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Efficiency on the Move: Assessing Operation Management Practices and Developing a Strategic Plan for Bus Companies in a Philippine Provincial District

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Abstract. This study assessed bus companies' operation and management practices in a provincial district in the Philippines, focusing on human resource management, facility management, safety protocols, and reservation systems. A descriptive-quantitative approach was employed to gather data from bus personnel, operators, and commuters, providing a comprehensive evaluation of the effectiveness of these practices. The research findings reveal significant operational inefficiencies in bus companies within the provincial district, particularly in safety practices, facility management, and human resource practices. Issues such as the lack of safety tools, poor maintenance schedules, and inadequate training for personnel lead to accidents and poor customer service, while outdated technological practices, like the absence of an online reservation system, further hinder operational effectiveness. Despite bus operators being content with current practices, commuters and personnel express dissatisfaction, highlighting a disconnect between stakeholders. Overall, the study underscores the need for safety, human resources, and facility management improvements to enhance operational effectiveness, customer satisfaction, and business performance. As a result, this study facilitated a collaboration with industry experts to create a comprehensive strategic operations management plan that contains the implementation of robust safety protocols, the establishment of a comprehensive facility management system, continuous staff training programs, the adoption of modern technological solutions, and enhancement of stakeholder communication channels which is progressively adopted by bus companies A, B, and C.

Keywords: Bus companies; Operation management; Public transportation.

1.0 Introduction

Public transportation, particularly buses, is essential for societal mobility, offering accessible and affordable travel to destinations like schools and workplaces. In the studied provincial district, various bus companies operate ordinary and air-conditioned buses servicing routes to the National Capital Region (NCR) and surrounding areas. Despite their importance, challenges such as increasing commuter demand, operational inefficiencies, and safety concerns necessitate an examination of bus companies' management practices.

The importance of an efficient and reliable transportation system is well-established in research. Olamigoke and Emmanuel (2013) highlight that a functional transport system drives local economic development by facilitating access to markets and enhancing productivity across various sectors. Transportation is vital for economic growth, as it opens avenues for trade and urbanization. Gallego, Gamboa, and Luistro (2015) also emphasize the role of

buses in promoting economic mobility and societal development, while noting the need for ongoing improvements in public transportation to meet the demands of a growing population (Munzilla et al., 2013; Manalo, 2018).

Population growth during peak periods, especially holidays, increases pressure on bus services, with Capulong et al. (2018) noting a 26% rise in Christmas trips. This demand leads to congestion at bus stations, particularly in Pasay City, where 3,000 passengers crowd terminals daily (Boquet, n.d.). Delays are common due to slow bus turnover and fully booked routes (CNN Philippines, 2016). Additionally, road safety is a significant challenge, with high accident rates linked to lax enforcement and older vehicles (Meixler, 2018). In 2015, the Philippine Statistics Authority reported 10,012 traffic fatalities, prompting temporary bus operation suspensions by the LTFRB.

Despite challenges, the bus industry has seen positive changes over the past decade. Major manufacturers are producing eco-friendly, safer vehicles designed for public transportation (Casayuran, 2019) and advancements in online reservation systems and mobile applications are transforming the public transportation landscape, addressing some operational challenges faced by bus companies (Hynes, 2016).

In the studied provincial district, bus operations face risks from a high-accident highway, congestion during peak periods, and overloading, alongside the need to evaluate bus stop conditions and personnel performance. Moreover, there are limited studies exist on local operational practices, commuter experiences, and the effectiveness of safety measures. Thus, this study aims to assess the operational management practices of local bus companies, analyze current methods, and propose a strategic operation management plan to address inefficiencies, safety concerns, and rising demand. The findings are expected to enrich discussions on public transportation management and offer practical insights for similar contexts.

2.0 Methodology

2.1 Research Design

This study employed a descriptive-quantitative research methodology to assess the operations management practices of bus companies operating within a provincial district in the Philippines. The descriptive approach was deemed appropriate for this research as it facilitated an accurate representation and detailed examination of the operational practices among selected bus companies by means of inferential questions. This method is suitable for identifying and documenting facts, enabling a comprehensive interpretation of data relevant to the operations management context.

2.2 Research Participants

The study targeted three groups of respondents: commuters, bus personnel, and bus operators. Commuters were considered key respondents due to their role as customers, while bus personnel (drivers, conductors, and employees) and bus operators provided insights from an operational perspective. The total sample size was 750 respondents, consisting of 300 commuters and 450 bus personnel (150 drivers, 150 conductors, and 150 other employees, including operators). The study used random stratified sampling to select major bus operators within the provincial district, ensuring a representative sample for accurate insights into the bus industry. Convenience sampling was used for respondent selection. Given the transient nature of commuters and bus personnel at terminals and bus stops, willing and available participants were chosen during the data collection period. Bus employees and operators, whose schedules varied, were surveyed according to a pre-arranged schedule provided by the operations manager of each participating bus company.

2.3 Research Instrument

The research instrument was a self-made structured questionnaire designed based on the research objectives and informed by an extensive literature review. The questionnaire was divided into three parts. Part 1 gathered demographic details such as the type of respondent (commuters and bus personnel), age, gender, educational background, and occupation. Part 2 focused on four key dimensions of operations management: safety, reservation systems, facilities, and human resource management. Each dimension included at least five statements designed to evaluate the extent of operations management practices employed by the bus companies. Part 3 assessed the perceived effectiveness of the identified operations management practices. Before formal data

collection, the structured questionnaire underwent Lawshe's content validity assessment, improving its CVI score from 0.70 to 0.90, indicating strong expert consensus and a pilot test with 15 non-target respondents confirmed the questionnaire's reliability, yielding a Cronbach's alpha of 0.875, demonstrating high internal consistency.

2.4 Data Gathering Procedure and Analysis

Following the pilot test, a consent letter and the questionnaire were sent to bus company administrators (e.g., owners, operations managers, and human resource heads) for review and approval. The researcher administered the survey in person upon receiving the consent of the participating companies. Respondents completed the questionnaire within 5 to 10 minutes. After data collection, the responses were processed and analyzed using IBM SPSS Statistics 21, with results further validated through manual checking by the researcher and a statistician.

3.0 Results and Discussion

3.1 Background Characteristics of Respondents

Commuters

Table 1 provides the background characteristics of the commuters of the bus companies in the studied provincial district.

Table 1. Background characteristics of commuters

Profile	Detail	Frequency	Percentage
Type of Commuter	Walk-in	300	100%
Age	Below 25-30 years old	254	84.7%
	31-40 years old	27	9%
	41.50 years old	15	5%
	51 and above years old	4	1.3%
Sex	Male	155	51.7%
	Female	145	48.3%
Educational Background	Elementary graduate	1	0.3%
	High School graduate (Old Curriculum)	29	9.7%
	Senior High School graduate	49	16.3%
	Vocational-Technical	18	6%
	College Undergraduate	94	31.3%
	Bachelor's Degree	102	34%
	Master's Units	3	1%
	Master's Degree	1	0.3%
	Others	3	1%
Occupation	Student	16	5.3%
	Private Employee	7	2.3%
	Government Employee	6	2%
	None	271	90.3%

The information reveals that there is no reservation system within the bus companies involved. Moreover, the data gathered suggest that most of the commuters are young male job seekers with a bachelor's degree who utilize buses to traverse to nearby municipalities or cities that may have job opportunities or who are just recently unemployed and are going home to their respective towns, given that contractual jobs are still vastly used by companies in the country. Information from the Urban Institute supports such claims, given that job seekers and newly hired employees' distance from work to home and vice versa is at least 6.3 miles or 10.2 km (Bliss, 2019). On the side of contractualization in the Philippines, up to this date, there is no viable law to extinguish 'endo' in the archipelago (Generalao, 2019). Furthermore, the information collected may indicate that 31 and above years old have master's units up to doctoral degrees, and private and government employees may prefer another mode of transport (e.g., UV Express, carpooling, etc.) or may have a private vehicle that they use to travel to their respective destination.

Bus Personnel and Operators

Table 2 shows the background characteristics of bus personnel and operators.

Table 2. Background characteristics of bus personnel and operators

Profile	Detail	Frequency (%)				
		Driver	Conductor	Employee	Operator	Total
Age	Below 25 – 30 years old	11 (7.3%)	77 (51.3%)	58 (41.4%)	2 (20%)	148
	31 – 40 years old	111 (74%)	55 (36.7%)	53 (37.9%)	3 (30%)	222
	41 – 55 years old	28 (18.7%)	18 (12%)	29 (20.7%)	5 (50%)	80
Sex	Male	149 (99.3%)	150 (100%)	65 (46.4%)	7 (70%)	371
	Female	1 (0.7%)		75 (53.6%)	3 (30%)	79
Educational Background	Elementary graduate	12 (8%)	11 (7.3%)			23
	High School graduate (old curriculum)	26 (17.3%)	60 (40%)			86
	Vocational-Technical	112 (74.7%)	79 (52.7%)	41 (29.3%)		232
	Bachelor's Degree			89 (63.6%)	9 (90%)	98
	Master's Units			10 (7.1%)	1 (10%)	11

The data suggests that the bus companies studied continue to traditionally prefer male drivers and conductors, as this has been a norm in the bus industry for decades. Furthermore, these companies may pair experienced drivers with younger conductors to mentor them on various aspects of road operations (e.g., routes, specific stops, driving, etc.) and to help bridge the generational gap within the workplace. Additionally, many employees may have been offered scholarships by their respective companies to pursue the National Certificate III (NCIII) in Driving, issued by the Technical Education and Skills Development Authority (TESDA). However, the rollout of such scholarships may still be ongoing.

Historically, the profession has been male-dominated for many years (Couto et al., 2011). Moreover, TESDA has actively encouraged bus companies, drivers, and conductors to obtain the NC III Driving certification, occasionally offered with free training and assessments nationwide (TESDA, 2015). In contrast, the bus companies studied tend to prefer middle-aged females, often with educational backgrounds in business and management, for operations, particularly clerical functions (e.g., documentation, finance, accounting, etc.). Male and some female employees with technical-vocational qualifications are typically deployed as bus inspectors or mechanics, while those with postgraduate units may hold managerial positions or lead specific divisions.

Gershon (2015) explains that employers have favored female employees for clerical roles for decades due to various perceived advantages, such as efficiency and a higher tolerance for routine tasks, which aligns with the data collected. Furthermore, the father is often the key figure in the operational management of family-owned bus companies. Operators aged between 25 and 40 are likely children or siblings of the primary operators, being groomed as successors and receiving mentorship from their parents or relatives.

3.2 Operation Management Practices

Safety Practice

Table 3 illustrates the extent of safety practices by the studied bus companies. It may suggest that the buses of the stated companies have minimal or no visible emergency tools (e.g., first aid kits, fire extinguishers, emergency exits, etc.). Data from 2014, 2015, and 2019 strongly support the findings, indicating that road accidents resulting in fatalities have steadily increased over time (Corrales, 2014; Meixler, 2018; Ibay et al., 2019; MDRRM, 2019). The lack of adequate emergency tools on buses, particularly during critical moments such as accidents, has exacerbated the fatality rate among severely injured passengers and bus personnel. This includes the absence of immediate first aid, challenges evacuating injured passengers and personnel, and difficulties in extinguishing fires.

On the other hand, there is a possibility that security tools on buses, such as CCTV cameras and dashboard cameras, are visible and properly utilized by drivers and conductors. Additionally, it is plausible that the buses operating within the district are either hybrid (HV) or electric vehicles (EV), or at least the latest diesel-powered buses available in Asia (Olchondra, 2013; Shah, 2018; Casayuran, 2019).

Table 3. Descriptive statistics of the assessment of safety practices

Indicators	Commuter		Driver		Conductor		Employee		Operator	
	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation
1. The bus company uses security tools in their buses (CCTV cameras, dashboard cameras, GPS, etc.)	3.40	Much extent	3.86	Much extent	4.48	Great extent	3.70	Much extent	4.10	Much extent
2. The bus company uses safety tools (seatbelts, handrails, etc.)	3.23	Moderate extent	3.76	Much extent	4.48	Great extent	4.00	Much extent	4.00	Much extent
3. The bus company uses emergency tools in their buses (first aid kits, emergency exits, fire extinguishers, etc.)	2.71	Moderate extent	3.59	Much extent	4.48	Great extent	3.41	Much extent	3.90	Much extent
4. Buses are checked in terminals before departure and upon arrival (brake system, fuel level, tire condition, etc.)	2.94	Moderate extent	3.86	Much extent	4.48	Great extent	3.70	Much extent	3.90	Much extent
5. Drivers and conductors are well-rested and in good health before driving.	3.31	Moderate extent	3.86	Much extent	4.48	Great extent	3.70	Much extent	4.10	Much extent
Weighted Mean	**3.11**	**Moderate extent**	**3.78**	**Much extent**	**4.48**	**Great extent**	**3.70**	**Much extent**	**4.00**	**Much extent**

Note: 4.2 – 5.0 Practice to a great extent, 3.4 – 4.19 Practice to a much extent, 2.6 – 3.39 Practice to a moderate extent, 1.8 – 2.59 Practice to a less extent,1.0 – 1.79 Not Practice at all (NPAA)

Reservation Practices

Table 4 discloses the extent of reservation practices of the bus companies in the studied provincial district. As illustrated, no reservation system practice exists within the studied provincial district. Data from Table 2, specifically the result of the type of commuters that resulted in a 100% walk-in response, may strongly support such claims. In addition, PinoyTravel, the only online website that caters to reserving bus seats in the country, may not be affiliated with the bus companies included in the study (Hynes, 2016).

Table 4. Descriptive statistics of the assessment of reservation practices

Indicators	Commuter		Driver		Conductor		Employee		Operator	
	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation
1. The bus company has an online reservation for bus seating	1.98	Less extent	2.02	Less extent	1.96	Less extent	1.87	Less extent	1.00	Not Practice
2. The bus company has a mobile application for reservation & and availability of seats	1.98	Less extent	2.02	Less extent	2.44	Less extent	1.58	Not Practice	1.00	Not Practice
3. The bus company has a mobile application/online website for schedules of departure and arrival of buses	2.03	Less extent	2.36	Less extent	2.23	Less extent	2.21	Less extent	1.00	Not Practice
4. The bus company uses different ticketing apparatuses for convenience (ticket machine, stubs, card, etc.)	2.63	Moderate extent	3.47	Much extent	3.02	Moderate extent	2.58	Less extent	1.90	Less extent
5. The bus company uses different payment methods for convenience (cash, QR code, load card, debit/credit card, etc.)	2.22	Less extent	3.47	Much extent	2.96	Moderate extent	2.00	Less extent	1.00	Not Practice
Weighted Mean	**2.16**	**Less extent**	**2.66**	**Moderate extent**	**2.52**	**Less extent**	**2.04**	**Less extent**	**1.18**	**Not Practice**

On the contrary, the data may reveal that bus conductors use state-of-the-art apparatuses or at least a variety of ticketing tools (e.g., stubs, cards, etc.) to ease commuter ticketing. It may indicate that the bus industry's ticketing process has evolved and innovated throughout the past decades (Transport for London, 2016).

Facility Management Practices

Table 5 displays the facility management practices of Bus Company A, B, and C. As can be seen, it may be assumed that there are minimal or zero worries about maintenance depot conditions. However, it may still indicate that scheduling repairs and maintenance may be ineffective, given that mechanical defects and poor maintenance are major reasons for vehicular accidents (Corrales, 2014).

However, the gathered information may infer that the settings of bus stops in the studied district (e.g., location, lighting, security measures, etc.) are not in its quality situation, given that bus drivers still illegally load and unload passengers rather than utilizing authorized bus stops, which also causes artificial traffic conditions (Boquet, n.d) that slows down bus turnover (CNN, 2019) which entails the improvement of facilities, efficiency and punctuality, especially in remote areas (Sano, et al., 2007; Li, et al., 2023).

Table 5. Descriptive statistics of the assessment of facility management practices

Indicators	Commuter		Driver		Conductor		Employee		Operator	
	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation
1. Waiting area in terminals is under ideal conditions (seats, lighting, entertainment, clean rest rooms, etc.)	3.22	Moderate extent	3.30	Moderate extent	3.48	Much extent	2.77	Moderate extent	4.10	Much extent
2. The bus company uses security measures in their terminals (CCTV cameras, security guards, K-9 dogs, etc.)	3.17	Moderate extent	2.84	Moderate extent	2.75	Moderate extent	2.77	Moderate extent	3.90	Much extent
3. Bus stops are in ideal condition (location, lighting, seats, rest rooms, security measures, etc.)	2.80	Moderate extent	2.44	Less extent	2.48	Less extent	2.43	Less extent	3.40	Much extent
4. Maintenance and repair depots are in quality condition that is in line with the regulations of LTFRB	3.36	Moderate extent	3.70	Much extent	3.52	Much extent	4.00	Much extent	4.20	Much extent
5. All terminals used by the bus company are open 24/7	2.81	Moderate extent	2.70	Moderate extent	2.72	Moderate extent	3.36	Moderate extent	3.90	Much extent
Weighted Mean	**3.07**	**Moderate extent**	**2.99**	**Moderate extent**	**2.99**	**Moderate extent**	**3.06**	**Moderate extent**	**3.90**	**Much Extent**

Human Resource Management Practices

Table 7 presents the human resource management practices of the included bus companies. As illustrated, the data collected indicate that bus drivers and conductors in the studied provincial district may be treated as regular employees unaffected by the country's contractualization scheme (Generalao, 2019). Unfortunately, passengers may have experienced impoliteness or humiliation from the said bus personnel (PhilNews, 2018) due to the restless workload and payment scheme used by bus companies (Dullana, 2017), which may affect passengers' satisfaction and may lead to less patronship (Munzilla et al., 2013; Islam et al., 2014; Manalo, 2018).

Table 6. Descriptive statistics of the assessment of human resource management practices

Indicators	Commuter		Driver		Conductor		Employee		Operator	
	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation
1. Drivers and conductors have the necessary education level required by LTO and LTFRB	3.53	Much extent	3.59	Much extent	4.27	Great extent	4.00	Much extent	4.50	Great extent
2. Drivers and conductors have necessary training required by LTO and LTFRB	3.57	Much extent	3.72	Much extent	4.27	Great extent	3.70	Much extent	4.50	Great extent
3. Drivers and conductors have the needed licenses and certificates (driver's license, NBI, etc.)	3.64	Much extent	3.59	Much extent	4.48	Great extent	4.00	Much extent	4.50	Great extent
4. Drivers and conductors are well-mannered to their commuters upon riding and leaving the buses	2.51	Moderate extent	3.45	Much extent	4.27	Great extent	3.70	Much extent	4.20	Great extent
5. Drivers follow proper road behavior and regulations (speed limit, correct loading and unloading of passengers, maximum passenger capacity, etc.)	2.61	Moderate extent	4.41	Great extent	4.48	Great extent	4.00	Much extent	4.20	Great extent
6. Drivers and conductors have passed regular medical examinations to see if they are physically fit to drive and travel	3.62	Much extent	4.10	Much extent	4.48	Great extent	3.70	Much extent	4.50	Great extent
7. Drivers and conductors stay in the bus companies as long-term employees	3.69	Much extent	3.70	Much extent	4.48	Great extent	4.0	Much extent	4.40	Great extent
8. Reliever drivers and conductors are available for long travel	2.89	Moderate extent	4.24	Great extent	4.48	Great extent	4.0	Much extent	4.30	Great extent
Weighted Mean	**3.25**	**Moderate extent**	**3.84**	**Much extent**	**4.48**	**Great extent**	**3.88**	**Much extent**	**4.38**	**Great extent**

Conversely, it implies that training is still being rolled out or that minimal or no other additional training and seminars are given to the stated personnel. Information from Table 2, specifically the educational attainment of drivers and conductors, strongly supports the data gathered.

3.3 Effectiveness of Operation Management Practices

Table 7 provides the effectiveness of the operation management practices of the studied bus companies. The highly agreeable responses from the respondents and the results in Tables four (4) to seven (7) may strongly suggest that relevant improvements should be made on such dimensions, especially on practices that are graded lowest (Gallego et al., 2015).

Table 7. Descriptive statistics of the assessment of the effectiveness of operation management practices

Indicators	Commuter		Driver		Conductor		Employee		Operator	
	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation	Mean	Interpretation
1. Waiting area in terminals is under ideal conditions (seats, lighting, entertainment, clean restrooms, etc.)	4.23	Very much agree	3.83	Much agree	4.0	Much agree	4.0	Much agree	4.20	Very much agree
2. The bus company uses security measures in their terminals (CCTV cameras, security guards, K-9 dogs, etc.)	4.07	Much agree	3.70	Much agree	4.0	Much agree	4.0	Much agree	4.20	Very much agree
3. Bus stops in ideal condition (location, lighting, seats, restrooms, security measures, etc.)	4.14	Much agree	3.70	Much agree	4.0	Much agree	4.0	Much agree	4.20	Very much agree
5. All terminals used by the bus company are open 24/7	4.16	Much agree	3.70	Much agree	4.0	Much agree	4.0	Much agree	4.20	Very much agree
Weighted Mean	**4.15**	**Much agree**	**3.73**	**Much agree**	**4.0**	**Much agree**	**4.0**	**Much agree**	**4.20**	**Very much agree**

Note: 4.2 – 5.0 Very much agree, 1.0 – 1.79 Do not agree, 3.4 – 4.19 Much agree (MUA), 2.6 – 3.39 Moderate agree, 1.8 – 2.59 Least Agree (LA)

3.4 Difference in Assessment of Operation Management Practices of Bus Companies

Table 8 presents a significant difference in the perceived operation management practiced when respondents are grouped by sex. As can be inferred, bus companies' operation management practices differ in how they perform and deliver their safety, reservation, and human resources functions. In addition, data from previous tables supports such claims because the overall weighted means and their specific practices are usually graded within the average margin (2.6 – 3.39) of the five (5) point Likert Scale, and the difference of age, educational background, and occupation.

Table 8. Differences in assessment of operation management practices of bus companies when grouped by sex

Indicators	Respondents	Mean	P-Value	Decision	Interpretation
Safety	Male	4.84	0.000	Reject Ho	There is a significant difference in the perceived operation management practices between male and female respondents.
	Female	3.61			
Reservation	Male	2.07	0.000	Reject Ho	There is a significant difference in the perceived operation management practices between male and female respondents.
	Female	1.69			
Facility	Male	3.23	0.616	Accept Ho	There is no significant difference in the perceived operation management practices between male and female respondents.
	Female	3.20			
Human Resource	Male	3.87	0.000	Reject Ho	There is a significant difference in the perceived operation management practices between male and female respondents.
	Female	3.61			

Table 9 shows the significant difference in the perceived operation management practiced among bus personnel. As illustrated, it indicates that the operation management practices of bus companies differ from the point of view of bus personnel, primarily drivers, conductors, and employees, regarding safety, facility, and human resource functions, having them apply such practices, the different nature of work within the company, age, sex, educational background, and how they scored the said functions from previous tables.

Table 9. Differences in assessment of operation management practices of bus companies when grouped by bus personnel

Indicators	Sum of Squares	P-Value	Decision	Interpretation
Safety	49.93 128.7	0.000	Reject Ho	There is a significant difference in the perceived operation management practices among bus personnel.
Reservation	10.66 582.7	0.044	Accept Ho	There is no significant difference in the perceived operation management practices among bus personnel.
Facility	46.82 116.4	0.000	Reject Ho	There is a significant difference in the perceived operation management practices among bus personnel.
Human Resource	38.63 192.9	0.000	Reject Ho	There is a significant difference in the perceived operation management practices among bus personnel.

Table 10 illustrates the significant difference between the perceived operation management practiced among bus operators. As can be seen, the data suggest that operators are likely to be satisfied with how their bus companies ply on the studied district. Prior tables conclude such assertions given that operators have usually graded the practices within the highest side (4.20 – 5.00) of the five (5) point Likert Scale. Thus, based on the findings, the first hypothesis (H_{a1}) is accepted.

Table 10. Differences in assessment of operation management practices of bus companies when grouped by bus operators

Indicators	Sum of Squares	P-Value	Decision	Interpretation
Safety	33.93 188.7	0.084	Accept Ho	There is no significant difference in the perceived operation management practices among bus operators.
Reservation	19.66 472.7	0.101	Accept Ho	There is no significant difference in the perceived operation management practices among bus operators.
Facility	86.42 189.4	0.435	Accept Ho	There is no significant difference in the perceived operation management practices among bus operators.
Human Resource	58.63 212.5	0.115	Accept Ho	There is no significant difference in the perceived operation management practices among bus operators.

3.5 Relationship Between Operation Management Practices and Operation Management Effectiveness

Table 11 presents the regression weights of the dimensions of operations management practices on management operations effectiveness. Regression weights measure the impact of a variable on another variable, i.e., the impact of safety, reservation, facility, and human resources on operation management effectiveness.

Table 11. Regression weights of operation management practices on operation management effectiveness

Variables	Standardized β-Coefficient	P-Value	Conclusion
Safety ←-Effectiveness	0.129	.001	There is a significant relationship between operations management practices and operations management effectiveness.
Reservation ← Effectiveness	-0.042	.270	There is no significant relationship between the operations management practices and operations management effectiveness.
Facility ← Effectiveness	0.302	.000	There is a significant relationship between operations management practices and operations management effectiveness.
HR ← Effectiveness	0.630	.000	There is a significant relationship between operations management practices and operations management effectiveness.

The findings indicate that the human resources component of operations management practices has the most significant impact on operational effectiveness. The lack of, or minimal, additional training and how frontline employees—such as drivers and conductors—interact and communicate with passengers (PhilNews, 2018), as discussed in Table 6, are critical factors. It can be argued that these practices directly influence customer satisfaction, company branding, revenue generation, and, ultimately, the overall effectiveness of the bus companies examined. (Munzilla, et.al, 2013; Manalo, 2018) And a standardized driver and conductor hiring process (Corpus et al., 2010).

The second most influential factor in operational effectiveness is the condition of the facilities. As shown in Table 6, poorly maintained bus stops often compel drivers to load and unload passengers in illegal or unsafe locations, contributing to temporary traffic congestion (Boquet, n.d.; Briones et al., 2015; CNN, 2019). This practice likely affects passengers' choices regarding their mode of transportation. It impacts the revenue of the bus companies, thus influencing their overall operational efficiency. It is necessary to have heuristic bus allocation and standardized bus monitoring inspections (Corpus et al., 2010).

The third most significant factor affecting operational effectiveness is safety. As presented in Table 4, the findings reveal a lack of adequate emergency tools on buses, alongside a gradual increase in fatal accidents (Corrales, 2014; Meixler, 2018; Ibay et al., 2019; MDRRM, 2019). This could deter passengers from choosing bus travel and negatively affect revenue, thereby impacting the overall operational effectiveness of the bus companies within the studied provincial district.

Although the regression analysis revealed that the reservation system does not significantly influence operational effectiveness, this is likely due to the absence of such a system in the provincial district studied, where all passengers are walk-ins (as discussed in Table 5 and disclosed in Table 2). While this aspect currently does not appear to affect operational efficiency, it is recommended that bus companies explore innovations and

improvements in their reservation processes and, more importantly, create a reservation mobile application (Abad & Fillone, 2014). Given the constant evolution of operations management and the transportation industry, improvements in this area may be beneficial (Clark, 2019). Based on the findings, the second hypothesis (Ha2) is accepted.

Thus, in response to the findings, a strategic operations management plan was developed with industry experts to tackle inefficiencies. The plan enhances safety through emergency tools and a monitoring command center, improves facility management with terminal and CCTV floor plans, upgrades human resources with driver and conductor training programs, and establishes an online reservation system via a website and mobile app. Bus companies A, B, and C are progressively implementing these strategies.

4.0 Conclusion

The research highlights major operational inefficiencies in provincial bus companies, particularly in safety, facility management, and human resources. Issues like inadequate safety tools, poor maintenance, and insufficient staff training lead to accidents and low customer service. While operators are generally satisfied, commuters and staff express dissatisfaction, highlighting a stakeholder disconnect. The study calls for stronger safety protocols, better facility management, ongoing staff training, modern technology, and improved communication, all included in the strategic operations management plan with industry experts to boost effectiveness, customer satisfaction, and overall business performance.

Future researchers should focus on longitudinal studies, stakeholder perspectives, and evaluating technology and training effectiveness. Key areas include regional strategy comparisons, economic impacts, policy influences, sustainability practices, customer feedback, and benchmarking metrics to enhance operational improvements in the Philippines' bus companies.

5.0 Contributions of Authors

The paper is the sole work of the author, who conceptualized, prepared instruments, collected data, performed statistical analysis, tabulated, and interpreted the data.

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9.0 References

Abad, R.P.B & Fillone, A.M. (2014). Developing a Public Transit Scheduling Tool for Metro Manila Bus Operators. 22nd Annual Conference of the Transportation Science Society of the Philippines Iloilo City, Philippines. Retrieved from https://bitly.cx/4vX1d

Bliss, L. (2019). Mapping the growing gap between job seekers and employers. Retrieved from https://bit.ly/4digqfY

Boquet, Y. (n.d). Bus transportation in the Philippines. Retrieved from https://bit.ly/3XY1Rtz

Briones, R.M., Gundaya, D.M., & Domingo, S.N. (2015). Diagnostic Report on the Bus Transport Sector. Philippine Institute for Development Studies (PIDS), Makati City. PIDS Discussion Paper Series No. 2015-02. https://bitly.cx/MnrJ

Capulong, R., Macapagal, M., Perez, A. & Virrey F. (2018, December 21). Christmas exodus, 'carmageddon' starts. ABS-CBN News. Retrieved from https://bit.ly/4eTQ4Cf

Casayuran, M. (2019, March 18). DOE, LTO support bill that will regulate, develop use of electric and hybrid vehicles. Manila Bulletin. Retrieved from https://bit.ly/3XVPuhs

Clark, W. (2019). History of operations management. Retrieved from https://bit.ly/4ezQKfL

CNN Philippines. (2016, December 23). Holiday rush: Thousands pack terminals for long weekend. CNN Philippines. Retrieved from https://bit.ly/4gEggm0

CNN Philippines. (2019, April 16). Bus passengers expected to reach 8,000 on Wednesday in Holy Week exodus. CNN Philippines. Retrieved from https://bit.ly/3ZwBiNb

Corpus, P.D.H.S, Cruz, A.M.L & Lee, L.L.O.L (2010). A System Study on the Bus Operations System of RCJ Lines.De La Salle University: Taft Avenue, Manila. Retrieved from https://bitly.cx/hi5wt

Corrales, N. (2014, April 10). More road accidents recorded in early 2014-police. Inquirer. Retrieved from https://bit.ly/4eD7rXt

Couto, M., Tillgren, P. & Söderbäck, M. (2011). Drivers' and conductors' views on the causes and ways of preventing workplace violence in the road passenger transport sector in Maputo City, Mozambique. BMC Public Health, 11(0), 800. https://doi.org/10.1186/1471-2458-11-800

Dullana, R. (2017, April 19). Bus in Nueva Ecija crash overloaded. Rappler. Retrieved from https://bit.ly/4ef2Ye1

Gallego, L.V., Gamboa, K.J. & Luistro, R.P. (2015). Optimization of buses with the integration of geographic information system through enhancing bus operation: The case of Mapúa Institute of Technology – Intramuros Community (Thesis). Mapúa University: Intramuros Manila.

Generalao, M. (2019, April 27). Still no law on 'endo' but more laws for workers' benefits protection. Inquirer. Retrieved from https://bit.ly/4elD9Jq

Gershon, L. (2015). Why is clerical work women's work? Retrieved from https://bit.ly/3BewPET

Hynes, C. (2016). Welcome to the future of bus travel in the Philippines. Retrieved from https://bit.ly/3MVRbFc

Ibay, F.J.G., De Guzman, K.J.N, Escobar, S.G., Nobles, B.G., and Oliquino, A.B. (2019). Survival analysis of persons involved in road accidents in National Capital Region. Indian Journal of Science and Technology, 12(12), 1-11. https://doi.org/10.17485/ijst/2019.v12i12.142498

Islam, R., Chowdhury, M. S., Sarker, M. S., & Ahmed, S. (2014). Measuring customer's satisfaction on bus transportation. American Journal of Economics and Business Administration, 6(1), 34-41. https://doi.org/10.3844/ajebasp.2014.34.41

Li, X., Yang, Z. & Lian, F. (2023). Optimizing On-Demand Bus Services for Remote Areas. Sustainability 2023, 15(9), 7264. https://doi.org/10.3390/su15097264

Manalo, N.B.A. (2018). Public Commuters' Satisfaction on the Services of Bus Companies in the Province of Batangas. International Journal of Advanced Research and Publications, 2(11), 6-14. https://bitly.cx/wzFh
Meixler, E. (2018, March 21). A passenger bus in the Philippines has plunged off a cliff and killed 19 people. Yahoo News. Retrieved from https://bit.ly/3TCEAe3
Munzilah Md R., Devapriya, C.W. & Ahmad, T.A.B, (2013). Bus Operation, Quality Service and The Role of Bus Provider and Driver. Procedia Engineering 53, 167-178. https://doi.org/10.1016/j.proeng.2013.02.022
Olamigoke, E.A., & Emmanuel, A.A. (2013). The role of road transportation in local economic development: A focus on Nigeria transportation system. Developing Country Studies, 3(6), 46-53. https://bit.ly/3MZiU8k
Olchondra, R. T. (2013, April 25). 1st hybrid buses in PH to roll out in Makati. Inquirer. Retrieved from https://bit.ly/3XUBR1T
PhilNews. (2018, April 7). Bus conductor who allegedly humiliates passengers faces complaints. PhilNews. Retrieved from https://bit.ly/3N2h46g
Sano, K., Suga, Y., Wisetjindawat, W., & Raothanachonkun, P. (2007). A Study on the Benefits of Improving Local Business Service Punctuality. Journal of the Eastern Asia Society for Transportation Studies, 7, 1575-1583. https://bitly.cx/6CmDh
Shah, P. (2018). 25 'made in India' Tata starbus hybrid electric buses delivered in Maharashtra: How Tata's latest is more eco-friendly the rest. Retrieved from https://bit.ly/4diStVC