subsidy and fare, and satisfaction independently.

4. CONCLUSION

Based on finding models, dependence on Trans bus influences users' perceptions of loyalty, subsidy and fare, and satisfaction to the mode. In this study the service quality delivered represents the dependence on Trans bus. It is understandable that even with low quality of service provided and distribution of transport subsidies is not well-targeted, the users tend more readily to perceive the available service as satisfactory and to show more loyalty to it, as long as it is able to fulfill their mobility needs.

5. REFERENCES

Arbuckle, J.L., and Worthke, W., 1999. *Amos 4.0 User's Guide*, SmallWater Corporation, Chicago, IL

Berawi, M.A., 2016. Forecasting the future: Accelerating countries development and the world's sustainable development, *International Journal of Technology*, Volume 7, Number 5, pp.729-731.

Berawi, M.A., 2015. Managing technology towards sustainable products and services, *International Journal of Technology*, Volume 6, Number 2, pp.105-108.

Eboli, L., Mazzula, G., 2007. Service quality attributes affecting customer satisfaction for bus transit, *Journal of Public Transportation*, Volume 16, Number 3, pp. 21-28.

Grujičić, D., Ivanović, I., Jović, J., Dorić,V., (2014), Customer perception of service quality transport, *Journal Transport*, Volume 29, Number 3, pp.285-295.

Hensher, D.A., 2015. Customer service quality and benchmarking in public transport contract, *International Journal of Quality Innovation*, Mei, 7 pages.

Kennedy, J., (2011), Current trend in service quality: A transportation sector review, *Journal of Marketing Developments and Competitiveness*, Volume 5, Number 6, pp.104-115.

Noor, H.M., Nasrudin, N., Foo, J., 2014. Determinants of customer satisfaction of service quality: city bus service in Kota Kinabalu Malaysia, *Procedia-Social and Behavioral Sciences*, Volume 153, pp. 595-606.

Ojo, T.K., Suleman, D., Nutsogbodo, R.Y., Mireku, D.O., 2014. Service quality and customer satisfaction of public transport on Cape coast-Accra route Ghana, *Developing Country Studies*, Volume 4, Number 18, July, pp. 142-149.

de Oña, J., de Oña, R., 2014. Quality of service in public transport based on customer satisfaction survey: *A review and assessment of methodological approaches, Transportation Science*, Dec 8, pp. 605-622.

Purba, A., Nakamura, F., Tanaka, S., 2014. Service delivered on new transit system from users viewpoint (case study: TransJogya and TransMusi-Indonesia), *Proceeding of Symposium on City Planning,* Hanoi, Vietnam, 2014, pp. 13 pages.

Ragnhild H., Kvale, K., Folstad, A., 2017. Improving service quality through customer journey analysis, *Journal of Service Theory and Practice*, October, pp. 841-866.

Rusiawati, A.W., Borhan, M.N., Riza, A.A.O.R,, 2017. Prediction of bus arrival times at bus stop, *International Journal of Technology*, Volume 8, Number 1, pp. 160-167.