Asia-Pacific Social Science Review 18(3) 2018, pp. 72-86

RESEARCH ARTICLE

State Railway of Thailand Employee Performance: A Structural Equation Model Analysis

Tanin Sivalai and Nuttawut Rojniruttikul
King Mongkut's Institute of Technology Ladkrabang, Thailand
t_sivalai@yahoo.com

Abstract: Dropping from a peak of 88 million riders in 1994, Thailand's state railway system today is only transporting 35 million passengers annually. Operations run at a loss, with infrastructure and aged equipment contributing to significant delays, and a continuing loss of passengers. However, in September 2017, a new 20-year US$81.57 billion plan was introduced to save the State Railway of Thailand [SRT] from its death spiral. Given the magnitude of the problem, this study aims to analyze employee performance of SRT civil servants. Using multi-stage random sampling, 360 individuals were selected; through a five-level, Likert type agreement scale questionnaire, 54 items concerning their characteristics, their perspectives on SRT's organizational culture, human resource management processes, the SRT's total quality management program, and their effect on employee performance were analyzed. From the data, LISREL 9.1 was used to conduct a confirmatory factor analysis and structural equation model to analyze the results. The structural equation model [SEM] results showed that all the causal factors in the model were shown to have a positive influence on SRT employee performance, which is explained by the variance of factors influencing SRT employee performance (R^2) by 92%. Ranked in importance, the results determined that human resources [HR=0.96], had the most significant impact on employee performance [EP], followed by total quality management [TQM=0.45], and finally, organizational culture [OC=0.37].

***Keywords*:** human resources, infrastructure, logistics costs, organizational culture, total quality management

The State Railway of Thailand [SRT] has operated since 1890. In recent decades, the SRT has experienced a significant and ongoing decline in both passengers and revenue, with SRT passenger peaking in 1994 at 88 million riders per year (*Ganjanakhundee, 2016). However, in 2018, it was reported that this has dropped to* 35 million passengers annually (Jotikasthira, 2018).

Recent studies have stated that change is critical. However populist programs, like the International Monetary Fund [IMF] loan, demand for an SRT hiring freeze (Jotikasthira, 2018). The aging equipment/ infrastructures have significantly slowed the wheels of change (Padeco Co., Ltd, 2014; Sornsaruht & Deebhijarn, 2016), with personnel policies and organizational bureaucracy stated to be at the root of the problems.

Research has suggested that a possible reason for the severe decline in SRT ridership has been the nationwide safety speed restriction placed on an expiring infrastructure and aging equipment, which has,

therefore, resulted in the SRT becoming uncompetitive against other forms of transportation modes such as buses, vans, and low-cost airlines. This was confirmed in a recent Padeco Co., Ltd. (2014) study, in which the main negatives expressed by passengers were SRT train punctuality and delays. As the SRT generates 65% of its revenue from passenger traffic, this has become a significant problem.

However, on September 22, 2017, Thailand's Office of Transport and Traffic Policy and Planning presented a three-phase, 20-year master plan for rail development for US$81.57 billion (Smith, 2017). The ultimate goals of each phase are the construction of 2,777 kilometers of double-track, 2,457 kilometers of standard-gauge lines for high-speed trains, network electrification, and the development of intermodal rail freight terminals.

The rationale for this significant investment comes from Thailand's total logistics value in 2016 that is estimated at US$85.9 billion, a 7.5% growth from 2015 (Srimalee, 2017). This also equals 14% of Thailand's gross domestic product [GDP], which consists of 7% of transportation costs, followed by inventory/warehousing costs at 6%, and management costs of 1%. Therefore, the development of Thailand's transportation infrastructure and rail system has been stated as an effective way to reduce logistics costs (Pomlaktong & Ongkittikul, 2008; Srimalee, 2017). Logistics costs in Thailand, however, are not cheap when compared to Thailand's neighbors of Singapore and Malaysia, which have logistics costs of 8% and 13% percent of their GDPs, respectively (Liu, 2016). Therefore, a primary motivation in rail investment is the reduction of costs, with railway transport benefitting from high carrying capacity, lower energy consumption, and lower weather influences (Changnon, 2006).

Further rationale for the SRT's expansion high costs is the creation of special economic zones [SEZs], tourism creation, and local development. Government officials have also stated that investor confidence increases when a long-term vision places rail at the center of Thailand's transport infrastructure development (Srimalee, 2017).

Therefore, given the problematic nature of past SRT performance and its crucial importance to Thailand's economic growth, this study was undertaken. The primary research instrument which measured the four latent variables and 18 observed variables was a questionnaire containing a five-level Likert type agreement scale to measure the opinions of the 360 SRT civil servants from 12 locations around Thailand. The main latent variables measured in the study included human resources [HR], organizational culture [OC], total quality management [TQM], and employee performance [EP]. A confirmatory factor analysis [CFA] was conducted with the use of LISREL Version 9.1. From the structural equation model [SEM] to analyze the results, which determined that all six hypotheses were supported, with human resources [HR] having the most significant overall effect on the railway's total quality management [TQM]. Second to this, was HR's role in the SRT organizational culture [OC]. The study has determined that the SRT staff judge organizational change as the most crucial aspect in improving efficiency, while the staff evaluation process and resource was judged to be the lowest aspect towards a goal of management of human resources.The study also identified a significant problem as the SRT moves forward in the 21st century, as its aging staff and the pension liabilities must be absorbed (Jotikasthira, 2018). This also raises many follow-on issues about the potential loss of expertise in the coming years and where the replacements will be found as a July 1998 order stated that the SRT can only hire five new employees for every 100 fresh retirees it has. If replacements are not found, how will junior staff be trained, or will technology replace them?

HR is a fundamental change in how most enterprises manage their business, with change difficult and time-consuming (Skinner, 1981). SRT management must, therefore, lead the HR initiative, with all employees becoming involved in HR. Continuous management improvement is an SRT business imperative, with many experienced employees nearing retirement age, and ongoing education and training process essential for all junior employees and new hires.

"Free Trains"

From 2008 until November 1, 2017, the SRT operated an extended network of "free" trains or coaches on commercial trains, which offered free seats to 3rd class passengers. Padeco Co., Ltd. (2014) has reported that were as many as 164 public service

obligation (PSO) trains dedicated to free tickets, as well as eight commercial trains that had cars allocated to free tickets for 3rd class passengers. Although the Thai government agreed to reimburse the SRT for the ticket price since the program's inception, the process has been anything but smooth, which significantly contributed to the SRT's unprofitability over many years (Sornsaruht & Deebhijarn, 2016).

Since the beginning, the SRT PSO reimbursement process worked as a subsidy mechanism requiring SRT to apply for support based on forecast financial information and traffic statistics. The procedure required very detailed financial data by service, which was beyond the accounting system of SRT to provide (Padeco Co., Ltd., 2014; Sornsaruht & Deebhijarn, 2016). This system, therefore, was not satisfactory for either the SRT or the Ministry of Finance (MOF), as it provided SRT with less than full reimbursement for losses incurred, causing further internal cross-subsidies within SRT to cover these losses.

According to the SRT, the PSO system did not adequately cover the losses incurred in running the ordinary, Bangkok commuter, local commuter, and mixed PSO services. From the perspective of MOF, the PSO system also did not achieve their social objective of increasing people's mobility as many of the PSO services were operating with few passengers. Data in 2012 showed that 65 out of 164 PSO trains had less than a 40% load factor, with ridership declining each subsequent year (Padeco Co., Ltd., 2014). This long-running populist program, however, was finally terminated on November 1, 2017. A national welfare-card system replaced the original free ticket mechanism ("Free bus, train services," 2017).

Literature Review

Human Resources (HR)

In a 636-senior executive survey given by the Economist Intelligence Unit (2013) concerning present and future HR challenges, 50% indicated that people management was the executive's most significant concern due to multi-generational workforces with growing cultural diversity**.** These same executives also indicated there were serious problems with the skills fostered by education and those needed by a 21st-century workforce. This was felt to be a considerable obstacle in the coming years**.**

Dechawatanapaisal **(**2005**)** investigated how HR practices in 18 large Thai corporations affected organizational learning capabilities**.** From the 606 questionnaires obtained, it was determined that HRM practices including recruitment and selection, training and development, performance appraisal, as well as reward and recognition, are strong enabling drivers that enhance the climate of organizational learning.

In Malaysia, it was also concluded that in small-medium enterprises (SMEs), human resource management (HRM) practices had significant and positive impacts on innovation and internal process, as well as a firm's employee learning and growth (Mansouri & Goher, 2016). Another study from the USA indicated that the most significant factor affecting retention rates was job advancement opportunities (Oladapo, 2014). In Greece, Katou (2012) studied 197 small firms and found that HRM policies, being contingent on business strategies (cost, innovation, and quality), had a positive effect on organizational performance through employee attitudes and employee behaviors. According to *Nigro* and *Nigro* (1984), HR is the ability to recruit and screen people as well as the development of individual capabilities which can work towards their full capacity, both regarding quantity and quality.

From the above theories and scholars' HRM studies, the following four items were therefore placed into the research framework, which included recruitment and selection (X1), training and development (X2), performance evaluation (X3), and employee rewards (X4). From this, the following hypotheses were developed:

H1: Human resource management (HRM) has a direct positive influence on total quality management (TQM).

H2: Human resource management (HRM) has a direct positive influence on employee performance (EP).

Total Quality Management

Researchers have referred to TQM as a management tool, philosophy, or set of principles which continuously improves the quality of products and services (Andrle, 1994; Prajogo & McDermott, 2005). Andrle (1994) stated that TQM has commonly been believed to be a Japanese management philosophy, but it originated

in the US following World War I. The Japanese, after World War II, later adopted it as they rebuilt their industries. Japanese TQM began to flourish in the early 1950s, evolving and changing somewhat over time.

According to Evans (2017), TQM involves six basic management concepts: customer focus, process orientation, continuous improvement, empowerment and teamwork, management by fact, and visionary leadership. This is consistent with Mukherjee (2006, p. 138) in which it was stated that "organizations with a strong foundation practice customer orientation and customer focus in all their business activities."

Also, for this study, TQM was analyzed at the SRT. In meetings conducted with Thailand's SRT, it was verified that there is an existing SRT-wide effort to develop a climate in which the group continuously improves its ability to deliver high-quality services to its passengers.

From the above and other related theories and scholars' concepts of TQM, the following five items were therefore placed into the research framework, which included leadership (Y1), data analysis (Y2), process management (Y3), strategic planning (Y4), and customer focus (Y5). From this, the following hypotheses were developed:

H4: Total quality management (TQM) has a direct positive influence on organizational culture (OC).

H5: Total quality management (TQM) has a direct positive influence on employee performance (EP).

Organizational Culture

In recent decades, OC has attracted a significant number of scholarly studies, with Deal and Kennedy (2000) defining OC as an organization's business environment, values, heroes, rites, and rituals. Prajogo and McDermott (2005) later examined 194 organizations in Australia and defined OC as a general pattern of mindsets, beliefs, and values that organizational members have in common. They also indicated that OC is an important element in a successful TQM implementation. Similarly, in Japan, Deshpande, Farley, and Webster (1993) considered OC as the pattern of shared values and beliefs that help individuals understand the organization's functions, which thus provide them guidelines for behavior in the organization.

It has also been determined that the failure of a TQM implementation is primarily due to an organization's inability to integrate TQM and cultural change (Cameron & Quinn, 2006). Prajogo and McDermott (2005) furthermore contend that OC is one of the critical determinants for a successful TQM implementation.

In research concerning OC, Ferreira and Hill (2008) also stated that the Competing Values Model (CVM) had remained one of the most adopted approaches for OC assessment, with numerous researchers adopting the mode to classify and assess OC. First introduced by Quinn and Rohrbaugh (1983), the CVM model was later modified in its discovery technique of OC. Instead of seeking the characteristics of effective organizations, experts were asked to give opinions about effective organizations. Subsequently, the research came up with a consensus that experts share the same implicit theoretical framework (Quinn, 1988), which resulted in the development of the competing values framework (CVF).

From the CVF Quinn (1988) developed, researchers have attempted to identify the types of OC that are most suitable for TQM implementation. In Spain, Gimenez-Espin, Jiménez-Jiménez, and Martínez-Costa (2013) found that clan culture, adhocracy culture, and the "culture for quality" all had a positive impact on quality management, while hierarchy and market cultures give adverse results. Zu, Robbins, and Fredendall (2009), on the other hand, found that in the US manufacturing plants studied, clan and market cultures had a significant effect on TQM practices, while adhocracy and hierarchy were found to have no links to TQM practices.

Despite these mixed findings, clan and adhocracy cultures have been widely advocated to be favorable to the successful TQM implementation (Dellana & Hauser, 1999; Prajogo & McDermott, 2005), whereas hierarchy and market cultures were often found to have none or adverse effects on the TQM implementation (Gimenez-Espin et al., 2013).

From the above theories and scholars' concepts of OC, the following four items were placed in the research framework. These included corporate strategy (Y6), organizational characteristics (Y7), organization mission (Y8), and adaptation (Y9). From this, the following hypothesis was developed:

H6: Organizational culture (OC) has a direct positive influence on employee performance [EP].

Employee Performance

In Indonesia, Prawirosentono (1999) discussed EP and reported that EP is related to an employee's own sense of authority and responsibility, along with their moral and ethical standards. According to Kraisuth and Panjakajornsak (2017), professional knowledge and skills have been frequently thought of as "soft skills," with various scholars including teamwork skills, communication skills, and leadership skills in their studies**.** This is consistent with survey data from the National Association of Colleges and Employers **(**2015**)**, which indicated that 75**%** of all hiring managers seek new graduates who can work as part of a team, while 80**%** were looking for evidence of leadership skills, which had the greatest influence over hiring one candidate over another**.** Written communication skills and problem solving skills, which are both sought by more than 70**%** of employers, are also highly valued as are verbal communication skills and a strong work ethic**.**

Song, Chai, Kim, and Bae (2018) also examined the structural relationships among learning-organization culture, self-efficacy, work engagement, and job performance in 21 Korean workforce institutions. From the results, it was determined that teachers' self-efficacy positively affects their work engagement and job performance.

In a research conducted in Indonesia, Manik (2016) determined that achievement motivation and organizational climate-mediated transformational leadership, with transformational leadership, have the ability to increase achievement motivation and organizational climate on an employee's performance. Thus, organizational leaders need to pay attention to improve the achievement motivation of employees and create more conducive OC that EP can be improved.

From the above theories and scholars' concepts of EP, the following five items were placed in the research framework. These included achievement and motivation (Y10), learning and development (Y11), honesty (Y12), service consciousness (Y13), and collaboration and teamwork (Y14).

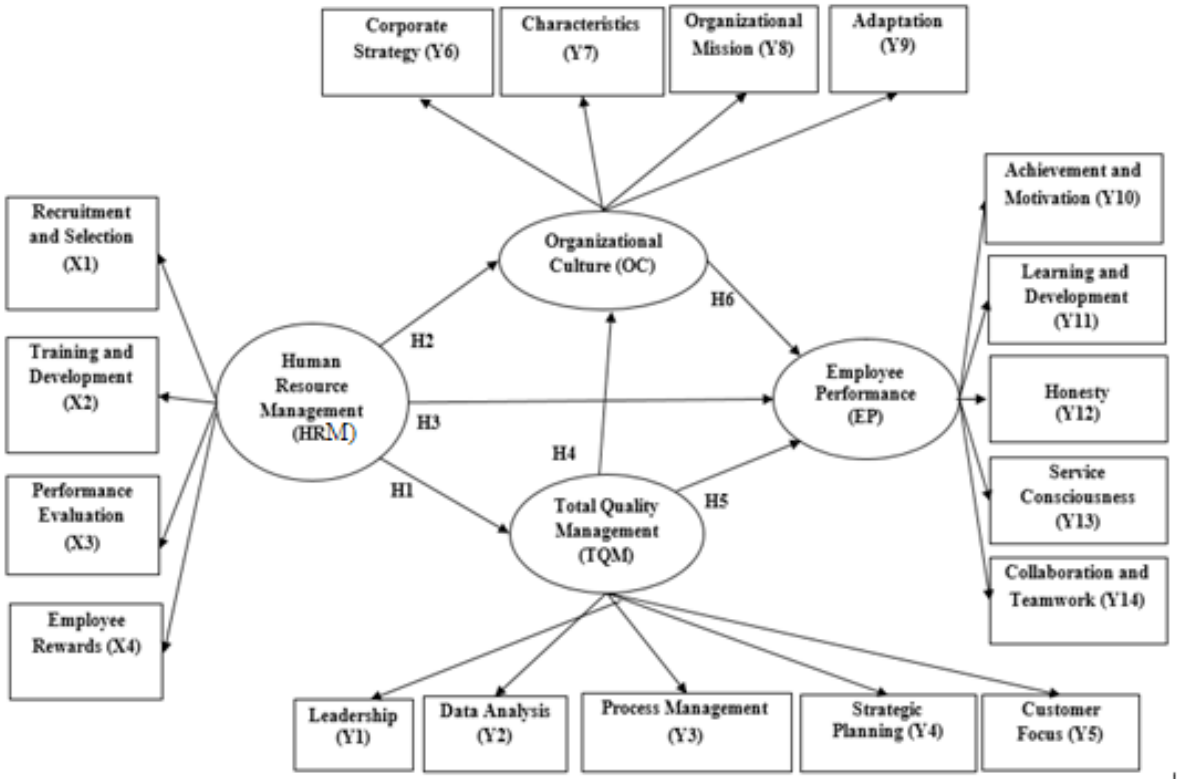

Figure 1. Conceptualized model.

Conceptual Model

We developed the conceptual framework and the model's six hypotheses (Figure 1) after a review of the theory and literature, which includes the causal relationships between HRM, OC, TQM, and EP.

Methods

Population and Sample

The sample population or unit of analysis for this research included 360 questionnaires obtained by multistage sampling from October–November 2017 from 12 SRT related seminars and workshops (Table 1).

The sample included supervisor level individuals who worked at the SRT in one of 13 departments across Thailand. Table 2 shows the results of the multistage random sampling process from October to November 2017. The research method used a 54-item instrument to assess the four constructs in the EP model. All questionnaire items used a 5-point, Likert type agreement scale response format (Likert, 1932).

Reliability

Seven experts determined the reliability of the questionnaire to ensure that the responses collected through the instrument were reliable and consistent. The seven experts included four deputy governors of the SRT and three professors in engineering, innovation, business administration, and research.

A trial assessment of 30 questionnaires was conducted before the actual survey to determine questionnaire reliability and consistency. The 30 collected and audited questionnaires were independent of the 360 collected for the final analysis. The reliability value was calculated by using Cronbach's α (Cronbach, 1997) to ensure internal consistency within the items. According to Best and Kahn (2003), when interpreting Cronbach's alpha (α), a value of ≥ 0.70 reflects good reliability. According to the pre-test, Cronbach's alpha (α) averaged 0.988, indicating reasonable reliability.

Furthermore, the survey questionnaire was divided into two parts, with Part 1 consisting of seven items concerning the SRT's civil service member's personal information, while Part 2 consisted of the actual questionnaire concerning the employee's views about the survey items.

Scale measurement made use of a 5-level Likert type agreement scale (Likert, 1932), with 1 indicating SRT staff's strong disagreement with the item's statement, while 5 indicated the SRT staff member strongly agreed with the item's statement.

Table 1
SRT Seminar and Workshop Participants (n = 360)

Time	Seminar day/month/year	Seminar location	Surveys given	Surveys returned	Audited surveys
1 (tryout)	2 October 2017	Housing Fund of Bangkok	50*	41*	30*
2	3 October 2017	Northern SRT Maintenance - Uttaradit	50	36	29
3	4 October 2017	SRT Bangkok	50	41	26
4	5 October 2017	SRT Structural Division, Bangkok	50	30	23
5	10 October 2017	SRT Information Systems, Bangkok	50	46	36
6	11 October 2017	Northeastern SRT Maintenance - Nakhon Ratchasima Railway Station	60	58	50
7	12 October 2017	SRT HRM Division, Bangkok	30	19	9
8	18 October 2017	SRT Assets Management, Bangkok	80	73	51
9	30 October 2017	SRT Bangkok	50	40	31
10	6 Nov. 2017	SRT Training center	60	60	35
11	13 Nov. 2017	SRT Training center	60	60	33
12	20 Nov. 2017	SRT Training center	60	60	37
Totals			600	523	360

Table 2
State Railway of Thailand Surveyed Departments (N=360)

Workgroup	Department/Office	Population	Sample
Deputy Governor of Traffic Business Cluster	Traffic Operation Dept.	288	73
Deputy Governor of Traffic Business Cluster	Passenger Service Dept.	64	20
Deputy Governor of Traffic Business Cluster	Freight Service Dept.	56	20
Deputy Governor of Locomotive and Rolling Stock Business Cluster	Mechanical Engineering Dept.	448	112
Deputy Governor of Infrastructure	Special Project and Construction Dept.	72	18
Deputy Governor of Infrastructure	Civil Engineering Dept.	222	56
Deputy Governor of Electrified Rail Management	Signaling and Telecommunications Dept.	84	21
Deputy Governor of Administration	Finance and Accounting Dept.	27	7
Deputy Governor of Administration	Stores Dept.	14	4
Deputy Governor of Administration	Legal Bureau	22	6
Deputy Governor of Strategy	Human Resource Dept.	23	6
Deputy Governor of Strategy	Information Technology Dept.	23	6
Deputy Governor of Strategy	Training center	13	11
Total		**1,356**	**360**

Statistical Analyses Overview

We made use of the survey method for data collection, and for the analysis of the hypotheses and their inter-relationships, LISREL 9.1 software (**Jöreskog**, **Olsson**, & Fan, 2016). Measurement and data collection imply an evaluation of the measurement model, which for the study included: 1) the individual item reliabilities, 2) the model's convergent validity, and 3) discriminant validity.

Item reliability was examined by looking at the loadings, or correlations, of each indicator on its construct. For reflective indicators, it is generally accepted that items must have a factorial load (λ) of 0.707 or above, and all values have been statistically significant ($|t| \geq 1.96$), representing convergent validity of scales. This threshold implies that there is more variance shared between the measures and their constructs that there is error variance. The initial analysis indicated that elimination of some items would enhance the fit indices, with standardized residuals indicating significant cross-loadings for several items being deleted if they exceeded 2.0. Reliability for the derived scale scores was also measured via internal consistency coefficient α (Cronbach, 1997).

Qualitative Data Analysis

Sample sizes depend on the complexity of the specified model, but typically range between 5 to 20 questionnaires per observed variable, with the overall sample size preferred to exceed n = 200 cases. Therefore, as the conceptual model was developed with 18 observed variables, it was determined that with a suggested sample size ratio of 20:1, the final sample size of 360 was highly reliable (18 x 20=360).

Confirmatory Factor Analysis (CFA)

To access the measurement models, a CFA was used followed by SEM to examine the general fit of the data to the proposed model and to determine the relationships among the constructs**.** Westland (2014) also reported that in marketing research, a significance level of 5%, a statistical power of 80%, and R^2 values of at least 0.25 are considered normal. In addition, Ullman (2001) indicated that in standard modeling, the proposed model should have a *p*-value higher than 0**.**05, and the x^2**/**df ratio should be less than two. Furthermore, other goodness**-**of**-**fit (GoF) statistics include the root mean square error of approximation (RMSEA), as a measure of GOF in SEMs and to measure the discrepancy per degree of freedom (df).

Results

Respondents' Characteristics (n=360)

From the final sample of 360 SRT civil service employees shown in Table 3, it was determined that 78.33% were male, and 21.67% were female. Also, from the survey's results, the majority, or 46.67%, were 51 years or older, and 75.55% had either a bachelor or master's degree.

Respondents' Information

Interpreted results from the 5-point Likert style agreement survey ranged from 4.05–4.52. These included EP, HRM, OC, and TQM.

Confirmatory Factor Analysis (CFA) Results

After a review of research documents and relevant theory, a CFA analysis was used to test the interrelationships of the internal and external variables (Table 4 and Table 5; Andre, 2017). By analyzing the CFA items with LISREL 9.1, $\chi 2$ was determined to not be statistically significant ($p \geq 0.05$), χ^2/df was ≤ 2.00, RMSEA ≤ 0.05, and standardized root mean square residual (SRMR) ≤ 0.05. The goodness-of-fit statistic (GFI) was also indicated to be 0.98, which shows good fit as it is higher than 0.90 (Hooper, Coughlan, & Mullen, 2008). The value for the adjusted goodness-of-fit index [AGFI] was 0.96, which indicates a well-fitting model as its value is also greater than 0.90. Concerning the CFA examination of the external latent variable for HRM, chi-square = 0.12, df = 1, *p*-value = 0.72570, and RMSEA = 0.000. For the internal latent variables TQM, OC, and EP, chi-qquare = 37.17, df = 42, *p*-value = 0.68284, and RMSEA = 0.000.

Convergent Model Analysis

From the LISREL 9.1 analysis of the data, and the measurement of the four constructs and their hypotheses, it was determined that there was a good model fit with the empirical data**.** Also, to assess the model's validity, convergent and discriminant validity were used (Westland, 2014). In SEM, CFA is usually used to access construct validity (**Jöreskog et al.,** 2016).

Results showed that the χ^2 value was 69.14, with the ratio between $\chi 2$ and the df equal to 0.93 when tested, which showed statistical significance as it was ≥ 0.05. This confirms the model's hypotheses were not different from the empirical data. Further confirmation was established as the results of the GFI equaled 0.98, and the adjusted goodness-of-fit index (AGFI) equaled 0.96. The RMSEA was equal to 0.000, the SRMR was equal to 0.010, and the root mean square residual (RMR) was 0.010. As SRMR is an absolute measure of fit, a value of zero indicates a perfect fit with a value of ≤ 0.05 indicating a good fit. The validated results are detailed in Tables 6–8, as well as in Figure 2.

Table 7 shows the *direct effect (DE)*, *indirect effect (IE)*, and *total* effect (TE) of each construct, with HR influencing EP the most, due to the value of 0**.**96.

SEM Results

Hooper et al. (2008) discussed low R^2 values of $\leq$ 0**.**20 and suggested that they be removed from the analysis, as this is an indication of high error rates. The SEM results (Figure 2) showed that the model met the required criteria as the $\chi 2$ index was not statistically significant, and all the causal factors in the model were shown to have a positive influence on SRT EP, which is explained by the variance of factors influencing SRT EP [R^2] by 92%. From the results, it was determined that HRM had the most significant impact on EP (0.96), followed by TQM (0.45), and finally, OC (0.37).

Discussion

Results from the study showed H1 to be supported, as HRM had a direct and positive impact on the SRT's TQM, with the correlation coefficient between the variables determined to be 0.82. This is supported by recent in-house and public SRT competency-based training programs, e-training, distance training, self-learning, on-the-job training, coaching, and the provisioning of scholarships, observation trips, and site visits (Wengchai, 2013).

Second, to prepare SRT officers to support new railway projects and provide guidelines for an establishment of an ASEAN Rail System Development Institute (ARSDI), Thailand's SRT has signed multiple Memorandums of Understanding (MOU) with government ministries and educational institutions. The MOUs include a Bachelor Degree program in Technology, which includes study in the fields of mechanical, electrical, construction, civil, traffic, and management, as well as a Bachelor Degree in Logistics for SRT officers. SRT grants 337 scholarships for its officers under the MOU's program (Wengchai,

Table 3
Survey Participants' Demographics (n-360)

Gender	Frequency	Percent
Male	282	78.33
Female	78	21.67
Total	360	100
Age		
21--30 years old	21	5.83
31--40 years old	76	21.11
41--50 years old	95	26.39
Over 51 years old	168	46.67
Total	360	100
Relationship Status		
Single	90	25.00
Married	260	72.22
Divorce/widowed/separated	10	2.78
Total	360	100
Education Level		
Senior High School	59	16.39
Vocational Certificate / High Vocational Certificate	29	8.06
Bachelor Degree	219	60.83
Graduate Degree	53	14.72
Total	360	100
Civil Service Rank		
CS 8	274	76.11
CS 9	26	7.22
CS 10	46	12.78
CS 11 or higher	14	3.89
Total	360	100
Work experience		
Less than or equal to 10 years	26	7.22
11-20 years	63	17.50
21-30 years	139	38.61
Over 31 years' experience	132	36.67
Total	360	100

Note. Respondent's survey not included in total numbers.

Table 4
Confirmation Elements for the External Latent Variable HR

construct	α	CR	AVE	Observed variables	loading	R^2
Human Resource Management (HR)	0.937	0.921	0.745	Recruitment and Selection (X1)	0.81	0.66
				Training and Development (X2)	0.79	0.63
				Performance Evaluation (X3)	0.92	0.85
				Rewards (X4)	0.93	0.86

Table 5
Confirmation Elements for the Internal Latent Variables TQM, OC, and EP

constructs	α	CR	AVE	Observed variables	loading	R^2
Total Quality Management (TQM)	0.918	0.939	0.754	Leadership (Y1)	0.82	0.67
				Data Analysis (Y2)	0.89	0.79
				Process Management (Y3)	0.74	0.54
				Strategic Plan (Y4)	0.88	0.78
				Customer Focus (Y5)	0.79	0.62
Organizational Culture (OC)	0.941	0.933	0.776	Corporate Strategy (Y6)	0.86	0.74
				Organizational Characteristics (Y7)	0.92	0.85
				Organization Mission (Y8)	0.92	0.85
				Adaptation (Y9)	0.87	0.75
Employee Performance (EP)	0.923	0.941	0.762	Achievement and Motivation (Y10)	0.86	0.74
				Learning and Development (Y11)	0.89	0.79
				Honesty (Y12)	0.83	0.69
				Service Consciousness (Y13)	0.81	0.66
				Collaboration and Teamwork (Y14)	0.83	0.68

Table 6
Correlation Coefficients, Construct Reliability (ρ_C), the Mean (, and Average Variance Extracted (AVE)

Latent Variables	TQM	OC	EP	HR
TQM	1			
OC	0.837	1		
EP	0.934	0.969	1	
HR	0.819	0.914	0.959	1
ρ_C (Construct Reliability)	0.939	0.933	0.941	0.921
ρ_V (AVE)	0.754	0.776	0.762	0.745
	0.869	0.881	0.873	0.863

Note. Sig. ≤ 0.01, the correlation coefficient between latent variables **(***below the diagonal in* **bold)**, *reliability of latent variables [ρ_C], and the average variance extracted [AVE]. TQM = total quality management, OC = organizational culture, EP = employee performance, and HR = human resource management.*

2013**).** Also, in 2013, SRT reopened its Railway Engineering School, and in 2013 and 2014, 180 and 110 were accepted into a 1**.**5-year vocational education certificate program in traffic, mechanical, electrical and electronics, civil and signaling, and telecommunications.

Hypothesis H2 was also supported, which showed that HRM had a direct positive impact on OC (0.70). This was consistent with research from Pakistan, in which it was shown that strong OC in organizations helps achieve a sustainable competitive advantage by augmenting human resource professionals' effectiveness (HRPE; Fareed, Isa, & Noor, 2016).

Moreover, organizations have to align their HRM strategies with robust HRM systems which also enhances HRPE. Concerning H3's proposed direct and positive relationship between HRM and EP, the hypothesis was supported as the correlation coefficient

Table 7
Standard Coefficients of Influence from the SEM of Factors Affecting SRT Employee Performance [EP]

Dependent variables		R^2	Independents		
			HR	**OC**	**TQM**
TQM	DE	.67	0.82**	-	-
	IE		-	-	-
	TE		0.82**	-	-
OC	DE	.84	0.70**	-	0.27**
	IE		0.22**	-	-
	TE		0.92**	-	0.27**
EP	DE	.92	0.33**	0.37**	0.35**
	IE		0.63**	-	0.10*
	TE		0.96**	0.37**	0.45**

Table 8
Hypotheses Testing Results

Hypotheses	Coef.	t-test	Results
H1: Human resource management (HR) has a direct positive influence on total quality management (TQM).	0.82	14.82**	Accept
H2: Human resource management (HR) has a direct positive influence on organizational culture (OC).	0.70	10.96**	Accept
H3: Human resource management (HR) has a direct positive influence on employee performance (EP).	0.33	4.53**	Accept
H4: Total quality management (TQM) has a direct positive influence on organizational culture (OC).	0.27	4.87**	Accept
H5: Total quality management (TQM) has a direct positive influence on employee performance (EP).	0.35	7.16**	Accept
H6: Organizational culture (OC) has a direct positive influence on employee performance (EP).	0.37	4.80**	Accept

*Note. **Sig. < 0.01*

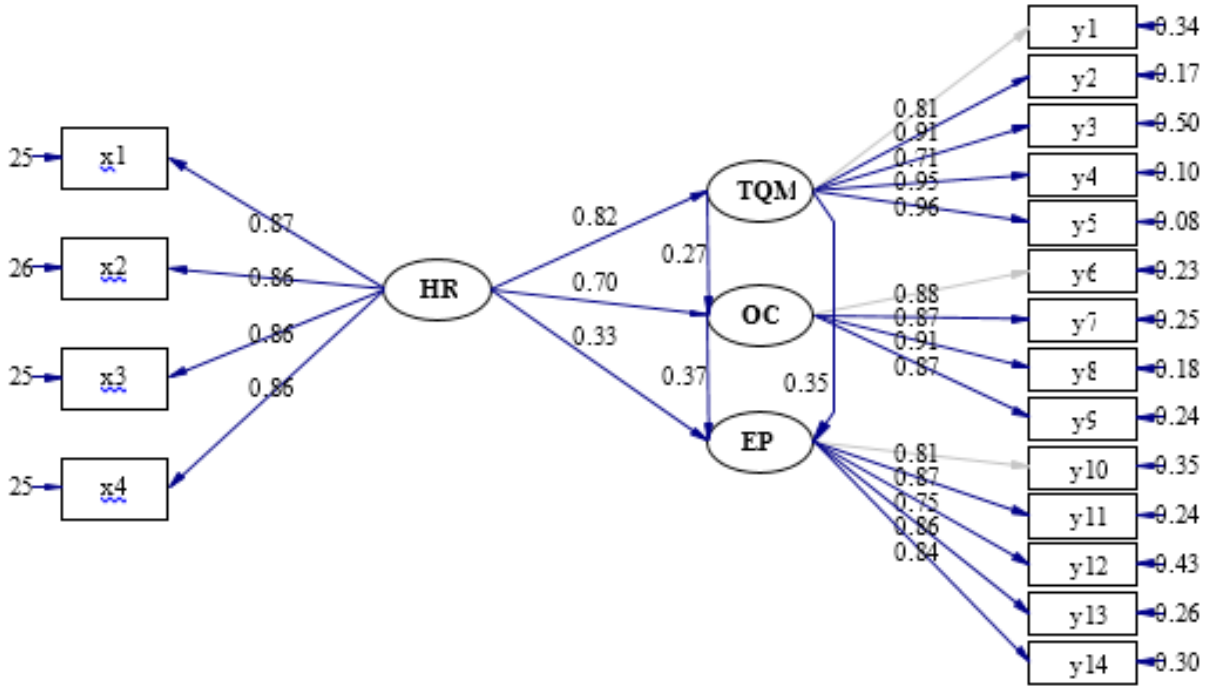

Figure 2. SEM final model with values from estimates (*n*=360).

between the variables was determined to be 0.33. With the SRT's recognition of the importance of HRM to the organization's future success, additional MOUs have been signed for the development of human resource and expertise development on the national rail system with the National Science Technology and Innovation Policy Office in collaboration with 14 other sectors.

However, what is interesting to note between SRT pronouncements to the public and the signing of the MOUs, is the comparatively low scores of how SRT internal staff recently view the success or failure of these policies and programs. While there seem to be high marks internally for methods in improving performance (Item 5), the staff evaluation process and evaluation results was judged to be the lowest aspect concerning HRM (Items 8 and 9).

When TQM was analyzed, H4 was also determined to be supported, with TQM having a direct and positive impact on OC as the correlation coefficient was at 0.27. TQM and EP were also shown to have a positive relationship as the correlation coefficient was 0.35. Further support for these positive relationships came from the SRT employee survey data in which SRT management places importance on problem identification and resolution (Items 8 and 13). There does, however, seem to be a limit as to how fast a passenger's complaint can be rectified (Item 10).

Finally, H6's relationship between OC and EP was supported as the correlation coefficient between the variables was determined to be 0.37. In Pakistan, Fareed et al. (2016, p.1722), defined OC as a "way people think", which can have a direct influence on the way people behave, which is consistent with research from Tsai (2011), in which OC was significantly and positively correlated with leadership behavior and job satisfaction. Berson and Linton (2005) also confirmed this as they discovered that within research and development and administrative environments, a manager's leadership behavior is closely related to employee work satisfaction. This is also supported by Denison (1990), in which it was concluded that working as a team competitively with a shared information base unites members in pursuit of a group project. As such, collaboration increases employee energy, creativity, and productivity, which usually leads to less stressed, happier, and more engaged workers (Tannenbaum, 2014).

However, results from the study's survey seems to shed a different light on just what constitutes "OC" within the SRT, as the highest ranked item is number 2,

which seems to suggest that within the SRT, discipline and punishment are a rule for infractions.

Conclusion

The objective of the study was to investigate SRT staff perspectives on their organizational culture, human resource processes, the SRT's total quality management program, and how these variables affected an SRT employee's performance. Far and away, human resource processes were determined to have the most significant impact on an employee's performance, as the causal factors in the model were shown to have a positive influence which is explained by the variance of factors influencing SRT EP **(**R^2**)** by 92**%.**

Human resource processes are a fundamental change in how most enterprises manage their business, with change difficult and time-consuming. SRT management must, therefore, lead the HR process, with all employees becoming involved in HR so that they can maximize SRT's EP. As stated earlier, and as validated from numerous studies on the SRT, continuous quality human resource improvement is a business imperative, and with many SRT experienced employees nearing retirement age, an ongoing education and training process will be essential for all junior employees and new hires. Also, employees hired by the SRT before 1999 were allowed to choose monthly or lump-sum pensions, but staff hired after 1999 are now only allowed a lump-sum payout. This has become a point of conflict that must be addressed. This could be a contributing reason that OC was ranked as the least important variable in an employee's performance.

In the investigation about the SRT's TQM process, it has been observed that fundamental change is often difficult and time-consuming. Therefore, SRT management must lead the TQM process, with all employees becoming involved in TQM, so that they can maximize SRT's employee performance.

Finally, railway projects can be a catalyst for the creation of new business opportunities for both the manufacturing and service sectors along the rail lines. The Thai government is, therefore, prioritizing the development of rail transport because it provides greater convenience, uses less land, and less fuel than road transport, making it more environmentally friendly.

Implications

From the SRT's survey respondents' characteristics (n=360), it was noted that 78.33% were male, and 46.67% were 51 years or older. Additionally, official statements released by the SRT in 2018 stated the SRT needs 18,015 employees to function effectively, but currently has only 10,305 working staff (Jotikasthira, 2018). This raises many follow-on issues about the lack of current expertise and the potential loss of staff in the coming years, and where and how the replacements will be found. If replacements are not found, how will junior staff be trained, or will technology replace them? It also raises questions about future SRT profitability, as the SRT is straddled with massive debt, as it was reported in 2011 that 16% of the SRT's total liabilities were accounted for by pension fund and pension obligations to retired employee, which at the time of the report totaled 13,952 million baht (Padeco Co., Ltd., 2014).

ETHICAL CLEARANCE:

The study was approved by the institution.

CONFLICT OF INTEREST:

None.

References

Andre, T. (2017). Advances in human factors in training, education, and learning sciences. *Proceedings of the AHFE 2017 International Conference on Human Factors in Training, Education, and Learning Sciences,* July 17-21, Los Angeles, CA. Retrieved from https://www.springer.com/gp/book/9783319600178

Andrle, S. J. (1994). Total quality management in public transportation. *Research Results Digest*, (3), 1–39. *Retrieved from* http://tinyurl.com/ybqeec8z

Berson, Y., & Linton, J. (2005). An examination of the relationships between leadership behavior, and employee satisfaction in R&D versus administrative environments. *R & D Management, 35*, 51–60. doi: 10.1111/j.1467-9310.2005.00371.x

Best, J. W., & *Kahn*, J. V. (*2003*). *Research in education* (9th ed.). Boston, MA: Allyn and Bacon.

Cameron, K. S., & Quinn, R. E. (2006). *Diagnosing and changing organizational culture: Based on the competing values framework*. San Francisco, CA: Jossey-Bass.

Changnon, S. A. (2006). *Railroads and weather*. Boston, MA: American Meteorological Society.

Cronbach, L. J. (*1997*). *Essentials of psychological testing*. Boston, MA: Allyn & Bacon.

Deal, T. E., & Kennedy, A. A. (2000). *Corporate cultures: The rites and rituals of corporate life*. New York, NY: Perseus Publishing.

Dechawatanapaisal, D. (2005). *The role of HRM in organizational learning: A perspective from Thai corporation employees*. In S. Hawamdeh (Ed.), *Knowledge management: Nurturing culture, innovation, and technology* (Proceedings of the 2005 International Conference on Knowledge Management, USA) (pp. 355–368). doi: 10.1142/9789812701527_0030

Dellana, S.A., & Hauser, R.D. (1999). Toward defining the quality culture. *Engineering Management Journal, 11*(2),11-15.

Denison, D. (1990). *Corporate culture and organizational effectiveness*. New York, NY: Wiley.

Deshpande, R., Farley, J. U., & Webster, F. E., Jr. (1993). Corporate culture, customer orientation, and innovativeness in Japanese firms: A quadrad analysis. *The Journal of Marketing, 57*(1), 23-37. doi: 10.2307/1252055

Economist Intelligence Unit. (2013). *Challenges for human resource management and global business strategy*. *Retrieved from* http://tinyurl.com/jm63mc3

Evans, J. R. (2017). *Quality & performance excellence: Management, organization, and strategy* (8th ed.). Boston, MA: Cengage Learning.

Fareed, M., Isa, M. F. M., Noor, W. S. W. M. (2016). Human resource professionals' effectiveness, organizational culture and high-performance work system link: Evidence from Pakistan. *International Business Management, 10*(9), 1720–1728. Retrieved from https://tinyurl.com/ya2tb8qh

Ferreira, A. I., & Hill, M. M. (2008). Organisational cultures in public and private Portuguese universities: A case study. *Higher Education,* 55(6), 637–650. doi: 10.1007/s10734-007-9080-6

Free bus, train services replaced with welfare-card system. (2017, November 1). *The Nation.* Retrieved from https://tinyurl.com/y9wqnspo

Ganjanakhundee, S. (2016, February 10). Rail plan may serve China's interests more than Thailand's. The Nation. Retrieved from http://tinyurl.com/gq5ubu7

Gimenez-Espin, J. A., Jiménez-Jiménez, D., & Martínez-Costa, M. (2013). Organizational culture for total quality management. *Total Quality Management & Business Excellence, 24*(5–6), 678–692. doi: /10.1080/14783363.2012.707409

Hooper, D., Coughlan, J., & Mullen, M. (2008). *Structural equation modelling: Guidelines* for *determining model fit. Electronic Journal of Business Research Methods*, *6*(1), 53--60. *Retrieved from* http://tinyurl.com/zyd6od2

Jöreskog, K. G., Olsson, U. H., & Fan, Y. W. (2016). *Multivariate analysis with LISREL*. Berlin, Germany: Springer.

Jotikasthira, O. (2018, April 29). Rail service on track to crisis. *Bangkok Post*. Retrieved from https://tinyurl.com/y86a77qb

Katou, A. A. (2012). Investigating reverse causality between human resource management policies and organizational performance in small firms. *Management Research Review, 35*(2), 134–156. doi: 10.1108/01409171211195161

Kraisuth, D., & Panjakajornsak, V. (2017). Thai engineer ASEAN readiness: A structural equation model analysis. *Asia-Pacific Social Science Review, 16*(3), 96–117. Retrieved from http://tinyurl.com/m2spsas

Likert, R. (1932). A technique for the measurement of attitudes. *Archives of Psychology, 22*(140), 1-55.

Liu, X. (2016). The impact of logistics costs on the economic development: The case of Thailand. *Business and Public Administration Studies, 10*(1), 37–42. Retrieved from https://tinyurl.com/y8ol2cog

Manik, E. (2016). The influence of transformational leadership on achievement motivation and organizational climate and employee performance. *International Journal of Academic Research in Business and Social Sciences, 6*(12), 599–608. doi: 10.6007/IJARBSS/v6-i12/2522

Mansouri, N., & Goher, K. (2016). Leading different dimensions of organization performance through human resource management practices. *International Journal of Human Resource Studies, 6*(4), 54–66. doi: 10.5296/ijhrs.v6i4.10336

Mukherjee, P. N. (2006). *Total quality management*. New Delhi, India: Prentice Hall of India.

National Association of Colleges and Employers. (2015). *Job outlook 2016.* Bethlehem, PA: National Association of Colleges and Employers. Retrieved from http://tinyurl.com/h9773yf

Nigro, F. A., & *Nigro*, *L. G*. (1984). *Modern public administration.* New York, NY: Harper and Row.

Oladapo, V. (2014). *The impact of talent management on retention. Journal of Business Studies Quarterly, 5*(3), 19–36. *Retrieved from* http://tinyurl.com/ja5mr8s

Padeco Co., Ltd. (2014). *Thailand: Improvement of railway passenger services* (Technical Assistance Consultant's Report). Japan: Asian Development Bank. *Retrieved from* http://tinyurl.com/zgpg7ml

Pomlaktong, N., & Ongkittikul, S. (2008). Infrastructure development in Thailand. In N. Kumar (Ed.),

International infrastructure development in East Asia – Towards balanced regional development and integration (pp. 263–291). Retrieved from https://tinyurl.com/yb8jwvt9

Prajogo, D. I., & McDermott, C. M. (2005). The relationship between total quality management practices and organizational culture. *International Journal of Operations & Production Management, 25*(11), 1101–1122. doi: 10.1108/01443570510626916

Prawirosentono, S. (1999). *Kebijakan kinerja karyawan* [Employee performance policy: Tips for building competitive organizations towards world free trade]. Yogyakarta, Indonesia: BPFE.

Quinn R. E., & Rohrbaugh J. (1983). A spatial model of effectiveness criteria: Towards a competing values approach to organizational analysis. *Management Science, 29*(3), 363–377. doi: 10.1287/mnsc.29.3.363

Quinn R. E. (1988). *Beyond rational management: Mastering the paradoxes and competing demands of high performance.* San Francisco, CA: Jossey-Bass.

Skinner, (1981, September). Managing human resources. *Harvard Business Review*. Retrieved from https://hbr.org/1981/09/managing-human-resources

Smith, K. (2017, September 25). Thailand unveils $US 81bn rail development plan. *International Railway Journal. Retrieved from* http://tinyurl.com/y7elaxkv https://www.railjournal.com/asia/thailand-unveils-dolus-81bn-rail-development-plan

Song, J. H., Chai, D. S., Kim, J., & Bae, S. H. (2018). Job performance in the learning organization: The mediating impacts of self-efficacy and work engagement. *Performance Improvement Quarterly, 30*(4), 249–271. doi: 10.1002/piq.21251

Sornsaruht, P., & Deebhijarn, S. (2016). Free train transportation in Thailand: A financial SWOT analysis on its social impact. *Asian International Journal of Social Sciences, 16*(1), 11–33. doi: 10.29139/aijss.20160102

Srimalee, S. (2017, January 6). Infrastructure plan to change the logistics landscape, boost property developers. *The Nation*. *Retrieved from* http://tinyurl.com/yd2e3u27

Tannenbaum, N. (2014, September 18). Leadership challenge: Creating a collaborative organizational culture. UNC Kenan-Flagler Business School. *Retrieved from* http://tinyurl.com/y7mydbyo

Tsai, Y. (2011). Relationship between organizational culture, leadership behavior and job satisfaction. *BMC Health Services Research, 11*, 98. doi: 10.1186/1472-6963-11-98

Ullman, J. B. (2001). Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (Eds.)*, Using multivariate statistics* (4th ed.; pp. 653-771. Needham Heights, MA: Allyn and Bacon.

Wengchai, B. (2013). *Human resource development of State Railway of Thailand*. Retrieved from https://tinyurl.com/yd9k6ucd

Westland, J. C. (2014). Statistical power and sample size in PLS path analysis. *SSRN Electronic Journal*. doi: 10.2139/ssrn.2488982

Zu, X., Robbins, T. L., & Fredendall, L. D. (2009). Mapping the critical links between organizational culture and TQM/Six Sigma practices. *International Journal of Production Economics, 123*(1), 86–106. doi: 10.1016/j.ijpe.2009.07.009