Understanding consumer satisfaction with railway transportation service: An application of 7Ps marketing mix

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1. Introduction

Transportation is an integral part in the existence and social-economic development of each local, zone, country, region and the world. Transportation plays an important role in helping distribute and circulate goods and products quickly and timely; it meets the travelling demand of human beings. Railway transport (RT), since its origin till the present, has always played a crucial role and is an inseparable part of the whole country’s main traffic network. Currently, RT enterprises are facing challenges and difficulties due to the increase in advantageous conditions in competition with other modes of transportations. One of the measures to overcome the difficulties and challenges of the transportation market is that rail transportation enterprises must find the necessary measures to attract more customers to their business. Customer satisfaction is a vital factor to be successful in the marketplace and is considered as a key performance indicator (Mostaghel, 2006). Customer satisfaction is a business term to measure how products and services meet or surpass customer expectation. Marketing is all activities undertaken by a company to create relationships with and satisfy customers. Marketing theory has been widely applied in the business services sector, including the transport sector. The science of marketing research will help RT companies understand the customers and the transportation market, which is one of the conditions for railway transport enterprises to exist and develop in the transport market.

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Research on marketing and RT sector is not new. Vargo and Lusch (2004) conducted a comprehensive assessment and analysis of the origins of service marketing, practices and marketing strategies. They concluded that firms should focus more than just creating goods and the exchange of information (part of relationships). Laisi (2010) evaluated the Russian railway freight market’s main national peculiarities and examined the barriers to entry and realize the market’s problems and positive factors. The study indicated that the main national peculiarities in Russian railway freight market is associated with personal relations. Beck (2011) conducted an empirical analysis on 11 rail companies. The research findings determined whether market entry barriers exist in this market. Based on the marketing theory, it can be concluded that the customer satisfaction and its maintenance is directly related to the return on investment, sales profits, growth in market share, and lowering costs. The effective components of services marketing on the customer satisfaction include product, place, process, people, promotion, physical evidence, and price. The variables of the current study are the same factors influencing on services marketing, the use of which can be effective on maximizing the consumption, customer satisfaction, right to choose, and services quality. Therefore, this study aims to investigate whether each of 7P marketing mix components can affect the RT customers’ satisfaction in Vietnam.

In the current study, authors attempt to look at customer satisfaction and identify the most influential factors in enhancing the customer satisfaction with RT service in Vietnam’s context and provide its recommendations to improve weak points by studying marketing mix including price, place, promotion, product, personnel, procedure management and physical assets.

2. 7Ps marketing mix components

The marketing mix is a series of marketing tools that an organization uses to produce the response it wants from its various target markets. It includes any measure that the organization can do to influence the demand for the services that it offers. A 4Ps (Product, Price, Place and Promotion) model is commonly used in manufacturing industry in which products are tangible; meanwhile, the service industry uses a 7Ps approach to satisfy the customers’ needs: product, price, place, promotion, people, physical facilities and processes (Ivy, 2008). The products of service industry have specific characteristics including intangibility, heterogeneity, inseparability and perishability (Agu et al., 2017; Jin & Suh, 2005). The 4Ps includes four elements (traditional marketing mix elements) namely product, price, promotion and place. Because any change on each element should be compatible with other elements, marketing mix term was chosen (Mullins et al., 2012). The product is what is being sold. Companies must determine what customers need and then develop the exact product with the suitable quality to meet their expectations. Pricing is a prominent element in the model of services marketing (Wood & Pierson, 2006). The dimensions of pricing include list price, discounts, allowances, payment term and credit terms. It can be concluded that pricing has a significant effect on customer motivation. Promotion is identified as sales promotion, advertising, personal selling and public relations.

![Fig. 1. Elements in 7Ps model](image-url)

Promotion activities are conducted to create awareness about a brand and to communicate with present and potential stakeholders, and the general public (Duncan, 2005). Place (or distribution) is defined as a set of interdependent organizations involved in the process of making a product available for consumption by consumers. The product should be available in the right place, at the right time and in the right quantity, while keeping storage, inventory and distribution costs to a reasonable level. It was found that there are positive relationships between distribution intensity or efficiency and brand preference, loyalty and patronage (Kim & Hyun, 2011; Tolba, 2011). It was believed that services need a different type of marketing mix (Booms & Bitner, 1982). Therefore, three Ps namely personnel, physical assets and procedures were included and finally 7Ps were shaped (Rafiq & Ahmed, 1995). Regarding people in 7Ps, the quality, skills and attitude of staffs/employees to a certain extent shape customers’ decisions (Agu & Ogbuiji, 2008). The RT enterprises have such employees/staffs as train driver, customer service officers, operations managers, operations staff, waybill officers, security personnel, porters/lodgers, as well as offline staff, accounts officers, auditors. Service process means the process of delivering the product/service, and the behavior of those who deliver it, are important to customer satisfaction. Product/service attractiveness to consumers can be
improved by providing timely, quick and accurate or error free services (Agu & Ogbuji, 2008). Physical evidence comprises of the factors which are integrated into a service to make it tangible and measurable. Due to similarities in services’ characteristics, 7Ps model can be applied to RT services.

3. Methodology

3.1. The proposed model

The model development includes the following steps:

- Assumptions of the model:

P1: The more diversity of RT services, the easier the customers to choose the service and the higher the customer satisfaction is.

P2: The more competitive the fares and freight rates are, the more satisfied the customers are.

P3: The availability of ticket types, the easiness of contract signing and the convenience in payment increase the customer satisfaction.

P4: The easier the access to discount programs, promotions, advertisements, the more satisfied the customers are.

P5: The better the service staffs are, the more satisfied the customers are.

P6: The more standardized the service process is, the more satisfied the customers are.

P7: The better the physical evidence is, the more the satisfaction level is.

- Measurement scale: Using a qualitative scale in an ascending order from 0 to 10, of which 0 is customers “strongly dissatisfied” and 10 is customers “strongly satisfied” with the service provided.

- Data analysis includes Cronbach’s coefficient alpha test; the multiple regression method; ANOVA analysis.

- Applicability of the model: 7Ps service marketing model to analyze the customer satisfaction is applied based on the survey results of customers’ opinions who use RT services. The satisfaction of customers is assessed through questionnaires or survey results.

3.2. Data collection

Two surveys were conducted to collect information and opinions from passenger and merchandise owner from May 2018 to June 2019. The passengers’ questionnaire consists of three parts: the first part includes demographic information such as age, gender, the frequency of using RT service; the second part includes the satisfaction of using RT services. The second part has 27 question items. The questions were asked on a 10-point Likert scale from 0 (strongly dissatisfied) to 10 (strongly satisfied). The third part offers open-ended questions that ask passengers to add their personal comments and suggestions. Similarly, the merchandise owners’ questionnaire consists of three parts and the second part includes 26 question items. The paper questionnaires were delivered by hand (manually) to every respondent. The survey took no more than 30 minutes to complete. In the passenger survey, 200 questionnaires were delivered. After excluding incomplete and invalid responses, 196 questionnaires were used for analyzing the data. In the merchandise owner survey, of 150 questionnaires we delivered, 145 questionnaires were valid.

3.3. The satisfaction model for passengers

In order to determine the satisfaction level of passengers (PS) based on the 7 variables of RT service marketing, the research proposes a model of analyzing the relationship of 7 factors to the overall satisfaction level of the passengers, characterized by the coefficients $\beta_{Pi}$ (i=0-7). Details of the questions are given in Table 1 as follows,

<table>
<thead>
<tr>
<th>Code</th>
<th>Passengers’ satisfaction level on RT service</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP1</td>
<td>Providing product information to passengers</td>
</tr>
<tr>
<td>PP11</td>
<td>The ease level in choosing the route</td>
</tr>
<tr>
<td>PP12</td>
<td>Punctuality</td>
</tr>
<tr>
<td>PP13</td>
<td>The ease level in switching to other modes of transport</td>
</tr>
<tr>
<td>PP2</td>
<td>The reasonability of ticket price</td>
</tr>
<tr>
<td>PP21</td>
<td>The information of ticket price</td>
</tr>
<tr>
<td>PP22</td>
<td>The diversity of ticket price in each service</td>
</tr>
<tr>
<td>PP23</td>
<td>The promotional ticket price</td>
</tr>
</tbody>
</table>

Table 1: Items on the passengers’ satisfaction level
### Table 1

**Items on the passengers’ satisfaction level (Continued)***

<table>
<thead>
<tr>
<th>Place (distribution system)</th>
<th>PP3</th>
<th>PP31</th>
<th>At station</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PP32</td>
<td>Online</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP33</td>
<td>The availability of various ticket types</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP34</td>
<td>The payment method</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Promotion</th>
<th>PP4</th>
<th>PP41</th>
<th>The dispersion of promotional campaigns</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PP42</td>
<td>The company's perceived image</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP43</td>
<td>The dispersion of advertising campaigns</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP44</td>
<td>Other promotional activities</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>People</th>
<th>PP5</th>
<th>PP51</th>
<th>The staff dress appropriately and politely.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PP52</td>
<td>The staff is polite and service-minded.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP53</td>
<td>The staff has good foreign skills.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP54</td>
<td>The staff provides accurate information.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Service process</th>
<th>PP6</th>
<th>PP61</th>
<th>The service process of departing passengers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PP62</td>
<td>The process of serving the arriving passengers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP63</td>
<td>The process of serving in railway wagons</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Physical evidence (transport and station facilities)</th>
<th>PP7</th>
<th>PP71</th>
<th>The comfort of transport and station facilities</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PP72</td>
<td>The cleanliness of stations and railway wagons</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP73</td>
<td>Audio equipment</td>
<td></td>
</tr>
<tr>
<td></td>
<td>PP74</td>
<td>The guide posts at station</td>
<td></td>
</tr>
</tbody>
</table>

### Table 2

**Results of the Cronbach’s alpha test for the passengers**

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable (PP)</th>
<th>Number of items</th>
<th>Cronbach alpha</th>
<th>No.</th>
<th>Variable (PP)</th>
<th>Number of items</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product (PP1)</td>
<td>4</td>
<td>0.739</td>
<td>5</td>
<td>People (PP5)</td>
<td>4</td>
<td>0.718</td>
</tr>
<tr>
<td>2</td>
<td>Price (PP2)</td>
<td>4</td>
<td>0.613</td>
<td>6</td>
<td>Process (PP6)</td>
<td>3</td>
<td>0.722</td>
</tr>
<tr>
<td>3</td>
<td>Place (PP3)</td>
<td>4</td>
<td>0.612</td>
<td>7</td>
<td>Physical assess (PP7)</td>
<td>4</td>
<td>0.637</td>
</tr>
<tr>
<td>4</td>
<td>Promotion (PP4)</td>
<td>4</td>
<td>0.615</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Table 3

**Results of Cronbach’s alpha test for items**

<table>
<thead>
<tr>
<th>No.</th>
<th>Code</th>
<th>Scale mean if item deleted</th>
<th>Scale variance if item deleted</th>
<th>Corrected item-total correlation</th>
<th>Cronbach’s Alpha if item deleted</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PP11</td>
<td>17.13</td>
<td>3.346</td>
<td>0.616</td>
<td>0.633</td>
</tr>
<tr>
<td>2</td>
<td>PP12</td>
<td>17.13</td>
<td>4.649</td>
<td>0.448</td>
<td>0.724</td>
</tr>
<tr>
<td>3</td>
<td>PP13</td>
<td>17.13</td>
<td>4.902</td>
<td>0.506</td>
<td>0.703</td>
</tr>
<tr>
<td>4</td>
<td>PP14</td>
<td>17.62</td>
<td>3.846</td>
<td>0.599</td>
<td>0.639</td>
</tr>
<tr>
<td>5</td>
<td>PP21</td>
<td>19.78</td>
<td>5.711</td>
<td>0.352</td>
<td>0.571</td>
</tr>
<tr>
<td>6</td>
<td>PP22</td>
<td>20.27</td>
<td>5.601</td>
<td>0.440</td>
<td>0.518</td>
</tr>
<tr>
<td>7</td>
<td>PP23</td>
<td>19.77</td>
<td>4.157</td>
<td>0.504</td>
<td>0.447</td>
</tr>
<tr>
<td>8</td>
<td>PP24</td>
<td>20.14</td>
<td>5.538</td>
<td>0.302</td>
<td>0.610</td>
</tr>
<tr>
<td>9</td>
<td>PP31</td>
<td>20.27</td>
<td>4.350</td>
<td>0.370</td>
<td>0.564</td>
</tr>
<tr>
<td>10</td>
<td>PP32</td>
<td>19.95</td>
<td>4.616</td>
<td>0.470</td>
<td>0.477</td>
</tr>
<tr>
<td>11</td>
<td>PP33</td>
<td>19.66</td>
<td>5.342</td>
<td>0.415</td>
<td>0.542</td>
</tr>
<tr>
<td>12</td>
<td>PP34</td>
<td>20.28</td>
<td>4.829</td>
<td>0.344</td>
<td>0.577</td>
</tr>
<tr>
<td>13</td>
<td>PP41</td>
<td>19.69</td>
<td>4.687</td>
<td>0.440</td>
<td>0.511</td>
</tr>
<tr>
<td>14</td>
<td>PP42</td>
<td>20.51</td>
<td>4.836</td>
<td>0.382</td>
<td>0.554</td>
</tr>
<tr>
<td>15</td>
<td>PP43</td>
<td>20.66</td>
<td>4.286</td>
<td>0.423</td>
<td>0.525</td>
</tr>
<tr>
<td>16</td>
<td>PP44</td>
<td>20.37</td>
<td>5.302</td>
<td>0.340</td>
<td>0.583</td>
</tr>
<tr>
<td>17</td>
<td>PP51</td>
<td>18.06</td>
<td>4.925</td>
<td>0.471</td>
<td>0.687</td>
</tr>
<tr>
<td>18</td>
<td>PP52</td>
<td>19.26</td>
<td>5.114</td>
<td>0.593</td>
<td>0.605</td>
</tr>
<tr>
<td>19</td>
<td>PP53</td>
<td>18.47</td>
<td>5.184</td>
<td>0.426</td>
<td>0.714</td>
</tr>
<tr>
<td>20</td>
<td>PP54</td>
<td>19.71</td>
<td>5.992</td>
<td>0.628</td>
<td>0.626</td>
</tr>
<tr>
<td>21</td>
<td>PP61</td>
<td>11.74</td>
<td>1.845</td>
<td>0.637</td>
<td>0.523</td>
</tr>
<tr>
<td>22</td>
<td>PP62</td>
<td>12.34</td>
<td>2.809</td>
<td>0.549</td>
<td>0.637</td>
</tr>
<tr>
<td>23</td>
<td>PP63</td>
<td>12.25</td>
<td>2.876</td>
<td>0.483</td>
<td>0.702</td>
</tr>
<tr>
<td>24</td>
<td>PP71</td>
<td>19.33</td>
<td>5.895</td>
<td>0.434</td>
<td>0.558</td>
</tr>
<tr>
<td>25</td>
<td>PP72</td>
<td>19.22</td>
<td>5.549</td>
<td>0.412</td>
<td>0.573</td>
</tr>
<tr>
<td>26</td>
<td>PP73</td>
<td>18.73</td>
<td>5.027</td>
<td>0.426</td>
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</tr>
<tr>
<td>27</td>
<td>PP74</td>
<td>18.70</td>
<td>6.415</td>
<td>0.421</td>
<td>0.574</td>
</tr>
</tbody>
</table>
Table 2 indicates that all Cronbach’s alpha coefficient >0.6, which shows the questionnaire is reliable (Nunnally & Bernstein, 1994). The corrected item - total correlation shows how much each item correlates with the overall questionnaire score. Correlations less than .30 indicate that the item may not belong on the scale. In Table 3 all corrected item - total correlation > .30 indicates that the corresponding item correlate very well with the overall scale.

Table 4
Passengers’ satisfaction statistics

<table>
<thead>
<tr>
<th>No.</th>
<th>Code</th>
<th>No. of samples</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PP11</td>
<td>196</td>
<td>5</td>
<td>8</td>
<td>5.87</td>
<td>1.057</td>
</tr>
<tr>
<td>2</td>
<td>PP12</td>
<td>196</td>
<td>5</td>
<td>8</td>
<td>5.87</td>
<td>0.803</td>
</tr>
<tr>
<td>3</td>
<td>PP13</td>
<td>196</td>
<td>5</td>
<td>7</td>
<td>5.88</td>
<td>0.668</td>
</tr>
<tr>
<td>4</td>
<td>PP14</td>
<td>196</td>
<td>5</td>
<td>8</td>
<td>5.38</td>
<td>0.918</td>
</tr>
<tr>
<td>5</td>
<td>PP21</td>
<td>196</td>
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<td>8</td>
<td>6.87</td>
<td>0.966</td>
</tr>
<tr>
<td>6</td>
<td>PP22</td>
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<td>6.39</td>
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<tr>
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<td>6.88</td>
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<td>8</td>
<td>PP24</td>
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<td>5</td>
<td>8</td>
<td>6.51</td>
<td>1.088</td>
</tr>
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<td>6.45</td>
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<td>196</td>
<td>5</td>
<td>8</td>
<td>6.11</td>
<td>1.143</td>
</tr>
<tr>
<td>26</td>
<td>PP73</td>
<td>196</td>
<td>5</td>
<td>8</td>
<td>6.60</td>
<td>1.271</td>
</tr>
<tr>
<td>27</td>
<td>PP74</td>
<td>196</td>
<td>5</td>
<td>8</td>
<td>6.63</td>
<td>0.882</td>
</tr>
<tr>
<td>28</td>
<td>PS</td>
<td>196</td>
<td>5</td>
<td>7</td>
<td>6.11</td>
<td>0.461</td>
</tr>
</tbody>
</table>

In order to investigate the passengers’ satisfaction (PS) on RT services, the multiply regression analysis was adopted. In the analysis, PP1, PP2, PP3, PP4, PP5, PP6 and PP7 are independent variables; the passengers’ satisfaction (PS) is dependent variable. The multiply regression equation can be written as:

\[ PS = \beta_0 + \beta_{P1}PP1 + \beta_{P2}PP2 + \beta_{P3}PP3 + \beta_{P4}PP4 + \beta_{P5}PP5 + \beta_{P6}PP6 + \beta_{P7}PP7, \]

where, \(\beta_{P1} (i=1\ldots7)\) are beta coefficients – one to go with each independent variable. In the equation, since the constant (beta zero) is included, these coefficients are unstandardized. In this study, the data were analyzed using SPSS version 20.0. The results of analysis are presented in Table 5.

Table 5
Multiple regression results of the analysis on passengers’ satisfaction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>(\beta_{P0} = -0.355)</td>
<td>0.458</td>
<td>-0.774</td>
<td>0.440</td>
</tr>
<tr>
<td>PP1</td>
<td>(\beta_{P1} = 0.157)</td>
<td>0.038</td>
<td>0.222</td>
<td>1.57</td>
</tr>
<tr>
<td>PP2</td>
<td>(\beta_{P2} = 0.185)</td>
<td>0.034</td>
<td>0.288</td>
<td>5.483</td>
</tr>
<tr>
<td>PP3</td>
<td>(\beta_{P3} = 0.188)</td>
<td>0.035</td>
<td>0.275</td>
<td>5.285</td>
</tr>
<tr>
<td>PP4</td>
<td>(\beta_{P4} = 0.080)</td>
<td>0.037</td>
<td>0.119</td>
<td>2.163</td>
</tr>
<tr>
<td>PP5</td>
<td>(\beta_{P5} = 0.171)</td>
<td>0.033</td>
<td>0.272</td>
<td>5.245</td>
</tr>
<tr>
<td>PP6</td>
<td>(\beta_{P6} = 0.091)</td>
<td>0.035</td>
<td>0.146</td>
<td>2.607</td>
</tr>
<tr>
<td>PP7</td>
<td>(\beta_{P7} = -0.143)</td>
<td>0.032</td>
<td>0.234</td>
<td>4.424</td>
</tr>
</tbody>
</table>

Table 6
Results of ANOVA test for the passengers’ satisfaction model

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>21.685</td>
<td>7</td>
<td>3.098</td>
<td>29.348</td>
<td>0.000</td>
</tr>
<tr>
<td>Residual</td>
<td>19.845</td>
<td>188</td>
<td>0.106</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>41.531</td>
<td>195</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

R² test

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R²</th>
<th>Adjusted R²</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.723</td>
<td>0.522</td>
<td>0.504</td>
<td>0.325</td>
</tr>
</tbody>
</table>
With Sig < 5%, all regression coefficients $\beta_{\psi i}$ ($i=0-7$) are statistically significant. F value of 29.348 and Sig.=0.000 <5% (ANOVA test); $R^2 = 0.522$ ($R^2$ test) show that the model is a good fit for the data and 52.2% of the variance was accounted for. The regression equation would be:

$$PS = -0.355 + 0.157 \cdot PP1 + 0.185 \cdot PP2 + 0.188 \cdot PP3 + 0.08 \cdot PP4 + 0.171 \cdot PP5 + 0.091 \cdot PP6 + 0.143 \cdot PP7$$

It can be concluded that Place (PP3) and Price (PP2) are the most influential factor in creating passengers’ satisfaction.

3.4. The satisfaction model for freight owners

In order to determine the satisfaction level of freight owners (OS) based on the 7 variables of RT service marketing, the research proposes a model of analyzing the relationship of 7 factors to the overall satisfaction level of the freight owners, characterized by the coefficients $\beta_{\psi i}$ ($i=0-7$).

Table 6

<table>
<thead>
<tr>
<th>Code</th>
<th>Freight owners’ satisfaction level on RT service</th>
</tr>
</thead>
<tbody>
<tr>
<td>OP1</td>
<td>Providing product information to freight owners</td>
</tr>
<tr>
<td>OP11</td>
<td>The ease level in choosing the route</td>
</tr>
<tr>
<td>OP12</td>
<td>On-time route</td>
</tr>
<tr>
<td>OP2</td>
<td>The reasonability of freight charges</td>
</tr>
<tr>
<td>OP21</td>
<td>The flexibility of freight charges</td>
</tr>
<tr>
<td>OP22</td>
<td>The regulation of freight charges</td>
</tr>
<tr>
<td>OP23</td>
<td>The accessibility of promotional activities</td>
</tr>
<tr>
<td>OP3</td>
<td>The ease level in signing transport contract</td>
</tr>
<tr>
<td>OP31</td>
<td>The method of signing contract</td>
</tr>
<tr>
<td>OP32</td>
<td>The contract payment method</td>
</tr>
<tr>
<td>OP4</td>
<td>The dispersion of promotional campaigns</td>
</tr>
<tr>
<td>OP41</td>
<td>The company’s image</td>
</tr>
<tr>
<td>OP42</td>
<td>The dispersion of advertising campaigns</td>
</tr>
<tr>
<td>OP43</td>
<td>Other promotional activities</td>
</tr>
<tr>
<td>OP5</td>
<td>The staff dress appropriately and politely</td>
</tr>
<tr>
<td>OP51</td>
<td>The staff is polite and service-minded</td>
</tr>
<tr>
<td>OP52</td>
<td>The contract is acknowledgeable and facilitate completely at stations</td>
</tr>
<tr>
<td>OP53</td>
<td>The contract is acknowledgeable and facilitate completely on route</td>
</tr>
<tr>
<td>OP6</td>
<td>The process to get a train wagon</td>
</tr>
<tr>
<td>OP61</td>
<td>The process to get a train wagon</td>
</tr>
<tr>
<td>OP62</td>
<td>The shipping and receiving process</td>
</tr>
<tr>
<td>OP63</td>
<td>The loading and unloading process</td>
</tr>
<tr>
<td>OP64</td>
<td>The loading and unloading process</td>
</tr>
<tr>
<td>OP7</td>
<td>The capability of loading and unloading facilities</td>
</tr>
<tr>
<td>OP71</td>
<td>The suitability of the train wagon</td>
</tr>
<tr>
<td>OP72</td>
<td>The connectivity to other transport modes</td>
</tr>
<tr>
<td>OP73</td>
<td>The convenience of loading and unloading</td>
</tr>
<tr>
<td>OP74</td>
<td>The convenience of loading and unloading</td>
</tr>
<tr>
<td>OS</td>
<td>Freight and goods-owners’ satisfaction level</td>
</tr>
</tbody>
</table>

In order to investigate the effect of 7Ps elements on the freight owners’ satisfaction level, 7 predictors (independent variables) including OP1, OP2, OP3, OP4, OP5, OP6 and OP7 were split into 26 observed variables. Table 7 indicates that all Cronbach’s alpha coefficient >0.6, which shows the questionnaire is reliable. The corrected item - total correlation shows how much each item correlates with the overall questionnaire score. Correlations less than .30 indicate that the item may not belong on the scale. In Table 8, all corrected item - total correlation > .30 indicates that the corresponding item correlate very well with the overall scale.

Table 7

<table>
<thead>
<tr>
<th>No.</th>
<th>Variable</th>
<th>Number of items</th>
<th>Cronbach alpha</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product (OP1)</td>
<td>3</td>
<td>0.617</td>
</tr>
<tr>
<td>2</td>
<td>Price (OP2)</td>
<td>4</td>
<td>0.613</td>
</tr>
<tr>
<td>3</td>
<td>Place (OP3)</td>
<td>3</td>
<td>0.649</td>
</tr>
<tr>
<td>4</td>
<td>Promotion (OP4)</td>
<td>4</td>
<td>0.718</td>
</tr>
<tr>
<td>5</td>
<td>People (OP5)</td>
<td>4</td>
<td>0.803</td>
</tr>
<tr>
<td>6</td>
<td>Process (OP6)</td>
<td>4</td>
<td>0.639</td>
</tr>
<tr>
<td>7</td>
<td>Physical assess (OP7)</td>
<td>4</td>
<td>0.648</td>
</tr>
</tbody>
</table>
Table 8
Results of Cronbach’s alpha test for all predictors

<table>
<thead>
<tr>
<th>No.</th>
<th>Code</th>
<th>Results of Cronbach’s alpha test of OP1</th>
<th>Results of Cronbach’s alpha test of OP2</th>
<th>Results of Cronbach’s alpha test of OP3</th>
<th>Results of Cronbach’s alpha test of OP4</th>
<th>Results of Cronbach’s alpha test of OP5</th>
<th>Results of Cronbach’s alpha test of OP6</th>
<th>Results of Cronbach’s alpha test of OP7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OP11</td>
<td>11.34 1.989 0.466 0.484</td>
<td>19.97 5.270 0.332 0.585</td>
<td>13.56 3.848 0.493 0.505</td>
<td>19.47 7.478 0.533 0.640</td>
<td>17.95 7.011 0.597 0.769</td>
<td>19.00 7.738 0.391 0.589</td>
<td>16.95 4.529 0.568 0.467</td>
</tr>
<tr>
<td>2</td>
<td>OP12</td>
<td>12.13 2.976 0.491 0.465</td>
<td>20.46 4.611 0.455 0.501</td>
<td>12.31 3.815 0.483 0.522</td>
<td>20.40 7.484 0.502 0.658</td>
<td>19.21 7.323 0.676 0.726</td>
<td>18.24 6.611 0.428 0.568</td>
<td>17.08 6.443 0.368 0.619</td>
</tr>
<tr>
<td>3</td>
<td>OP13</td>
<td>11.92 2.918 0.368 0.596</td>
<td>19.83 4.375 0.399 0.539</td>
<td>12.77 5.128 0.420 0.610</td>
<td>20.27 4.115 0.402 0.540</td>
<td>18.44 7.103 0.556 0.792</td>
<td>19.67 7.475 0.722 0.734</td>
<td>17.34 5.190 0.419 0.594</td>
</tr>
</tbody>
</table>

Table 9
Freight owners’ satisfaction statistics

<table>
<thead>
<tr>
<th>No.</th>
<th>Code</th>
<th>No. of samples</th>
<th>Min</th>
<th>Max</th>
<th>Mean</th>
<th>Std. dev</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>OP11</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.36</td>
<td>1.188</td>
</tr>
<tr>
<td>2</td>
<td>OP12</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.57</td>
<td>0.798</td>
</tr>
<tr>
<td>3</td>
<td>OP13</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.77</td>
<td>0.934</td>
</tr>
<tr>
<td>4</td>
<td>OP21</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.88</td>
<td>0.832</td>
</tr>
<tr>
<td>5</td>
<td>OP22</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.39</td>
<td>0.914</td>
</tr>
<tr>
<td>6</td>
<td>OP23</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>7.01</td>
<td>1.051</td>
</tr>
<tr>
<td>7</td>
<td>OP24</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.57</td>
<td>1.129</td>
</tr>
<tr>
<td>8</td>
<td>OP31</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.30</td>
<td>1.221</td>
</tr>
<tr>
<td>9</td>
<td>OP32</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.56</td>
<td>1.235</td>
</tr>
<tr>
<td>10</td>
<td>OP33</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>7.10</td>
<td>0.852</td>
</tr>
<tr>
<td>11</td>
<td>OP41</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>7.52</td>
<td>0.944</td>
</tr>
<tr>
<td>12</td>
<td>OP42</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.57</td>
<td>1.032</td>
</tr>
<tr>
<td>13</td>
<td>OP43</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.37</td>
<td>1.160</td>
</tr>
<tr>
<td>14</td>
<td>OP44</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.66</td>
<td>1.010</td>
</tr>
<tr>
<td>15</td>
<td>OP51</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>7.19</td>
<td>1.086</td>
</tr>
<tr>
<td>16</td>
<td>OP52</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.92</td>
<td>0.965</td>
</tr>
<tr>
<td>17</td>
<td>OP53</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.70</td>
<td>1.138</td>
</tr>
<tr>
<td>18</td>
<td>OP54</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.46</td>
<td>0.677</td>
</tr>
<tr>
<td>19</td>
<td>OP61</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.89</td>
<td>1.100</td>
</tr>
<tr>
<td>20</td>
<td>OP62</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.87</td>
<td>1.156</td>
</tr>
<tr>
<td>21</td>
<td>OP63</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.66</td>
<td>1.320</td>
</tr>
<tr>
<td>22</td>
<td>OP64</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>6.61</td>
<td>0.900</td>
</tr>
<tr>
<td>23</td>
<td>OP71</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.92</td>
<td>1.149</td>
</tr>
<tr>
<td>24</td>
<td>OP72</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.80</td>
<td>0.813</td>
</tr>
<tr>
<td>25</td>
<td>OP73</td>
<td>145</td>
<td>5</td>
<td>7</td>
<td>5.73</td>
<td>0.690</td>
</tr>
<tr>
<td>26</td>
<td>OP74</td>
<td>145</td>
<td>5</td>
<td>8</td>
<td>5.54</td>
<td>1.155</td>
</tr>
<tr>
<td>27</td>
<td>OS</td>
<td>145</td>
<td>5</td>
<td>7</td>
<td>6.13</td>
<td>0.490</td>
</tr>
</tbody>
</table>

In order to predict the freight owners’ satisfaction (OS) on RT services, the multiple regression analysis was adopted. In the
analysis, OP1, OP2, OP3, OP4, OP5, OP6 and OP7 are independent variables; the passengers’ satisfaction (OS) is dependent variable. The multiply regression equation can be written as:

\[ OS = \beta_{00} + \beta_{01}.OP1 + \beta_{02}.OP2 + \beta_{03}.OP3 + \beta_{04}.OP4 + \beta_{05}.OP5 + \beta_{06}.OP6 + \beta_{07}.OP7 \]

where, \( \beta_{0i} (i=1…7) \) are beta coefficients – one to go with each independent variable. In the equation, because the constant (beta zero) is included, these coefficients are unstandardized. In this study, the data were analyzed using SPSS version 20.0. The results of analysis are presented in Table 10.

### Table 10
Multiple regression results of the analysis on freight owners’ satisfaction

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>( B_{00} = 0.197 )</td>
<td>0.274</td>
<td>0.720</td>
<td>0.473</td>
</tr>
<tr>
<td>OP1</td>
<td>( B_{01} = 0.147 )</td>
<td>0.041</td>
<td>0.198</td>
<td>3.594</td>
</tr>
<tr>
<td>OP2</td>
<td>( B_{02} = 0.168 )</td>
<td>0.037</td>
<td>0.223</td>
<td>4.505</td>
</tr>
<tr>
<td>OP3</td>
<td>( B_{03} = 0.116 )</td>
<td>0.031</td>
<td>0.168</td>
<td>3.699</td>
</tr>
<tr>
<td>OP4</td>
<td>( B_{04} = 0.088 )</td>
<td>0.040</td>
<td>0.116</td>
<td>2.192</td>
</tr>
<tr>
<td>OP5</td>
<td>( B_{05} = 0.140 )</td>
<td>0.037</td>
<td>0.188</td>
<td>3.772</td>
</tr>
<tr>
<td>OP6</td>
<td>( B_{06} = 0.147 )</td>
<td>0.039</td>
<td>0.191</td>
<td>3.811</td>
</tr>
<tr>
<td>OP7</td>
<td>( B_{07} = 0.134 )</td>
<td>0.045</td>
<td>0.153</td>
<td>2.954</td>
</tr>
</tbody>
</table>

With Sig < 5%, all regression coefficients \( \beta_{0i} (i=0-7) \) are statistically significant. F value of 70.197 and Sig.=0.000 <5% (ANOVA test); \( R^2 = 0.781 \) (R^2 test) show that the model is a good fit for the data and 52.2% of the variance was accounted for. The regression equation is as follows,

\[ OS = 0.197 + 0.147. OP1 + 0.168. OP2 + 0.166. OP3 + 0.08. OP4 + 0.140. OP5 + 0.147. OP6 + 0.134. OP7. \]

Based on the above regression equation, Price (OP2) and Place (OP3) have the largest impact on freight owners’ satisfaction.

### 4. Discussions and implications

The study findings have revealed the relationship between the main independent variables (the marketing mix elements: price, place, promotion, people, physical evidence, and process) and the dependent variable (the consumers’ satisfaction on RT services). Of the independent variables, price element has the largest effect on customer satisfaction on RT services. In order to increase the satisfaction level of customers, several suggestions are as follows:

- RT company must adjust the method to calculate rail transport fares and costs in compliance with the current new situation. The transport costs consist of two main parts: the first part is allocated for the railway infrastructure fee and the rest is the cost at the RT company. Of the above 2 cost portions, RT company can only adjust the first part. The RT company must spend expenses items reasonably, efficiently and economically to reach the target of cost reduction and lower price.

- RT Enterprises need to complete the new online channel by diversifying and enriching sales channels, meeting the tastes of train passengers through applying scientific technologies in the process of buying tickets, helping passengers to access in the easiest way. With the limited budget for marketing activities, using E-marketing is an effective solution. In order for E-marketing to reach its targets, RT Enterprises need to integrate the above tools to achieve the highest possible performance. E-marketing tools may include: website marketing, email marketing, search engine optimization (SEO).

- RT company should improve the service quality of staffs who work directly with passengers. There are two main groups including the on-board staffs and at-the-station staffs. Several solutions are: regular training and upgrading of professional qualifications; improve the communication skills of service personnel (both on-board and at-the-station staffs); implement an appropriate remuneration package for on-board and at-the-station staffs.

- RT company must establish a standard service processes including service process for passengers boarding a train at the station; service process for on-board passengers; and service process for passengers detraining at the destination station.
- Stations and station architecture should be improved. At large stations, there are a large number of often tourists, it is advisable to arrange a waiting room specifically intended for this type of passengers. Reconstruct the radio system on board and at the station, adjust the sound system properly so that passengers can hear the broadcasted information clearly. Create mobile storages to solve the problems related to the unloading of cement, phosphate.

- It is necessary to develop means of transportation: renovation, upgrading and replacement of old locomotives; assembling, manufacturing new locomotives; renovating and upgrading old railway carriages; Import, build new high-quality railway carriages.

Moreover, RT Enterprises transport a variety of goods from chemicals, rebar of all kinds, construction materials (diatomite brick), home appliances to agricultural products. So, the preservation to maintain the good quality services in transportation of commodities during the transportation is especially important. If this cannot be guaranteed, goods cannot be consumed in the market. At the end of the transportation process, the consignee will inspect the seals, the goods’ quality, then accept and receive the goods. The goods are transported by RT Enterprises through many stages, processes, procedures from departure place to destination. Goods are transported to the station, which is then loaded onto the wagons, after reaching the destination station, goods are unloaded at stations and the transport process is finished when the goods are delivered to the consignee.

Avoiding the loss or damage of transported goods can be managed upon the stages of the transport process: Goods are loaded onto the wagons, Goods are on the way of transferring, and Goods are unloaded at destination stations. During the above stages of freight transport, RT Enterprises shall be responsible for the whole process from when the goods are sealed, leaded, invoiced until the goods are handed over to the owners/consignees.

During the freight transport of RT Enterprises, depending on the type of transported goods, escort personnel are required and they are in charge of technique and freight safety issues: goods caring and fire prevention. In order to ensure safety when participating in the freight transport process, the escort personnel must firmly grasp the process, technique and characteristics of the goods to be transported; strictly follow the regulations to make sure of the safety of goods. In addition to ensure the safety of railway personnel participating in the freight transport, the safety of traffic participants is also important. Currently, Vietnam Railways regularly encounters incidents and obstacles that affect the smooth flow of the entire route during freight transport and passenger transport. These issues can be divided into two groups: objective incidents and subjective incidents. Objective incidents are often accidental incidents caused by crashing, striking with people and vehicles outside the railway sector due to violations of architectural contiguity and violations of regulations on crossroads. Subject incidents are RT Enterprises’ own obstructive problems: carriage failure, locomotive failure, freight contract issues, and service process violations.

The characteristics of freight transport process is not to use labor tools to change the physical appearance and physical & chemical properties of the labor objects.

5. Conclusions

RT Enterprises are facing to the sharp decline in the number of passengers and freight transport volume, the study has investigated the relationship between the marketing mix components and consumers’ satisfaction and given several suggestions to maximize the satisfaction for the demand of passengers and freight owners. The study proposed two satisfaction model based on multiple regression method for passengers and freight owners. With the application of the proposed method for measuring the consumers’ satisfaction on RT services it comes to increased objectivity by using the subjective opinions of customers, freight owners, and by using this method and testing its results and statistical software for the consistency coefficient, we may obtain some insight about the target group about the quality of the services. Also based on the research results, RT Enterprises can measure the impact of each group of factors affecting the satisfaction of the RT service users in certain periods. The solutions proposed in the study may satisfy the current existing customers and incite customers using other means of transportation to switch to RT services and also attract new customers.

References


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