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| RESEARCH ARTICLE

Business Continuity Management Framework for the Aviation Sector of the Philippines

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| ABSTRACT

The COVID-19 pandemic profoundly impacted the aviation sector, underscoring the importance of recovery and resilience strategies. This study developed a Business Continuity Management Framework (BCMF) for the Philippine aviation sector to enhance resilience and operational efficiency against future disruptions. A mixed-methods approach was employed, incorporating surveys from three major Philippine airlines and qualitative interviews for in-depth insights. The research examined business resilience in areas such as institutional control, planning and preparedness, and external support, alongside business process efficiency in facility management, safety, and technology governance. Findings indicated varying resilience levels, with business processes ranging from managed to standardized. A positive correlation was observed between efficient processes and resilience, demonstrating that well-structured operations enhance disruption management. The study recommended targeted training for airline managers, process improvements, and continuous refinement. The proposed BCMF provided tools for risk management, operational stability, and sustainability, contributing to the understanding of resilience in Philippine aviation.

| KEYWORDS

Business continuity management framework (BCMF), aviation sector, business resilience, operational efficiency, recovery strategies, mixed-methods approach, communication strategies, business process efficiency, risk management, disruption adaptation, sustainability.

| ARTICLE INFORMATION

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1. Introduction

1.1 Background of the Study

Amid the global pandemic, the so-called "new normal" has been a critical consideration for industries, economies, communities, schools, households, and the air transport sector, which was severely affected by the health crisis. The pandemic grounded airline fleets worldwide, leaving them stranded at various tarmacs. Consequently, the pressing concern for organizations has been how to regain strength post-pandemic. Changes in consumer behavior, travel restrictions at local and international levels, and the subsequent global economic downturn have led to a significant decline in air transportation demand. These challenges resulted in recessions, retrenchment of airmen and crew members, and early retirement packages offered by several airlines.

Comparable to the aftermath of the 9/11 attacks, the pandemic's impact on aviation appears overstated. Continuous uncertainties and evolving restrictions hindered airlines' efforts to innovate and revitalize operations. Air travel recovery showed modest improvement by June 2021, with revenue passenger kilometers (RPKs) declining by 60.1% compared to June 2019 (International Air Transport Association [IATA], 2021).

In June 2020, the Philippine Statistics Authority reported a 17.7% unemployment rate, with 7.3 million Filipinos losing their jobs in April at the height of the lockdown. The airline industry alone was projected to lose $4.48 billion, leaving 548,300 unemployed, leading firms to heavily rely on government stimulus packages to survive. The Philippine government allocated ₱70 billion for transport businesses, maritime and public utility operators, and trucking, railways, and shipping sectors (San Pedro, 2020).

The global pandemic's impact on aviation, tourism, trade, and the economy in 2020 was significant. Air passenger traffic saw a 60% decline compared to 2019 (International Civil Aviation Organization [ICAO], 2020). Airports experienced a 64.6% drop in passenger traffic and a 66.3% loss in revenue, amounting to over $125 billion (Airports Council International [ACI], 2020). Airlines faced a 65.9% decrease in revenue passenger kilometers (International Air Transport Association [IATA], 2020).

The aviation sector's recovery depends on the pandemic's trajectory, government support, passenger behavior, and commercial conditions. According to Secretary Tugade of the Department of Transportation, government agencies aim to sustain cooperation until flights and passenger numbers rebound.

Despite the challenges faced by the aviation sector amid uncertainties, companies have implemented recovery programs to address business losses and turn them into opportunities. Manifestations of the "new normal" are evident, and the aviation industry must embrace profound changes to emerge stronger and more resilient. Philippine Airlines (PAL), for instance, implemented a workforce reduction program, affecting approximately 2,300 employees or 30% of its workforce. The program, which included voluntary separations and involuntary retrenchments, extended employment benefits to affected personnel until mid-March 2021. Before this, PAL adopted work stoppages and flexible work arrangements to preserve jobs and provide salaries and benefits during the pandemic.

Natural disasters and unforeseen events highlight the need for businesses to ensure operational viability and build resilience. Organizational resilience, particularly in the aviation sector, is vital for managing disruptive challenges and maintaining business continuity.

Motivated by these contexts, this study, authored by a Cebu Pacific Airline employee involved in operations, sought to develop a recovery program and business continuity framework for the Philippine aviation sector. The study aligned with the government's COVID-19 recovery response, offering strategies for organizations to rebound, adapt, and optimize resources. Through theoretical and practical analysis, the research aimed to provide actionable insights for sustaining operations amid future uncertainties.

In its contribution to the Thematic Report by the Special Rapporteur on the Right to Development regarding the compliance of COVID-19 recovery plans with the right to development perspective and the 2030 Agenda for Sustainable Development, the Republic of the Philippines ensured that its COVID-19 response and recovery plans aligned with AmBisyon Natin 2040 and the Philippine Development Plan (PDP) 2017–2022. These frameworks emphasized placing people and their rights at the center of the development agenda. The Inter-Agency Task Force - Technical Working Group (TWG) for Anticipatory and Forward Planning (AFP), in collaboration with NEDA, conducted nationwide surveys in 2020 to assess the economic outcomes of the Enhanced Community Quarantine (ECQ). These surveys identified the challenges faced by consumers, businesses, and agricultural workers during the pandemic, which informed the crafting of the We Recover as One (WRAO) Report. This report outlined programs, projects, and activities aimed at mitigating the pandemic's impact, particularly on vulnerable groups.

Chapter 5 of the Updated PDP 2017–2022 emphasized ensuring public access to transparent and strategic risk communication, promoting volunteerism, and fostering shared public service values in social service delivery, disaster response, and humanitarian efforts. Furthermore, the State prioritized investments in sectors most affected by the pandemic through its 4-Pillar Socioeconomic Strategy Against COVID-19. This strategy included emergency support for vulnerable groups, with PhP505.6 billion allocated; marshalling PhP53.2 billion for expanded medical resources and frontline safety; implementing monetary actions and financing support to maintain economic stability and recovery; and launching an economic recovery program focused on job creation and growth sustainability.

The Updated PDP also identified strategies for pandemic recovery and preparedness. Chapter 10 highlighted human capital development, including multisectoral responses to malnutrition by harmonizing nutrition-specific interventions. Chapter 11 emphasized ensuring food resiliency and reducing vulnerabilities by securing access to nutritious food during emergencies and enhancing preparedness for disasters, governance risks, and human-induced challenges. These comprehensive strategies underscored the government's commitment to aligning its recovery efforts with sustainable development goals and addressing the needs of the most affected sectors.

1.2 Statement of the Problem

The main purpose of this study was to propose a recovery program and business continuity framework for the aviation sector in the Philippines based on the results of its investigation. While several studies addressed global pandemic issues, few explored a recovery program specifically for the aviation sector in the Philippines.

Specifically, the study aimed to provide answers regarding the status of the aviation sector in the Philippines in terms of the efficiency of business processes, including facility management; health, wellness, and safety; technology governance; and people management. It also sought to determine business resilience from the perspective of aviation industry employees who served as respondents.

In line with these objectives, the researcher endeavored to address specific research questions that guided the study.

1. What is the demographic profile in terms of:
   1.1. Position; and
   1.2. Years of Service?

2. What is the extent of business resilience of the three Aviation Companies from the perspective of the two groups of respondents (managers and rank- and-file employees) in terms of the following attributes:
   2.1 Institutional control;
   2.2 Planning and preparedness;
   2.3 Philosophy and integrity;
   2.4 External support and linkages; and
   2.5 Communication and media?

3. What is the extent of efficiency of the business processes of the aviation companies in times of uncertainties (pandemic, force majeure, and emerging issues) as assessed by managers and rank-and-file employee in terms of:
   3.1 Facility management;
   3.2 Health, wellness and safety;
   3.3 Technology governance; and
   3.4 People management?

4. Is there a significant difference on the extent of business resiliency of the three Aviation Companies from the perspective of the two groups of respondents?

5. Is there a correlation between the extent of business resilience and extent of efficiency of business processes based on the perspective of the respondents?

6. Is there a significant difference on the extent of efficiency of the business processes of the three Aviation Companies as assessed by the two groups of respondents?

7. Based on the results, what recovery program and business continuity framework for aviation industry can be proposed for future disaster proofing initiatives?

1.3 Hypotheses

The following null hypotheses were employed in the study:

1. There was no correlation between the extent of business resilience and the extent of efficiency of the business processes based on the respondents' perspective.
2. There was no significant difference in the extent of efficiency of the business processes among the three aviation companies as assessed by the two groups of respondents.
3. There was no significant difference in the extent of business resilience among the three aviation companies from the perspective of the two groups of respondents.

1.4 Scope and Limitations

The study focused on determining the status of the business processes of the three selected aviation sectors in the Philippines in terms of four indicator variables: facility management; health, wellness, and safety; technology governance; and people management. In addition, the study investigated the extent of business resilience of the three airline industries from the perspective of two groups of respondents—managers and rank-and-file employees. However, the scope was limited to data collection from only three airlines due to constraints such as access, time, and availability of data.

Data gathering from the three selected airlines was conducted over one or two months to allow enough time for survey-based data collection. The names of the three locally based carriers were not mentioned in the paper for data privacy considerations.

Specifically, the target group of respondents consisted of top and middle management employees, as literature recommended that risk management be assigned to the management level. However, to minimize bias, the perspectives of rank-and-file employees were also included as respondents. The respondents were grouped under the Operations and Support Group of the airline industry, specifically from the respective managers of each division down to direct reports, such as assistant managers and supervisors.

1.5 Significance of the Study

Discovering the status of the aviation industry in terms of the aforesaid indicators in the research problem leads to the identification of the extent of business resilience and efficiency of business processes of the selected aviation companies from the perspective of the managers and rank-and-file employees. This can serve as a basis for the recovery program and business continuity framework of the organization in the aviation sector in general. Thus, the following stand to benefit from this paper:

1.5.1 Policy-makers. Indeed, managers can gain knowledge on how to impress upon their teams the essence of accomplishing work through leadership and how it aids in achieving company goals. Managers can also develop and implement strategies that build and sustain a competitive advantage. For the government, the inputs from this study may guide in addressing the felt needs of the aviation industry and provide the appropriate rationale for enacting relevant laws and policies.

1.5.2 Aviation Sector. The work presents the results of planned versus actual flights, or the number of flights that are canceled. Through this aspect, the beneficiaries of the output understand how crucial it is for flights not to be canceled during the pre-pandemic, pandemic, and post-pandemic periods. Planning for uncertainties helps highlight the regularity indicators during the pandemic period. Another indicator is the level of health and safety before and during the pandemic for aircraft, passengers, and crew. The study examines the health standard guidelines before the pandemic and compares them with the current practices, allowing the aviation system to benefit from identifying effective practices that should be retained and remain effective during and after the pandemic.

1.5.3 Financing and Insurance Companies. The paper updates them on trends in aviation that are instructive in properly evaluating risks associated with its products.

1.5.4 Business Owners. This research serves as a foundation and a general guide toward effective leadership and management, with an emphasis on ethical values in risk management. It provides a broader perspective on working with current managers and leaders, focusing on integrity, fairness, and reliability, while encouraging individuals to separate their emotions from their professional duties to enhance job performance.

1.5.5 Future researchers. The study serves as a basis for graduate student research on similar topics to further validate its results.

1.6 Definition of Terms

To facilitate understanding of this paper, the following terms used in this study were conceptually and operationally defined:

Business resilience. A reaction to an event demonstrated after an event or crisis has encountered. The capacity of an organization to foresee difficulties, adjust to address these difficulties, and provide ongoing value to its clients and consumers. The ability to adjust in order to meet the demands of the business environment and devise a workable plan to address the security, risk, survivability, and readiness concerns that are inherent in any dynamic business environment is known as resilience.

Communication and media. This refers to the organization's crisis communication plan that utilizes and understands the importance of social media.

Efficiency of Business Continuity Framework. The proactive way of the organization to ensure mission-critical business operations proceed during disruption or in the event of a disaster.

External support and linkages. Immediate operational recovery is directly correlated with the management of the company's ability to coordinate and implement capacity with authorities involved in disaster management. The kind of coordination that is required should be less of a top-down supervisory role and more of a participatory one, in line with the shift in emphasis toward a more proactive role.

Facility management. It refers to how the aviation industry allocates facilities before and during pandemic; it includes allocation plan, utilization schedule, and facilities efficiency record.

Health, wellness, & safety. An indicator that pertains to the health and safety of the crew and pax during the flight and the pandemic. It includes the measures being undertaken by the aviation industry to ensure healthy, wellness, and safety. It includes insurance records of employees, budget, monitoring process, and health reports, as well as gathering data of personal wellness approach of the personnel.

Institutional control. An effective response due to a total lack of capacity or no experience of how to respond.

Planning and preparedness. The soundness of the preparations of the business or organization for impending disasters.

Philosophy and integrity. The priority for disaster preparedness and recovery that must be embedded in organization's/corporate objectives.

People management. It refers to dealing with the decline in the number of people working in the aviation industry during pandemic; such includes the need to increase number of people to approach the business process and combined duties.

Technology governance. It refers to one of the most significant tools/resources in the aviation industry; it includes technology resource allocation, improvement plan; and technological capability.

1.7 Related Literature

This section presents works that support the findings, conclusions, and recommendations of this paper. These works guide readers in understanding the treatment of the research variables, among other aspects; thus:

1.7.1 Facility Management

Changes in airport operating procedures were inevitable. The most noticeable difference was the strengthening of the verification process for passengers' health conditions, which led to an increase in dwell time. This study identified that the increase in dwell time had a more significant impact on increasing existing purchasers' spending than on creating new buyers. Airport operators introduced a service differentiation perspective, such as a dedicated service, to utilize the current buyers' dwell time more effectively. Additionally, the rise of online channels required airport operators to change sales strategies, reinforcing emotional promotion to stimulate impulse buyers' willingness to buy. Before the global pandemic, there was little effort to reconcile operation policies and commercial revenue despite the growing importance of revenue management (Choi, 2021; Zhang et al., 2021; Kalakou & Moura, 2021). The novel restrictions brought about by the pandemic created new challenges for airport operators, such as the need for airport terminals to be redesigned and passenger flows to be managed (Schultz et al., 2021).

In one study, it was found that facility ambiance and aesthetics had a greater influence on airport experience compared to cleanliness and functionality. Atmospherics also indicated a significant and high impact on experience evaluations and destination revisit, underscoring its crucial role. Therefore, it was suggested that destination and airport managers craft sensory strategies to enhance visitors' overall experience and intentions to revisit (Yerimoua et al., 2022). The Financial Management (FM) sector dealt with significant challenges, including increased operating costs and a shortage of FM staffers. FM organizations were found to be agile, addressing challenges quickly by making fast changes to service offerings, actively engaging facility owners, and incorporating flexible, responsive, and health-centric employee care schemes (Ling & Tam, 2022). Amid the pandemic, the tourism industry considered financial commitment essential for recapitalizing stakeholders, aiding operations, recalling laid-off workers, settling wage debts, renovating, and servicing existing facilities and equipment. This assistance helped operators reduce charges, leading to increased travel and leisure-seeking behavior when lockdown policies were relaxed (Ocheni et al., 2020).

In line with the foregoing, Philippine Airlines (PAL) adheres to the highest safety standards, including strict hygiene and cleanliness measures for its aircraft and facilities, which were implemented in response to the COVID-19 pandemic. As further explained below, PAL's aircraft are equipped with HEPA (high-efficiency particulate air) filters and air circulation systems that filter most viruses (JG Summit, 2021). According to Lange (2020), historically, the commercial aviation industry globally supported over 80 million jobs and contributed up to 8% of global gross domestic product. Additionally, more than 30% of all international trade by value was transported by air, and approximately 60% of international tourists traveled by air.

In connection with this, Aman et al. (2020) highlighted in their study that the airline industry was in a good condition and performing well prior to the global pandemic. The results show that operating profit margins, net profits, return on invested capital, and revenues were at acceptable levels before the health crisis.

Meanwhile, in an interview by the International Air Transport Association (IATA) with Cebu Pacific's CEO, Gokongwei (2020), it was noted that Cebu Pacific was optimistic about flying its 200 millionth passenger since it began operations in 1996. The airline's mission is to enable people, regardless of background, to travel in an accessible and affordable manner. Sustainability is also at the core of Cebu Pacific's initiatives, with a goal to drive greater efficiency and reduce its carbon footprint by investing in aircraft and aviation technology to reduce fuel consumption. According to IATA (2019), Asia-Pacific carriers recorded a demand increase of 7.1% in January 2019, surpassing the 5.0% growth seen in December 2017. The capacity increased by 5.1%, while the load factor surged by 1.5 percentage points to 81.7%.

In parallel, the study by Uslu et al. (2019) confirmed several significant factors influencing customers' attitudes toward revenue management practices. The findings indicate that customers disapprove of the airline industry's revenue management practices and are vocal about raising concerns and complaints. Furthermore, when loyal passengers experience ancillary revenue practices and witness privileges for frequent flyer program members, they tend to avoid booking with the same airline in the future.

Wyman (2017) noted that, in recent years, the airline industry in the United States has seen increased valuations, improved balance sheets, and generated thirteen consecutive quarters of profitability, with operating margins near or above 10%, attesting to the discipline and quality of management.

Prior to the global coronavirus outbreak, the aviation industry recorded steady improvements across nations. For instance, the annual growth of Revenue Ton-Miles (RTM) projections for international flights by U.S. commercial air carriers was around 4 percent for the period from 2020 to 2040. Additionally, before the pandemic, the projected size of the aircraft Maintenance, Repair, and Overhaul (MRO) market in North America exceeded 22 billion U.S. dollars in 2020. However, after substantial changes induced by the virus, the North American MRO market is now projected to generate around 12 billion U.S. dollars over the same term. It was also forecasted that between 2019 and 2038, the demand for over 260,000 technicians in the aviation industry would emerge in the Asia-Pacific region alone (Mazareanu, 2021).

Meanwhile, user sentiment analysis in one study found a significant and negative correlation between passengers' emotions and their experiences related to flight delays. Following a delay, passengers' attention to service aspects increased, while their satisfaction with airport services significantly decreased (Song et al., 2020).

In another study, findings suggested that more frequent flights and larger aircraft were associated with more flight delays. High levels of route congestion resulted in more delays, particularly for low-cost carriers. Additionally, jet fuel prices were identified as a factor contributing to flight delays, especially for legacy airlines compared to low-cost carriers. However, intense competition among airlines can lead to improvements in service quality, including fewer delays (Mohammadian et al., 2019).

According to Flight-Delayed.com (2019), the real-time flight tracking website Flightradar24 enabled the tracking of 225,000 flights in one day, and it was expected that the following days would be even busier. This expectation was realized, with 230,000 flights tracked shortly after. Additionally, Cebu Pacific (PSE: CEB) and its subsidiary, Cebgo, flew 68,284 passengers on 414 domestic and international flights on December 21, 2018. This represented the highest number of passengers flown on a single day, surpassing the previous record of 65,298 passengers flown on May 7, 2018, during the summer peak season. During the yuletide peak season from December 16, 2018, to January 7, 2019, Cebu Pacific and Cebgo transported 1.391 million passengers, a 7.4 percent increase compared to the previous period (Inquirer, 2019).

In consonance with the foregoing, Statista Research Department (2021) reported that in 2018, the annual scheduled domestic passenger traffic in the Philippines reached 27.28 million, showing an increase of 2.47 million compared to the 2017 numbers. However, the pandemic has severely impacted the economy, including the aviation industry's labor force. In a study, it was noted that in Turkey, the Civil Aviation Industry's market faced considerable challenges, with the number of carriers entering a phase of recovery. Airline staff experienced significant decreases in salaries due to reduced airline revenues. While flight numbers increased, passenger figures declined (Deveci et al., 2021).

In another report, the global revenue of the airline industry was seen to represent losses of USD 113 billion. Specifically, for every 100 cases of COVID-19, there was a reduction in passenger demand, which led to a cost of almost USD 113 billion. This also impacted airline logistics, and flight cancellations contributed to the reduction of cargo belly capacity (Rahman et al., 2020). At the onset of the pandemic, the aviation industry, closely tied to tourism and other economic activities, was projected to experience a decrease in scheduled international passenger traffic during the first six months of 2020, with a reduction of 41-51% in seats offered by airline firms. This equated to a reduction of up to 561 million passengers (Feyisa, 2020). Miani (2020) projected that the aviation industry would face severe effects in the second quarter of 2020, with industry demand expected to fall by 70%.

These findings were practically reiterated by Nhamo et al. (2020) in their study of pandemic implications on global tourism and the aviation sector. Additionally, Lange (2020) from Airbus remarked that in 2020, the aviation industry faced unprecedented declines. By April, two-thirds of the world's aircraft fleet was grounded, 90% of operations were suspended, and international operations were nearly non-existent, with a 98% reduction. According to the International Air Transport Association (IATA), by the end of the year, passenger traffic was expected to be down by 60% to 65%.

Any review of "Commercial Aviation in 2020" must address the most significant event of the year: the spread of COVID-19 starting in February 2020, which led to a dramatic decrease in the number of flights operated and the number of passengers. This caused a moderate decline in airline earnings and employment in the passenger sector. However, it is important to note that air cargo volume increased, and on-time arrival performance improved.

A paper documents how the International Air Transport Association (IATA) observed a shift in preference toward domestic or short-haul travel, which is believed to be safer. It indicates that local travel is expected to perform better than international service, at least for the next several years. Asia Pacific airlines are projected to be the first to recover, attributed to relatively successful anti-virus measures and high cargo demand. Airlines with significant cargo operations have already demonstrated better financial performance compared to those relying solely on commercial passenger flights (Masigan, 2021).

In connection with this, the lowering of airline fees and cost support, as implemented by China and other nations, has helped reduce marginal costs for airlines. However, this alone is insufficient to return airlines to profitability or sustainable operations. Capital injection and/or credit guarantees may be needed for airlines to survive. Given the various, often uncoordinated, regulations applied to international markets, airlines based in open economies with small domestic markets will face unique challenges (Czerny et al., 2020). The IATA emphasized that the pandemic forced the airline industry to grapple with survival in 2020. Faced with a half-trillion-dollar revenue decline (from US$838 billion in 2019 to $328 billion in 2020), airlines reduced costs by $365 billion (down from $795 billion in 2019). The primary cause of this damage was the evaporation of passenger demand when international borders were closed. Loss reduction is expected to come from reopening borders, leading to an increase in passenger volume (Thomas, 2020).

In a related study, it was noted that cargo traffic was not significantly impacted by the global health crisis and even saw increases in some cases due to the supply of medical equipment. It was confirmed that air transport mobility for selected airports dropped by more than 96%, directly affecting the reduction of CO2 emissions—by a factor of 1.81 for Zagreb, a commercial airport, and 3.49 for Split, a seasonal airport. Normalization of air transport mobility is projected to occur within a year, even as the number of flights remains reduced (Nižetić, 2020). However, a study highlighted concerns where some participants believed that long-haul flights would be the last to recover due to the uneven scrapping of travel bans and the slow re-connection of nations to international travel markets (Suau-Sanchez et al., 2020).

The industry's recovery will also be supported by active freight transport and relatively low fuel prices. Undoubtedly, competition between airlines will intensify, which will serve as a strong incentive for travelers to return to the skies. The challenge for 2022 will be turning the reduced losses from 2021 into profits to help airlines recover from this tragic crisis, according to Juniac (2020). Marenu (2021) noted that the pandemic severely impacted passenger aviation, while cargo aviation fared better due to lockdowns and travel bans limiting global tourism. Passenger aviation alone was expected to lose $314 billion in 2020.

Verily, even as operations begin to resume in certain international locations, the ideal scenario may take years. Longer recovery times are linked to several factors, including the COVID-19-induced economic recession, people's confidence in traveling, and stricter travel restrictions.

According to the study of Tande et al. (2021), data suggest that even at higher levels of active community infection, a single molecular test performed within 72 hours of departure can reduce the rate of active infection onboard a commercial aircraft to a level that is several orders of magnitude lower than active community infection rates.

In relation to this, to address concerns regarding the so-called "ghost flights," airlines have resorted to grounding aircraft as a strategy. This action acknowledges the costs brought about by the pandemic, particularly in the tourism sector (Nhamo et al., 2020). Research indicates that engaging in walking, cycling, and taking public transportation for short-distance travel is correlated with flying less for long distances. In-depth interviews with domestic travelers suggest that flying less for work may be a synergistic satisfier, as it addresses multiple human needs without hampering others. This has implications for the well-being of people who engage in flight-intensive practices for work (Guillen-Royo, 2022).

1.7.2 Health and Safety

Beck et al. (2017) argued that travelers who possess a more trusting nature toward authorities are more likely to travel internationally, while those who feel less safe on planes are more likely to avoid travel. Indeed, findings show that attitudes and potential screening measures are linked to feelings of overall safety, with the presence of uniformed police being a key factor. The study introduces novelty by considering attitudes in the context of recent air-related disasters and documenting reluctance to accept screening processes perceived to compromise privacy beyond current practices.

McCrie et al. (2018) maintained that passenger screening is a crucial contribution to safety at airports and in the sky. These safety measures are permanent, though they evolve with the development of risks and controls. The Transportation Security Administration (TSA) leads in implementing these security measures. However, poorly designed technology and overly complex processes have made the agency unpopular with the public, discouraging travelers from using air travel.

In the study by Schulte et al. (2016), key priorities were identified to better understand and characterize the connection between occupational safety and health and climate change scenarios, ensuring that workers' health and safety issues are anticipated, mitigated, recognized, and evaluated. Concerns such as surveillance, research, risk assessment, risk management, and policy development should be considered. Much evidence suggests that climate change will continue to present occupational safety and health hazards, and the proposed framework may be an effective tool to combat these adverse outcomes.

It has been noted that the People's Republic of China remains one of the top markets for inbound tourism to the Philippines and is a significant trade partner. China is the largest outbound travel market, and given the rapid development of transportation infrastructure, it is expected that the propensity for people to travel will increase. According to Cebu Pacific CEO Gokongwei (2020), the airline will continue to seize these opportunities and offer safe, reliable, and affordable air services.

Before the COVID-19 pandemic, airlines had various cleaning procedures for airplanes depending on turnaround times between flights. These procedures typically involved wiping surfaces with disinfectant, picking up rubbish, and changing linens. International flights featured more detailed cleaning due to the longer time between flights. American Airlines, for instance, maintains that its international aircraft receive a "detailed 30-point cleaning package each day." Additionally, airlines perform deeper cleaning daily, including wiping down trays, seats, overhead bins, and toilets with high-grade disinfectants (Trafalgar, 2020).

Southwest Airlines asserts that they spend more than six hours cleaning each aircraft every night, whereas most airlines remove their aircraft from flight rosters every four to six weeks for a thorough scrub. Amid COVID-19, most airlines have adopted stringent new cleaning procedures guided by World Health Organization (WHO) and government health advisories. Australian airline Qantas, for example, has implemented enhanced plane cleaning using hospital-grade disinfectants effective against coronaviruses. The airline focuses on high-contact areas such as seats, seatbelts, toilets, air vents, and overhead lockers. Similarly, Southwest Airlines disinfects all hard surfaces within the cabin, including seat and carpet cleaning. Hong Kong airline Cathay Pacific takes extra precautions when there is a confirmed virus case, disinfecting all surfaces, carpets, and galley equipment, replacing seat covers, cleaning the bathrooms in detail, replacing air filters, and sterilizing the planes' water system.

On a related note, Cebu Pacific Air announced its commitment to achieving greater efficiency and reducing its carbon footprint by investing in aircraft and aviation technology aimed at reducing fuel burn. The airline has made investments in new planes and plans to have an all-new fleet of next-generation Airbus jets by 2024. Additionally, the company seeks to enhance the flying experience for passengers by investing in facilities and technology that improve efficiency and support customer service (Gokongwei, 2020).

There is clear evidence from the Hyena Study by Jarup et al. (2008) of Imperial College London that night flights are detrimental to people's health. The study, which involved almost 5,000 participants between the ages of 45 and 70, found that noise from night flights caused an immediate rise in blood pressure in sleeping individuals, even if they were not awakened by the noise. The risk of high blood pressure increased by 14% for every 10 dB increase in night-time noise from airplanes. High blood pressure can lead to heart problems and even premature death.

Previous studies have shown conflicting results on the effects of sleep deprivation on cardiovascular disease morbidity and mortality. Scientists have found that sleep disturbances caused by night-time aircraft noise can trigger acute cardiovascular mortality, with a relationship similar to that of prolonged exposure to aircraft noise (Foundas et al., 2018; Saucy et al., 2021). In addition, sleeping less than six hours a day increases the risk of obesity, high glucose, lipid metabolism disorders, and high blood pressure. For these reasons, noise-induced sleep disorders are considered the most damaging non-auditory effect of ambient noise (Basner et al., 2017; Patrick & Harrison, 2018). Aircraft noise is the most damaging environmental impact of air traffic. It can cause anger in the community, impair activity and communication, disrupt sleep, affect children's academic performance, increase

the risk of cardiovascular disease in airport residents, and provoke stress responses due to activation of the nervous system. Elevated sympathetic nervous system activity and increased levels of circulating stress hormones must be considered (Münzel et al., 2016).

Meanwhile, Yim et al. (2015) explored the use of concentration-response functions to estimate premature deaths from exposure to PM2.5 and ozone attributable to aviation emissions. Their findings indicate that aviation emissions cause approximately 16,000 premature deaths (90% CI: 8,300-24,000), with land transportation office (LTO) emissions contributing a quarter of this total. The study estimates that premature deaths resulting from long-term exposure to aviation-related PM2.5 and ozone cost approximately $21 billion annually. A comparison of these costs to other social costs of aviation revealed that they are on the same order of magnitude as the global climate costs attributable to aviation and significantly higher than the attributable costs of accidents and noise.

The International Air Transport Association (IATA) provides guidance on cabin operations during and after the pandemic in its "Guidance on Cabin Operations During and Post Pandemic Edition 2" (2021). This guide outlines operational and safety risks that airlines need to consider as they resume operations during and after a pandemic. Specifically, it emphasizes measures to prevent contamination of aviation and cabin crew members with infectious diseases during a pandemic such as COVID-19. It also highlights known precautionary measures and regulations from health authorities that must be implemented.

Additionally, IATA's "Guidance on Accessible Air Travel in Response to COVID-19 Edition 1" (2021) addresses aspects of air travel that need to be considered to adapt to existing rules during the pandemic. It aims to promote consistency and improve the overall travel experience for persons with disabilities. In line with these directives, a study proposed a classification of COVID-19 measures to manage passenger mobility, distinguishing between categories such as "avoidance of travel," "modal shift," and "improvement of quality" (Shortall et al., 2021). The study further outlined various measures and their effects—economic, social, and environmental.

Preventive measures remain a key strategy to limit the spread of the virus. Unless these measures are already implemented at an airport, there is a high probability that an infected passenger could board an airplane. The basic preventive scheme includes wearing face masks, frequent hand washing, using hand sanitizers, and avoiding touching the face and mouth after interacting with potentially contaminated environments (Blišťanová et al., 2021).

In another study, it was suggested that strategies for mitigation and infection prevention should be combined to include mandatory masking on the plane, minimizing time without a mask while eating, turning on the gasper airflow in-flight, hand sanitizing, disinfecting high-touch surfaces, practicing physical distancing during boarding and deplaning, limiting passenger movement onboard, observing pre-flight screening measures, and improving contact tracing capabilities. It was emphasized that evaluating multiple factors contributing to the cumulative risk of a traveler during the pandemic is essential. A multi-faceted approach is necessary to reduce the risks associated with air travel during this period (Khatib et al., 2020).

According to JG Summit (2021), the Philippines' leading carrier, Cebu Pacific (PSE: CEB), is actively pursuing testing and taking rigorous steps to restore passenger confidence. Other initiatives include enhanced safety, sanitation, and traceability measures. Cebu Pacific continues to adopt a multi-layered approach to safety, receiving a 7/7 star rating from Airlinesratings.com for compliance with COVID-19 protocols. Passengers are also reminded to register with the Department of Transportation's Traze app to facilitate more effective contact tracing.

In response to the pandemic, Philippine Airlines (PAL) adheres to the highest safety standards, including strict hygiene and cleanliness measures for both aircraft and facilities, as outlined in the Frequently Asked Questions (FAQs). PAL's aircraft fleet is equipped with High Efficiency Particulate Air (HEPA) filters and air circulation systems that filter out most coronaviruses. The airline's ground and flight crews are also trained to handle passengers with suspected communicable diseases. PAL continues to encourage passengers to prioritize their health and work closely with health authorities in the countries it serves to ensure security protocols and control measures are followed. To comply with local and international regulations, PAL has temporarily suspended issuing digital boarding passes, requiring passengers to check in at counters and undergo security checks. Additionally, the airline has canceled flights to destinations with local and international travel restrictions or bans.

In the study by Sebastian et al. (2020), the authors identified two likely transmissions of SARS-CoV-2 during a flight, involving seven indicator cases. These transmissions could have occurred before or after the flight as well. The risk of infection transmission from droplets in an airplane depends on several factors, such as the proximity of the original case, passenger and crew movements, fomites, and passenger-to-passenger contact at the gate. In this study, the transmission occurred within two rows of the index

case. The cabin airflow, which moves from the ceiling to the floor and from the front to the rear, may have contributed to a reduced transmission speed. It was also suggested that the speed of transmission could have been further reduced if passengers were wearing masks (Summit, 2021).

According to Barnett (2021), the reason COVID-19 is particularly fearsome is due to its threat of death. For an individual passenger with a 1% risk of death from the virus—slightly above the 0.7% risk currently assumed for the general population—the anticipated mortality risk on a typical flight lasting one hour would be approximately 1 in 430,000, or around 1 in 770,000 if all seats except the middle ones are occupied. However, even an airline that is willing to fill every seat does not expect to do so. Instead, it likely aims for a specific passenger load factor, which is calculated by dividing passenger miles by seat miles.

1.7.3 Technology Governance

Innovations have been essential amid COVID-19, including inflight social distancing, disinfecting planes with UV rays, and using touchless technologies in airports (Amankwah-Amoah, 2021; Santoso & Fianto, 2022). The aviation industry has long invested in contactless technology, viewing innovation as a key foundation for growth. One study sought to determine the decrease in passenger demand for RIX ground handling services (based in Latvia) due to the COVID-19 pandemic. It emphasized the need to promote innovative solutions and the development of touchless airports, which may enhance passenger satisfaction and renew airport services. However, such technologies still require the "human touch" to operate and maintain, as well as soft skills inherent to aviation services (Saydam et al., 2022).

A study notes that many countries have moved toward self-service technology at airports. It predicts that literature will soon focus on technology and process innovation, such as innovative security control lane operations amid COVID-19 (Tanrıverdi et al., 2020). A survey documented three types of passengers: those who prefer traditional services, those who prefer technology-based services, and those who opt for technology only in specific contexts, such as when crowds are smaller and processing times are shorter. The study found that only one-third of passengers prefer technology-based services at airports, which impacts waiting times at check-in facilities (Tyagi & Lodewijks, 2022; Galdolage, 2022).

Another paper explored the role of recently introduced technologies at airports and the benefits of a technology-driven transition. Technologies like Robots, AI, and Service Automation (RAISA) were considered from the viewpoint of airport clients. The study categorized core airport technologies and examined the benefits, including process efficiency and customer convenience from RAISA. Despite COVID-19, opportunities to restructure and reorganize airport service processes with RAISA remain (Kim & Park, 2022). Service quality has become increasingly critical for airports to maintain a competitive edge (Bakır et al., 2022).

In a related study, Ruan et al. (2021) proposed the use of autonomous indoor disinfection robots to address health concerns related to COVID-19. Although the demand for cleaning services has tripled in recent years, costs have increased due to the large number of areas requiring cleaning, including offices and departments. Robots offer global solutions to minimize person-to-person contact and reduce human effort in disinfection work (Van et al., 2022).

1.7.4 People Management

In a paper, it was submitted that although retrenchment appears to be an immediate response, persevering is an alternative. This may be viable for financially strong firms amid crises of limited duration, as "sources of internal and external slack may dry up at some point." Persevering seeks to maintain the firm's status quo—prevailing amid crises with little or no changes in strategy, structures, and assets (Albers & Rundshagen, 2020). Still, it has been noted that many employees have lost their jobs or are the next candidates to lose theirs (Debata et al., 2020; Kumar et al., 2021; Al-Mughairi et al., 2021).

A study documented the impacts of job-related stressors and outcomes among Hong Kong airline crew members. The research considered both traditional and pandemic-triggered stressors. Findings indicated novel stressors due to the pandemic, including safety concerns, unstable jobs, and hygiene requirements. Notably, the unstable job situation positively affected mental health, whereas safety concerns negatively impacted it. Airline crew members appeared to be grateful for still having their jobs amid the economic crisis (Kim, Wong, Han, & Yeung, 2022).

As stated from the study of Joyce (2021), there is a need for transparency and honesty—not only with clients but with employees as well, even when managers do not know all the answers. This builds trust and confidence and ensures that difficult decisions are understood at the right time. It is essential to ensure the safety of airline employees in relation to clients (Dube et al., 2021; Milano & Koens, 2022). Aviation employees' well-being must be prioritized amid the pandemic; thus, authors have called for an integrated health and safety culture at airports (Cahill et al., 2022). Indeed, the virus spread has severely impacted workers psychologically (Yüksek et al., 2022; Karkala et al., 2022).

Sujan (2023) asserted that systems thinking, or the system theory of management, views organizations as complex systems made up of different parts working together to achieve a common goal. Similarly, an organization must continue functioning well even in times of uncertainty or disaster; therefore, the level of business resilience must not be disregarded. This is an example of taking a systems thinking approach to managing risk and increasing resilience.

1.7.5 Business Continuity and Organizational Resilience

Mirjana (2018) emphasized that, from a human resource management perspective, an organization is considered resilient if it can respond efficiently to changes with minimal stress. A resilient organization is one that can adapt to new conditions, reflecting how effective the management is during emergency preparedness. Moore et al. (n.d.) further highlight that the advantage of becoming a resilient organization lies in its awareness of the business environment and its ability to act upon challenges, enabling quicker and more effective responses.

Business continuity and disaster recovery are critical aspects of resilience. These concepts refer to an organization's ability to remain operational after an adverse event. The role of business continuity is to minimize the effects of disruptions on business operations, allowing the organization to recover swiftly, reduce risks, and improve operations to prevent future emergencies.
Miyan (2014) suggested that an organization's ineffective response to disasters can be due to a lack of capacity or experience in handling crises. This challenge is often faced by policymakers, exhausting their ability to respond appropriately. However, on a case-by-case basis, the scale of a crisis can be managed effectively depending on the flexibility of the organization. Businesses must learn from their operational environment, integrate accrued experience, and adapt accordingly to future challenges.

Weinschenk (2016) defined business resilience as the ability of a firm to anticipate challenges, adapt to them, and create ongoing value for customers and clients. Resilience involves adapting to the business environment and developing strategies to address issues related to security, risk, survivability, and preparedness. A resilient organization is one that can continue functioning and providing its essential services even amid external or internal crises or disruptions (Sadgrove, 2015).

Nelson (2022) noted that the recent global pandemic highlighted the importance of organizational resilience for business leaders. While the magnitude of the crisis and its domino effects were largely unforeseen, some businesses had processes and procedures in place that proved effective under critical conditions. Nelson emphasizes that organizations need to have detailed action plans, including robust systems that are well-conceived, constructed, and managed to withstand the impacts of unforeseen incidents. Adopting a systems-based approach to managing risk and increasing preparedness can significantly enhance the resilience of an organization.

Mwangi (2021) explored various business continuity planning (BCP) strategies adopted by organizations in response to operational disruptions. These strategies spanned across critical areas such as ICT systems, human resources, financial management, market share, and engagement with key business partners. The primary aim was to safeguard business operations during major disruptions. The study identified several key factors impacting organizational resilience and business continuity, including emerging media technologies, advancements in ICT, the liberalization of airwaves, declining revenues, customer base contraction, growing competition, and stricter regulations. Despite these challenges, the study concluded that the adoption of a robust business continuity planning strategy was crucial for ensuring the resilience of the organization. BCP strategies provide a framework for addressing significant disruptive events, ensuring that the business can maintain critical operations even during crises, ultimately safeguarding long-term survival.

Campos (2015) studied business resilience in the context of post-disaster recovery in Davao City, Philippines. The research highlighted that business resilience is multidimensional, encompassing several factors that contribute to a business's ability to recover after a disaster. These factors include institutional control, planning and preparedness, philosophy and integrity, external support and linkages, and communication and media. Each of these elements plays a significant role in how businesses can withstand and recover from disruptive events, underlining the importance of comprehensive and well-integrated approaches to disaster recovery and business continuity.

1.7.6 Recovery Programs

Efforts to restore the aviation industry post-COVID-19 have been multifaceted and of significant importance to both industry players and policymakers. In a study by Zhu et al. (2021), the complexity of post-recovery behavior was explored using a Causal Bayesian Network (CBN), which was designed to model the interconnected factors influencing recovery. The model synthesized parameters derived from expert knowledge, interviews, and open-source information from travelers to understand these complexities and guide future recovery efforts.

Airlines have leveraged various strategies to weather the crisis, with loyalty programs being at the forefront. Several airlines, including Delta, LATAM, Air Canada, Avianca, American Airlines, British Airways, JetBlue, Qantas, Turkish Airlines, Qatar Airways, Southwest Airlines, United Airlines, and Virgin Atlantic, have extended elite status, waived points expiration dates, and modified award thresholds to encourage customer retention and loyalty (Pascual & Cain, 2021; Chanpariyavatevong et al., 2021). These airlines have also formed partnerships with hotels, credit card companies, and rental car firms to further strengthen their recovery efforts.

In addition to airline initiatives, governmental intervention has been deemed crucial for restoring confidence in the airline industry. Xuan et al. (2021) suggested that economic stimulus packages, along with softened passenger rules (e.g., refunding unflown tickets), can stimulate travel demand. Reducing overflight taxes and passenger taxes would further alleviate financial burdens. Furthermore, adherence to globally recognized standards is vital to ensuring effective execution of recovery plans.
Abdou et al. (2020) cautioned that restoring international air traffic requires building confidence that COVID-19 is under control globally and ensuring secure travel conditions. Recovery efforts must be approached cautiously and methodically, with a focus on manageable and calculated steps. A conference held in October 2020 raised concerns about the reshaping of airline operations due to the pandemic, including border closures, demand forecasting, changes in revenue management, and shifts in booking behavior and passenger preferences (Garrow & Lurkin, 2020).

While much research has focused on aerosol transmission in aircraft, Sandle (2020) noted that the efficiency of high-efficiency air filters in aircraft ventilation systems is well-documented in capturing particulate matter. However, contaminated surfaces and direct contact with infected individuals remain significant, often underestimated, risks for in-flight transmission. This highlights the need for a more comprehensive approach to mitigating transmission risks beyond just airborne factors.

IATA (International Air Transport Association) Director General Walsh emphasized the critical need for airlines to automate the verification of COVID-19-related health credentials, such as vaccination and test certificates, as part of efforts to ramp up air traffic. Despite the availability of technical solutions, he noted that the real challenge lies in the necessity for governments to agree on universal digital certification standards and the processes for adopting them. Walsh suggested that integrating these medical credentials into existing automated processes would be vital for a seamless recovery and for allowing travel to resume more efficiently.

Qantas CEO Joyce (2021) echoed similar sentiments, stressing the importance of standardized, internationally recognized digital certificates for COVID-19 testing and vaccination. In response to the pandemic's financial impact, Qantas launched a three-year plan to cut operational costs by AU $1 billion per year, with AUD 600 million in savings already realized in the first year. The airline also managed to access debt markets at favorable prices due to its strong investment-grade rating. With the active recovery of domestic travel in Australia, the airline has been able to begin paying off some of its debt, though full recovery will take time. Joyce reflected that the pandemic had caused airlines to reevaluate their entire business models and operations, forcing leaders to make quicker decisions and prioritize transparency with customers, employees, and shareholders.

The air cargo sector has demonstrated remarkable resilience throughout the pandemic (Choi & Park, 2020; Kim et al., 2020; Li, 2020), and has emerged as a potential growth area for the aviation industry. As passenger demand declined, air cargo flights surged, especially with the rise of online deliveries. Research suggests that airlines could explore converting empty passenger spaces into additional cargo capacity, and future studies could assess the viability of mixed operations, including the potential impact on passenger acceptance.

Based on the study by Olaganathan (2021), governments should collaborate with other organizations to ensure a healthy and clean environment for both airline passengers and staff. This would allow passengers from agreed countries to travel without quarantine. Consequently, the airline industry must consider political, economic, social, and technological factors, ensuring that airlines continue to operate in a safe ecosystem. In addition to providing economic support, governments need to cooperate with other nations to restart air travel, particularly for business travelers and students, through travel bubbles, air corridors, or corona corridors.

According to the Cebu Pacific website's contactless flight guidelines, the airline has developed "Charlie" — a chatbot designed to assist customers with flight-related questions or concerns 24/7. Charlie helps passengers with tasks such as retrieving their itinerary, checking in, rebooking, purchasing add-ons, converting funds to their Travel Fund, requesting refunds, and updating personal information such as name, birthday, nationality, and salutations. The airline also offers self-service check-in kiosks, allowing passengers to check in quickly, print bag tags, and attach them to their luggage before heading to the bag drop counters. This reduces contact with others and minimizes queue times, making travel a safer experience. Cebu Pacific has also implemented extensive disinfection and cleaning procedures, using certified cleaners and AC manufacturer disinfectants to sanitize aircraft,

passenger surfaces, check-in counters, and even airport buses. Regular antibody testing for pilots and crew members is part of their commitment to safety.

Philippine Airlines (PAL) continues to serve its valued customers as it progresses through a key stage of its recovery, with the support of its stakeholders and the dedication of its personnel. The airline has been working closely with creditors, lessors, suppliers, shareholders, and employees to find permanent solutions for its recovery and ensure its future. As part of this effort, PAL voluntarily filed for restructuring under a pre-arranged Chapter 11 process in the United States while simultaneously executing a supporting filing under the Financial Rehabilitation and Insolvency Act in the Philippines (Republic Act No. 10142). Chapter 11 allows PAL to restructure contracts governed by foreign laws, ensuring that agreements with its largest creditors outside the Philippines can be executed through a well-established legal process that is universally recognized and can be completed expeditiously. According to US courts, cases filed under Chapter 11 of the United States Bankruptcy Code are often referred to as "reorganization" bankruptcies. In such cases, the debtor typically remains "in possession," holding the powers and duties of a trustee. The debtor can continue operations and, with court approval, borrow new money. A reorganization plan is proposed, and creditors whose rights are affected may vote on the plan. If the plan receives the required votes and satisfies legal requirements, the court may confirm it.

According to the article (United Nations, 7 C.E.), the Philippine government responded to the unprecedented mass return of millions of OFWs. Efforts to ensure the safety of its nationals returning to the country can be summarized into 5Rs: Relief, Repatriation, Recovery, Return, and Reintegration. These efforts were aimed at assisting affected Filipino migrants in all stages of the migration process amidst the pandemic.

Relief: As the government's representatives abroad, the Philippine Foreign Service Posts were tasked with providing assistance to distressed overseas Filipinos through financial and welfare assistance, temporary shelter, and eventual repatriation.

Repatriation: The pandemic enabled governments to conduct repatriation of their nationals with a focus on public health concerns. The Philippines facilitated repatriation flights to bring home its land-based and sea-based nationals, including accommodating medical repatriation and other special concerns.
Recovery: The Philippine government ensured that there were enough public quarantine facilities, COVID-19 testing, and other mandatory health protocols available to repatriates upon arrival. The government also emphasized the critical role of economic recovery by easing border control measures during the pandemic.

Return: Given the archipelagic nature of the Philippines, the government assisted in transporting returning overseas Filipino workers from the airport to their home provinces and cities.

Reintegration: As returning migrants reintegrate into society, current initiatives have been made to prepare them for future deployment, whether locally or abroad. These initiatives include loan programs to provide working capital for start-ups, scholarship programs for re-skilling or up-skilling, and financial literacy training.

Even though the industry is opening itself to the public, it should do so responsibly, ensuring that policy measures protect clients, improve efficiency, lower costs, and maintain a high-quality experience grounded in the health and safety of airline employees (Dube, Nhamo, & Chikodzi, 2021; Milano & Koens, 2022). It has been argued that there must be coordination in global response mechanisms to address future outbreaks and establish a framework that includes a matrix for threat response, so that aviation can continue safely during future pandemics and reduce socioeconomic fallout (Arora et al., 2021; Kim et al., 2022; Piotrowska-Trybull & Sirko, 2022).

A study in Nepal suggests that the service quality of domestic airliners is affected by various factors, including empathy, assurance, reliability, tangibility, and responsiveness. These factors are crucial in ensuring reliable service for clients. In particular, reliability, tangibility, and responsiveness should focus more on maintaining the standard of service in the context of COVID-19. During COVID-19 and similar scenarios, tangibility should focus on the highest level of operations (Biswakarma & Gnawali, 2021).

The "traffic light system" for traveling, recently introduced by the Council of the European Union, is a first step towards the normalization of air travel. Although the quarantine of travelers may delay the introduction or re-introduction of the virus, or may delay the peak of transmission, the effect is small and there is limited evidence. New protocols detailing on-arrival rapid testing and tracing are being implemented to ensure that restricted movement is pragmatically enforced (Bielecki et al., 2020).

A study sought to explore the possibility of using Artificial Intelligence (AI) applications for strategic decision-making in airlines amid the pandemic. Among other things, Business Intelligence (BI) applications, which help structure and analyze data, are seen as essential for airline firms to better understand previous and future market trends. For example, insights derived from this analysis can prevent a carrier from losing market share due to shifts in customer preferences or allow for the execution of cross-selling initiatives to enhance client experience and prevent the loss of potential passengers (Pérez-Campuzano et al., 2021; Bendík & Novák, 2022; Sullcahuamán et al., 2022)

Furthermore, a qualitative study has identified several shared conditions and experiences among general aviation participants across sector subsets: the need for policy direction, clarity, and fiscal support, as well as significant exposure to community dislocation. Indeed, aviation recovery policies should consider different levels of the industry, rather than being solely airline-centric (Tisdall et al., 2021; Sun et al., 2021; Li, 2021; Remencová et al., 2021; Deng et al., 2022).

In the study by Amoah et al. (2021), a synthesis was conducted on the chronological activities of state-owned enterprises (SOEs), including PIA and SLA Airlines, to identify similarities and differences using case studies of these SOEs. It was found that one of the key issues affecting the airline for the longest period was culture and the connections, recommendations, and practices underpinning family and kinship-based social structures. A strategy for revitalization during and after a crisis is strategic renewal, which involves utilizing an organization's underlying resources and expertise to respond to emerging challenges, though execution can be very challenging. These strategies do not necessarily mean a complete overhaul of the SOE airline to recover from sharp revenue decreases and increased operational losses. Even though partnering with other entities may help, it does not guarantee that the top management of the state-owned airline will change issues such as overstaffing and mismanagement. There is a need to define synergies to achieve the goals of the SOE in responding to black swan events and developing two-handed learning capabilities to adapt their business models. Nevertheless, companies must focus on the potential synergies between existing and new business ventures.

Amoah (2021) developed the concept of "CoviNovation" to describe the firm's innovations emerging from, rooted in, or accelerated by the crisis. The author's analysis provided insights into innovations inspired by the global pandemic across the airline industry, including in-flight social distancing, the use of touchless technologies at airports, disinfecting aircraft with UV, the open-middle-seat policy, accelerated use of biometrics in check-in, and COVID-19 insurance.

According to Santos et al. (2021), the theory of dynamic systems, similar to the study by Amoah et al. (2021), was considered. However, the difference is that the researcher also incorporated market positioning, which was not covered in the previous study. The researcher understood that specific target markets or passenger variations significantly impacted the downturn in airline revenue. Santos et al. (2021) also explored whether the business model before and during the global pandemic had any impact on the sudden downturn in passengers. The comparison of the identified KPIs of the airlines that were important prior to the pandemic and still applicable during the global pandemic was also examined.

1.7.7 Local Sector vs Global Assessment

The Philippine Development Plan (PDP) has been updated to include strategies and recalibration of targets. The Socioeconomic Report is published annually to assess the implementation of the PDP and to ensure that effective strategies are in place. COVID-19 response policies and programs are consistently revisited and assessed in relation to the level of risks and primary concerns. The review and assessment of policies and programs are being carried out by the Philippine government, which continually works with primary research from PIDS (Philippine Institute for Development Studies), various academic, development, and private sectors. The Monitoring and Evaluation Staff for NEDA strictly implements close tracking of the progress of strategic development programs and various projects as contributors to achieving the goals set in the PDP. It also validates the continued relevance and viability of PAPs during implementation in partnership with NEDA Central Office staff, regional offices, agencies that assist with implementation, and development partners. The government also evaluates COVID recovery measures and conducts human rights impact assessments using the PDP's RM (Results Matrix) for recovery plans and interventions to measure the achievement of outcomes and impacts of policies, programs, and projects.

Alternatively, global assessments are carried out in different forms and by various agencies. The OECD (Organization for Economic Cooperation and Development) and G20 countries have analyzed the dynamics of defense spending. Over several decades, several countries have been able to reduce their defense expenditures as a percentage of total public expenditure, thanks to the so-called "peace dividend." This shift has allowed for more public spending on social security and health (Clements et al., 2021). However, Russia's aggressive assault on Ukraine serves as a stark example of the growing geopolitical tensions that have recently forced a thorough reevaluation of this approach. Now, several nations have declared their intentions to increase defense budgets in the coming years. These programs, currently in place in some countries, will exacerbate the growing demands on public spending and

the viability of public finances due to aging populations, the shift to a more sustainable environment, and rising debt servicing expenses. The dynamics of defense spending over the past few decades are shown in this context.

Conversely, the US Department of Transport has provided general observations and commendations related to COVID-19 research impacts. The group recommends that the FAA assess facilities, specifically the pavement at the National Airport Pavement Testing Facility, during production, construction, placement, and finishing. Similar recommendations have been made for workforce proficiency training requirements to address risk skill degradation, with the aim to assess realistic and justifiable training quantities and frequencies. This will inform realistic assessments of current training footprints and intervals, as well as provide guidance on maintaining proficiency. Similar assessments have been conducted by Clean Sky 2 Technology Evaluators, who assessed airports as part of efforts to implement substantial improvements in noise reduction technologies.

1.8 Synthesis

The above-related literature presented similarities and differences vis-à-vis other works related to this study.
The cited works, a great number of which were studies, manifested the pivotal role of airlines in society. Indeed, multifarious commercial transactions, among others, were done through the facilities of airliners. Hence, the pandemic, as shown above, affected many operations, to the extent that personnel were reduced, flights were stalled, and uncertainties abounded, among other issues. It may then be said that the response to the global pandemic led to the adoption of novel health protocols, unprecedented management actions, and research on how to endure and continue business amid the virus context.

Still, according to the pieces of literature, any disasters and pandemic concerns persisted despite the resumption of flight operations across the globe. Thus, examination of current policies, disaster risk assessments, and recovery plans was necessary to address the peculiarities or uncertainties of the future. Verily, the literature indicated the need to address such thrusts.

The papers considered the difficulties brought about by uncertainties, such as the recent global pandemic crisis; hence, their similarity with this research. Also, much of the work cited above presented foreign contexts, which may have led to the non-applicability of certain principles; thus, the differences in relation to this paper. In any case, certain basic principles toward recovery were universal in character and were instructive; hence, the similarities with this paper.

Thus, it was notable that there was a lack of local studies on formulating the recovery scheme; indeed, this indicated a research gap.

1.9 Theoretical Framework

The main objective of this study was conceptualized based on the theory that states, "work can be viewed as a process, a series of steps to be improved upon," which was first recorded by Frederick Taylor in the 19th century. Taylor described in his published work The Principles of Scientific Management that, through the scientific method, productivity could be greatly improved. His theory focuses on employee productivity, emphasizing work efficiency. However, in the late 1960s, technology accelerated change and became a driving force in business. This led to the foundation of process orientation known as Kaizen, which has influenced the evolution of various Business Management Processes and Solutions today.

Another theory that this study is based on is the systems thinking theory by Stead and Smallman (1999). According to this theory, organizational resilience and the efficiency of business processes are driven by systems thinking and the general systems approach. The theory commonly states that systems thinking views an organization as a system made up of components that together have a value greater than the sum of their parts. In the context of business processes efficiency and resiliency, systems thinking is valuable in understanding the relationships between components and how they function to withstand future disasters or uncertainties.

In addition, several researchers have attempted to define and model the concept of business process management. Meerkamm (2010) defined process management as a well-established management theory and practice aimed at increasing efficiency, which is fundamental to the economic development of companies and of the country as a whole. However, literature reveals many theoretical concepts that differ considerably in some aspects. Empirical analyses have been conducted on management practices and employees.

This theory of business process management has continued to evolve through its practice in business organizations, leading to the creation of various business continuity frameworks by established organizations. One example is the theory of Kaizen, which posits that a business continuity framework begins with a comprehensive threat and risk assessment, considering potential threats from a 360° perspective. Hence, this study aimed to investigate management practices, compare them with theoretical concepts,

and elaborate on the concepts used in practice. This involved gathering empirical data on the status of business processes in the aviation sector. The researcher aimed to understand how airlines conducted business impact analysis, identifying critical business processes and systems. Scholars had conducted empirical research and discovered that variables in business process theory had evolved over the years.

On the other hand, the role of recovery programs and business continuity frameworks for the Philippine aviation sector had not been sufficiently explored, despite research related to global pandemics being undertaken and published. Therefore, this paper aimed to investigate the status of the aviation industry in terms of the efficiency of business processes in facility management, health, wellness, safety, technology governance, and people management. The study also aimed to determine the extent of business resilience in three aviation companies from the perspective of two groups of respondents. This study was based on the following theories and concepts: (1) Business Process, (2) Systems Thinking, and (3) Kaizen theory on business management.

Figure 1 Ingredients of Business Process (Dumas et al., 2018)

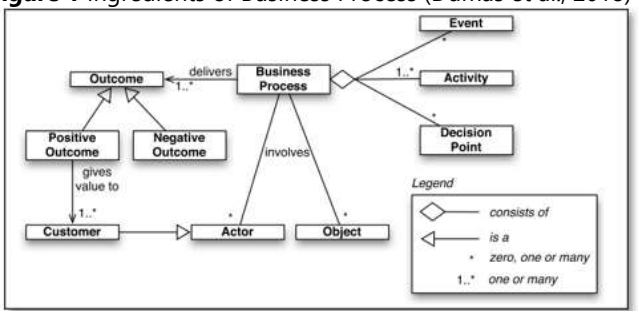


Figure 1, as illustrated by Dumas, La Rosa, Mendling, and Reijers (2018), presents a conceptual breakdown of the fundamental elements that constitute a business process. This diagram is instrumental in understanding the various components and their interrelationships within business process management.

The central element of the diagram is the Business Process, depicted as the core activity that connects various inputs and outputs. This process is driven by events and involves activities that may lead to specific decision points. Decision points are critical junctures where choices are made, directing the flow of the process based on pre-determined conditions. These choices impact subsequent actions and outcomes, as highlighted by the connections between activities and outcomes in the diagram.

In the theoretical framework, this model serves as a foundational reference for analyzing and optimizing business processes. By identifying each component—such as activities, decision points, outcomes, and actors—organizations can systematically examine how these elements interact and impact overall efficiency and resilience. This understanding is critical, particularly in complex industries like aviation, where streamlined processes are essential for operational continuity and customer satisfaction.

Thus, Dumas et al.'s (2018) diagram provides a valuable conceptual model for examining and improving business processes by defining clear relationships among the components involved. This theoretical perspective underpins the study's approach to analyzing process efficiency and resilience in organizational settings.

Figure 2 Systems Thinking Process (Goff & Tomko, 2021)

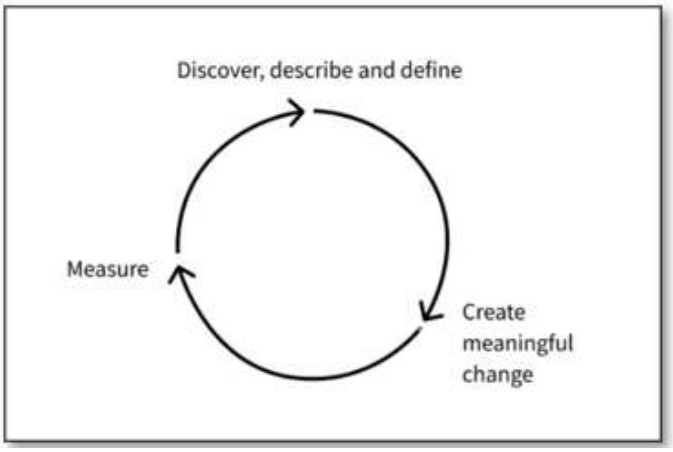
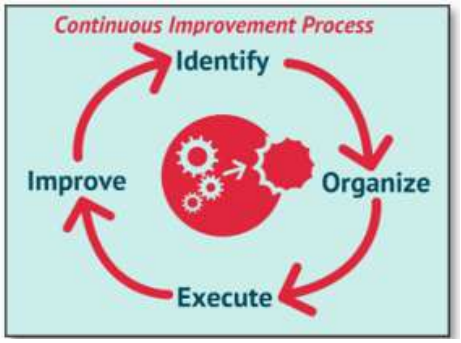


Figure 2, adapted from Goff and Tomko (2021), depicts the Systems Thinking Process as a continuous cycle with three key phases: Discover, Describe, and Define; Create Meaningful Change; and Measure. This model offers a structured approach to analyzing complex systems by focusing on the relationships and interdependencies within an organization, rather than viewing processes in isolation.
The process begins with Discover, Describe, and Define, where the core issues and dynamics within the system are identified and mapped out. This foundational stage enables organizations to gain a clear understanding of how various elements within their processes are interconnected. The next phase, Create Meaningful Change, is where targeted interventions are developed and implemented to address these identified issues, aiming to foster improvements that align with the organization's goals.

In the final phase, Measure, the impact of these changes is assessed, providing feedback that informs future adjustments. This cyclical model is particularly relevant in the theoretical framework, as it supports continuous improvement—an essential component of resilience in complex sectors like aviation. By following this structured approach, organizations can enhance their adaptability, ensuring that business processes remain efficient and responsive to evolving challenges.

Figure 3 Gemba Kaizen or Continuous Improvement (Cuofano, 2024)



The Continuous Improvement Process model, based on Gemba Kaizen principles as presented by Cuofano (2024), illustrates a cycle comprising four key stages: Identify, Organize, Execute, and Improve. This model embodies Kaizen's focus on incremental improvements at the "Gemba," or the workplace, emphasizing that small, continuous changes can lead to substantial long-term gains. By involving frontline workers in identifying areas for enhancement, the model fosters a hands-on, practical approach to improvement.

In this cycle, the Identify phase is dedicated to observing daily operations to spot inefficiencies or opportunities for improvement. This leads to the Organize phase, where resources and processes are arranged to address identified issues strategically. Next, in the Execute phase, planned changes are put into action directly at the workplace, allowing for immediate observation and adjustment. Finally, the Improve phase involves reviewing outcomes to ensure alignment with organizational goals, creating a feedback loop that fuels future improvements.

This model is integral to the theoretical framework as it encapsulates a structured, continuous improvement process crucial for operational resilience, especially in dynamic industries like aviation. By embedding these stages in day-to-day practices, organizations can remain adaptable and proactive, addressing inefficiencies as they arise and maintaining a culture of constant enhancement (Cuofano, 2024).

Figure 4 Business Continuity and Resilience (Gagliardi, 2023)

The Business Continuity Process in Figure 4 outlines five sequential steps that organizations can implement to ensure resilience and continuity. The first step, Build a Continuity Plan, serves as the foundational stage where the organization develops core resilience procedures. This stage involves defining essential processes, identifying critical assets, and setting up response measures that can be activated during disruptions. Establishing a continuity plan is vital to prepare the organization for various contingencies, allowing it to respond effectively to potential operational threats.

The second step, Implement Feedback and Collaborate, focuses on gathering insights from stakeholders and encouraging procedural alignment. This stage emphasizes the importance of stakeholder involvement, ensuring that those affected by the continuity plan have a say in its development. Collaboration fosters a shared commitment to resilience, as input from different departments and personnel can help identify blind spots and improve the overall continuity plan. Following this, the Start Monitoring phase involves continuously tracking potential risks and evaluating the plan's performance, enabling the organization to detect vulnerabilities early and make necessary adjustments.

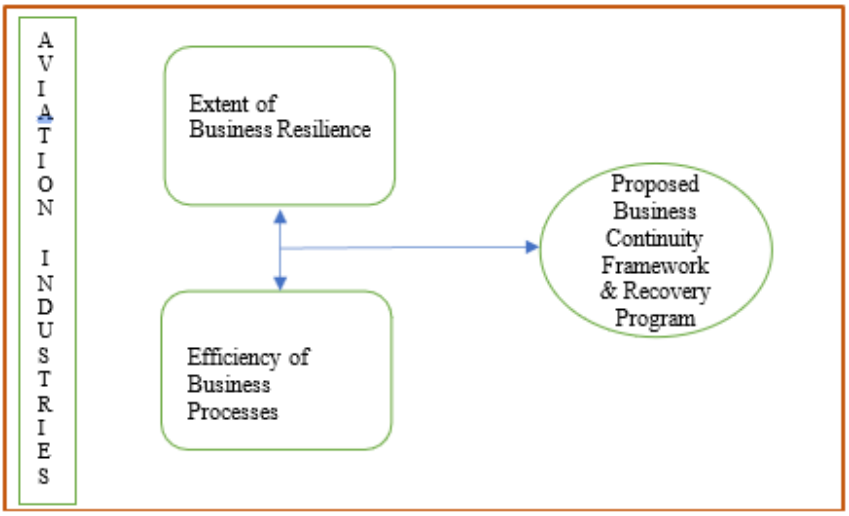
Steps four and five—Prioritize Safety and Assess Risks and Resources—round out the continuity process. In Prioritize Safety, the organization focuses on safeguarding personnel and securing sensitive information from potential threats, which is essential for maintaining both operational stability and trust within the organization. Finally, Assess Risks and Resources calls for ongoing risk assessment and resource allocation to ensure that the organization remains prepared for unforeseen events. Together, these steps create a robust framework that supports proactive planning, rapid response, and adaptability, which are essential for resilience in complex industries such as aviation.

1.10 Conceptual Framework

The research paradigm that guided the researcher was shown on the next page; it depicted the interplay of variables in this paper.

In the conceptual paradigm presented in Figure 5, the arrows illustrated the direction and flow of relationships among the study's main variables: the Extent of Business Resilience, Efficiency of Business Processes, and the resulting Business Continuity Framework & Recovery Program. Each arrow represented the conceptual pathway by which these variables interacted to address the research objectives. The bidirectional arrow between Extent of Business Resilience and Efficiency of Business Processes signified an interdependent relationship between business resilience and process efficiency.

Figure 5 Author's Conceptual Framework



The study hypothesized that resilience within an organization was closely tied to the efficiency of its processes in areas such as facility management, health and safety, technology governance, and people management. Higher efficiency in these areas could enhance an organization's resilience by allowing it to respond more effectively to disruptions. Conversely, a resilient organization was likely to maintain or improve process efficiency, even in adverse conditions. This reciprocal relationship underscored the need for both resilience and efficient processes to support operational stability within the aviation sector.

The unidirectional arrow from the two main variables—Extent of Business Resilience and Efficiency of Business Processes—toward the Business Continuity Framework & Recovery Program indicated that these variables served as foundational components for developing a continuity strategy. The study aimed at analyzing how the level of resilience and efficiency in business processes contributed to building a structured continuity framework. This framework provided guidelines for sustaining operations and recovering swiftly in the face of unexpected events, a critical necessity in the aviation sector given its exposure to various risks, including natural disasters and global health crises.

The arrows in this paradigm were essential in illustrating how empirical data on business resilience and process efficiency were used to inform the development of a practical framework for business continuity. Based on insights from the literature, the researcher posited that an effective continuity plan must integrate both resilience and efficiency to ensure a robust response to evolving threats. By gathering data on these variables and understanding their interrelationship, the study aimed to offer a framework tailored to the unique needs of the aviation sector in the Philippines, ultimately supporting sustained operations even under disruptive conditions.

It was within the theory of business process management discussed in the theoretical framework that the researcher conceptualized the objectives of this study, as presented in a conceptual paradigm shown in Figure 5. The paradigm showed the interrelationships of the main variables of the study, illustrating the conceptual flow of the variables to be investigated in the research. A correlation and comparison of the attributes of the two main variables were to be investigated, and the result of the analysis would serve as the basis for a business continuity management framework and recovery program for the aviation sector in the Philippines.

Based on the reviewed literature presented in the previous pages of this paper, the researcher believed that organizations must have a structured business continuity framework to guarantee operational resiliency. The study aimed to elaborate on the concepts used in practice, which would be the result of the study involving 159 survey participants. Thus, there was a need to gather empirical data for analysis to support this claim. Hence, the main purpose of the present study was to gather empirical data on the extent of efficiency of business processes in terms of facility management, health, technology governance, and people management, as well as the extent of business resilience of the selected aviation industry from the viewpoints of the two groups of respondents in three selected airlines in the Philippines.

As threats continued to evolve, it was vital for every organization to demonstrate operational resiliency and the ability to quickly adapt to dynamic events that could stretch their existing plans. Hence, determining the extent of business resilience became crucial.

This emphasized the importance of continuously assessing and improving business continuity plans, especially in industries like aviation, which are highly susceptible to disruptions. It was not only crucial for sustaining operations but also for ensuring long-term recovery after major crises.

Additionally, the output of the study generated a business continuity management framework and recovery programs, which indicated that, since the aviation sector had become aware of the impact of various unforeseen events that disrupt its operations, such as natural disasters and the recent global pandemic, a business continuity framework was useful as a general guide for the continued operations of the industry.

Furthermore, the study aimed to establish a more adaptable and effective approach for the aviation industry, considering that unforeseen events like pandemics, political instability, and environmental disasters had shown how vulnerable the sector could be. A proactive recovery plan, regularly updated, would not only safeguard the continuity of operations but also foster confidence in stakeholders—from employees to customers—and ensure a rapid recovery process when disruptive events occurred. The findings of this study could potentially set a new standard for business continuity planning in the aviation sector, creating a blueprint that could be replicated or adapted in other industries facing similar challenges.

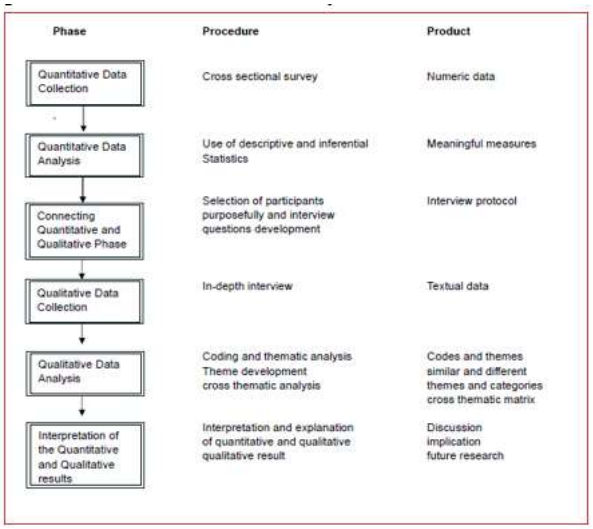
2. Methods

This study employed a mixed-methods approach, specifically the sequential explanatory design. Given the complexity of the research problems, this design was chosen. The method involved first collecting quantitative data and then explaining the quantitative results through in-depth qualitative data analysis. According to Creswell and Clark (2018), the purpose of mixed-methods research is to provide a comprehensive understanding, explanation, and insight into unexpected results concerning the research questions and complex phenomena, which neither approach alone could achieve. This design allowed for a thorough exploration of business resilience and the efficiency of business processes across the three airline companies in the Philippines.

2.1 Research Design

A mixed-method research design was employed, specifically to examine the correlation between the extent of efficiency in business processes and business resilience. Quantitative data were also used to conduct a comparative analysis of the three aviation companies. In addition, researchers such as Demir et al. (2018) noted that the research process can be represented as both quantitative and qualitative (Morse, 1991). The study utilized the sequential explanatory approach, which provided answers to the research problems outlined in Chapter 1. This approach is illustrated in Figure 6.

Figure 6 The Research Methods of this Study



As shown in Figure 6, the Model of Sequential Explanatory Mixed Methods Design (Subedi, 2016) includes two phases of data collection and analysis: the quantitative phase and the qualitative phase. In the quantitative phase, a survey questionnaire was used to gather personal information, assess the status of the airline industry in terms of business process efficiency, and determine the extent of business resilience. After data collection and analysis in the quantitative phase, semi-structured interview questions were developed based on the survey results and analysis.

In addition, the quantitative analysis aimed to transform raw numbers into meaningful data through rational and critical thinking, utilizing both descriptive and inferential statistical techniques. The quantitative approach was linked to testing the study's hypotheses, helping to either reject or accept them (Saunders et al., 2019). The primary purpose of analyzing the compiled data was to provide insights for management use.

2.2 Data Management

Data were gathered from three different carriers, whose names were not mentioned in this paper in consideration of the Data Privacy Act. They were labeled as Airline A, Airline B, and Airline C in the discussion of the results after data collection. Both quantitative and qualitative data analyses were conducted. The analysis of the quantitative data using descriptive and inferential statistics was organized, concise, and plain in nature.

To facilitate the distribution of survey questionnaires, the researcher appointed a single contact person within each department, ensuring coverage across all staff levels—from department heads to rank-and-file employees. This designated individual was tasked with handing out the survey forms to all personnel in their department. After the surveys were completed, the contact person gathered the responses and returned the forms to the researcher within three days. This structured process was implemented consistently for Airlines B and C as well, allowing for a standardized approach across all participating airlines.

The numerical values generated from the status of each airline were supported by interviews. Inviting different heads made it possible to raise questions anchored on the current level status of the aviation industry. The data were compared to identify which airline performed better for data analysis. The expected output of the paper was intended to be used as a long-term mitigation planning program, considering “black swan events” as one of the critical periods.

The collected data were anonymized to secure any sensitive information. In all cases, the researcher adhered to the mandates of Republic Act 10173, the Data Privacy Act. Overall, all data were backed up regularly in case other researchers validated and made additional inputs to the findings.

The research instruments or data collection tools used in this study were in two separate forms for triangulation analysis purposes. First, in the quantitative stage, a survey questionnaire was used to gather data. The survey instrument consisted of sections on the demographic profile, the status of airline industry business processes, and the extent of business resilience. A four-point Likert scale was utilized to assess the efficiency of business processes, while a five-point Likert scale was used to measure the extent of business resilience. In the qualitative stage, a semi-structured interview form was employed, which was constructed after the quantitative data analysis. The semi-structured interviews aimed to ask additional inquiry questions for an in-depth understanding of the issues and the reasons behind participants' responses. The interview form contained main questions, along with follow-up inquiry questions, and other probe questions not included in the form were asked to gain a deeper understanding of the participants' views on the efficiency of business processes and the extent of business resilience.

The researcher used a self-made questionnaire for business processes and an adapted survey tool for business resilience. Thematic analysis and cluster analysis, following the procedures of Braun and Clarke (2018), were used to analyze the emerging themes from the key informants' responses. The researcher’s approach to qualitative data analysis was influenced by prior work in her master's thesis, where thematic analysis was also employed. The researcher selected a five-point Likert scale for assessing Business Resilience and a four-point Likert scale for evaluating Business Process Efficiency based on the distinct objectives of each measurement. The five-point scale for Business Resilience allowed respondents a broader range of responses, capturing varying degrees of resilience.

Conversely, the four-point scale for Business Process Efficiency was selected to encourage definitive responses by eliminating a neutral option, ensuring that respondents expressed a clear stance on the efficiency of business processes.

This decision supported the study's goal of obtaining more direct and unambiguous assessments of process efficiency. These choices were made to ensure that each scale was optimally suited to the specific variable being measured, contributing to a more precise and meaningful analysis of both business resilience and business process efficiency.

2.3 Sampling Design

The study covered a group of people in the top and middle management directly involved in the departments responsible for the decision-making process of business operations. To avoid biases, the viewpoints of rank-and-file employees were also considered as respondents. With this, the data supported the indicators of the study. Thus, the study considered participants from facility management, health, wellness and safety, technology governance, and people management departments.

A stratified random sampling method was used to obtain the number of respondents from each group, considering the four departments as the strata. The total number of employees from each department in the three selected aviation companies was gathered from the organizational charts shared by the Human Resource Department. The four departments—facility management, health, wellness and safety, IT, and people management—had a total of 159 employees (including both managers and rank-and-file staff). The distribution of the obtained number of respondents using stratified sampling was presented in Table 1.

2.3.1 Sample Population

Table 1 Distribution of the Respondents

Department	Airlines		
	Airline A	Airline B	Airline C
Facilities Management	32	15	10
Health, Wellness & Safety	11	13	12
IT	16	7	7
People Management	14	13	9
Total	**73**	**48**	**38**
Overall Total:	**159**		

There were four criteria for selecting the number of respondents: (1) the respondent had to be working in the three subject companies; (2) the respondent had to belong to a decision-making group; (3) the respondent had to work within the group of variables related to facility management, health, wellness & safety, technology governance, and people management; and (4) the respondent had to be an expert in their field to provide high reliability and valuable feedback.

The researcher employed a five-step validation method. These steps were as follows: (1) **Establishing face validity**—this process involved having the survey instrument reviewed by at least three different parties. The first party was a group familiar with the topic who could evaluate whether the survey questions successfully captured the topic. The second review came from an expert in question construction, ensuring that the survey questions did not contain common errors such as leading, confusing, or double-barreled questions; (2) **Running a pilot test**—this involved selecting a subset of the intended survey population to pilot the survey. About 10 percent of the total population was chosen to help identify irrelevant or weak questions in the instrument; (3) **Cleaning the collected data**—this process involved entering the collected responses into a spreadsheet to identify and correct any errors, such as double-checking the minimum and maximum values on the four-point scale used in the instrument; (4) **Using Principal Components Analysis (PCA)**—PCA is a statistical test that identifies underlying components measured by the survey questions, known as factor loadings. This step validated what the survey was measuring. The researcher sought the guidance of a statistician during this step; (5) **Checking internal consistency**—this process involved reviewing the internal consistency of questions by checking the correlation between questions that loaded on the same factor to measure question reliability and ensure the survey answers were consistent. The researcher used Cronbach's Alpha (CA) for this purpose, with a standard CA value of at least 0.80 or higher indicating internal consistency; and (6) **Revising the survey instrument**—this was the final stage, where the instrument was revised based on the information gathered from the PCA and CA. This six-step validation method was used, considering multiple items measuring the same underlying construct. The questionnaires were adapted and modified from the Barbados Employers' Confederation's six-step business continuity plan (May, 2020) and Campos' (2015) Business Resilience survey questionnaire. After reliability testing, the survey instrument was revised, and the revised version was used in the actual survey.

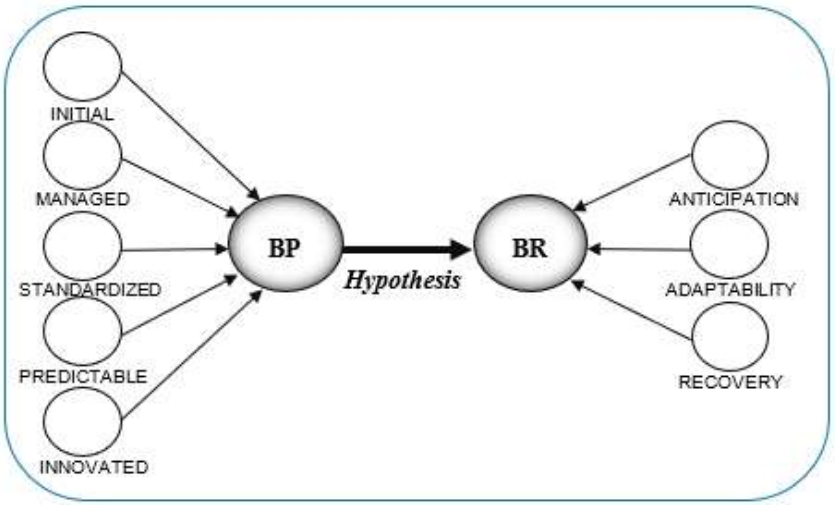
2.3.2 Presentation of the theoretical model and operationalization of variables

This study focused on the extent of business resilience and the efficiency of business processes, as assessed by managers and rank-and-file employees of Airlines A, B, and C in the Philippines. The figure illustrates the conceptual domains of business processes, which were hypothetically considered as predictor variables for business resilience, the dependent variable.

Figure 7 illustrates the hypothesis tested in this study, which posits that business processes positively impact business resilience. The model was based on theoretical frameworks and previous research by Alkhudary et al. (2022), Battisti et al. (2020), Fiksel et al. (2015), Pettit et al. (2013), Fosso et al. (2017), and Altay et al. (2018), all cited and utilized in the study by Sincora et al. (2022). The theoretical proposition emphasizes that to improve resilience, organizations must first adopt specific measures of business processes and strategies. This is because organizations that practice effective and efficient business process management are better able to manage instability without disrupting their operational processes and services. These researchers recognize that such initiatives foster the development of resilience capabilities across the entire organizational chain.

Figure 7 illustrates a conceptual model for understanding the relationship between Business Processes (BP) and Business Resilience (BR). This model is based on existing theoretical frameworks and research, with notable contributions from Alkudary et al. (2022), Battisti et al. (2020), Fiksel et al. (2015), Pettit et al. (2013), Fosso Wamba and Mishra (2017), and Altay et al. (2018). Their work provides foundational insights into how robust business processes contribute to organizational resilience.

Figure 7 Research Hypothesis Model



The left side of the model represents BP, consisting of various stages: Initial, Managed, Standardized, Predictable, and Innovate. These stages indicate different levels of process maturity and organizational capability in handling operations effectively. According to Alkudary et al. (2022) and Battisti et al. (2020), reaching a high maturity level, where processes are systematically managed and standardized, is crucial for organizations aiming to handle disruptions effectively. Each stage in BP adds a layer of control and flexibility, which enhances the organization's capacity to prevent and respond to potential risks.

The arrow connecting BP to BR, labeled as "Hypothesis," symbolizes the suggested cause-and-effect relationship. This relationship posits that improvements in business processes can lead to an increase in resilience. Fiksel et al. (2015) and Pettit et al. (2013) argue that predictable and streamlined processes support resilience by allowing organizations to react swiftly to unanticipated events. According to their findings, predictability and structured processes help sustain operational continuity, minimizing disruptions.

On the right side, the model outlines BR, encompassing three key components: Anticipation, Adaptability, and Recovery. These elements represent the different facets of resilience that organizations exhibit. As Altay et al. (2018) and Sincora et al. (2022) suggest, Anticipation involves proactively identifying possible threats, Adaptability refers to the ability to adjust processes in response to change, and Recovery denotes the capacity to restore normalcy efficiently after disruptions. Together, these elements form the core of organizational resilience, enabling continuity and stability even amid challenges.

The underlying proposition of this model is that business process improvement is integral to building resilience across an organization. By achieving high process maturity through standardization and continuous innovation, organizations can better manage uncertainties without hindering their core functions. These ideas align with the researchers' perspectives that well-established business process management promotes resilience across the organization, ultimately protecting the integrity of services and operational flow.

Table 2, shows the operationalization of the variables, the scale used, and its qualitative formative constructs. The scale used for business resilience was inspired by the work of Pettit et al. (2013), and the scale used for business process efficiency was adopted from Dijkman et al. (2015), as cited and utilized in the study of Sincora et al. (2022). The construction process of the survey instrument began with 49 items to assess business resiliency in three aviation companies and 20 items to assess the efficiency of their business processes. The construction process was carried out inductively, generating items from relevant literature, and deductively, based on three theoretical concepts from which items were then created: (1) business processes, (2) systems thinking, and (3) Kaizen theory on business management, as shown in Figures 1, 2, and 3 in Chapter 1. For content validity, items that evaluated the survey instrument were selected through a process involving a literature review, creation of a pool of items, and pilot tests.

Table 2 Operationalization of the variables and its scale measurements

Variables	Likert scale	Mean range	Qualitative formative constructs	Interpretation of constructs
Business resilience (49 items)	Five-Point (Strongly Agree to Strongly disagree)	1.00 – 1.80	No Extent at all	Anticipation
		1.81-2.60	Low Extent	
		2.61-3.40	Moderate Extent	Adaptability
		3.41-4.20	High Extent	
		4.21- 5.00	Very High Extent	Recovery
Business Process Efficiency (20 items)	Four-point (Not efficient to Very efficient)	1.00 - 1.74	Not efficient	Not accepted
		1.75 – 2.49	Less efficient	Initial
		2.50 – 3.24	Efficient	Managed
		3.25 - 4.00	Very efficient	Standardized

The scale used for business resilience was inspired by the work of Pettit et al. (2013), and the scale used for business process efficiency was adopted from Dijkman et al. (2015), as cited and utilized in the study of Sincora et al. (2022). The construction process of the survey instrument began with 49 items to assess business resiliency in three aviation companies and 20 items to assess the efficiency of their business processes. The construction process was carried out inductively, generating items from relevant literature, and deductively, based on three theoretical concepts from which items were then created: (1) business processes, (2) systems thinking, and (3) Kaizen theory on business management, as shown in Figures 1, 2, and 3 in Chapter 1. For content validity, items that evaluated the survey instrument were selected through a process involving a literature review, creation of a pool of items, and pilot tests.

The literature review focused on the construct of business resiliency and the efficiency of business processes in general business literature, as well as on studies examining the categories of business resiliency assessment and efficiency of business processes and their measurement scales. Additionally, the ways in which managers and rank-and-file employees in different companies experienced and handled business risks were examined, including literature on resilience, well-being, appraisal, regulation, coping, and efficacy. This literature provided the researcher with a framework for conceptualizing the dimensions of business resiliency and efficiency of business processes, as well as for developing a valid and reliable instrument to measure how employees assessed each dimension. Related studies that focused on business resiliency and efficiency of business processes in aviation companies were also used.

Following the literature review, a total pool of 49 items related to assessing business resiliency and a pool of 20 items for assessing the efficiency of business processes were created. These items were modified and expressively adapted to be compatible with the characteristics of the general business processes context. The questionnaire was validated by three professionals to verify possible gaps in the scale items and ensure appropriate language for respondents. It was then shared with 24 employees for a pilot test. The 24 pilot samples evaluated the item matching per category using a 5-point and 4-point Likert scale, and Cronbach's Alpha was tested, finding it reliable at no less than 0.80 for each item.

Principal Component Analysis (PCA) was conducted through SPSS 27 software for extraction and Varimax rotation with Kaiser Normalization. The Kaiser-Meyer-Olkin Measure of Sampling Adequacy was .919, indicating excellent suitability of the data for factor analysis. Bartlett's Test of Sphericity was significant ($\chi 2 = 5152.47$, $p < .000$), supporting the factorability of the correlation matrix. The two general factors (business resilience and efficiency of business processes) accounted for 71.64% of the total variance, confirming the questionnaire's effective measurement of the underlying constructs.

Furthermore, to analyze the collected data, SPSS 27 was used to perform data normality tests and outlier tests. Then, using SPSS Amos 29, the researcher utilized the SEM method to verify the validity and reliability of the scale measures and confirm the robustness of the structured model of the study. Table 3 below presents the data analysis procedure, and Table 5 in Chapter 3 presents the measurement model fit indices from SPSS AMOS.

Table 3 Data Analysis procedure through SPSS 27 and SPSS Amos 29.

Validation tests	Procedures	Parameters
Evaluation of the variables and constructs through relationship among constructs and indicators	Multicollinearity	TOL >0.20 VIF <5
	Significance	Hypothesis test (indicators): p-value ≤0.05
Structural model evaluation through direct and indirect relationships among constructs	Multicollinearity	TOL >0.20 VIF <5
	Significance	Hypothesis test (indicators): p-value ≤0.05
	Variance Determination Coefficient (R^2)	R^2: 0.75 (High, substantial); 0.50 (moderate); 0.25 (weak)

2.4 Statistical Treatment

Since the data were obtained through surveys and interviews, the following were utilized for quantitative data analysis: (1) the data were treated statistically to answer the problems stated in Chapter 1; (2) descriptive statistics were used to address research problems 1, 2, and 3, such as frequency, percentage, mean, and standard deviation. These statistics were used to describe the personal profile, efficiency of business processes, and extent of business resilience; and (3) inferential statistics were used to address research problems 4, 5, and 6 and hypothesis statements 1, 2, and 3. Research problem 4 adopted structural equation modeling (SEM) as the researcher sought to find relationships between the extent of business resilience and the extent of efficiency in business processes based on the respondents' perspectives, aiming to reduce model errors (Hair, Hult, Ringle & Sarstedt, 2014). These statistical tests were employed, with other statistical tests used as needed throughout the investigation and analysis process.

This study aimed to carry out an investigation focusing on management, comparing it with an examination of theoretical concepts and attempting to elaborate on the concepts used in practice, which were the results of this study. This was done by gathering empirical data on the current status of business processes in the aviation sector. The researcher aimed to understand how airlines conducted their business impact analysis to identify critical business processes and systems. Scholars had provided empirical research and discovered that variables in business processes evolved over the years from the theory of business processes.

Table 4 outlines the research problems and the statistical tools used to address each of them. The first research problem focused on the demographic profile of the respondents, specifically their position and years of service. Descriptive statistics were used to summarize and analyze this data. The second problem explored the extent of business resilience in the aviation companies, assessing various attributes such as institutional control, planning, philosophy, external support, and communication. Descriptive statistics were also used to provide an overview of these factors. The third research problem evaluated the efficiency of business processes in the aviation industry during uncertain times, such as pandemics or force majeure events, with a focus on areas like facility management, health and safety, technology governance, and people management. Descriptive statistics were used again to summarize the responses.

The fourth research problem examined whether there were significant differences in the efficiency of business processes across the three aviation companies. Comparative analysis, specifically ANOVA with post-hoc tests, was employed to determine any statistical differences between the groups. The fifth problem investigated whether there was a correlation between business resilience and the efficiency of business processes. Correlation analysis was used here to assess the relationship between these two variables. Finally, the sixth research problem looked at whether there were significant differences in the extent of business resilience between the two groups of respondents. This was also analyzed using comparative analysis (ANOVA with post-hoc tests) to determine if different perceptions of resilience existed between the groups. Each statistical tool was selected to appropriately address the specific nature of the research problem, ranging from summarizing data to comparing groups and analyzing relationships.

Table 4 Statistical Tools

Research Problems	Statistical Tool
1. What is the demographic profile in terms of: 1.1. Position; and 1.2. Years of Service?	Descriptive statistics
2. What is the extent of business resilience of the three Aviation Companies from the perspective of the two groups of respondents in terms of the following attributes: 2.1. Institutional control; 2.2. Planning and preparedness; 2.3. Philosophy and Integrity; 2.4. External Support and Linkages; and 2.5. Communication and media?	Descriptive statistics
3. What is the extent of efficiency of the business processes of the aviation industry in times of uncertainties (pandemic, force majeure, and emerging issues) as assessed by managers and rank-and-file employee in terms of: 3.1. Facility management; 3.2. Health, wellness and safety; 3.3. Technology governance; and 3.4. People management?	Descriptive statistics
4. Is there a significant difference on the extent of efficiency of the business processes of the three Aviation Companies as assessed by the two groups of respondents?	Comparative analysis (ANOVA, post-hoc test)
5. Is there a correlation between the extent of business resilience and extent of efficiency of business processes based on the perspective of the respondents?	Correlation Analysis (multiple correlation) Structural Equation Modeling (SEM)
6. Is there a significant difference on the extent of business resiliency of the three Aviation Companies from the perspective of the two groups of respondents?	Comparative analysis (ANOVA, post-hoc test)

2.5 Qualitative Analysis

2.5.1 Description of Key informants

The key informants involved in this study comprised participants from surveys, specifically focusing on managers and rank-and-file employees from three distinct airline companies. The selection of these personnel was intentionally restricted to those engaged in operational and support roles within the airline industry.

Managers and rank-and-file staff were identified as the most relevant individuals within ground operations and support groups, as they were likely to serve as pivotal strategic leaders and contributors in facilitating airline recovery during various disruptions.
Key informant #1 selected for this study was a manager from Airline A, specifically within the facilities department, with a tenure of five years or more. This individual played a critical role in overseeing the maintenance and operational efficiency of airport facilities, which were essential for supporting airline operations.

Key informant #2 selected for this study was a Director from Airline A, specifically within the facilities department, with a tenure of five years or more. This individual was instrumental in managing the maintenance and operational efficiency of various critical infrastructures, including airport facilities, airline headquarters, and station offices across multiple airports in the Philippines.
Key informant #3 selected for this study was a manager overseeing facility services for major hubs and stations outside of Manila, with over five years of experience in the field. This individual played a significant role in ensuring the operational efficiency and maintenance of critical facilities that supported airline operations across various locations.

Key informant #4 selected for this study was a Project Manager from Airline B, specifically within the Ground Operations Project Management Office, with over five years of experience in the role. This individual was instrumental in overseeing various programs

tailored to meet the specific needs of different departments, aimed at enhancing operational processes and driving continuous improvement.

Key informant #5 selected for this study was a Director of Ground Operations at Airline B, with over seven years of experience in the airline industry. In this role, he was responsible for overseeing all aspects of ground operations, ensuring that the airline's services were delivered efficiently and effectively while maintaining high safety and quality standards.

Key informant #6 selected for this study was a Program Manager with over seven years of tenure in the airline industry. In this role, he was responsible for introducing and planning the implementation of various programs across different departments, leveraging best practices from leading airlines in Asia to enhance operational efficiency and service quality within its division of programs and projects.

Key informant #7 selected for this study was a Program Manager from Airline C, specifically within the facilities department, with a tenure of four years or less. In this role, he was responsible for overseeing a variety of projects across multiple departments, including IT and inflight catering services, ensuring that each initiative aligned with the airline's strategic objectives. This key informant played a pivotal role in coordinating and managing projects that enhanced operational efficiency and service delivery within the airline.

Key informant #8 selected for this study was a Director of Ground Operations at Airline C, specifically within the Ground Operations Department, with over five years of experience in the role. In this capacity, he was responsible for managing a wide range of ground operations across various stations that facilitated both commercial and charter flights.
Key informant #9 selected for this study was a Quality Manager with over five years of experience in the airline industry. In this role, she was responsible for ensuring that all operational processes and services met the highest standards of quality and compliance.

Rank-and-file participants in this study were selected based on their direct involvement in day-to-day operations within airline companies. Their roles encompassed a variety of functions, operations, and support groups. Each participant had different tenure, ensuring they possessed initial or substantial experience and familiarity with the operational challenges faced by the airline industry. This experience allowed them to offer valuable perspectives on how business resilience was manifested at the operational level.

Key informant #10 selected for this study was a Supervisor from Airline A, specifically within the facilities department, with a tenure of five years or more. This individual was responsible for overseeing electrical works, maintenance, and operational efficiency across various airport facilities, which were crucial for supporting airline operations.

Key informant #11 selected for this study was a Pollution Control Officer from Airline A, with over five years of experience in the field. This individual played a vital role in managing the proper handling and reporting of chemicals, as well as overseeing hazardous waste management across various airport facilities, airline headquarters, and station offices throughout multiple airports in the Philippines.

Key informant #12 chosen for this study was an Asset Management Associate with more than five years of experience in the field. This individual was responsible for managing the receipt of various assets, ranging from low-value items to high-value equipment, utilized in nationwide airline operations. Additionally, they oversaw the disposal of various scrap materials and asset disposals across the country. A key aspect of their role involved sourcing certified waste haulers for each station to ensure compliant and efficient disposal practices.

Key informant #13 selected for this study was a Travel Supervisor from the People Management Department at Airline B, with over five years of experience in the airline industry. In this role, she was responsible for overseeing the travel arrangements and accommodations for Airline B employees, ensuring their smooth and efficient movement between various locations while maintaining cost-effectiveness and compliance with company policies.

Key informant #14 selected for this study was an Administrative Assistant in the Facilities Department at Airline B, bringing over six years of experience in the field. In this role, he was responsible for processing various permits related to Ground Support Equipment (GSE) operations, including permits for hot work, access passes for third-party service providers (TPSP), and monitoring fuel consumption for the GSE fleet.

Key informant #15 selected for this study was a Supervisor in Ground Support Equipment (GSE) operations, with over four years of experience in maintenance operations within the airline industry. In this role, he was responsible for overseeing the maintenance and repair of ground support equipment, ensuring that all equipment was functioning optimally to support airline operations.

Key informant #16 selected for this study was a Supervisor of Non-Motorized Maintenance in the Ground Operations Department at Airline C, bringing over four years of experience in this specialized area. In this role, he was responsible for overseeing the maintenance and operational readiness of non-motorized ground support equipment, which was essential for efficient airline operations.

Key informant #17 selected for this study was a Parts and Logistics Specialist with over five years of experience in the airline industry. In this role, he was responsible for managing the procurement, inventory, and distribution of parts for Ground Support Equipment (GSE) and aircraft, ensuring that all necessary components were available to support efficient operations.

Key informant #18 selected for this study was a Cargo Asset Management Associate with over two years of tenure in the airline industry. In this role, he was responsible for managing supplies related to airport and cargo operations, including overseeing assets and coordinating with third-party service providers (TPSP) to ensure efficient logistics and operational effectiveness.

2.6 Ethical Considerations

For the ethical considerations of this study, the principle of confidentiality and anonymity was observed and adhered to before the conduct of the study. Voluntary participation of the respondents was emphasized. The respondents were required to participate on the basis of informed consent prior to the survey. Moreover, the respondents in the survey and participants in the interview were informed of their right to withdraw from participation at any time or at any stage if they wished to do so.

The respondents were not subject to harm in any way, with respect being prioritized, and full consent was obtained from them prior to the study. In addition, their privacy was protected by not revealing their names or any personal information, and the research data was kept at an adequate level of confidentiality. Hence, adherence to the Data Privacy Act of 2012 was observed.

2.6.1 Conflict of Interest

The researcher had no conflicts of interest to declare. There was no financial interest to report, and this dissertation was for academic purposes only. The researcher certified that this submission was an original work, and that other sources and references used in any part of this dissertation were cited and acknowledged properly using the latest APA formatting.

2.6.2 Privacy and Confidentiality

The names of respondents in the survey and participants in the interview were safely kept with utmost confidentiality. Access to this study was limited to Adamson University, where the researcher was currently enrolled, for the purpose of this dissertation. Priority was given to the confidentiality of the respondents above all else. The methods used to identify, contact, and obtain information from them were appropriate according to their will. The researcher ensured the confidentiality of research data by establishing the following:

An agreement was established between the researcher and the research respondents in the conduct of the survey and with participants in the interview regarding the handling, management, and dissemination of identifiable private information.
Data was only divulged following the agreement of trust between the researcher and the respondents.

2.6.3 Informed Consent Process

Informed written consent was obtained from research respondents without any coercion or intimidation before the conduct of the study. Thus, respondents joined voluntarily and could withdraw at any stage of the study if they wished to.

2.6. Vulnerability

The respondents of the study were of legal age and were working in three selected aviation companies, ranging from top/middle management down to rank-and-file employees. The selection was random and was not forced. They were provided with an informed consent statement to sign when they decided to participate in the survey and interview phases.

2.6.5. Recruitment

The researcher did not recruit other participants outside the scope of this study.

2.6.6 Assent

There were no respondents of non-legal age who participated in the conduct of this study.

2.6.7 Benefits

The findings and recommendations of this study were beneficial to the management of the aviation company, researchers, and future researchers specializing in aviation operational fields. The research outcomes, including the business continuity framework and recovery program, were beneficial for aviation management to consider.

2.6.8 Compensation, Incentives or Reimbursement

There was no compensation, incentives, or reimbursement in the conduct of the study, as it was for academic purposes only, from the perspective of the researcher being enrolled in the post-graduate program.

2.6.9 Community Considerations

In this regard, privacy and confidentiality of the respondents' survey responses were given a high level of protection to safeguard their privacy. It was ensured that the contents of the questionnaire did not contain conflicting statements that could affect their employment or individual responsibilities.

2.6.10 Anonymity

The researcher protected the anonymity of individuals and organizations participating in the research.

For ethical considerations, the principles of confidentiality and anonymity were observed and adhered to before the conduct of the study. Voluntary participation of the respondents was given importance. The respondents participated on the basis of informed consent prior to the survey. Moreover, the respondents in the survey and participants in the interview were reminded of their right to withdraw from participation at any time or at any stage, should they choose to do so.

2.6.11 Potential Harm

The respondents were not subject to harm in any way, and respect was prioritized throughout the study. Full consent was obtained from them prior to the study. Additionally, their privacy was protected by not revealing their names or any personal information, and all research data was kept at an adequate level of confidentiality. Adherence to the Data Privacy Act of 2012 was observed.Type the text here

3. Results

This chapter presents the results of the study, along with their interpretation and analysis, based on the research objectives. The findings are organized as follows: (1) presentation of the theoretical model and operationalization of variables; (2) results of the quantitative survey, aligned with the sequence of the research questions outlined in Chapter 1; and (3) results from the qualitative phase of the study.

3.1 Quantitative Results

3.1.1 (SOP #1) Demographic Profile of Respondents in Terms of Position and Years of Service

Table 5 Profile of the Respondents

	Airline A		Airline B		Airline C	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Position						
Rank-in-file	64	87.67%	38	79.17%	33	86.84%
Managers	9	12.33%	10	20.83%	5	13.16%
Years of Service						
5 yrs & above	35	48.61%	20	41.67%	15	39.47%
4 yrs & below	37	51.39%	28	58.13%	23	60.53%

Table 5 presents a demographic breakdown of respondents from three airlines, focusing on positions and years of service. The data offered key insights into the workforce composition and its implications for operational efficiency and recovery strategies in the aviation sector.

In Airline A and Airline C, a significant majority of respondents were rank-and-file employees, at 87.67% and 86.84%, respectively. Airline B had a slightly lower proportion at 79.17%. However, Airline B showed the highest representation of managerial staff (20.83%), compared to Airline C (13.16%) and Airline A (12.33%). This suggested that Airline B may have prioritized managerial oversight, which is essential for strategic decision-making and regulatory compliance. As highlighted by Smith and Anderson (2020), strong managerial leadership is crucial in industries like aviation, especially during periods of crisis and change, where safety and efficiency are top priorities.

The data also revealed that Airlines B and C had a higher proportion of employees with fewer than five years of service, at 58.13% and 60.53%, respectively. This may have reflected recent recruitment efforts following the pandemic. In contrast, Airline A showed a more balanced distribution, with 48.61% having over five years of service.

These findings underscored the importance of workforce training and development, especially in Airlines B and C, where many employees were relatively new. Ensuring they were adequately trained would have been vital to maintaining operational continuity and safety standards in the aviation sector. As noted by Lopez and Hernandez (2021), industries where safety is critical must focus on training newer employees to ensure they can adapt quickly and contribute effectively.

3.1.2 (SOP #2) Extent of Business Resilience of Three Aviation Companies from the Perspective of Managers and Rank-and-File Employees in Terms of Five Attributes

Tables 6-11 presents the mean and standard deviation results of the survey collected from three airline companies in the Philippines. The five dimensions of business resilience assessed were institutional control, planning and preparedness, philosophy and integrity, external support and linkages, and communication and media.

Table 6 highlighted the results for institutional control resilience, using 16 constructs to measure the extent of business resilience based on responses from employees of Airlines A, B, and C. The participant counts for each airline were 73 for Airline A, 48 for Airline B, and 38 for Airline C.

Overall, Airline A recorded the highest rating, with a mean score of 4.34 and a standard deviation of 0.61, signifying a high extent of resilience in the recovery phase. This implied that Airline A demonstrated strong recovery capabilities, maintaining structured activities and processes even under adverse conditions. In contrast, Airline B, with a mean of 3.70 and a standard deviation of 0.65, and Airline C, with a mean of 4.10 and a standard deviation of 0.69, both fell within the normal extent of resilience. This suggested that Airlines B and C had adaptive capabilities, enabling them to prepare for and manage unexpected events, but they may not have been as robust as Airline A in terms of full recovery readiness.

Institutional control, as defined by various studies, referred to a company's ability to remain flexible and manage resources effectively, even in post-disaster scenarios. The individual item analysis revealed that both Airline A and Airline B had their lowest scores for the item "Hires disaster and risk mitigation officer," indicating a normal extent of resilience for this practice. This suggested that hiring specialized disaster and risk mitigation personnel was not a widespread practice in these airlines, which could affect their readiness for effective risk management. Meanwhile, Airline C's lowest score was for "Maintains adequate number of staff," also indicating a normal extent of resilience. This highlighted a potential vulnerability in ensuring sufficient staffing levels to maintain operations during disruptions.

The constructs presented in the Principal Component Analysis (PCA) reflected key indicators related to decision-making, preparedness practices, managing interventions post-disaster, and resource management, all critical components of institutional control. It was essential to interpret these results with caution, as respondents may not have fully disclosed their true perspectives on current practices. To validate the survey findings, further qualitative investigations, such as individual interviews with department heads, were conducted. Initial investigations revealed insights consistent with Turnbull et al. (2013), who argued that effective disaster resilience is reflected in a company's ability to strategize its business processes, policies, and recovery management measures.

Table 6 Business Resilience in Terms of Institutional Control of Airline A, B, and C

	Mean and SD		
	Airline A (n=73)	**Airline B (n=48)**	**Airline C (n=38)**
1. Maintains a sense of control about what happens to the business	4.45, 0.55 High	3.73, 0.71 Normal	3.95, 0.70 Normal
2. generates fund sources to revitalize business operations	4.42, 0.55 High	3.48, 0.90 Normal	3.92, 0.71 Normal
3. Does disaster preparedness and drills	4.55, 0.55 High	3.79, 0.74 Normal	4.05, 0.73 Normal
4. Requests employees to cooperate with in rebuilding the business	4.44, 0.60 High	3.67, 0.93 Normal	4.13, 0.81 Normal
5. Maintains adequate number of staff	4.15, 0.68 Normal	3.48, 0.90 Normal	3.89, 0.73 Normal
6. Adapts well to differing conditions	4.38, 0.54 High	3.92, 0.71 Normal	4.29, 0.65 High
7. Invests in training its personnel for risky situations	4.40, 0.59 High	3.73, 1.03 Normal	4.34, 0.67 High
8. Keeps a stock of supplies and materials that can be used in times of emergencies	4.34, 0.63 High	3.79, 0.85 Normal	4.32, 0.81 High
9. Conducts post-disaster/post-crisis assessments on the extent of damages that have hit the business	4.40, 0.55 High	3.73, 0.87 Normal	4.00, 0.74 Normal
10. Invests for insurance of the facility and of the products and inventory in it from possible crisis, earthquake, fire or force majeure	4.42, 0.58 High	3.81, 0.70 Normal	4.05, 0.57 Normal
11. Prepares post-disaster/crisis plans to see the weaknesses of the establishment after the damage	4.40, 0.59 High	3.90, 0.69 Normal	4.11, 0.69 Normal
12. Has a mentor or consultant who discusses business preparedness with the owners.	4.21, 0.74 High	3.44, 0.97 Normal	4.16, 0.68 Normal
13. Provides a resource manual for risk reduction and management	4.33, 0.58 High	3.75, 0.79 Normal	4.08, 0.63 Normal
14. Takes business risk management to a new level	4.25, 0.64 High	3.71, 0.77 Normal	4.16, 0.64 Normal
15. Hires a disaster and risk mitigation officer	3.97, 0.78 Normal	3.42, 1.03 Normal	4.03, 0.72 Normal
16. Stores a contact list of all personnel.	4.38, 0.59 High	3.92, 0.82 Normal	4.11, 0.65 Normal
Over-all	**4.34, 0.61 High**	**3.70, 0.65 Normal**	**4.10, 0.69 Normal**

Mean Range and its Interpretation: 1.81 – 2.60 Very Low Extent (Anticipation); 2.61 – 3.40 Neutral (Anticipation); 3.41 – 4.20 Normal Resilience (Adaptability); 4.21 – 5.00 High Extent of Resilience (Recovery).

Airline A stood out for having the greatest number of high extent ratings, with 15 out of 16 constructs classified in the recovery phase. This indicated a comprehensive approach to institutional control, with robust measures in place. Conversely, Airline B showed normal extent ratings across all 16 constructs, highlighting a need for stronger institutional resilience practices. Airline C had three high extent ratings for adapting well to differing conditions, investing in personnel training for risky situations, and keeping emergency supplies, indicating some strengths but also areas requiring enhancement.

The findings emphasized that while some airlines demonstrated solid resilience, particularly in certain areas, there was room for improvement in practices such as hiring risk mitigation officers and ensuring adequate staffing. The alignment between business processes and disaster response strategies was crucial for enhancing resilience and maintaining business continuity.

Table 7. Business Resilience of Three Airline Companies in Terms of Planning and Preparedness

	Mean and SD		
	Airline A (n=73)	Airline B (n=48)	Airline C (n=38)
1. Has a long-term plan to strengthen the business	4.58, 0.52 High	4.00, 0.71 Normal	4.13, 0.66 Normal
2. Has a sound financial management plan	4.38, 0.62 High	3.96, 0.74 Normal	4.13, 0.74 Normal
3. Have risk and vulnerability assessments	4.38, 0.59 High	3.94, 0.76 Normal	4.18, 0.56 Normal
4. Initiates researches relative to risk reduction and management	4.33, 0.60 High	3.85, 0.82 Normal	4.00, 0.66 Normal
5. Has a business continuity plan	4.53, 0.53 High	3.92, 0.74 Normal	4.13, 0.81 Normal
6. Ensures that transport facility is prepared at all times in case disaster sets in	4.29, 0.68 High	3.75, 0.79 Normal	3.89, 0.92 Normal
7. Can improvise when usual resources are not available	4.32, 0.62 High	3.73, 0.76 Normal	4.08, 0.67 Normal
8. Has a workplace health and safety plan	4.34, 0.61 High	3.88, 0.73 Normal	4.08, 0.75 Normal
9. Conducts pre-disaster assessments on the extent of damages that will hit the business	4.25, 0.64 High	3.63, 0.82 Normal	3.97, 0.72 Normal
10. Ensures that readiness is observed at all times	4.44, 0.55 High	4.04, 0.68 Normal	4.24, 0.85 High
11. Encourages all personnel to get insurance for future claims	4.14, 0.80 Normal	3.73, 0.82 Normal	4.05, 0.73 Normal
Over-all	**4.36, 0.62 High**	**3.86, 0.55 Normal**	**4.08, 0.74 Normal**

Mean Range and its Interpretation: 1.81 – 2.60 Very Low Extent (Anticipation); 2.61 – 3.40 Neutral (Anticipation); 3.41 – 4.20 Normal Resilience (Adaptability); 4.21 – 5.00 High Extent of Resilience (Recovery).

Table 7 illustrates the perceived resilience of three airline companies in terms of their planning and preparedness attributes. The 11-item construct, which included factors like long-term planning, financial management, and disaster preparedness, reflected essential dimensions of business resilience, as noted by Campos (2015). These factors provided a comprehensive view of how prepared each airline was for handling unexpected disruptions.

Among the three companies, Airline A had the highest overall mean score (M=4.36, SD=0.62), suggesting a "High Extent" of resilience in planning and preparedness. This score indicated that employees perceived Airline A to be proactive and effective in key areas such as business continuity, risk management, and disaster preparedness. Their resilience strategy appeared robust, with an emphasis on sustaining operations during unforeseen events.

Airline C and Airline B followed with mean scores of (M=4.08, SD=0.74) and (M=3.86, SD=0.55), respectively, placing them within the "Normal Resilience" range. Airline C's score showed moderate engagement in resilience activities, indicating that while certain preparedness measures were in place, there was room for strengthening. Airline B, with the lowest score, needed to enhance specific aspects of its resilience framework, particularly in proactive disaster preparation.

Each airline's lowest-rated item highlighted potential areas for improvement. Airline A scored the lowest on item 11, "Encourages all personnel to get insurance for future claims" (M=4.14, SD=0.62), suggesting limited emphasis on insurance as a resilience measure. Airline B rated item 9, "Conducts pre-disaster assessments on the extent of damages that will hit the business," the lowest (M=3.63, SD=0.82), indicating a potential need for stronger risk assessment practices. Airline C rated item 6, "Ensures that transport facility is prepared at all times in case disaster sets in," the lowest (M=3.89, SD=0.92), which pointed to logistical readiness as an area requiring attention.

These lower scores implied that, although overall resilience levels were moderate to high, there were specific areas in each airline's planning and preparedness that could benefit from focused improvement. Addressing these areas could have enhanced each airline's capability to manage unforeseen disruptions effectively.

According to Miyan (2014), effective disaster risk management required both strategic policies and operational measures that anticipated future risks. For these airlines, improving resilience in the lowest-rated areas—such as insurance, risk assessments, and

transport facility readiness—could have been instrumental in fostering a more comprehensive preparedness framework. Such enhancements would likely have reinforced the organization's ability to respond robustly to future challenges, ensuring operational continuity and safety.

The scores in Table 7 revealed that these airlines demonstrated a "Normal" to "High Extent" of resilience across key attributes of planning and preparedness. However, the items with lower ratings, specifically in insurance promotion, pre-disaster assessment, and logistical preparedness, underscored the need for continuous improvement. By focusing on these areas, the airlines could have further strengthened their disaster preparedness and resilience, ultimately improving their capacity to withstand disruptions.

Table 8 Business Resilience of Three Airline Companies in Terms of Philosophy & Integrity

	Mean and SD		
	Airline A (n=73)	Airline B (n=48)	Airline C (n=38)
1. Emphasizes a culture of putting in the best effort in the business.	4.41, 0.52 High	3.77, 0.75 Normal	4.08, 0.43 Normal
2. Imbibes with a compassionate corporate philosophy of taking care of the other before self-interest.	4.29, 0.68 High	3.75, 0.73 Normal	4.05, 1.01 Normal
3. Shows compassion to others who are victimized by calamities/crisis.	4.49, 0.58 High	3.81, 0.89 Normal	4.29, 0.65 High
4. Compensates the efforts of volunteers to rebuild the business.	4.10, 0.78 Normal	3.48, 0.92 Normal	4.00, 0.57 Normal
5. Indicates readiness of external forces in its vision and/or mission statement.	4.15, 0.64 Normal	3.73, 0.68 Normal	4.05, 0.52 Normal
6. Maintains the philosophy of "business as usual".	4.14, 0.82 Normal	3.96, 0.77 Normal	4.29, 0.65 High
7. Understands that risks are existing.	4.44, 0.58 High	4.10, 0.63 Normal	4.45, 0.50 High
8. Embed responsibility for business continuity throughout the organization.	4.42, 0.60 High	3.94, 0.67 Normal	4.18, 0.65 Normal
9. Must be confident in its future activities	4.44, 0.62 High	4.17, 0.63 Normal	4.21, 0.66 High
Over-all	**4.32, 0.65 High**	**3.86, 0.54 Normal**	**4.18, 0.63 Normal**

Mean Range and its Interpretation: 1.81 – 2.60 Very Low Extent (Anticipation); 2.61 – 3.40 Neutral (Anticipation); 3.41 – 4.20 Normal Resilience (Adaptability); 4.21 – 5.00 High Extent of Resilience (Recovery).

The International Civil Aviation Organization (ICAO) emphasized that achieving necessary resilience requires a high level of commitment. In line with this principle, Table 8 illustrates the extent of business resilience of three airline companies in terms of Philosophy and Integrity. The nine constructs in Table 10 captured the core beliefs, values, and principles underlying the companies' operations. The results revealed that Airline B had the lowest overall rating, with a mean score of 3.86 and a standard deviation of 0.54, indicating a normal extent of resilience. This implied that while Airline B had adaptive practices in place, there was still room for improvement to enhance its resilience, particularly in areas such as compensation or extra pay during uncertainties. Airline C followed with an overall mean of 4.18 and a standard deviation of 0.63, also showing a normal extent of resilience, suggesting managed but improvable business principles. On the other hand, Airline A stood out with a mean of 4.32 and a standard deviation of 0.65, reflecting a high extent of resilience. This indicated a well-developed and robust set of philosophies and principles that effectively supported the organization's operations and crisis management.

A detailed analysis of the nine constructs showed that the lowest-rated items for each airline highlighted critical areas for improvement. Specifically, item 4, "Compensates the efforts of volunteers to rebuild the business," received the lowest rating from respondents of Airline A, with a score indicating normal resilience. This suggested that although compensation practices were in place, they might not have been adequate to fully support volunteer efforts during crisis recovery. Similarly, Airline B also rated this item the lowest, reflecting a need to improve how it valued and incentivized volunteer contributions. Meanwhile, Airline C's lowest-rated item was item 2, "Imbibes with a compassionate corporate philosophy of taking care of the other before self-interest," which also fell under normal resilience. This indicated that the company's compassionate practices could have been more prominently integrated to strengthen its overall philosophy.

Airline A achieved high extent ratings in the majority of items, demonstrating strong values and principles that enhanced resilience. Only three items—compensation for volunteers, readiness of external forces in the mission statement, and maintaining the business-as-usual philosophy—received normal ratings, indicating areas that could have benefited from refinement. In contrast,

Airline B exhibited normal ratings across all constructs, highlighting the need for a comprehensive review of its corporate philosophy to achieve higher resilience. Airline C managed to secure high extent ratings in four items, specifically in showing compassion to those affected by calamities, understanding that risks existed, embedding business continuity responsibility throughout the organization, and maintaining confidence in future activities.

These findings suggested that the lower-rated areas reflected opportunities for improvement. Companies needed to reflect on their principles to ensure they were not only well-articulated but also effectively implemented. The philosophy and integrity of a business greatly influenced decision-making and relationships with stakeholders, which in turn strengthened long-term sustainability. Business management principles emphasized the importance of sustainability in shaping corporate philosophies, particularly in the context of risk mitigation and resilience. Insights from research by Annarelli and Nonino (2016) and Pierobon (2021) underlined the significance of pre-planned, well-resourced infrastructure for organizational resilience, especially during crises.

Thus, the high mean scores in several constructs indicated the airlines' strong alignment with values that fostered resilience. They reflected readiness in terms of external forces, a clear understanding of risks, and embedded responsibility for continuity, alongside confidence in future business endeavors. Addressing areas of normal resilience would further enhance each company's capacity to withstand and recover from crises effectively.

Table 9 Business Resilience of Three Airline Companies in Terms of External Support & Linkages

	Mean and SD		
	Airline A (n=73)	Airline B (n=48)	Airline C (n=38)
1. Has a strong relationship with its customers/clients	4.51, 0.56 High	4.10, 0.63 Normal	4.34, 0.63 High
2. Sources expert assistance concerning disaster preparations in times of need	4.25, 0.62 High	3.92, 0.77 Normal	4.03, 0.75
3. Coordinates with local planners, emergency managers, and public works officials to prepare for instances of damages or loss of properties	4.40, 0.66 High	4.06, 0.70 Normal	4.13, 0.78 Normal
4. Keeps a network of contacts with government agencies	4.44, 0.58 High	4.15, 0.71 Normal	4.24, 0.75 High
5. Is well supported by the local community	4.32, 0.68 High	3.79, 0.87 Normal	4.03, 0.64 Normal
6. Meets with other businesses in working together to rebuild what was left of their establishments	4.36, 0.71 High	3.67, 0.91 Normal	4.13, 0.58 Normal
7. Participates in talks or discussions about climate change or any environmental issue	4.30, 0.70 High	3.65, 0.86 Normal	4.03, 0.82 Normal
8. Develops strong relationships with suppliers	4.42, 0.66 High	4.21, 0.62 High	4.13, 0.62 Normal
Over-all	**4.37, 0.65 High**	**3.94, 0.53 Normal**	**4.13, 0.70 Normal**

Mean Range and its Interpretation: 1.81 – 2.60 Very Low Extent (Anticipation); 2.61 – 3.40 Neutral (Anticipation); 3.41 – 4.20 Normal Resilience (Adaptability); 4.21 – 5.00 High Extent of Resilience (Recovery)

Table 9 presents the extent of business resilience of three airline companies in terms of external support and linkages, a critical attribute of overall business resilience. The eight-item constructs described how effectively each airline company maintained relationships with external entities. The overall mean scores showed that Airline B received the lowest rating, with a mean of 3.94 and a standard deviation of 0.54, indicating a normal extent of resilience. This suggested that their external support practices were adaptive but could have been further strengthened. Airline C followed with a mean score of 4.13 and a standard deviation of 0.70, also reflecting a normal extent of resilience, implying that their practices were managed adequately but could have benefited from greater robustness. In contrast, Airline A had the highest overall rating of 4.37, with a standard deviation of 0.65, signifying a high extent of resilience. This suggested that Airline A's external support systems were well-developed and capable of providing a strong and effective response during emergencies.

Among the eight constructs, the lowest-rated items for each airline highlighted specific areas for improvement. For Airline A, the lowest score was in sourcing expert assistance concerning disaster preparations in times of need, with a mean of 4.25 and a standard deviation of 0.65. Although this score still represented a high extent of resilience, it indicated that there was room to enhance expert collaboration to further strengthen disaster preparedness. Airline B's lowest rating was in participation in talks or discussions about climate change or any environmental issue, with a mean of 3.65 and a standard deviation of 0.86. This normal

extent of resilience suggested that while there was some level of environmental engagement, a more proactive approach was necessary to achieve greater resilience. Airline C received equal scores in three areas: being well supported by the local community, participating in environmental discussions, and sourcing expert disaster assistance, each with a mean of 4.03. These scores indicated a normal extent of resilience, reflecting adequate but not exemplary coordination and community engagement.
The lowest ratings across these constructs emphasized potential gaps in how each airline managed external relationships and coordination, which were crucial for effective emergency response. Weaknesses in sourcing expert assistance, securing community support, and engaging in environmental discussions may have hindered the airlines' ability to respond swiftly and efficiently in crisis situations. As highlighted by Rahman and Rahman (2013), managing both internal and external synchronization was essential at national and international levels. This approach should have been participatory and involved all stakeholders to ensure comprehensive and effective disaster management.

The results from Table 9 underscored that while all three airlines had established some degree of external support and linkages, only Airline A had reached a high extent of resilience. For Airlines B and C, addressing the lower-scoring areas could have led to significant improvements. By enhancing disaster preparedness, increasing community support, and engaging more actively in environmental initiatives, these airlines could have created a more resilient framework for handling emergencies.

Table 10 Extent of Business Resilience of Three Airline Companies in Terms of Communication & Media

	Mean and SD		
	Airline A (n=73)	Airline B (n=48)	Airline C (n=38)
1. Utilizes social media as a tool to disseminate information regarding risks	4.44, 0.55 High	3.75, 0.93 Normal	4.18, 0.56 Normal
2. Utilizes technology in monitoring and assessing the extent of the damage of the disasters/crisis	4.41, 0.57 High	3.90, 0.93 Normal	3.95, 0.98 Normal
3. Handles the communication channels of the organization effectively	4.44, 0.55 High	3.85, 0.85 Normal	2.92, 1.30 Normal
4. Formulates quick decision-making protocols in times of disasters/crisis	4.47, 0.55 High	3.96, 0.65 Normal	4.13, 0.81 Normal
5. Get essential updates regarding impending disasters from the Internet	4.27, 0.61 High	3.96, 0.74 Normal	4.26, 0.64 High
Over-all	**4.41, 0.57 High**	**3.88, 0.65 Normal**	**3.89, 0.86 Normal**

Mean Range and its Interpretation: 1.81 – 2.60 Very Low Extent (Anticipation); 2.61 – 3.40 Neutral (Anticipation); 3.41 – 4.20 Normal Resilience (Adaptability); 4.21 – 5.00 High Extent of Resilience (Recovery).

Table 10 presents the extent of business resilience among three airline companies in terms of Communication and Media. The overall ratings revealed that Airline A achieved the highest resilience level, with a mean of 4.41 and a standard deviation of 0.57, signifying a high extent of resilience in the recovery phase. This indicated that Airline A had robust and well-established communication strategies for crisis situations. In contrast, Airline C, with a mean score of 3.89 and a standard deviation of 0.86, and Airline B, with a mean of 3.88 and a standard deviation of 0.65, both showed a normal extent of resilience. This classification fell under adaptability, suggesting that while communication practices were effective, there was room for improvement to reach higher resilience levels.

Among the five specific constructs analyzed, Airline A's lowest rating was 4.27, with a standard deviation of 0.61, in the area of obtaining essential updates regarding impending disasters from the internet. Despite this being the lowest score for Airline A, it still represented a high extent of resilience, indicating that while effective, their internet-based information strategies could have been further enhanced. Airline B had its lowest score of 3.75 and a standard deviation of 0.93 for utilizing social media to disseminate risk information, falling into the normal resilience category. This suggested that their use of social media was functional but could have been improved to strengthen crisis communication. Airline C had its lowest score in handling organizational communication channels effectively, with a mean of 2.92 and a standard deviation of 1.30, which reflected a very low extent of resilience. This indicated a significant gap in internal communication management that required immediate attention to boost their overall crisis response capabilities.

The three lowest-rated constructs highlighted areas where each airline could have enhanced their communication strategies. For instance, improving how social media and internet resources were used to share crucial updates and how internal communication channels were managed could have greatly influenced overall resilience. These areas were critical for building robust crisis

management frameworks, as effective communication with credible sources and stakeholders, including the media, was vital for managing risks. Nicholls (2012) emphasized that organizations needed to develop solid relationships with the media and other stakeholders to efficiently disseminate information during crises.

The survey results underscored the importance of strengthening communication and media practices to improve business resilience. While Airline A showed commendable strength, Airlines B and C needed to focus on enhancing their protocols for risk communication, internal coordination, and the use of digital resources. Addressing these gaps would not only have enhanced each airline's crisis response but also contributed to greater organizational stability and resilience.

Table 11 Mean and Standard Deviation of the Five Attributes of Business Resilience by Group of Respondents of Airlines A, B, and C

			Mean	SD	Mean; SD		
		n			Airline A	Airline B	Airline C
1. Institutional Control	Manager	24	4.30	.66	4.63; .58 (n=9) High	3.84; .62 (n=10) Normal	4.25; .21 (n=5) High
	Rank-in-file	135	4.50	.55	4.70; .39 (n=64) High	4.12; .66 (n=38) Normal	4.07; .37 (n=33) Normal
2. Planning and preparedness	Manager	24	4.15	.56	4.39; .45 (n=9) High	3.86; .61 (n=10) Normal	4.60; .20 (n=5) High
	Rank-in-file	135	4.14	.52	4.36; .42 (n=64) High	3.86; .54 (n=38) Normal	4.45; .45 (n=33) High
3. Philosophy & integrity	Manager	24	4.11	.55	4.35; .50 (n=9) High	3.84; .58 (n=10) Normal	4.24; .34 (n=5) High
	Rank-in-file	135	4.15	.49	4.32; .44 (n=64) High	3.86; .54 (n=38) Normal	4.17; .38 (n=33) Normal
4. External support & linkages	Manager	24	4.25	.48	4.54; .43 (n=9) High	4.03; .45 (n=10) Normal	4.15; .41 (n=5) Normal
	Rank-in-file	135	4.18	.53	4.35; .48 (n=64) High	3.92; .55 (n=38) Normal	4.13; .48 (n=33) Normal
5. Communication & media	Manager	24	4.23	.67	4.67; .41 (n=9) High	3.92; .76 (n=10) Normal	4.04; .50 (n=5) Normal
	Rank-in-file	135	4.11	.55	4.37; .44 (n=64) High	3.87; .63 (n=38) Normal	3.87; .41 (n=33) Normal

Mean Range and its Interpretation: 1.81 – 2.60 Very Low Extent (Anticipation); 2.61 – 3.40 Neutral (Anticipation); 3.41 – 4.20 Normal Resilience (Adaptability); 4.21 – 5.00 High Extent of Resilience (Recovery)

Table 11 shows the extent of business resilience in terms of five attributes across three aviation companies, as reported by the respondents from Airline A, B, and C.

In Airline A, for institutional control, it was revealed that rank-and-file employees reported a higher mean score (M = 4.50, SD = 0.55) compared to managers (M = 4.30, SD = 0.66), placing both groups in the "High Extent of Resilience" category during the recovery phase (4.21 – 5.00). This outcome suggested that both employee groups had a strong perception of resilience when it came to institutional control. These findings resonated with recent literature on organizational resilience. For instance, Ilseven and Puranam (2021) highlighted the importance of quantifying organizational resilience as a performance measure, advocating for the use of well-defined metrics to gauge resilience within organizations.
For planning and preparedness, ratings were also within the recovery phase. Rank-and-file employees in Airline A (M = 4.36, SD = 0.42) rated slightly lower than managers, though still within the recovery range. In philosophy and integrity, rank-and-file respondents from Airline A (M = 4.32, SD = 0.44) had higher ratings compared to managers within the recovery phase.

Managers at Airline A evaluated institutional control of business resilience—particularly in areas like external support and linkages and communication and media—with higher "High Extent of Resilience" ratings compared to rank-and-file employees. This disparity was reflected in the mean and standard deviation values, indicating that managers perceived the organization's resilience

efforts more positively than the rank-and-file staff. This perceptual gap aligned with the findings of Kokubun, Ino, and Ishimura (2023), who explored how employees' perceptions of organizational resilience influenced their behavior and adherence to practices during the COVID-19 pandemic. The critical impact of institutional resilience in shaping organizational behavior and operations was evident in these findings.

The qualitative responses from both managers and rank-and-file employees further illuminated these statistical differences. Key Informant #1 (Manager) remarked, "The process of administered repair requests is coordinated yet flexible and can be tailored to accommodate immediate needs." This highlighted the management's confidence in the organization's adaptability and swift response mechanisms—key components of institutional control in resilience.

Similarly, Key Informant #2 (Manager) stated, "We do the drill every 2 weeks—ensuring that everyone from the building will follow the procedure in case of earthquakes," and Key Informant #3 (Manager) added, "We are doing regular drills in the office to ensure everyone knows what to do when earthquakes strike the building." These statements underscored the proactive measures taken by management to instill a culture of preparedness and regular practice, reinforcing their high ratings of resilience.

On the other hand, rank-and-file employees provided insights that reflected their operational experiences with the organization's resilience initiatives. Key Informant #10 (Rank-and-File) observed, "The risk mitigating officers know the steps to form and shape disaster and risk control activities. How to convene people from different departments and assign action to each of their respective departments." This suggested that while employees recognized the structured risk management processes, they may have felt one step removed from the strategic planning, potentially contributing to their slightly lower ratings.

Key Informant #11 (Rank-and-File) noted, "There are forums where higher management is involved during typhoons—this focuses the attention of each department head so that everyone gets updates." This indicated effective communication channels during crises but also highlighted that information dissemination was top-down, which might have affected employees' perceptions of resilience planning.

Furthermore, Key Informant #12 (Rank-and-File) mentioned, "We conduct earthquake drills here regularly along with fire-fighting training for flight crews." While this demonstrated active participation in preparedness activities, it might have reflected a routine engagement rather than a deeper involvement in resilience strategy, influencing their perception as reflected in the mean and standard deviation values.

These qualitative insights suggested that while managers were deeply involved in both the strategic and operational aspects of resilience—leading to higher evaluations—the rank-and-file employees experienced resilience initiatives primarily through drills and communications without as much involvement in planning. This could explain the perceptual gap indicated by the statistical data.

The convergence of both quantitative (mean and standard deviation differences) and qualitative data underscored the importance of bridging this perceptual gap. Enhancing engagement with rank-and-file employees in resilience planning and decision-making processes could elevate their perception of institutional resilience. This holistic approach aligned with Kokubun et al.'s (2023) findings and reinforced the idea that when all levels of an organization are actively involved and perceive resilience efforts positively, it strengthens overall organizational behavior and operations.

Furthermore, the results of the study were further supported by the responses from the Airline A key informants from both groups, whose feedback corroborated the findings as shown above.

Key Informant #1 (Manager) stated, "The process of administered repair requests is coordinated yet flexible and can be tailored to accommodate immediate needs." This statement suggested that the organization is highly adaptable to immediate needs, a characteristic of high resilience in institutional control.

Key Informant #2 (Manager) remarked, "We do the drill every 2 weeks – ensuring that everyone from the building will follow the procedure in case of earthquakes."

Key Informant #3 (Manager) added, "We are doing regular drills in the office to ensure everyone knows what to do when earthquakes strike the building."

Key Informant #10 (Rank-and-File) responded, "The risk mitigating officers know the steps to form and shape disaster and risk control activities. How to convene people from different departments and assign action to each of their respective departments." Key Informant #11 (Rank-and-File) noted, "There are forums where higher management is involved during typhoons—this focuses the attention of each department head so that everyone gets updates."

Key Informant #12 (Rank-and-File) explained, "We conduct earthquake drills here regularly along with fire-fighting training for flight crews."

Despite the high level of resilience indicated in terms of institutional control, some areas revealed a need for improvement due to gaps in organizational processes identified by the respondents.

For instance, Key Informant #10 (Rank-and-File) stated, "There are crisis management committees that are formed every time there is a disaster affecting operations." While this demonstrated a structured approach to crisis management, it suggested that these committees are only established during disasters. This implied that preparation and resilience efforts might not be as robust during non-crisis periods, indicating an opportunity for the organization to adopt more proactive and continuous crisis management strategies.

Similarly, Key Informant #12 (Rank-and-File) explained, "We conduct earthquake drills here regularly along with fire-fighting training for flight crews. Training covers various aspects—from personal development training to IOSA or IATA training organized by HR—even IT training. There are crisis management meetings involving executive committees and downline managers. These meetings monitor operations until everything returns back to normal." While these practices showed active participation in preparedness activities, they seemed to focus on reactive measures aimed at restoring normal operations rather than fostering a continual process of adapting and improving resilience. This suggested a need for improvement in continuous resilience-building efforts.

Overall, Airline A exhibited a high extent of resilience across all attributes—including institutional control, planning and preparedness, philosophy and integrity, external support and linkages, and communication and media during crises—as highlighted by the regular drills, preparedness forums, and structured responses from both managers and rank-and-file employees. This observation aligned with the findings of Hillmann and Guenther (2021), who emphasized that proactive and continuous resilience strategies enhance an organization's ability to adapt and thrive during crises. They argued that addressing identified gaps and involving all organizational levels in resilience planning significantly strengthened overall resilience. Similarly, Burnard and Bhamra (2019) highlighted the role of continuous improvement and employee engagement in resilience efforts. Their research suggested that organizations fostering a culture of resilience through ongoing training and inclusive decision-making processes are better equipped to handle disruptions.

By incorporating these approaches, addressing the identified gaps, and fostering more proactive and continuous resilience strategies, Airline A could further strengthen its overall resilience, ensuring it remains robust in the face of future challenges.
Key Informant #10 (Rank-and-File): "There are crisis management committees that are formed every time there is a disaster affecting operations."

Key Informant #12 (Rank-and-File): "We conduct earthquake drills here regularly along with fire-fighting training for flight crews. Training covers various aspects—from personal development training to IOSA or IATA training organized by HR—even IT training. There are crisis management meetings involving executive committees and downline managers. These meetings monitor operations until everything returns back to normal."

For Airline B, both managers and rank-and-file employees rated all five attributes of resilience within the "Normal Resilience" range (3.41 – 4.20). Managers consistently rated these attributes slightly higher, particularly in Institutional Control and External Support & Linkages, suggesting a more favorable perception of these areas. However, both groups agreed on the general adequacy of the organization's resilience, acknowledging room for improvement in specific areas like preparedness and communication.

The qualitative responses from key informants reinforced these quantitative findings. Key Informant #4 (Manager) stated, "The project team members are adequate, managing 5-6 projects each. Our Director projects next year's needs, and CAPEX participation from all departments is required." This highlighted effective project management and strategic planning, aligning with the higher managerial ratings in institutional control.

Similarly, Key Informant #5 (Manager) noted, "Sufficient operations team members. We transferred the hub to Clark, outsourcing some roles, but maintained flight schedules." Key Informant #6 (Manager) added, "Handling system enhancements, and adapting

to WFH during the pandemic. Meetings and project sign-offs are digital now." These responses demonstrated operational flexibility and resource management, supporting the perception of strong institutional control and adaptability to change, and reflected the organization's adaptability and technological integration, further corroborating the managers' positive ratings.

These responses highlighted strong project management, adaptability to change, and operational flexibility—key aspects of both Institutional Control and External Support & Linkages. The alignment between the qualitative feedback and the quantitative data suggested that while managers perceived the organization's resilience favorably, both managers and employees recognized the need for improvement in areas such as preparedness and communication.

By integrating these qualitative insights with the quantitative results, it becomes evident that Airline B has a solid foundation in resilience attributes but could benefit from enhancing specific areas to achieve a higher level of resilience. This feedback aligned with the study's findings and underscored the importance of continuous improvement and proactive strategies in organizational resilience.

The recognition of the need for improvements in preparedness and communication areas aligns with literature on resilience, emphasizing that ongoing enhancements in communication channels, preparedness drills, and engagement strategies can significantly elevate an organization's ability to adapt and recover from disruptions. By focusing on these areas, Airline B can further strengthen its resilience framework, creating a more robust response mechanism for future challenges.

Key Informant #4 (Manager): "The project team members are adequate, managing 5-6 projects each. Our Director projects next year's needs, and CAPEX participation from all departments is required."

Key Informant #5 (Manager): "Sufficient operations team members. We transferred the hub to Clark, outsourcing some roles, but maintained flight schedules."

Key Informant #6 (Manager): "Handling system enhancements, and adapting to WFH during the pandemic. Meetings and project sign-offs are digital now."

For External Support & Linkages, both managers (M = 3.92, SD = 0.65) and rank-and-file employees from Airline C (M = 3.87, SD = 0.63) rated this attribute in the Normal Resilience range, with managers giving it a slightly higher rating. The qualitative responses support this finding:

Key Informant #4 (Manager) mentioned, "We participated in government vaccine supply efforts throughout provinces via air shipments," showing active engagement in external collaborations for critical initiatives. This indicates that while Airline C is involved in external support efforts, it focuses on specific, operationally driven collaborations rather than broad community engagement.

However, Key Informant #5 (Manager) stated, "I have never engaged with the local community," reflecting limited external community involvement at the managerial level. This response indicates that while the airline may be participating in key partnerships, the scope of such engagements may be narrow or more reactive than proactive.

On the rank-and-file side, Key Informant #13 (Rank-and-file) remarked, "For expert assistance in ground incidents, there is an airport emergency rescue team...," indicating that external support is available during emergencies, but it is more functional in nature, focused primarily on operational incidents.

Key Informant #14 (Rank-and-file) also noted, "Our quality and HR teams get the latest updates from the Pasay government...," reflecting ongoing communication with external authorities but limited proactive engagement in the broader community. This suggests that while external communication is maintained, it may not be extensive or deeply embedded in daily practices.

These responses reflect support systems in crises but indicate limited community engagement. While responses from Airline B show strong institutional control and external support and linkages with adaptability, there appears to be a reactive disaster management approach and limited external engagement in certain areas. These observations align with the study's results and reinforce the notion that while institutional control and external linkages are present, there is still room for growth in proactive and holistic engagement with both communities and external partners.

Wieland and Wallenburg (2020) emphasized that institutional control within organizations plays a crucial role in ensuring adaptive resilience. Their study focuses on how clear internal controls can enhance organizations' ability to manage disruptions and increase responsiveness during crises. This principle is reflected in the responses from Airline C, where internal controls and external support are acknowledged but could benefit from broader, more integrated engagement strategies.

These findings align with the Normal Resilience ratings in Airline C's table for both Institutional Control and External Support & Linkages. While both groups acknowledge the adequacy of the organization's resilience in these areas, the slightly higher ratings from managers suggest that they perceive these attributes more favorably. The qualitative responses indicate that while Airline C has strengths in institutional control and external support systems, there are gaps in areas such as disaster mitigation, community engagement, and preparedness.

By integrating both quantitative and qualitative insights, it becomes evident that Airline C could enhance its external support and linkages by expanding its community engagement efforts, focusing on proactive rather than reactive measures, and improving disaster preparedness strategies. This approach would ensure that Airline C not only strengthens its existing support systems but also increases its capacity to handle a wider range of disruptions and crises, thus enhancing its overall resilience framework.
Key Informant #4 (Manager): "We form disaster committees when needed and evacuate aircraft if necessary. Guided by community lockdowns."

Key Informant #4 (Manager): "Participated in vaccine shipments and government collaborations during the pandemic."

Key Informant #5 (Manager): "No engagement with the local community."

Key Informant #6 (Manager): "Flexible rebooking options for passengers with no time limit."

Key Informant #13 (Rank-and-files): "For expert assistance in ground incidents, there is an airport emergency rescue team, and there are also OEMs from ATR or Airbus."

Key Informant #13 (Rank-and-files): "There have been talks with the local community, especially regarding coordination with employees who tested positive; this has been reported to the local community."

Key Informant #13 (Rank-and-files): "We don't have anything like this yet, but there are plans for the future."

Key Informant #14 (Rank-and-files): "I don't have much information about this; it falls under engineering or management."

Key Informant #14 (Rank-and-files): "Our quality and HR teams get the latest updates from the Pasay government and Pampanga to know the requirements for personnel going onsite and to allow them to pass through checkpoints or city boundaries to get to work and ensure continuous service for stranded passengers. This also applies to reporting infected ground staff."

Key Informant #14 (Rank-and-files): "I don't know anything about this; it's handled by the higher-ups."

Key Informant #15 (Rank-and-files): "There are airport responders during emergency situations; they are the first group to assist airlines during disasters. However, for minor flooding incidents, we respond ourselves."

Key Informant #15 (Rank-and-files): "During the pandemic, local Pasay government quarantined our group whenever someone tested positive."

Key Informant #15 (Rank-and-files): "I don't have much information about this; it's handled by others above me."
For Airline C in table 11, on planning and preparedness, managers had rated it 4.60 (SD = 0.20), and rank-and-file employees had rated it 4.45 (SD = 0.45), both in the High Resilience range, with managers rating it more favorably. For Philosophy & Integrity, managers had rated it 4.24 (SD = 0.34), and rank-and-file employees had rated it 4.17 (SD = 0.38), both in the Normal Resilience range, suggesting room for improvement. For External Support & Linkages, managers had rated it 4.25 (SD = 0.21), while rank-and-file employees had rated it 3.87 (SD = 0.41), indicating a difference in perception, with managers rating it higher. For Communication & Media, managers had rated it 4.04 (SD = 0.50), and rank-and-file employees had rated it 3.87 (SD = 0.41), both in the Normal Resilience range, suggesting communication gaps at the rank-and-file level.

For Institutional Control, both rank-and-file employees and managers in Airline C had rated it within the High Resilience category, with managers giving it a slightly higher rating, indicating a stronger perception of control processes. The interview responses had

further supported these findings on Institutional Control: Key informant #7 (Manager) had stated, "If the company acquires more aircraft, they need more flight crews. They invest in training like IATA and safety-related modules, especially for flight crews and IT who maintain our systems and portals." This had demonstrated strong institutional control through training and personnel management, ensuring the organization was prepared for growth and operational demands. Additionally, Key informant #8 (Manager) had noted, "We ensure we have an adequate number of check-in agents and ground personnel to eliminate delays," which had highlighted effective staffing control to avoid operational disruptions. Moreover, Key informant #9 (Manager) had shared, "We don't hire outside help; everyone participates in disaster and risk mitigation actions," reflecting a self-sufficient approach to disaster preparedness where internal teams played a critical role in ensuring the organization's resilience.

Regarding Planning for Preparedness, both groups had rated it within the High Resilience range, with managers rating it more favorably, suggesting they had seen the airline as better prepared for potential disruptions. Key informant #16 (Rank-and-file) had confirmed this with the statement, "The work in our group is manageable... even during the pandemic, we were able to do our jobs." This response had underscored the adaptability of the workforce and the airline's ability to maintain operations under challenging circumstances, further supporting the perception of strong preparedness within the organization.
The interview responses had further supported the findings of the study on Institutional Control.

Key informant #7 (Manager): "If the company acquires more aircraft, they need more flight crews. They invest in training like IATA and safety-related modules, especially for flight crews and IT who maintain our systems and portals." This indicated strong institutional control through training and personnel management.

Key informant #8 (Manager): "We ensure we have an adequate number of check-in agents and ground personnel to eliminate delays."

Key informant #9 (Manager): "We don't hire outside help; everyone participates in disaster and risk mitigation actions."

Key informant #16 (Rank-and-file): "The work in our group is manageable... even during the pandemic, we were able to do our jobs."

For Planning for Preparedness, both managers and rank-and-file employees at Airline C had rated the attribute within the High Resilience range, with managers rating it more favorably. The responses from key informants had supported this, highlighting the organization's focus on training and disaster preparedness. Key informant #9 (Manager) had mentioned, "The company invests in training, especially in quality and safety training for the same team and flight operations members," indicating that managers had prioritized training as a core aspect of preparedness to ensure their teams were well-prepared for any disruptions.

On the rank-and-file side, Key informant #18 (Rank-and-file) had shared, "HR conducts training about the virus and how to avoid it... and there are also emails with reminders on what to do during disasters like floods or dengue." This showed that rank-and-file employees were also involved in training programs aimed at maintaining operational continuity during emergencies. Additionally, Key informant #17 (Rank-and-file) had added, "Yes, ma'am, and I am a member of the company's GABAY volunteer group... because, ma'am, that's where the employees who are members are there to sleep in case of disaster events – at the crash site." This indicated the airline's commitment to disaster preparedness, with employees actively participating in emergency response efforts.

These responses demonstrated that both managers and rank-and-file employees were engaged in a proactive approach to planning for preparedness, with some differences in perception, likely due to the closer involvement of managers in decision-making and training initiatives.
The key informants' responses had aligned with the discussion above.

Key informant #9 (Manager): "The company invests in training, especially in quality and safety training for the same team and flight operations members."

Key informant #18 (Rank-and-file): "HR conducts training about the virus and how to avoid it... and there are also emails with reminders on what to do during disasters like floods or dengue."

Key informant #17 (Rank-and-file): "Yes, ma'am, and I am a member of the company's GABAY volunteer group... because, ma'am, that's where the employees who are members are there to sleep in case of disaster events – at the crash site."

In terms of Philosophy & Integrity of Airline C, both managers and rank-and-file employees had rated the attribute in the Normal Resilience range, indicating positive perceptions of the organization's ethical practices, though there had been room for improvement. The responses from key informants had provided further insight into these perceptions. Key informant #7 (Manager) had shared, "We didn't receive cash assistance; only onsite personnel received assistance, which I think is good enough," suggesting that while the company had provided support during crises, it had been limited to onsite staff, indicating a potential gap in providing assistance to all employees. Similarly, Key informant #8 (Manager) had stated, "Teams are supported with financial assistance when reporting onsite," highlighting the company's commitment to supporting onsite staff, but this support may not have been equally extended to others. Key informant #9 (Manager) had added, "There were HR efforts to fund employees without onsite duties by giving leave credits," indicating that the company had made efforts to support employees who couldn't be on-site, although this solution may not have been universally applicable to all situations.

On the rank-and-file side of Airline C, Key informant #16 (Rank-and-file) had mentioned, "They offered rebooking of flights for passengers whose flights were canceled," which reflected the company's integrity in ensuring passenger satisfaction during disruptions. Finally, Key informant #18 (Rank-and-file) had shared, "I think the company is showing that they care for us during times of crisis, in whatever way they can," demonstrating that employees had felt valued and supported during challenging times. While these responses had indicated that the company's ethical practices were perceived positively, they also suggested that there had been room for improvement in providing more equitable and inclusive support, especially for offsite or non-operational employees who worked from home.

In addition, the study's outcomes had been validated by the feedback from the key informants during the interview process.

Key informant #7 (Manager): "We didn't receive cash assistance; only onsite personnel received assistance, which I think is good enough."

Key informant #8 (Manager): "Teams are supported with financial assistance when reporting onsite."

Key informant #9 (Manager): "There were HR efforts to fund employees without onsite duties by giving leave credits."

Key informant #16 (Rank-and-file): "They offered rebooking of flights for passengers whose flights were canceled."

Key informant #18 (Rank-and-file): "I think the company is showing that they care for us during times of crisis, in whatever way they can."

Finally, for Communication & Media, both managers and rank-and-file employees in Airline C had rated it within the Normal Resilience range, with managers perceiving communication systems more positively, suggesting some gaps in internal communication effectiveness at the rank-and-file level. The responses from key informants had supported this conclusion. Key informant #7 (Manager) had mentioned, "Announcements are made over our Facebook account, official website, and Instagram," highlighting that managers had utilized multiple platforms to communicate important updates to a wide audience.

Similarly, in Airline C, Key informant #8 (Manager) had shared, "We use Viber for ground operations, emails, and meetings over Google Meet," reflecting the use of modern communication tools to keep the teams connected and engaged. Key informant #9 (Manager) had added, "We cite government memorandums and check different protocols from other stations that may affect our incoming and outgoing passengers," indicating that managers had ensured communication channels were used to stay informed about external factors that could impact operations.

On the rank-and-file side of Airline C, Key informant #16 (Rank-and-file) had stated, "I believe there are communication channels like Viber and email, as well as Facebook, similar to other airlines," suggesting that rank-and-file employees were aware of the communication tools available but may not always have had consistent access. However, Key informant #18 (Rank-and-file) had noted, "Updates come from our Supervisor and some via HR emails, but not frequently," highlighting that rank-and-file employees had felt they had less access to regular, effective communication compared to managers, which underscored a potential gap in communication effectiveness at the employee level. This suggested that while communication tools were in place, there may have been inefficiencies or gaps in how often and how effectively information was shared with rank-and-file employees.

The study's conclusions had been further supported by the information gathered from the key informants of Airline C from two groups during the interview process.

Key informant #7 (Manager): "Announcements are made over our Facebook account, official website, and Instagram."

Key informant #8 (Manager): "We use Viber for ground operations, emails, and meetings over Google Meet."

Key informant #9 (Manager): "We cite government memorandums and check different protocols from other stations that may affect our incoming and outgoing passengers."

Key informant #16 (Rank-and-file): "I believe there are communication channels like Viber and email, as well as Facebook, similar to other airlines."

Key informant #18 (Rank-and-file): "Updates come from our Supervisor and some via HR emails, but not frequently." This suggested that rank-and-file employees felt they had less access to regular, effective communication, highlighting a potential gap in communication effectiveness.

The qualitative responses aligned with the Normal Resilience ratings for both Philosophy & Integrity and Communication & Media. Both managers and rank-and-file employees at Airline C viewed the company's ethical practices and communication positively, but there were clear gaps in communication effectiveness, particularly at the rank-and-file level. These findings suggested that while the company had strategies in place to support employees, there was still room for improvement in communication and clarity across all levels.

Supporting this, Hargie (2016) emphasized that effective communication is central to an organization's success and employee engagement, stressing that communication systems should be inclusive and accessible at all levels. Similarly, Sarpong (2023) highlighted the importance of transparent communication for leadership, noting that inclusive practices foster an environment where employees feel valued and informed. Winters (2020) also underscored that organizational well-being relies on clear and inclusive communication, which is crucial for building trust and ensuring an equitable work environment. Furthermore, Training Industry (2023) stressed that effective communication supports DEI (Diversity, Equity, and Inclusion) initiatives, which are essential for organizational success in diverse environments.

These perspectives indicated that Airline C would benefit from strengthening its communication strategies, particularly in ensuring equitable support across all levels and fostering greater clarity within internal communication. By doing so, the company could enhance employee engagement, increase operational efficiency, and further improve its organizational resilience.

3.1.3 (SOP #3) Extent of Efficiency of Business Processes of Aviation Companies in Times of Uncertainties (Pandemic, Force Majeure, and Emerging Issues) as Assessed by Managers and Rank-and-File Employees in Four Areas

Table 12 Efficiency of Business Processes of Airlines A, B, and C in Terms of Facility Management

	Mean and SD		
	Airline A	Airline B	Airline C
1. Physical facilities management	3.33, 0.65 Very Efficient	3.25, 0.56 Very Efficient	3.24, 0.49 Efficient
2. Response to repair/servicing request (internal customer service	3.27, 0.71 Very Efficient	3.13, 0.70 Efficient	3.21, 0.66 Efficient
3. Office/plant /area security system	3.32, 0.57 Very Efficient	3.06, 0.73 Efficient	3.39, 0.79 Very Efficient
4. Budget allocation	3.30, 0.57 Very Efficient	2.98, 0.79 Efficient	3.21, 0.81 Efficient
Over-all	**3.30, 0.63 Very Efficient**	**3.10, 0.58 Efficient**	**3.26, 0.69 Very Efficient**

***Mean Range and its Interpretation:** 1.00 – 1.74 Not Efficient/Reject; 1.75 – 2.49 Less Efficient/Accepted with major condition (Initial); 2.50 – 3.24 Efficient (Managed); 3.25 – 4.00 Very Efficient (Standardized)*

Table 12 provides the efficiency ratings of facility management within the business processes of Airlines A, B, and C, based on four item indicators. The overall mean scores showed that Airline A (M = 3.30, SD = 0.63) had achieved the highest rating, followed by Airline C (M = 3.26, SD = 0.69) and Airline B (M = 3.10, SD = 0.58). These overall scores indicated a "Managed" to "Very Efficient" level of efficiency, where Airline A and Airline C fell within the "Very Efficient" (Standardized: 3.25 – 4.00) range, and Airline B was in the "Efficient" (Managed: 2.50 – 3.24) range.

Analyzing individual indicators, Airline A had its lowest rating in "Response to repair/servicing request (internal customer service)," scoring 3.27 (SD = 0.71), which was categorized as "Very Efficient," where the response of servicing from admins was standardized. Airline B's lowest-rated area was "Budget allocation," with a mean of 2.98 (SD = 0.79), placing it in the "Efficient" range. This meant budget allocation was managed. For Airline C, the lowest scores were for both "Response to repair/servicing request (internal customer service)" and "Budget allocation," each with a mean of 3.21 (SD = 0.66 and 0.81, respectively), also falling within the "Efficient" range, meaning these processes were managed.

These interpretations revealed areas where performance could be improved. The "Managed" level of efficiency indicated that processes like budget allocation and response to repair requests were functional but could have benefited from enhancements to reach a "Standardized" level of efficiency. The standardized ratings reflected a higher level of effectiveness and should have been maintained consistently to ensure optimal facility management.

Facility management, as defined by the International Facility Management Association (IFMA) and ISO, integrated people, place, and processes to promote productivity and improve quality of life in the work environment. If areas such as budget allocation and internal service response had remained at the "Managed" level, it could have compromised overall business continuity and resilience. Therefore, reassessing and optimizing these functions was crucial to elevate them to a "Standardized" level of efficiency, ensuring robust support for core business operations.

Table 13 Extent of Efficiency of Business Processes of Airline Companies in Terms of Health, Wellness, and Safety

	Mean and SD		
	Airline A	Airline B	Airline C
1. Frequency of onsite disinfection	3.30, 0.57 Very Efficient	2.94, 0.64 Efficient	3.00, 0.74 Efficient
2. Allocation of medical supplies (e.g., vitamins, alcohols, etc.)	3.40, 0.64 Very Efficient	3.02, 0.64 Efficient	2.92, 0.59 Efficient
3. Wellness program	3.40, 0.62 Very Efficient	2.94, 0.63 Efficient	3.03, 0.85 Efficient
4. Communication to medical personnel	3.33, 0.67 Very Efficient	3.10, 0.63 Efficient	3.24, 0.88 Efficient
5. Shuttle/carpooling service	3.36, 0.67 Very Efficient	2.13, 1.10 Less Efficient	3.13, 0.78 Efficient
6. Collaboration/meeting space allocation	3.36, 0.65 Very Efficient	2.75, 0.84 Efficient	3.11, 0.69 Efficient
Over-all	**3.36, 0.64 Very Efficient**	**2.81, 0.61 Efficient**	**3.07, 0.75 Efficient**

***Mean Range and its Interpretation**: 1.00 – 1.74 Not Efficient/Reject; 1.75 – 2.49 Less Efficient/Accepted with major condition (Initial); 2.50 – 3.24 Efficient (Managed); 3.25 – 4.00 Very Efficient (Standardized)*

The efficiency of business processes related to Health, Wellness, and Safety in the three airline companies was evaluated using six key indicators in Table 13, as shown above. These indicators included measures for onsite disinfection, medical resource allocation, wellness programs, communication with medical personnel, shuttle services, and meeting space allocation.

Overall, Airline A scored the highest with a mean of 3.36 and a standard deviation of 0.64, indicating a "Very Efficient" performance at a standardized level. This suggested strong, well-executed processes for maintaining health and safety. Airline C followed with a mean score of 3.07 and a standard deviation of 0.75, classified as "Efficient," reflecting that their processes were well-managed but could have been enhanced for greater effectiveness. Airline B, with the lowest overall score of 2.81 and a standard deviation of 0.61, also fell into the "Efficient" category, showing that while their practices were functional, there was considerable room for improvement to reach a standardized level of efficiency.

Examining individual items, Airline A's lowest score was in the frequency of onsite disinfection, with a mean of 3.30 and a standard deviation of 0.57. Even as the lowest score for this airline, it still signified a "Very Efficient" level, indicating consistent and effective disinfection practices. Airline B received its lowest rating for shuttle/carpooling service, with a mean of 2.13 and a standard

deviation of 1.10, which indicated "Less Efficient" performance, pointing to the need for major improvements. Airline C's lowest rating was for the allocation of medical supplies, with a mean of 2.92 and a standard deviation of 0.59, categorized as "Efficient." This suggested that while the supply management system was adequate, it had the potential to be optimized further.

These results highlighted the need for ongoing improvements, particularly in areas that scored lower, to ensure more robust health and wellness processes. Enhancing efficiency in managed areas, like shuttle services in Airline B, could elevate overall effectiveness and better support the workforce, thereby reinforcing business continuity and resilience.

Table 14 Extent of Efficiency of Business Processes of Airline Companies in Terms of Technology Governance

	Mean and SD		
	Airline A	Airline B	Airline C
1. Cybersecurity implementation	3.48, 0.69 Very Efficient	2.98, 0.67 Efficient	3.26, 0.76 Very Efficient
2. Internet/Cloud space allocation and budgeting	3.45, 0.62 Very Efficient	2.83, 0.69 Efficient	3.29, 0.77 Very Efficient
3. Response of installation/repair/service requests	3.36, 0.67 Very Efficient	3.08, 0.74 Efficient	3.29, 0.73 Very Efficient
4. Accessibility to website and/or portals	3.40, 0.64 Very Efficient	3.00, 0.77 Efficient	3.11, 0.65 Efficient
Over-all	**3.42, 0.66 Very Efficient**	**2.97, 0.59 Efficient**	**3.24, 0.73 Efficient**

***Mean Range and its Interpretation:** 1.00 – 1.74 Not Efficient/Reject; 1.75 – 2.49 Less Efficient/Accepted with major condition (Initial); 2.50 – 3.24 Efficient (Managed); 3.25 – 4.00 Very Efficient (Standardized)*

Table 14 highlights the extent of efficiency of business processes in terms of technology governance among three airline companies. The overall mean scores revealed a range from "Efficient" to "Very Efficient." Airline B, with an overall mean of 2.97 and a standard deviation of 0.59, fell under the "Efficient" category, indicating that while the processes were adequately managed, there was room for improvement. Airline C had a slightly higher overall score of 3.24 and a standard deviation of 0.73, also categorized as "Efficient," suggesting well-managed but not fully optimized processes.

In contrast, Airline A stood out with an overall mean of 3.42 and a standard deviation of 0.66, classified as "Very Efficient." This reflected a standardized level of performance in technology governance, indicating highly effective and well-implemented processes.

When analyzing the four specific constructs, Airline A's lowest score was on the response to installation, repair, or service requests, with a mean of 3.36 and a standard deviation of 0.67. Despite being the lowest for Airline A, this score still signified a "Very Efficient" level, indicating that the response processes were highly effective. Airline B received its lowest rating on internet and cloud space allocation and budgeting, with a mean of 2.83 and a standard deviation of 0.69, categorized as "Efficient." This suggested that while the allocation and budgeting practices were functional, they could have benefited from improvements to reach a higher standard. Airline C had its lowest score on accessibility to websites and portals, with a mean of 3.11 and a standard deviation of 0.65, which was also classified as "Efficient." This reflected a well-managed system that still required some enhancements to achieve full efficiency.

Overall, these results indicated that while all three airlines had established technology governance processes, there were areas where efficiency could be improved. Airline B, in particular, should have focused on enhancing internet and cloud resource management to achieve a more standardized level of efficiency. Similarly, Airline C could have benefited from improving the accessibility of digital platforms. By addressing these areas, the airlines could have better supported operational continuity and maintained high levels of technological governance.

Table 15 Extent of Efficiency of Business Processes of Airline Companies in Terms of People Management

	Mean and SD		
	Airline A	Airline B	Airline C
1. Productivity monitoring	3.33, 0.71 Very Efficient	2.96, 0.82 Efficient	3.24, 0.82 Efficient
2. Incentive system	3.19, 0.72 Efficient	2.83, 0.72 Efficient	3.18, 0.87 Efficient
3. Complaints/counselling system	3.22, 0.67 Efficient	2.98, 0.64 Efficient	3.03, 0.79 Efficient
4. Recruitment	3.40, 0.64 Very Efficient	3.25, 0.81 Very Efficient	3.18, 0.87 Efficient
5. Training and development	3.40, 0.66 Very Efficient	3.23, 0.75 Efficient	3.26, 0.83 Very Efficient
6. Evaluation and promotion	3.36, 0.61 Very Efficient	2.77, 0.86 Efficient	3.21, 0.78 Efficient
Over-all	**3.32, 0.67 Very Efficient**	**3.00, 0.58 Efficient**	**3.18, 0.82 Efficient**

***Mean Range and its Interpretation:** 1.00 – 1.74 Not Efficient/Reject; 1.75 – 2.49 Less Efficient/Accepted with major condition (Initial); 2.50 – 3.24 Efficient (Managed); 3.25 – 4.00 Very Efficient (Standardized)*

Table 15 illustrated the extent of efficiency of business processes in terms of People Management among three airline companies. Overall, Airline A had the highest rating, with a mean score of 3.32 and a standard deviation of 0.67, reflecting a "Very Efficient" level of performance, indicating that their people management practices were highly effective and well-standardized. Following Airline A was Airline C, with an overall mean score of 3.18 and a standard deviation of 0.82, categorized as "Efficient," which suggested that their practices were well-managed but could have been improved to reach a more standardized level of efficiency. Airline B had an overall rating of 3.00 and a standard deviation of 0.58, also classified as "Efficient," demonstrating managed and adequately functional people management processes but indicating the potential for further optimization, particularly in succession planning.

Among the six indicators, Airline A's lowest score was on the incentive system, with a mean of 3.19 and a standard deviation of 0.72. Although this score fell into the "Efficient" category, it highlighted an area where processes could have been further refined to elevate performance to a very efficient, standardized level. Airline B's lowest rating was on evaluation and promotion, scoring 2.77 with a standard deviation of 0.86, also considered "Efficient." This rating implied that while evaluation and promotion systems were in place and functioning, there was room for improvement to make these systems more effective and impactful. Meanwhile, Airline C's lowest rating was for the complaints and counseling system, with a mean score of 3.03 and a standard deviation of 0.67, which was categorized as "Efficient." This score indicated that, while managed well, there was potential for improvement to optimize employee support systems.

These specific areas, identified as having lower efficiency scores, could have served as focal points for human resource management. As discussed in various business management literature, including Schooley (2023), effective people management is crucial for increasing productivity and optimizing business processes. Since people management is a critical component of human resource management, addressing inefficiencies in the incentive system, evaluation and promotion processes, and the complaints/counseling system could have enhanced overall organizational performance.

Table 16 Summary of the Mean and Standard Deviation on Efficiency of the Business Process by Group of Respondents and Airlines

			Mean	SD	Mean; SD		
		n			Airline A	Airline B	Airline C
Facility Management	Manager	24	3.13	.60	3.11; .80 (n=9) Efficient	3.03; .43 (n=10) Efficient	3.35; .52 (n=5) Very Efficient
	Rank-in-file	135	3.25	.53	3.33; .45 (n=64) Very Efficient	3.13; .62 (n=38) Efficient	3.25; .54 (n=33) Very Efficient
Health, wellness & safety	Manager	24	2.95	.57	3.17; .58 (n=9) Efficient	2.68; .57 (n=10) Efficient	3.10; .42 (n=5)
	Rank-in-file	135	3.15	.60	3.38; .48 (n=64) Very Efficient	2.84; .62 (n=38) Efficient	3.07; .62 (n=33) Efficient
Technology governance	Manager	24	3.17	.66	3.33; .70 (n=9) Very Efficient	2.83; .54 (n=10) Efficient	3.55; .48 (n=5) Very Efficient
	Rank-in-file	135	3.26	.61	3.43; .58 (n=64) Very Efficient	3.01; .60 (n=38) Efficient	3.19; .60 (n=33) Efficient
People management	Manager	24	3.08	.53	3.07; .63 (n=9) Efficient	2.95; .47 (n=10) Efficient	3.34; .47 (n=5) Very Efficient
	Rank-in-file	135	3.21	.60	3.35; .52 (n=64) Very Efficient	3.02; .61 (n=38) Efficient	3.16; .66 (n=33) Efficient
Over-all	**Manager**	**24**	**3.07**	**.53**	**3.16; .62 (n=9) Efficient**	**2.86; .46 (n= 10) Efficient**	**3.31; .44 (n=5) Very Efficient**
	Rank-in-file	**135**	**3.21**	**.52**	**3.37; .44 (n=64) Very Efficient**	**2.99; .56 (n=38) Efficient**	**3.16; .53 (n=33) Efficient**

***Mean Range and its Interpretation**: 1.00 – 1.74 Not Efficient/Reject; 1.75 – 2.49 Less Efficient/Accepted with major condition (Initial); 2.50 – 3.24 Efficient (Managed); 3.25 – 4.00 Very Efficient (Standardized)*

Table 16 shows that for Facility Management, rank-and-file respondents from Airline A (M=3.33, SD=0.45) and Airline B (M=3.13, SD=0.62) rated efficiency higher than their respective managers (Airline A: M=3.11, SD=0.80; Airline B: M=3.03, SD=0.43). In Airline C, however, managers rated it higher (M=3.35, SD=0.52) compared to the rank-and-file (M=3.25, SD=0.54). While this supported previous statements, rank-and-file employees from Airline A, such as Key Informant #10, noted that repairs were faster due to "fewer people in the office" but faced "supply issues" during the pandemic. Key Informant #11 highlighted "lack of transportation" and "frozen CAPEX" as significant challenges. In Airline B, Key Informant #13 mentioned that repairs were delayed because "contractors lacked personnel," and Key Informant #14 pointed out budget restrictions, saying only "priority repairs" were addressed. For Airline C, rank-and-file respondents like Key Informant #16 expressed frustration over "long repair times," while managers, such as Key Informant #7, focused on strategic measures like installing "acrylic barriers" for compliance, which could have explained their higher ratings.

For Health, Wellness, and Safety, the ratings from rank-and-file respondents of Airline A (M=3.38, SD=0.46) were higher than their managers' ratings (M=3.17, SD=0.58). In Airline B, both groups rated this attribute similarly, with rank-and-file at M=2.84 (SD=0.82) and managers at M=2.88 (SD=0.57). In Airline C, managers rated the attribute higher (M=3.10, SD=0.42) compared to rank-and-file respondents (M=3.07, SD=0.62). Rank-and-file employees from Airline A, such as Key Informant #12, discussed active disinfection and the use of "Mareve staff" for cleaning, contributing to their positive ratings. Key Informant #11 noted that "medical supplies" were available and regularly replenished. In Airline B, Key Informant #14 shared concerns about limited sanitization supplies, and Key Informant #15 mentioned that some essential items like alcohol were "often running out." Airline C's rank-and-file respondents, such as Key Informant #16, noted that disinfection was less frequent in certain areas, whereas managers like Key

Informant #8 emphasized the implementation of health measures like "counter shields," which may have contributed to their higher ratings.

The analysis of Technology Governance across Airlines A, B, and C revealed varying levels of satisfaction among employees. In Airline A, rank-and-file employees reported higher satisfaction (M=3.43, SD=0.68) compared to managers (M=3.33, SD=0.70). This was reflected in qualitative feedback, with Key Informant #11 expressing contentment with “cloud storage” and the responsiveness of IT support, though Key Informant #12 noted initial “portal issues” during the transition to remote work. Airline B exhibited lower satisfaction levels, with rank-and-file employees rating Technology Governance at M=3.01 (SD=0.80) and managers at M=2.83 (SD=0.54). Key Informant #13 highlighted “server issues” and the lack of “cloud storage” as key frustrations, while Key Informant #14 described the technology as “outdated,” causing inefficiencies. In contrast, Airline C's managers reported higher satisfaction (M=3.65, SD=0.48) than rank-and-file employees (M=3.18, SD=0.60). Managers like Key Informant #9 praised “efficient remote support” from IT, which contributed to their higher ratings, while Key Informant #16 from the rank-and-file group mentioned a reliance on “Excel-based” systems, limiting efficiency.

These findings aligned with recent literature emphasizing the importance of effective IT governance in enhancing employee satisfaction and organizational performance. For instance, Bakshi (2016) discussed the role of performance measurement metrics in IT governance, highlighting how well-structured IT frameworks could improve service delivery and satisfaction. Curtis (2020) underscored that IT governance aligns business objectives with IT strategies, fostering a more satisfied and productive workforce. These studies suggested that organizations with robust IT governance structures were better equipped to address technological challenges, leading to higher employee satisfaction. Therefore, the quantitative and qualitative data from the three airlines underscored the crucial role of effective Technology Governance. Airlines that invested in modernizing their IT infrastructure and ensured responsive support tended to have more satisfied employees, as supported by recent research in the field.

The ratings for People Management revealed some disparities in perceptions between managers and rank-and-file employees across Airlines A, B, and C. In Airline A, rank-and-file respondents rated People Management higher (M=3.35, SD=0.52) than their managers (M=3.07, SD=0.83), indicating that while frontline staff found the management practices relatively fair, there were still areas for improvement. This sentiment was supported by qualitative insights: Key Informant #11 noted the importance of "transparent evaluations" but expressed a desire for more growth opportunities, while Key Informant #12 mentioned the value of "carpooling support" during the pandemic, which eased employee transportation challenges.

In Airline B, the ratings between rank-and-file (M=3.16, SD=0.68) and managers (M=2.95, SD=0.47) were closer, reflecting a generally lower perception of People Management. Key Informant #15 highlighted a lack of engagement and described management as unresponsive to employee needs. Additionally, Key Informant #14 voiced concerns about "delayed promotions," further illustrating dissatisfaction with career advancement opportunities. These observations aligned with research by He, Fan, and Li (2020), who argued that effective people management practices, including engagement and responsiveness, were crucial for employee retention and satisfaction.

For Airline C, managers rated People Management more positively (M=3.34, SD=0.47) compared to the rank-and-file (M=3.16, SD=0.58). Managers like Key Informant #9 emphasized their commitment to "fair evaluations" and actively supporting employee development, which likely contributed to their higher ratings. However, rank-and-file respondents, such as Key Informant #18, acknowledged that while evaluations were fair, there were still challenges related to limited opportunities for advancement. According to a study by Lee, Kim, and Suh (2021), organizations that provided fair evaluations but lacked clear paths for career advancement might see discrepancies in satisfaction between managers and frontline staff.

Overall, the quantitative ratings reflected a consistent theme where managers perceived processes as more efficient, likely due to their oversight and involvement in planning and strategic decisions. Rank-and-file employees, on the other hand, highlighted operational delays, resource shortages, and a lack of engagement from management, which influenced their lower ratings. The qualitative data from Airlines A, B, and C provided a comprehensive understanding of the differences in perception between these groups.

3.1.4 (SOP #4) Significant Difference in the Extent of Business Resiliency of Three Aviation Companies from the Perspective of Managers and Rank-and-File Employees

Table 17 Descriptives, ANOVA, and Post-hoc Tests of the A, B, and C Airline Companies' Business Resiliency

	Airline	n	Mean	Min	Max	F	Sig.	Post-Hoc (Tukey HD)	
								Airline	Sig.
Institutional Control	A	73	4.691	3.94	5.44	22.491	<.001	A - B	<.001
	B	48	4.065	3.06	5.44			B - C	<.001
	C	38	4.466	3.69	5.38			A - C	.068
	Total	159	4.448	3.06	5.44				
Planning & Preparedness	A	73	4.362	3.55	5.00	16.353	<.001	A - B	<.001
	B	48	3.857	2.64	5.00			B - C	.012
	C	38	4.082	2.91	4.82			A - C	.082
	Total	159	4.142	2.64	5.00	14.831	<.001		
Philosophy & Integrity	A	73	4.320	3.56	5.00			A - B	<.001
	B	48	3.858	2.67	5.00			B - C	.271
	C	38	4.178	3.56	5.00			A - C	.004
	Total	159	4.146	2.67	5.00				
External Support & Linkages	A	73	4.375	2.88	5.00	11.534	<.001	A - B	<.001
	B	48	3.945	2.63	5.00			B - C	.038
	C	38	4.133	2.75	4.88			A - C	.181
	Total	159	4.188	2.63	5.00				
Comm. & Media	A	73	4.406	3.60	5.00	20.428	<.001	A - B	<.001
	B	48	3.883	2.00	5.00			B - C	<.001
	C	38	3.889	3.00	4.60			A - C	.998
	Total	159	4.125	2.00	5.00				

The Descriptives, ANOVA, and Post-Hoc tests for comparison analysis in terms of business resilience between the three airline companies were presented in Table 17. It could be observed that in five attributes of business resilience—namely: Institutional Control, Planning & Preparedness, Philosophy & Integrity, External Support & Linkages, and Communication & Media—there was a statistically significant difference found between Airlines A, B, and C, $F(2, 156) = 22.491$, 16.353, 14.831, 11.534, and 20.428 with $p < .001$. The test for multiple comparisons using Tukey's HSD found that the mean value for Institutional Control was statistically significantly different between Airline A and B ($p < .001$) and between Airline B and C ($p < .001$), but no statistically significant difference between Airline A and C ($p = .068$).

In terms of Planning & Preparedness, Tukey's HSD test for multiple comparisons found that there was a statistically significant difference between Airline A and B ($p < .001$) and between B and C ($p = .012$), but no statistically significant difference between Airline A and C ($p = .082$). For Philosophy & Integrity, Tukey's HSD found a statistically significant difference between Airline A and B ($p < .001$) and between Airline A and C ($p = .004$), but no statistically significant difference between Airline B and C ($p = .271$). External Support & Linkages were found to be statistically significant between Airline A and B ($p < .001$) and between B and C ($p = .038$), but no significant difference between Airline A and C ($p = .181$). Lastly, in terms of Communication & Media, there was a statistically significant difference found between Airline A and B ($p < .001$) and between Airline B and C ($p < .001$); however, there was no significant difference between Airline A and C ($p = .998$).

These results appeared to have relevant implications, considering the statistically significant differences found in business resilience between the three airline companies. According to the literature (Fiksel, 2019; Wieland & Durach, 2021; Alvarenga et al., 2022), resilience is manifested in terms of a set of capabilities that, if developed by an organization, can strengthen the organization.

The results on differences in the extent of resilience likely suggested that each airline company had different levels of resilience in similar aspects of business operations. This could depend on the maturity of the business process management related to factors like Institutional Control, Planning for Preparedness, Philosophy, External Support, and Communication within the company. On the other hand, attributes or factors that were found to have no significant difference between the airline companies might have indicated common attributes in their business operation management processes and their maturity.

In this regard, and based on the definitions of resilience mentioned previously, it could be concluded that organizations with resilience capabilities are both proactive and reactive, as they anticipate and recover better from challenges and difficulties. However, Linnenluecke (2017), who conducted a systematic literature review, emphasized that resilience has been used at the

organizational level to describe the inherent characteristics of those corporations that had fast response and recovery times, and who could develop more innovative ways of doing business under critical situations compared to other corporations. According to the author, resilience most often refers to strength, perseverance, and organizational recovery in the face of adversity.

Furthermore, it was noteworthy that the concept of resilience adopted in this dissertation referred to the capabilities of anticipation, adaptability, and recovery, while maintaining control over the usual structure and functions and ensuring the continuity of business processes at the desired level.

3.1.5 (SOP #5) Correlation Between the Extent of Business Resilience and Efficiency of Business Processes Based on Respondents' Perspectives

Table 18 Pearson Correlation Coefficient and Its Significance

	Facility Management	Health, Wellness & safety	Technology governance	People management
Institutional Control	.56** Sig: <.001	.58** Sig: <.001	.53** Sig: <.001	.49** Sig: <.001
Planning & Preparedness	.53** Sig: <.001	.49** Sig: <.001	.43** Sig: <.001	.42** Sig: <.001
Philosophy & Integrity	.56** Sig: <.001	.55** Sig: <.001	.53** Sig: <.001	.49** Sig: <.001
External Support & Linkages	.58** Sig: <.001	.61** Sig: <.001	.54** Sig: <.001	.52** Sig: <.001
Communication & Media	.45** Sig: <.001	.50** Sig: <.001	.48** Sig: <.001	.46** Sig: <.001
Over-all	0.65 Sig: <.001			

***Correlation is significant at the 0.01 level (2-tailed)*
Degree of Correlation Coefficients: Values near ±1 – indicate a perfect correlation; High Degree: ±0.50 - ±1 – suggest a strong correlation; Moderate Degree: ±0.30 - ±0.49 – indicate a moderate correlation; Low Degree: values below ±0.29 are considered weak correlation.

Table 18 presents the findings from a Pearson correlation analysis, which examined the strength of relationships between business resilience attributes and the efficiency of business processes. This analysis provided insight into how various resilience dimensions, such as Institutional Control and Planning & Preparedness, aligned with process efficiency metrics like Facility Management and Health, Wellness & Safety.

The table showed that the overall correlation between business resilience and business process efficiency was strong, with an aggregate coefficient of $r = 0.65$, $p < 0.001$. This result suggested a significant, positive relationship, implying that higher levels of resilience within an organization were associated with more efficient business processes. This strong correlation aligned with prior studies indicating that resilience-enhancing practices could support effective process management, thereby improving organizational adaptability and stability (Sincora, 2022; Bogondistov et al., 2022).

Among specific attribute pairs, the "strongest relationship" was between External Support & Linkages and Health, Wellness & Safety, with a high positive correlation coefficient of $r = 0.61$, $p < 0.001$. This indicated that organizations with robust external support structures were more likely to maintain effective health and safety standards—a critical factor for resilience, especially during disruptions. This result emphasized the importance of external partnerships in supporting internal well-being and safety measures.

On the other end of the spectrum, the "weakest relationship" appeared between Planning & Preparedness and People Management, showing a moderate positive correlation of $r = 0.42$, $p < 0.001$. Although still statistically significant, this lower correlation suggested that preparedness efforts might not have directly impacted people management to the same extent as other resilience attributes. This finding indicated that while planning was essential for resilience, people management might require different strategies to foster resilience.

The strong positive relationships observed across most attributes underscored the idea that building resilience could enhance process efficiency. For example, strong scores in Institutional Control and Technology Governance (with correlation coefficients of

r = 0.53 and r = 0.54, respectively) indicated that structured governance mechanisms contributed significantly to efficient operations. This insight aligned with findings from Alvarenga et al. (2022) and Pettit et al. (2019), who suggested that resilient organizations were better equipped to handle operational challenges and minimize disruptions.

This analysis had relevant implications for the airline industry, where unexpected events could greatly impact operations. Enhanced resilience—demonstrated by effective facility management and solid external support—could reduce the adverse effects of such events. For airlines, fostering these resilience attributes could lead to a smoother response to disruptions, ultimately protecting operational continuity and mitigating negative consequences (Zakir et al., 2023).
The results of this study reinforced the understanding that resilience and process efficiency were intertwined, a connection highlighted in past research by scholars like Ruel & El Baz (2023) and Singhai & Wilson (2020). In a rapidly changing business environment, this relationship was crucial, as resilient processes were essential for responding to market demands and coping with crises like the COVID-19 pandemic.

By recognizing how resilience attributes contributed to efficient operations, organizations could identify practical ways to enhance both dimensions simultaneously. This study's findings provided additional empirical data to support the view that resilience, particularly through aspects like health and safety, external support, and governance, could significantly benefit business process management and, by extension, overall organizational performance.

3.1.5.1 The Structural Equation Modeling

This part of the research presents the measurement model fit indices (Table 5). Measurement model fit indices were essential for evaluating the adequacy of a model in representing the data. Each fit index provided insight into different aspects of model performance.

According to Kline (2015), the most pertinent measures reported were: 1) The model chi-square (CMIN/DF); 2) The Root Mean Square Error of Approximation (RMSEA); 3) The Comparative Fit Index (CFI); and 4) The Standardized Root Mean Square Residual (SRMR). The model chi-square assessed overall fit and the discrepancy between the sample and fitted covariance matrices, while the Root Mean Square Error of Approximation referred to values closer to zero (0), which represented a good fit. The Comparative Fit Index compared the fit of a target model to the fit of an independent or null model, and the Standardized Root Mean Square Residual "square-rooted" the difference between the residuals of the sample covariance matrix.

Table 19 Measurement Model Fit Indices

Measure	Estimate	Threshold	Interpretation
CMIN/DF	1.693	Between 1 & 3	Excellent
CFI	1.984	>0.95	Excellent
SRMR	0.041	<0.08	Excellent
RMSEA	0.066	<0.05	Acceptable

The cutoff criteria for model fit indices, such as CMIN/DF, CFI, SRMR, RMSEA, and PClose, are categorized into 'Terrible,' 'Acceptable,' and 'Excellent' based on specific threshold values, where better model fit is indicated by lower CMIN/DF, SRMR, RMSEA values, higher CFI, and PClose values greater than 0.05.

The study's main results showed that the overall fit of the model was strong, as all the fit indices presented in Table 19 met the recommended levels. CMIN/DF, CFI, and Standardized RMR all suggested that the model performed well, while the RMSEA indicated an acceptable fit. Continued examination of the RMSEA and potential adjustments to the model might have further enhanced the overall fit.

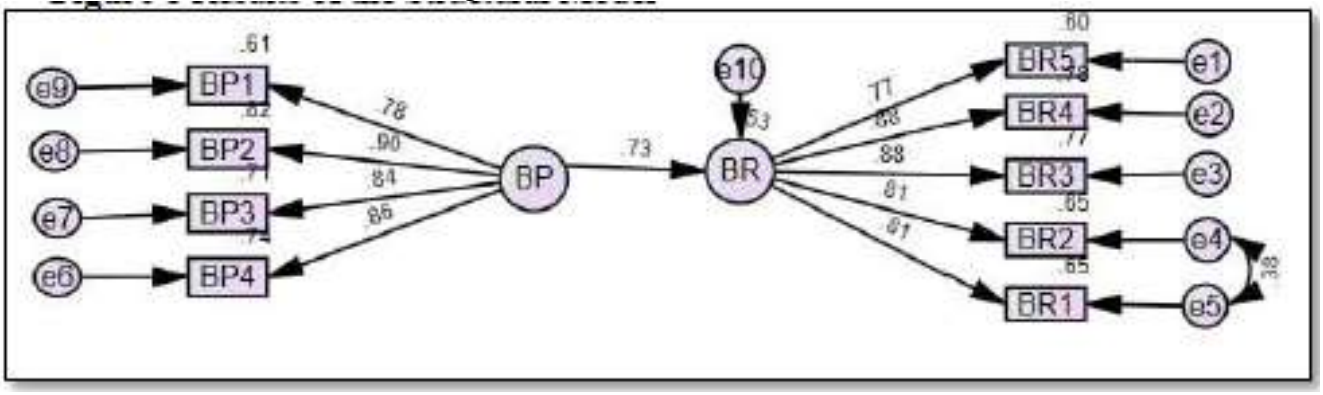
The researcher hypothesized two latent factors: Extent of Business Resilience and Efficiency of Business Processes. The model fit indices suggested an acceptable fit. The Chi-Square value for the default model was significant, $\chi^2(25) = 42.335$, $p = .017$, with a CMIN/DF ratio of 1.693, indicating a reasonable fit relative to the degrees of freedom. The Goodness of Fit Index (GFI) was .945, suggesting a good fit between the hypothesized model and the observed data. The Comparative Fit Index (CFI) and Normed Fit Index (NFI) were .984 and .963, respectively, both indicating a strong model fit. Additionally, the Root Mean Square Error of Approximation (RMSEA) was .066, with a 90% confidence interval of .028 to .100, and a PCLOSE value of .205, suggesting that the model fit well in terms of error approximation. Overall, these indices supported the validity of the two latent factors in explaining the underlying factors that influenced business resilience.

Table 20 Hypothesis Test Summary

Hypothesis	Estimates	Standard Error	t-value	p-value	Remarks
Business Process < - - > Business Resilience	0.161	0.026	6128	.000	Accepted

In Table 20, the study's findings indicated a statistically significant relationship between Business Processes (BP) and Business Resilience (BR). As shown in Table 6, the hypothesis test yielded a coefficient estimate of 0.161, with a standard error of 0.026 and a high t-value of 6128 ($p < .001$), confirming a positive association. This finding implies that efficient business processes were positively correlated with enhanced business resilience. The model fit indices further supported this relationship, with CMIN/DF at 1.693, GFI at 0.945, CFI at 0.984, and an RMSEA of 0.066 (PCLOSE = 0.205). Together, these metrics validated the model's robustness and the hypothesized link between BP and BR.

Figure 8 Results of the Structural Model



In Figure 8, the arrows represent the directional influence from Business Processes (BP) to Business Resilience (BR). The path from BP to BR, with a coefficient of 0.73, signifies a strong, direct effect, showing that improvements in BP directly contribute to increased BR. Each sub-factor of BP (e.g., BP1 through BP4) points towards the BP latent variable, emphasizing how these components collectively support an efficient process framework. Similarly, arrows connecting BR1 to BR5 highlight different facets of resilience influenced by BP, with correlation coefficients (ranging from 0.61 to 0.84) indicating strong associations among resilience components. These arrows outline the model's conceptual structure, illustrating BP as the driving force in predicting BR.

The hierarchy in the model underscores Business Process as the primary predictor of Business Resilience. Specific components within BP (such as BP3 and BP4) exhibited stronger predictive relationships with BR facets, guiding organizational focus areas for resilience-building. This hierarchy implied that some elements of BP had a more substantial impact on resilience, helping to identify areas where improvement efforts could yield the most benefit. Overall, the model showed that optimizing business processes led to a higher level of resilience, making BP a strategic focus for organizations aiming to enhance stability and adaptability.

The Structural Equation Modeling (SEM) model was evaluated and demonstrated a good fit to the data. The Chi-square test was significant, $\chi^2(25) = 42.335$, $p = .017$, with a CMIN/DF ratio of 1.693, indicating an excellent fit. Further fit indices supported this, including GFI = .945, AGFI = .902, and RMR = .011. The RMSEA was .066 (90%

CI [.028, .100]), with a PCLOSE value of .20. The CFI and TLI were both equal to .98. Analysis of the regression paths showed that business processes significantly predicted business resilience, b = .633, SE = .075, CR = 8.429, $p < .001$, with a standardized regression weight of .727, indicating that higher levels of efficiency in business processes were associated with higher levels of resilience.

3.1.6 (SOP #6) Significant Difference in the Extent of Efficiency of Business Processes of Three Aviation Companies as Assessed by Managers and Rank-and-File Employees

The ANOVA results indicated no statistically significant difference in Facility Management efficiency among the three airlines, $F(2, 156) = 2.104$, $p = .125$. This outcome suggested that all three airlines had comparable levels of effectiveness in managing facilities, with no single airline exhibiting markedly superior or inferior performance in this area. The absence of significant differences could

imply a standardization in Facility Management practices across the airlines, possibly due to regulatory requirements or industry norms in aviation that necessitate consistent facility standards to maintain operational safety and compliance.

Table 21 Descriptives, ANOVA, and Post-hoc Tests of the A, B, and C Airline Companies' Efficiency of Business Processes

	Airline	n	Mean	Min	Max	F	Sig.	Post-Hoc (Tukey HD)	
								Airline	Sig.
Facility management	A	73	3.305	1.75	4.00	2.104	.125	A - B	.112
	B	48	3.104	2.00	5.00			B - C	.361
	C	38	3.263	2.00	4.00			A - C	.920
	Total	159	3.234	1.75	5.00				
Health, wellness & safety	A	73	3.356	1.33	4.00	14.205	<.001	A - B	<.001
	B	48	2.813	1.83	4.00			B - C	.085
	C	38	3.070	1.50	4.00			A - C	.028
	Total	159	3.124	1.33	4.00				
Technology governance	A	73	3.421	1.50	4.00	8.292	<.001	A - B	<.001
	B	48	2.974	2.00	4.00			B - C	.104
	C	38	3.237	1.00	4.00			A - C	.266
	Total	159	3.242	1.00	4.00				
People management	A	73	3.315	2.00	4.00	4.229	.016	A - B	.012
	B	48	3.00	1.83	4.00			B - C	.319
	C	38	3.185	1.00	4.00			A - C	.498
	Total	159	3.189	1.00	4.00				

Tukey's HSD Test for multiple comparisons found that the mean value of Health, Wellness, and Safety was significantly different between Airline A and B (p = <.001) and between Airline A and C (p = .028). However, there was no statistically significant difference between Airline B and C (p = .085). In terms of Technology Governance, there was a statistically significant difference between Airline A and B (p = <.001), but no statistically significant difference between Airline B and C (p = .104) and Airline A and C (p = .266). Lastly, in terms of People Management, there was a statistically significant difference between Airline A and B (p = .012), but no statistically significant difference between Airline B and C (p = .319) and Airline A and C (p = .498).

This comparative analysis is very relevant because organizations in the aviation industry, being part of a complex and globalized ecosystem, rely heavily on efficient and effective supply chain management to ensure the smooth flow of services, goods, and information. This involves the coordination and integration of activities among various stakeholders to optimize the movement of their business processes in general (IMC, 2024). Additionally, as Lee and Chuah (2016) and Newswire (2011), cited by Zakir et al. (2023), noted, business process improvement has become an essential part of the routine operations and life cycle of business processes. Therefore, it is crucial to take into account success tools, factors, and performance evaluation elements from employee assessments, including flexibility, customer satisfaction, time, cost, and staff management in business operations.

Airline A often scored higher than Airlines B and C across multiple attributes, which could be attributed to its position as a larger, more established airline with access to greater resources. Larger airlines typically have more structured processes, broader resources for employee development, and better-established management practices. Consequently, Airline A's scale may have allowed it to implement and maintain higher standards across various operational areas, particularly in health, safety, and people management.

3.1.7 (SOP #7) Proposed Business Continuity Management Framework and Recovery Program for Future Disaster-Proofing in the Aviation Industry

The results of the study suggest a robust and adaptive Business Continuity Management Framework (BCMF) and Recovery Program tailored to meet the specific needs of the aviation industry in the Philippines, particularly for future disaster-proofing initiatives. The proposed BCMF emphasizes a proactive and resilient approach, integrating a comprehensive risk assessment and Business Impact Analysis (BIA) to identify and prioritize vulnerabilities, such as supply chain disruptions, critical operational functions, and technological dependencies. By employing real-time monitoring and utilizing tools like Management of Change or Hazard Identification Risk Analysis, the framework ensures a dynamic and responsive strategy that evolves alongside emerging threats, minimizing operational disruptions and facilitating rapid recovery.

The Recovery Program focuses on several critical components designed to strengthen operational resilience and financial stability. An agile Crisis Management Team (CMT) is proposed to facilitate interdepartmental collaboration and ensure effective

communication. This includes regular simulation exercises and structured crisis meetings to keep management informed and prepared. Business Continuity Planning (BCP) highlights the importance of continuity plans for essential functions, flexible resource deployment through staff cross-training, and communication protocols that maintain transparency with all stakeholders. These measures aim to ensure a well-coordinated response to disruptions, preserving the safety of customers and employees while sustaining financial health and market presence.

Resource management strategies are a key part of this framework, emphasizing the need to ensure the availability of essential supplies and develop redundant technology governance to support operational continuity. The program also focuses on employee safety and well-being by establishing health protocols and offering mental health support to enhance workforce morale during crises. Flexible working arrangements and clear communication of employee roles are critical components in maintaining workforce productivity and engagement. This holistic approach to resource and workforce management ensures that the aviation sector is well-equipped to handle unforeseen events efficiently.

High-level recommendations include institutionalizing resilience as a strategic priority, investing in advanced technology governance to mitigate IT vulnerabilities, and strengthening external partnerships to secure critical resources. Continuous training and crisis simulations are emphasized to ensure staff are well-prepared for various scenarios. By framing these strategies as vital investments in the long-term stability and competitiveness of the aviation industry, the proposed BCMF and Recovery Program provide a comprehensive disaster-proofing solution, enabling the sector to thrive even amid challenges and uncertainties.

3.2 Qualitative Results

3.2.1 On Business Resilience

Table 22 Thematic Clustering for Airline A Key informants

Key informants Significant Reponses	Formulated Meanings	Key Themes	Codes
1,2	The organization has a structured approach to managing repair requests while remaining adaptable to urgent needs.	Resource Management and Outsourcing	Outsourcing Budget
10, 12	Outsourcing is utilized strategically to manage larger projects effectively.	Prioritization of Requests	Prioritization Job Request
10, 11	Budget constraints during the pandemic have significantly impacted operational capabilities.	Operational Challenges During Crises	Supply issues CAPEX Cancellations
12, 1	Personnel availability affects the efficiency of repair processes, especially during crises.	Adaptability and Flexibility	Repairs Operational Efficiency

From the analysis in Table 22, Airline A's business resilience in terms of institutional control, planning and preparedness, philosophy and integrity, external support and linkages, and communication and media revealed several key insights into the organization's operational capabilities. The answers from key informants of Airline A indicated a clear and flexible approach to managing repair requests, demonstrating a high extent of resilience in resource management and outsourcing.

Key informant #1 mentioned, "*The process of administering repair requests is coordinated yet flexible and can be tailored to accommodate immediate needs,*" which supported Airline A's ability to adjust well while maintaining its level of efficiency. The airline's fast adaptability was important in the aviation environment, where it needed to serve a large number of stakeholders, and where operational requirements could vary depending on the situation.

However, the analysis also identified significant challenges, particularly regarding operational issues during crises and disruptions. As Key Informant #10 responded, "*During the pandemic, all CAPEX was frozen,*" explaining how these CAPEX cancellations severely

impacted operational capabilities. This situation reflected a very low extent of resilience, as budget constraints and supply chain disruptions hindered the organization's ability to respond effectively during emergencies. Relying on outsourcing for large projects that exceeded certain thresholds indicated a strategic approach to resource management, but it also underscored the potential risks when external resources were unavailable.

The first key informant stated that an evaluation of potential disasters had been completed, showing how employees were proactive in implementing safety protocols during onsite activities. Emphasizing these safety precautions demonstrated a strong commitment to resiliency, as the company focused on reducing risks through various airline strategies. Additionally, the company's emphasis on safety was reinforced by the existence of well-trained and focused committees, as well as regular toolbox or departmental meetings specifically aimed at tackling potential risks.

Finally, regarding employee welfare, health, and life insurance, Key Informant #11 highlighted that "*this service is free and provided by HR,*" indicating support for Airline A employees' welfare during emergency situations. However, there was an acknowledgment that communication about these benefits could be improved.

Overall, the analysis illustrated that while Airline A showed strengths in resource management in identified activities and safety protocols onsite, it faced challenges related to external constraints from third-party services or contractors and communication. By addressing these vulnerabilities and enhancing operational and support strategies through data-driven decision-making by leadership, as well as improving communication channels between departments, Airline A could further strengthen its resilience in the face of any unprecedented disruptions.

Table 23 Thematic Clustering for Airline B Key informants

Key informants Significant Reponses	Formulated Meanings	Key Themes	Codes
4, 5	The organization effectively manages personnel allocation to meet increased operational demands.	Resource Management and Personnel Allocation	Staffing Outsourcing
6, 5	Outsourcing is a strategic choice to handle larger projects and manage workload efficiently.	Safety Management and Risk Assessment	Safety Protocols Risk Mitigation
15, 4	There is a lack of dedicated transport for disaster situations, indicating a gap in preparedness.	Preparedness and Resource Availability	Disaster Preparedness Resource Gaps
14, 13	Personnel availability affects the efficiency of repair processes, especially during crises.	Communication and External Support	Communicatio n Channels External Linkages

The analysis of Airline B's business resilience, as illustrated in Table 23, highlighted several significant aspects regarding the organization's operational capacities and strategic management. The responses from key informants suggested a structured approach to resource management and personnel allocation, which was crucial for meeting the increasing demands of flight operations, as noted in the study by Severo and Guimarães (2023). Key informant #4 noted, "*The project team members here and managers are adequate... Every project or program personnel handles 5-6 projects,*" indicating that the airline had implemented effective strategies to ensure sufficient staffing levels (Ackrén, 2024). In the airline industry, Airline B's structured management discipline was considered one of the most important traits for maintaining operational efficiency, particularly in the face of fluctuating external demands.

However, the analysis also identified notable challenges, particularly concerning preparedness and resource availability. Key informant #15 raised issues related to dedicated transport for disaster scenarios, stating, "*There is no standby vehicle for disaster*

preparedness," which highlighted a significant gap in the organization's readiness to respond to emergencies. Such a lack of preparedness indicated a very low level of resilience; the absence of dedicated transport could hinder effective disaster response (Harahushi et al., 2023). This vulnerability underscored the importance of strategic planning and resource allocation to ensure that the organization could respond effectively to unforeseen events.

In terms of safety management and risk assessment, Key Informant #5 remarked, "*Safety and risk management are prioritized with designated officers overseeing protocols.*" This demonstrated a normal level of resilience, as the organization actively engaged in risk mitigation strategies (Mattingly et al., 2021). The presence of designated officers indicated that the organization recognized the importance of proactive risk management in maintaining operational integrity. However, continuous improvement was necessary to enhance overall safety protocols and ensure that all personnel were adequately trained and equipped to handle emergencies (Easy One Day Building and Repair Projects, 2023).

Finally, regarding communication and external support, Key Informant #14 highlighted, "*The higher-ups often hold meetings when there are typhoons or floods that may disrupt flights.*" This indicated that while there were some collaborative efforts in place, the probability of resource conflicts existed. This theme was interpreted as a neutral extent of resilience, as communication about external partnerships could be improved to ensure all personnel were aware of available resources during crises (Zirena-Bejarano et al., 2023). Effective communication channels, especially using different applications during crises, were deemed essential to maintain collaboration with external parties and stakeholders and to ensure that all employees were informed about safety protocols and available support mechanisms.

Overall, the analysis illustrated that while Airline B demonstrated strength in resource management and safety protocols, it faced challenges related to external constraints and preparedness. By addressing the identified weaknesses and improving its operational approach and strategies—particularly through transparent collaboration with external partners and enhanced communication channels—Airline B could further strengthen its resilience in the face of unpredictable events.

Table 24 Thematic Clustering for Airline C Key informants

Key informants Significant Reponses	Formulated Meanings	Key Themes	Codes
7, 8	The organization effectively manages personnel allocation to meet increased operational demands.	Resource Management Personnel Allocation	Staffing Outsourcing
8, 9	Safety and risk management are prioritized with designated officers overseeing protocols.	Safety Management Risk Assessment	Safety Protocols Risk Mitigation
9, 16	There is a lack of dedicated transport for disaster situations, indicating a gap in preparedness.	Preparedness Resource Availability	Disaster Preparedness Resource Gaps
16, 18	Facilities and transport readiness are acknowledged, but potential resource conflicts exist.	Communication External Support	Communication Channels External Linkages

In Table 24, several critical themes related to institutional control, preparedness, philosophy and integrity, external support and linkages, and communication and media were highlighted. The theme *Resource Management and Personnel Allocation* indicated a high extent of resilience, as the organization effectively managed personnel allocation to meet increased operational demands. Key Informant #7 noted, "*The organization effectively manages personnel allocation to meet increased operational demands,*" suggesting that effective staffing strategies directly impacted service quality and customer experience (Morgeson, 2024). This

structured management approach was vital for optimizing resource management and implementing effective workflows, which were crucial as flight frequencies and operational demands increased (Bakic, 2024).

The theme of *Safety Management and Risk Assessment* also emerged from the responses of key informants 8 and 9. Key informant #8 remarked, "*Safety and risk management are prioritized with designated officers overseeing protocols,*" indicating the organization's commitment to ensuring safety. This response reflected a *normal extent of resilience*, as there were systems in place to manage risks effectively, though continuous improvement was necessary to enhance overall safety protocols (eSafety Systems, n.d.). The presence of designated employees with specific tasks emphasized the importance of proactive strategies in identifying and mitigating risks, rather than waiting for incidents to become significant issues. Airline C's structured approach enhanced operational integrity through continuous assessment and improvement of safety protocols (Certa, n.d.).

In terms of *Preparedness and Resource Availability*, Key Informant #9 stated, "*There is a lack of dedicated transport for disaster situations,*" highlighting a significant gap in the organization's readiness to respond to emergencies. The critical role of disaster resilience in maintaining operational integrity during crises was emphasized. Effective disaster management requires dedicated resources and proactive strategies to enhance resilience against various risks (Shrestha et al., 2021). Relying on third-party service providers for transport services used in regular ground operations during emergencies complicated preparedness, as highlighted by Key Informant #8: "*We rely on third-party providers for transport services,*" underscoring potential vulnerabilities in emergency management strategies.

Lastly, in terms of *Communication and External Support*, Key Informant #16 mentioned, "*Facilities and transport readiness are acknowledged,*" indicating that although some efforts were made, there might be potential resource conflicts. The theme of communication and external support was interpreted as a *neutral extent of resilience*, as communication significantly impacted the adaptive capacity of organizations during crises. The importance of effective communication about external partnerships was critical for building resilience (Doerfel et al., 2021).

Overall, the analysis of Airline C in terms of *Extent of Business Resilience*, as shown in Table 24, illustrated that while Airline C demonstrated strengths in resource management and safety protocols, it faced challenges related to external constraints and preparedness. To bolster its resilience against future challenges, Airline C could strengthen its operational strategies by improving collaboration with external partners, clarifying the services to be provided during emergencies, and enhancing communication channels to address vulnerabilities. Effective communication strategies, both within the organization and with external stakeholders such as passengers, regulatory bodies, and partners, are critical during crises (Andrews, 2023).

3.2.2 On Efficiency of the Business Processes

Table 25 Thematic Clustering for Airline A Key informants

Key informants Significant Reponses	Formulated Meanings	Key Themes	Codes
1, 2	The organization has a systematic approach to managing repair requests based on operational needs. There is a structured prioritization process for urgent requests amidst regular procedures.	Resource Management Facility Operations	Staffing Outsourcing
10, 12	Supply chain disruptions have impacted the ability to complete repairs efficiently.	Health, Wellness, and Safety	Safety Protocols Employee Support
3, 11	Budget allocations are determined by planned projects and operational necessities.	Technology Governance	IT Infrastructure Digital Tools
2, 12	Personnel challenges during the pandemic indicate a need for improved support systems	People Management	Employee Engagement
			Communication

From Table 25, it could be seen that Airline A's business processes highlighted several significant themes related to facility management, health and wellness, technology governance, and people management. The responses from key informants revealed a systematic approach to managing repair requests and resource allocation, which was crucial for maintaining operational efficiency in the aviation sector. Key Informant #1 emphasized that "*departments fill out JO forms based on schedule or situational needs depending on the size of repairs,*" indicating a structured prioritization process for urgent requests amidst regular procedures. Being operationally ready in the face of staff shortages, flight irregularities, adverse weather conditions, and other unexpected contingencies required effective resource planning, scheduling, operations, and analysis (Upheus, 2022). Systems that are resilient could quickly and effectively adjust to changing circumstances, but they depended on effective communication, cooperation, coordination, and collective action from stakeholders. If these elements were overlooked, the system's ability to respond cohesively to disruptions was hindered, leading to fragmented efforts (Steinmann, 2023). The practices of Airline A demonstrated an efficient extent of resilience in resource management and facility operations, highlighting the organization's ability to adapt to varying operational requirements.

In terms of health, wellness, and safety, Key Informant #10 noted, "*We've had some supply issues because most suppliers during the pandemic were also closed.*" This statement pointed out the impact of supply chain disruptions caused by the closure of suppliers, which affected Airline A's ability to complete repairs efficiently. The challenges faced during this period reflected a less efficient business process, as, while safety protocols were in place, the organization needed to enhance its capacity to manage health-related supplies effectively. The reliance on third-party services for sanitation and maintenance further complicated the situation, emphasizing the importance of following health protocols and ensuring that all areas requiring sanitation were properly addressed.

Regarding technology governance, Key Informant #3 stated, "*Allocations for our department are based on the planned projects for next year,*" which indicated that budget allocations were determined by operational necessities. However, key informant #11 pointed out that "during the pandemic, all CAPEX was frozen," reflecting a *Not Efficient* extent of resilience in technology governance. This situation highlighted how financial constraints could severely limit an organization's ability to invest in necessary technological upgrades and infrastructure improvements (McNeely et al., 2014).

Finally, the theme of people management was evident in Key Informant #12's response: "*Our group's work repairs continue although it's challenging for our personnel onsite due to difficulties commuting amid strict checkpoints.*" This indicated that personnel challenges during the pandemic had highlighted a need for improved support systems. This theme reflected an efficient extent of resilience, as there were efforts to support employees during crises; however, other organizations facing similar challenges could benefit from establishing consistent and open lines of communication, which could enhance trust and boost morale, ensuring that employees felt valued and heard amidst uncertainty (Psico-Smart, 2024).

Therefore, the overall analysis illustrated that while Airline A demonstrated strengths in resource management, facility operations, and people management, it faced challenges related to safety protocols, particularly in the area of technology governance. The development of trust between humanitarian organizations and other partners/stakeholders was necessary for coping with complex tasks during disaster relief and following a standard code of ethics (Kumar et al., 2022). By addressing these vulnerabilities and enhancing its operational strategies through better collaboration with external partners and improved communication channels, Airline A could further strengthen its resilience against future challenges.

The analysis of Airline B's business processes, as illustrated in Table 26, in terms of facility management, health and wellness, technology governance, and people management revealed significant insights. The responses from key informants indicated a systematic approach to managing repair requests through designated departments, which was essential for maintaining operations in the aviation sector. Key informant #4 emphasized that "*facility or IT repairs are sent to their respective departments for handling,*" highlighting a structured process for resource allocation (Tayeb, 2012). This organized methodology reflected resilience in facility management, demonstrating the organization's capability to adapt to varying operational demands. According to Newland (2023), facility management had developed into a strategic facilitator, stressing the importance of organizations adjusting to disruptions by planning effectively and integrating technology. This underscored the critical nature of resilient infrastructure planning and flexible responses to operational needs for sustaining functionality during unforeseen circumstances.

Table 26 Thematic Clustering for Airline B Key informants

Key informants Significant Reponses	Formulated Meanings	Key Themes	Codes
4, 5	The organization has a systematic approach to managing repair requests through designated departments.	Facility Management	Repair Requests Budget Allocations
6, 13	Budget allocations for repairs are determined based on operational necessities and planned projects.	Health, Wellness, and Safety	Sanitization Protocols Employee Support
4, 15	Supply chain disruptions have impacted the ability to complete repairs efficiently.	Technology Governance	IT Infrastructure Digital Tools
14, 5	Personnel challenges during the pandemic indicate a need for improved support systems.	People Management	Employee Engagement Communication

In the realm of health, wellness, and safety, Key Informant #6 noted, "*Janitors are all over the office and disinfect tables and other areas; they do this about three times a day.*" This statement highlighted the organization's commitment to creating a safe and healthy work environment for its employees. However, Key Informant #13 pointed out that "*there are times when it takes a long time because our contractor cannot serve us due to their own lack of personnel,*" indicating that personnel challenges during the pandemic had affected the organization's ability to consistently implement safety protocols. This situation reflected gaps in ensuring adequate staffing levels to address emergencies or unforeseen circumstances. A systematic review conducted by Naylor et al. (2023) highlighted that maintaining sufficient staffing levels to handle emergencies or unexpected situations remained a challenge due to various constraints, which affected health and wellness support systems. The authors stressed that these challenges could hinder advancements in achieving optimal health system performance.

Regarding technology governance, Key Informant #4 stated, "*We use local drives so far,*" which suggested a reliance on outdated infrastructure. Key informant #15 further elaborated that "when equipment breaks down simultaneously, especially at outstations, it causes delays in our PMS for the unit." These responses indicated challenges related to IT infrastructure and digital tools, revealing issues in technology governance. Serveline (2024) pointed out that managing IT infrastructure involves common challenges such as cybersecurity threats, data management issues, and the need for flexible solutions. Investing in modern and reliable systems could enhance operations and minimize disruptions caused by equipment failures or technological issues.

Finally, in terms of people management, Key Informant #14's response, "*Everything is okay; we have requests for office repairs—some have been delayed while others have been completed,*" indicated that personnel challenges during the pandemic had highlighted a need for improved support systems. Key Informant #5 emphasized this point by stating, "*For operations teams like us... allowances for transportation were provided for those who had issues commuting.*" This theme reflected a structured approach to people management, as there were efforts to support employees during crises. However, ongoing communication about available resources could further enhance employee engagement and morale (Demerouti et al., 2018).

Therefore, the overall analysis illustrated that while Airline B demonstrated resilience in facility management and a commitment to employee health and safety, it faced challenges related to supply chain disruptions, unavailability or outdated technology, and personnel management. By addressing these identified issues through better collaboration with external partners, investing in modern infrastructure, and improving communication channels, Airline B could further strengthen its resilience against future challenges.

Table 27 Thematic Clustering for Airline C Key informants

Key informants Significant Reponses	Formulated Meanings	Key Themes	Codes
7, 16	Facility management plays a crucial role in maintaining employee well-being.	Facility Management	Compliance Health Protocols Maintenance Delays
7, 18	Personnel who are working remotely or onsite has facing challenges in terms of medical supplies and support during sickness or in the midst of possible exposure to virus	Health, Wellness, and Safety	Employee Support Supply Shortages Remote Work
9, 18	Technology governance is essential for facilitating remote work but faces challenges in efficiency.	Technology Governance	IT Support Internet Access Remote Work Tools
16, 17	People management practices are often inconsistent, reflecting the impact of budgetary constraints on employee morale and performance.	People Management	Performance Evaluations Incentives Communication

The analysis of Airline C's business processes highlighted the critical role of facility management, particularly in maintaining employee well-being during the pandemic. Key informants emphasized that facility management was essential for ensuring compliance with health protocols and addressing maintenance delays. As Key Informant #7 stated, "*Facilities make onsite changes, especially in ticketing offices that require acrylic barriers, in compliance with health protocols.*" This proactive initiative was crucial not only for safeguarding employees but also for enhancing overall operations. Research indicates that effective facility management positively impacts employee satisfaction and productivity, reinforcing the idea that a well-maintained work environment is crucial for organizational success (Arampatzi & Burger, 2020).

However, challenges remained in the realm of health, wellness, and safety. Key informants noted that personnel working remotely or onsite faced significant challenges regarding medical supplies and support during sickness. Key Informant #18 pointed out, *"The supply of alcohol isn't regular; we often run out because of shortages."* This situation reflected gaps in health and wellness support systems. Studies have shown that inadequate health support can lead to decreased employee morale and increased stress levels, particularly in high-stakes environments like aviation (Kristensen et al., 2015). Addressing these challenges was crucial for fostering a safe and supportive workplace culture.

In terms of technology governance, key informants highlighted its importance in facilitating remote work but identified challenges in its implementation. Key Informant #9 remarked, *"We use laptops to save our files; no cloud services are provided by IT."* This lack of adequate technological support underscored the necessity for organizations to invest in robust IT infrastructures to enhance remote work capabilities. Research has shown that effective IT governance is essential for organizational agility and performance,

particularly during turbulent times (Gregory et al., 2018). Thus, improving technology governance was imperative for Airline C to ensure seamless operations.

Finally, the analysis revealed inconsistencies in people management practices, largely attributed to budgetary constraints. Key Informant #16 noted, *"It's fair when the company earns because bonuses are given; if not, then no bonuses are distributed."* This reflected challenges in managing employee performance and morale. The literature suggests that clear communication regarding performance evaluations and incentives is critical for maintaining employee motivation and engagement (Thatcher & Milner, 2014). As organizations navigated economic uncertainties, prioritizing transparent people management practices would be essential for sustaining workforce morale and productivity.

3.2.3 Summary of Qualitative Results from Thematic Analysis on Business Resilience and Efficiency of the Business Processes

The thematic analysis of resilience and business process efficiency across three airlines—Airline A, Airline B, and Airline C—highlighted each airline's strengths, challenges, and potential strategies for improvement. These insights informed a Business Continuity Management Framework and Recovery Plan for strengthening resilience in the Philippine aviation industry.

1. Airline A - Strengthening Resource and Communication Strategies
- Strengths: Demonstrates strengths in resource management, facility operations, and onsite safety.
- Challenges: Full reliance on third-party services, internal communication gaps, and technology governance weaknesses.
- Recommendations :
  Enhance Interdepartmental Communication - establish clear channels for better coordination across departments.
  Improve Safety Protocols and Technology Governance - update protocols and oversight and governance for better resilience.
  Develop Trust with External Providers - strengthen collaboration and engage them in full responsibility even in uncertainties with third-party services.
  Data-Driven Decision-Making - use data to guide strategic improvements on each department.

2. Airline B - Addressing Supply Chain and Technology Limitations
- Strengths: Shows resilience in facility management and prioritizes employee health and safety.
- Challenges: Supply chain disruptions, outdated technology, and personnel management issues.
- Recommendations :
  Enhance Partnerships for Supply Chain Resilience - improve collaboration with external partners. (i.e. Parts concession, Blanket PO, sourcing other potential suppliers to manage continuous supplies and services, transparency of lead time from suppliers/contractors and ensuring contingency stocks from end to end)
  Invest in Technology and Infrastructure - update systems to support operational resilience.

Improve Communication Channels - strengthen both internal and external communication.

3. Airline C: Enhancing Preparedness and Crisis Communication
- Strengths: Resource management and Safety protocols.
- Challenges: Preparedness and reliance on external partners.
  Recommendations :
  Clarify Service Roles for Emergencies - define expectations and roles clearly for each department head and downline supervisors up to staffs.
  Strengthen Crisis Communication - improve communication with passengers, regulatory bodies, and partners.
  Enhance External Collaboration - develop stronger partnerships to bolster resilience.

4. Common Challenges in People Management
- Across airlines, inconsistencies in people management are linked to budget constraints and economic pressures.
- Recommendations:
  Implement Transparent Practices - communicate clearly about performance evaluations and incentives (Thatcher & Milner, 2014).
  Adapt to Financial Constraints - develop flexible reward systems to maintain employee motivation.

Implications for Business Continuity and Recovery Planning

These findings underscored targeted areas for resilience and process improvement across the aviation sector. For the Business Continuity Management Framework and Recovery Plan, these insights helped airlines:

- Strengthen Communication and Coordination internally and externally.
- Build Resilient Partnerships with suppliers and contractors.
- Invest in Technology and Infrastructure to support operational efficiency.
- Enhance People Management through transparent practices to maintain workforce engagement

4. Discussion

This chapter summarizes the results presented in the previous chapter, draws conclusions based on the findings, and provides recommendations for future research and practical implications.

4.1 Conclusions

In light of the findings of this study, the following conclusions are drawn:

1. The assessment of airline employees (managers and rank-and-file) from the three airlines on how resilient their airline company was varied from normal adaptability to a high extent of resilience (recovery) in terms of five attributes: institutional control, planning for preparedness, philosophy and integrity, external support and linkages, and communication and media. These results indicated that airlines were likely to be "adaptable" to "recovery" based on employees' perspectives and experiences within the company. This suggested that each airline had established control over its institutional affairs and had equipped itself with the necessary measures to withstand incoming disasters, especially in relation to disaster risk reduction and mitigation. Their planning extended to the company's managerial preparation, financial strategies, and workplace plans concerning impending disasters. Managers of the airlines claimed that they had plans in place to secure possible resources during times of crises and calamities. Therefore, it could be concluded that the airline companies had continued serving their clients, ensuring that their operations would not be derailed by simple lapses of oversight. A business that instilled the philosophy of "customer first" and "business as usual," while maintaining its business integrity, was evident across the airlines.

2. Regarding the efficiency of business processes within the three airline companies, the findings provided evidence from employee assessments, which indicated that the airlines were considered efficient (managed) to very efficient (standardized) in terms of facility management, health, wellness and safety, technology governance, and people management. However, results from the qualitative phase revealed a need to maximize the utilization of resources through equal distribution across all departments. Additionally, qualitative findings pointed out that some operations and activities within the airlines were inconsistent, with certain activities being handled on an ad-hoc basis. Therefore, there was a clear need to revisit business process management strategies, assess their maturity, and address the financial management aspect of each airline in order to reevaluate the efficiency of their business management processes.

3. In terms of the significant correlation found between business process attributes (facility management, health, wellness and safety, technology governance, and people management) and the attributes of business resilience (institutional control, planning for preparedness, philosophy and integrity, external support and linkages, and communication and media), it most likely meant that having an effective and efficient model of business processes contributed directly to the extent of resilience within the business, which was reflected in how resilient employees were. This result encouraged managers across all departments in the airline companies to reflect on their business process management strategies and consider the maturity of their business processes. Implementing an effective business process model helped managers develop more efficient and profitable business strategies, which were likely to contribute to the overall resilience of the organization. Thus, it was concluded that the more resilient the business processes were, the more they mitigated the effects of unexpected disruptions, reducing negative consequences for the airline companies and the organization as a whole. Therefore, it was highly relevant to note that business resilience was directly associated with the efficiency of business process management.

4. The findings of this study revealed that the level of efficiency of business processes acted as a predictive element for determining the variation in the extent of business resilience across airline companies. This result answered the main research question of the study regarding the impact of business processes on resilience, showing a statistically positive and highly significant relationship. It could be concluded that airline companies that aimed to manage their processes efficiently—through institutional control, planning, maintaining integrity, fostering support through linkages, and optimizing communication media—were more capable of preparing for unexpected events. They demonstrated a higher

ability to adapt to disturbances, recover from these events, and maintain control over their business structure and functions, particularly in ensuring the continuity of operational processes at the desired level.

4.2 Recommendations

Based on the research findings and conclusions, the researcher offers the following recommendations:

1. Concerns and Recommendations for Future Research: This research highlighted several concerns that should be addressed in future studies. A larger-scale implementation is needed to validate the scales used and identify categories for both measurement scales applied to the two constructs: business resilience and efficiency of business processes. Expanding the sample size would enhance the reliability of the results. The researcher suggests that a longitudinal study on these airlines could further explore the relationship between resilience and long-term business process efficiency or company performance. This study could also focus on profitability in relation to risk exposure. Additionally, for more refined analysis, future research could incorporate multiple measures for each determinant with objective metrics, as these could be more specialized for the airline industry.

2. Refining Processes Based on Resilience Assessment: After assessing the current state of the airline's resilience, each department can refine its processes and activities to better integrate the vision of resilience throughout the entire value chain, both internally and externally. Furthermore, an assessment of evolving sustainability capabilities could provide a deeper analysis of resilience strategies.

3. Training Programs for Airline Managers: A seminar or training program focused on educating airline managers about the concept of resilience and providing standardized tools is crucial for enhancing current risk management and business process strategies. These programs should emphasize the importance of equipping both new and seasoned employees with the skills necessary to ensure operational continuity and safety, particularly in light of the demographic profiles of Airlines B and C. Given that a significant proportion of employees in these airlines have relatively fewer years of service, it is essential to invest in training initiatives to ensure that staff are well-prepared for potential disruptions.

4. Expanding the Scope of Future Research: This study focused solely on the extent of business resilience and efficiency of business processes. However, the researcher acknowledges that other factors may influence business process management. Therefore, future research could examine additional factors or variables that may affect the efficiency of business processes. A measurement model for business process management maturity could be considered for future survey-based research to provide a more in-depth assessment and enhance the business continuity framework and recovery program.

5. Managerial Recommendations for Enhancing Resilience: From a managerial perspective, the findings suggest that an airline company seeking to become highly resilient must develop effective and standardized business processes. This information technology systems, which enable the company to prepare for unexpected events, respond to disruptions, and recover while maintaining control over business functions and structures. Most importantly, these systems should ensure the continuity of operations. Finally, department managers who are committed to improving their business process management must assess the maturity of their processes. Regular testing of process maturity will foster innovative management practices, leading to more flexible and continuously improving business processes. This will help eliminate outdated routines and procedures, driving sustained quality improvement within the company.

4.3 Implications of the Study

This study appears to have relevant implications, especially regarding the business processes and activities considered in the survey. Understanding the extent of the efficiency of business processes reflects the business's resilience in facing unexpected situations, such as the global pandemic. It can also help identify effective ways to respond to the work demands and needs of airline companies in general.

The findings of this study suggest that airline companies should aim to achieve at least efficient (managed) business processes. While this may seem like a trivial conclusion, the majority of the managers and rank-and-file employees interviewed stated that their operations still face inconsistencies, and some activities are handled in an ad-hoc manner. Although the survey results showed that the airline companies' business processes are generally efficient (managed) and very efficient (standardized), there is qualitative evidence indicating that even small airline companies stand to benefit from striving for a higher efficiency (predictable to innovative) in business process management. This higher level of efficiency is linked to increased business resilience, particularly in terms of anticipation, adaptability, and recovery.

The findings also imply that airline companies with efficient technology governance, people management, facility management, and health & safety processes should continue to improve their business processes to achieve higher efficiency. A highly efficient, innovative company that does not have the proper processes in place to exploit these innovations is likely to affect its overall resilience. Without the right processes, the company may not achieve the expected performance levels associated with these innovative and highly efficient business processes.

The study's implications emphasize the need for a robust Business Continuity Management Framework (BCMF) and Recovery Program tailored to the aviation industry in the Philippines. This framework should address vulnerabilities highlighted through both quantitative and qualitative analyses. With a workforce that includes a significant proportion of relatively new employees, the proposed framework focuses on targeted training, risk assessment, and operational resilience to ensure preparedness for crises such as natural disasters or economic disruptions. Key elements of the framework include enhancing interdepartmental collaboration, strengthening IT infrastructure, and building strategic partnerships to mitigate supply chain dependencies. These initiatives aim to maintain safety, operational stability, and financial sustainability, helping the sector adapt and recover quickly from future disruptions.

4.4 Output of the Study

The airline industry in the Philippines faces numerous challenges, including natural disasters, operational disruptions, and economic volatility, making business resilience and recovery planning essential for long-term sustainability. This business continuity management framework and recovery program aims to equip airlines with the necessary strategies to manage crises, ensure operational continuity, and recover swiftly from unforeseen events. By focusing on risk assessment, crisis management, resource allocation, and employee well-being, the framework provides a comprehensive approach to strengthening resilience and maintaining business stability in the face of disruptions.

A. Proposed Business Continuity Management Framework and Recovery Program for Airline Companies in the Philippines

Introduction

The airline industry in the Philippines is vital for connectivity, tourism, and commerce. Given its vulnerability to challenges like natural disasters, pandemics, and geopolitical issues, a robust **Business Continuity Management Framework (BCMF)** and **Recovery Program** are essential for resilience. This proposed BCMF addresses key findings from the quantitative and qualitative analysis in Chapter 4, specifically designed to enhance resilience in operations and preparedness for unpredictable events.

1. Business Continuity Management Framework Overview

The BCMF aims to maintain operational stability during disruptions and support rapid recovery afterward. Integrating the quantitative and qualitative analysis insights into core components allows the framework to adapt to aviation-specific uncertainties.

1.1 Purpose

The thematic analysis identifies targeted objectives to ensure the BCMF is proactive and resilient:

- **Minimize operational disruptions** during crises like natural disasters, economic challenges, or external dependencies.
- **Rapid recovery** of normal operations post-disruption.
- **Protect stakeholder interests**, ensuring customer and employee safety.
- **Sustain financial health** and maintain market presence.

1.2 Key Components of the Framework

1.2.1 Risk Assessment and Business Impact Analysis (BIA): Incorporate key findings to account for uncertainties in aviation:

- Assess **supply chain vulnerabilities** linked to external contractors and partners, focusing on critical resources like fuel, parts, and IT systems.
- Identify essential functions such as air traffic control, customer service, and maintenance that must continue.
- Prioritize response strategies, particularly in technology and communication, based on the likelihood and severity of risks.
- To use tools such as Management of Change or Hazard Identification Risk Analysis

1.2.2 Crisis Management Team (CMT): Based on the thematic findings, structure the CMT to enhance interdepartmental collaboration:

- Include representatives from all critical departments, including resource management, people management, operations head and technology, to address observed vulnerabilities.
- Define roles that improve interdepartmental communication, as gaps were noted in communication during crises.
- Regular simulation exercises should address coordination with external partners and stakeholders.
- During crisis an interval of every 4 hours meeting to ensure that the higher management are up to date on the criticality, action taken/to take to control the impact from different units.

1.2.3 Business Continuity Planning (BCP): Adapt the BCP to strengthen resilience in specific areas:

By incorporating the quantitative and qualitative analysis findings into the BCMF and Recovery Program, this framework addresses specific resilience challenges within the aviation industry. It supports proactive preparation for unforeseen events, helping aviation sector of the Philippines enhance resilience and sustainability in a volatile environment.

- Develop continuity plans for all critical functions, with special attention to **facility and technology governance**, as highlighted in the thematic analysis.
- Establish contingency action plans, including cross-training staff for flexible resource deployment.
- Create communication protocols that address the need for transparency with employees, contractors, and regulatory bodies.

1.2.4 Resource Management and Logistics: Address resource management and supply chain challenges identified in thematic findings:

- Ensure stockpiling of essential supplies and negotiate with suppliers for priority access during crises.
- Develop **redundant IT systems** and backup resources for operations to reduce downtime.

1.2.5 Employee Safety and Wellness: Incorporate findings on people management and morale:

- Establish health protocols to ensure employee safety and address **mental health support** for managing crises.
- Implement flexible working arrangements and ensure clear communication regarding employee roles and expectations.

B. Recovery Program for Airline Companies

Introduction

The recovery program includes thematic insights to restore operations and adapt to evolving industry uncertainties.

2.2.1 Assessment and Evaluation of Damage:

- Conduct an in-depth assessment post-crisis, prioritizing facility and technology recovery as identified in the thematic analysis.

2.2.2 Operational Resilience:

- Develop flexible flight schedules and maintain backup crews for rapid recovery.
- Address safety protocols and evaluate partner readiness, emphasizing the need for **resilience in technology** and **supply chain support**.

2.2.3 Financial Recovery:

- Implement cost-effective financial strategies that ensure liquidity, including **strategic revenue diversification** such as cargo and charter services.

2.2.4 Technology Governance Recovery:

- Prioritize technology investment to support operations remotely and securely. Implement cloud-based systems to ensure continuity.
- implement a mobile-friendly operational software or office platform that supports timekeeping, digitization, and other daily operational desktop applications.

2.2.5 People Management Recovery:

- Integrate flexible workforce management practices, considering economic and operational uncertainties.
- Provide ongoing resilience training to prepare staff for future disruptions.

C. High-Level Recommendations

Introduction

Based on the findings from Chapter 4 and industry best practices, the following recommendations are made for the implementation of the proposed framework and recovery program.

3.1 Institutionalize Business Resilience:

- Make resilience a strategic objective across departments, as indicated in thematic findings on resource management, people management, and external dependencies.

3.2 Investment in Technology for Governance:

- Strengthen IT infrastructure, as vulnerabilities in **technology governance** were identified. Equip staff with tools for remote work and implement satellite communication solutions for regions with poor connectivity specially on affected areas.

3.3 Strengthen External Partnerships:

- Build cooperative agreements with partners for critical resources, addressing third-party dependency challenges identified in the analysis.

3.4 Continuous Training and Simulation:

- Regularly train staff in crisis management and include simulations with external stakeholders to test communication and response protocols.

D. Implementation Road Map

Below is the proposed roadmap for implementing the business continuity management framework and recovery program.

- **Week 1-2:** Conduct risk assessment and business impact analysis.
- **Week 3:** Establish the Crisis Management Team and develop crisis protocols.
- **Week 4:** Draft the Business Continuity Plan and develop resource management strategies.
- **Week 5-6:** Begin training employees and conducting crisis simulations.
- **Week 7-9:** Implement technology enhancements and backup systems.
- **Week 10-12:** Establish partnerships with external stakeholders and finalize the financial recovery program.

The proposed framework's dynamic nature is demonstrated through several essential features. Real-time updates, using continuous monitoring and iterative assessments, enable quick adjustments to emerging threats or changes. Flexible protocols allow crisis management and communication strategies to be scaled and adapted as necessary. Continuous training and simulations are updated regularly, ensuring the organization remains prepared for various scenarios. Additionally, health, safety, and resource management measures are designed to be proactive and responsive, evolving to address changing needs. This approach ensures the framework's continuous adaptation and effectiveness, maintaining resilience under unpredictable conditions in the aviation industry.

Figure 9 Implementation Road Map for the proposed business continuity framework and recovery program.

The airline industry in the Philippines is crucial to the nation's economy and is highly vulnerable to disruptions. Implementing a well-structured business continuity management framework and recovery program will enable airlines to manage crises more effectively, ensuring operational continuity and long-term sustainability. This proposed framework focuses on holistic resilience across operations, technology, finance, and human resources, providing a strategic roadmap for recovery and growth amidst uncertainties.

To persuade airline companies and stakeholders to implement these recommendations, it is essential to emphasize the long-term benefits, including improved resilience, operational efficiency, and profitability. Implementing these strategies can reduce risks associated with disruptions, leading to cost savings and sustained performance. Training programs for managers are strategic investments that equip employees, both new and experienced, to handle crises effectively, thus protecting customer trust and stakeholder interests. Refining business processes and integrating advanced IT solutions will enhance flexibility and adaptability, strengthening the company's competitive edge. Additionally, further research and process maturity assessments will position the airline as a forward-thinking leader, committed to continuous improvement and operational excellence. Framing these recommendations as strategic growth opportunities underscores their value and importance.

To ensure compliance with the high-level recommendations in the aviation industry, a strategic approach focused on engagement, alignment, and accountability is essential. First, institutionalize business resilience by incorporating it into the company's strategic objectives and balance scorecards of all departments, ensuring each understands the value of proactive risk management and aligning efforts through clear communication and incentives. Second, emphasize investment in technology governance by demonstrating how upgraded infrastructure and communication tools can mitigate disruptions and improve efficiency. Highlight return-on-investment scenarios to gain executive buy-in. Third, foster external partnerships by establishing mutually beneficial agreements, emphasizing reliability and resource accessibility in times of crisis. Finally, implement continuous training and simulation exercises, using a phased rollout and emphasizing real-world benefits through measurable performance improvements. Regular assessments and feedback loops should be integrated to maintain compliance and promote a culture of continuous improvement, ensuring all stakeholders are engaged and accountable.

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