Embedded Resilience Properties Identified in Quality Assurance and Corporate Governance in the South African Aviation Industry

Estie Serfontein

Da Vinci Institute for Technology Management, Johannesburg, South Africa, E-mail,
estie.serfontein@icloud.com, https://orcid.org/0000-0002-4940-2479

Krishna Govender*

University of KwaZulu Natal, Durban, South Africa, E-mail, govenderkrishna@gmail.com ,
https://orcid.org/0000-0002-3079-5989

*Corresponding Author

Abstract

This study aimed to identify embedded drivers of organisational resilience through examination of stakeholders' perceptions of the interaction between quality assurance and corporate governance in the South African aviation industry. The study followed the methodological principles of qualitative content analysis to collect and analyse data from semi-structured interviews conducted among a convenience sample of 26 stakeholders to the South African aviation industry. A fragmented relationship between quality assurance and corporate governance in the South African aviation industry was identified. Dissonance between quality assurance and corporate governance reduces an organisation's ability to remain resilient. Principles and practices associated with quality assurance and corporate governance stimulate underlying resilience. The study provided a framework promoting organisational resilience derived from participants' perceptions on quality assurance and corporate governance principles in the South African aviation industry. This contribution harmonised multiple disciplines of existing management systems into a practical and synergised unit to simultaneously overcome fragmented cooperation between quality assurance and corporate governance and stimulate resilience. As the aviation industry provides a service to the public and serves as a platform for economic development of other industries, the insight associated with this study transcends the aviation industry itself.

Keywords: Aviation, sociotechnical system, organisational resilience, quality assurance, corporate governance.

Introduction

The value of the aviation industry primarily lies not only in the fast movement of people and goods across borders (Schmidt, 2017), but it also since it facilitates trade and stimulates economic growth in other industries worldwide (Gill, 2016). The industry is characterised by strict policy, high safety standards and stringent operational practices, since probable failures are perceived to pose significant risk to society (Kvalnes, 2017). However, the industry maintains high operational standards and requires controlled multi-dimensional interaction between various elements, resulting in air transport being considered as the safest mode of transportation worldwide (International Air Transport Association, 2018).

Several researchers (Amankwah-Amoah, 2018; Chialastri & Pozzi, 2008; Mhlanga & Steyn, 2016; Njoya, 2013) identified a disconnect between the principled organisational management and outcome-based procedural supervision in the aviation industry worldwide. As a result, the risks of reduced commercial competitiveness, reduced reputation from

stakeholders and an inability to adapt to the rapidly changing macro-environment, are prominent in the aviation industry (Amankwah-Amoah, 2018). This viewpoint of reduced integrated management control and its effect on reputational perception is consistent with perceptions on the South African aviation industry (Le Cordeur, 2017) and permits further research and analysis.

Coherence between principled organisational management and the lower-level outcome-based procedural supervision facilitates optimal performance and sustainable credibility among internal and external stakeholders and improves sustainability (Chialastri & Pozzi, 2008). Considering the complexity of the aviation industry worldwide, an all-inclusive and stringent governance framework that holistically addresses an organisation's technical performance and commercial integrity through improved multi-level accountability is a necessity (Tjorhom, 2010). Vogus and Sutcliffe (2007:3419) argue that resilient organisations 'promote competence, restore efficacy, and encourage growth through the behavioural processes' of the organisation in a holistic sense.

Amankwah-Amoah (2018), Lazur, Jagadeesh, Karthikeyan and Shanmugaraja (2014) and Njoya (2016) concur that insight on the relationship between management control processes that address commercial management and technical operations respectively is lacking. Like Linnenlueckle (2017) who argues that future research in this regard could yield valuable insights into multi-disciplinary organisational resilience, Annarelli and Nonino (2016) recognised the need for further research in the arena of resilience in the organisational and operational domains of the enterprise system. In light of the above, this study was conducted to achieve a determine stakeholders' perceptions of the interaction between quality assurance and corporate governance in the South African aviation industry to identify embedded drivers of organisational resilience. As a management control system to support outcome-based procedural supervision, the manifestation of quality assurance in the aviation industry is juxtaposed to the implementation of corporate governance which supports principled commercial management.

Contextual background

As a contracting state to the International Civil Aviation Organisation (ICAO), South Africa participates in the global aviation system (Department of International Relations and Cooperation, 2003) and integrates international operating standards into its own regulatory framework (Department of Transport, 2017). Since South Africa's participation in the international aviation context, a period of exclusion occurred between 1986 and 1994 due to international sanctions associated with apartheid policies (Itani, O'Connel & Mason, 2014). This isolation impacted negatively the South African industry's economic growth and necessitated the deregulation of the domestic aviation market to allow privately-owned entities participation from 1991 (Pirie, 1992). Therefore, the South African aviation industry is considered a fairly young industry and the institutional arrangements and interrelationships between stakeholders to maintain and promote a functional cooperative system is still developing (Amankwah-Amoah, 2018).

Despite this status, the South African aviation industry directly contributed between 3.1% and 3.5% to the annual South African Gross Domestic Product (GDP) over the past decade (International Air transport Association, 2019; Industry High Level Group, 2017; Oxford Economics, 2011, 2017; Smith, 2018). This endowment is comparable to the global aviation industry's contribution to GDP worldwide, and a projected annual industry growth rate of 4.5% until 2035 is forecasted (Industry High Level Group, 2017).

The Department of Transport (2017) defines a two-dimensional governance approach to regulating the South African aviation industry; whereas the South African Civil Aviation

Authority (SACAA) remains responsible for the development, oversight and enforcement of operating standards. The respective Air Service Licencing Councils (ASLC) perform economic governance to assure that the required operating standards can be financed by each licence holder. The governance authority includes various supporting functions, such as infrastructure (airports and airspace), flight operations (scheduled and non-scheduled domestic and international, private operations, commercial operations, medical and specialised services, flight surveying, crop spraying, etc.), design and manufacturing, training and personnel licencing, aircraft maintenance, etc, and increases the complexity of the industry (Department of Transport, 2017).

Theoretical background
Sociotechnical and organisational resilience
Over the past two decades, the complexity and interdependence of components within the aviation system increased dramatically worldwide (Maurice & Burleson, 2012). Adding to this complexity, Kahn, Barton, Fisher, Heaphy, Reid and Rouse (2018) argue that organisations and industries are socially constructed systems formulated by deliberate placement of nucleus elements and functions within other structures and hierarchies. Similarly, Patriarca, Di Gravio and Constantino (2016) argue that the aviation industry is a complex sociotechnical system since each of the embedded nuclei consist of multiple aspects (methods, technology, human capital, specialised human interface, procedures, institutions, etc.), that cohesively collaborate towards the system's all-inclusive target. Therefore, the performance of one aspect of the system, as well as that of the overall system, depend on the effective realisation of stakeholder value in various nuclei in the aviation system. In turn, the failure of one element can have a cascading effect on stability and stakeholder satisfaction of another component of the system. The capability of a sociotechnical system to absorb instability and maintain operational contingency points to the resilience of such a system (Amir & Kant, 2018). Hickford, Blainey, Ortega and Raghav (2018:20) describe organisational resilience as 'the ability of an organisation to anticipate, prepare for, responds and adapt to incremental change and sudden disruptions in order to survive and prosper'. As a system's behaviour is influenced by its internal and external context (Whitney, Bradley, Baugh & Chesterman, 2015), effective and pro-active management control overcomes vulnerable instability through autonomous transformation (Whitney et al., 2015). Therefore, organisational resilience in sociotechnical systems is characterised by transformative change in the micro-environment enabling adaption to fluctuations in either the macro or micro-environment.

Although the theory on organisational resilience in a sociotechnical system developed from Erik Hollnagel's cyclic principles of learning, responding, monitoring and anticipating to safeguard a contained system, the scope and application of organisational resilience differ (Futura, 2015; Xiao & Cao, 2017). Despite the difference, these cyclic principles to operationalise resilience remains relevant to organisational resilience (Kurapati, Lukosch, Verbraeck & Brazier, 2015). Organisational resilience theory surpasses contingency and disaster management; it includes all areas of an organisation's response to multi-disciplinary and interconnected opportunities and changes and encompasses the system's overall management (Xiao & Cao, 2017). A resilient organisation manages internal and external complexities through holistic thinking, acknowledgement of multiple perspectives, and reframing the complexities as moving targets (Cristancho, 2016). Continuous assurance of viability and sustainability develops stakeholder value (Hamel & Välikangas, 2003). Organisational resilience expands the focus from single disruptions to anticipation of, and adjustment to, secular trends in the micro-, market- and macro-environment (Hamel & Välikangas, 2003). Hamel and Välikangas (2003:53) further argue that organisational

resilience persists as a strategic driver ensuring 'the capacity to change before the case for change becomes desperately obvious'. To enhance an organisation's inherent capability to respond to uncertainties, Lee, Vargo and Seville (2013) argue the necessity to centralise internal management controls (such as quality assurance and corporate governance) to yield increased organisational knowledge, creative problem solving, and sustainable adaptation to improve future responses and stakeholder value in the management of uncertainties.

Quality Assurance

Specific to the South African aviation industry, the South African Civil Aviation Regulations (SACAR) (South African Civil Aviation Authority, 2011: Part 1) defines quality assurance as 'all the planned and systematic actions necessary to instil adequate confidence that all organisational activities satisfy given standards and requirements, including the ones specified by the relevant organisation in relevant manuals'. The application of quality assurance in the aviation industry is therefore aimed at verifying compliance to technical process requirements defined by the legislative framework. Reverting to international best practice, the International Organization for Standardization revised the ISO 9001 (Quality Management System Requirements) standard in 2015. The National Committee SABS/TC 176 endorsed this standard as appropriate and applicable to South Africa (International Organization for Standardization, 2015). The implementation of ISO 9001:2015 assures consistent stakeholder value through reliable products and/or services that meet statutory and internal standards (International Organization for Standardization, 2015).

Whereas the specific quality assurance requirements in the SACAR are mandatory for various licenced organisations, these requirements are defined in different parts of the SACAR (South African Civil Aviation Authority, 2011). In turn, the adoption and implementation of the International Organization of Standardization's (2015) ISO 9001:2015 specification that encompasses all areas of an organisation are optional. The element of continual improvement is a fundamental similarity between the SACAR and ISO 9001:2015 (International Organization for Standardization, 2015; South African Civil Aviation Authority, 2011). These two sets of standards also align in the requirements for management control and supervision, adequate delegation of duties and responsibilities, authorised internal protocols denoting procedural integration, various levels of staff involvement, independent internal monitoring of performance, corrective action and structured procedures assessing the system's performance (International Organization for Standardization, 2015; South African Civil Aviation Authority, 2011). Customer satisfaction, as a separate element to compliance to technical standards, receives specific emphasis in the ISO 9001:2015 framework (International Organization for Standardization, 2015). However, the SACAR concentrates on outcome-based assurance that prescribed operational and maintenance practices relating to the operation of aircraft are met (South African Civil Aviation Authority, 2011).

Corporate governance

The Institute of Directors of Southern Africa (IoDSA) drives the development of South African corporate governance policy (Cliffe Dekker Attorneys, 2002). A Committee, chaired by Judge Mervyn E. King (retired), was established to develop a non-legislative Code of Practice to establish and sustain economic, social, and environmental success (Institute of Directors Southern Africa, 2016). Therefore, corporate governance rather emphasises commercial management conduct than quality assurance's focus on technical practices and operational processes. When King I (Code) was published in 1994, Judge King viewed the publication as a framework for sustainable business practices through leadership principles, and an opportunity to align a newly democratic South Africa's business environment to global trends

(Nakpodia, Adegbite, Amaeshi & Owolabi, 2016). Since the initial publication of the King Report, three revision were published and the King IV Report designates the current framework for corporate governance (Institute of Directors Southern Africa, 2016). The authors note 'greater expectations from stakeholders than ever before' (Institute of Directors Southern Africa 2016:3). Whereas the previous King Reports aimed at insight into ethical financial stability, the King IV report notes 'the organisation's specialist functions that facilitate and oversee risk management and compliance' to satisfy contemporary stakeholder needs (Institute of Directors Southern Africa 2016:9). Therefore, the contemporary stakeholder views the creation of value inclusive of the fulfilment of technical specifications, such as compliance to legislative requirements that is conventionally noted as a quality assurance function. The notion emerges that corporate governance develops legitimacy in the processes associated with compliance to technical specifications and quality assurance as a whole.

The Institute of Directors Southern Africa (2016:27) argue the inclusion of 'governance as a holistic and integrated set of arrangements' as a distinguishing feature from its predecessors. Governance becomes an all-inclusive framework supporting integrated control throughout an organisation. In the international context, Marx and Mohammadali-Haji (2014) propose that the integration of management controls yields profound value to stakeholders across geographic boundaries. Pies and Koslowski (2011) agree that integrated management control systems advances the long-term legitimacy of an organisation, but adds the advantage of all-inclusive and mutually-beneficial stakeholder value across industries and economies.

Methodology
Qualitative content analysis
Qualitative content analysis was selected as a methodology to support the relativist approach of this study. It entails the examination of purposively selected data sources with the inherent capacity to specifically address the research questions investigated (Hashemnezhad, 2015). This methodology extracts manifest and latent meaning from purposively selected texts thereby identifying the actual discourse as well as the implied, or intended, discourse (Bengtsson, 2016). Because this methodology yields both evident and concealed insight, the researcher deducts that this methodology is appropriate for this study; it aligns with the intended comprehensive critical analysis associated with the phenomena of interest. This methodology identifies emergent themes to elicit an in-depth understanding of the phenomenon investigated relative to the subjective position of the data source (Hashemnezhad, 2015; Mayring, 2014). Therefore, qualitative content analysis is a research methodology that provides insight into both the phenomenon under study, and the data source's relationship and subjective views on the phenomenon investigated. This characteristic of qualitative content analysis was useful to identify stakeholders' perception of the unit of analysis within a specific context.

Population and sample
The target population includes individuals who share the characteristic of being a stakeholder to the South African aviation industry. The Department of Transport (2017) classified such stakeholders into five categories. Therefore, the target population is stratified as it can be classified into categorical subsets (Creswell, 2014). A description of these categories is summarised in Table 1.

Table 1: Categories of stakeholders to the civil aviation system

Stakeholder category	Description
Governance stakeholder	Responsible for policy and regulation development to simultaneously maintain economic viability and technical operating standards compliant to municipal, governmental, and international requirements.

Stakeholder category	Description
Commercial stakeholder	Associated with the supply chain and economic activity within the aviation system and includes entities who provide or procure services/goods such as fuel, aircraft maintenance services, air travel services, training and staff certification, airport, and air traffic organisations, etc.
Support stakeholder	Direct and indirect facilitation of the operation and service provision of commercial stakeholders, such as insurance organisations, financing institutions, travel agents, cargo, and shipment organisations, etc.
Society stakeholder	Stakeholders who do not directly participate in the civil aviation system's service provision activities, but who have a direct interest in the economic, safety, security, and environmental performance of the civil aviation system.
Security stakeholder	Responsible for the development and implementation of policy that enables regulating instruments relating to national security. Security stakeholders also include the South African Police Service and military veterans.

Source: Adapted from Department of Transport, 2017

The sample size should be appropriate to the study to reach data saturation (Latham, 2018). For qualitative studies, a typical sample size ranges between one (1) to 30 informants (Bengtsson, 2016). Creswell (2014) and Yin (2018) argue that case studies of a descriptive nature rarely have a sample greater than five (5). The sample size for this study was therefore set at five (5) participants from each stratum of the target population.

Sampling supports either a random or convenience sampling approach (Creswell, 2014). Whereas random sampling indicates equal opportunity for participants to be selected (Creswell, 2014), a selection of members from a target population that meet certain criteria points to convenience sampling (Etikan, Musa & Alkassim, 2016). As this study is aimed at the South African aviation industry, ideal research participants share an association to this criterion. Therefore, convenience sampling was employed to allow for participant selection based on an association with the phenomenon of interest as well as accessibility, availability, or willingness to participate (Etikan et al., 2016) and supported the viability of this study.

Data Collection

Semi-structured interviews with pre-defined open-ended questions were conducted with 26 research participants. Data equivalent to 25 hours, 26 minutes and 48 seconds was collected and transcribed verbatim. An alphanumerical acronym was assigned to each participant to support anonymity. Despite various efforts to recruit at least five (5) participants from the governance stakeholder stratum, only three (3) from this category provided informed consent to enable participation. However, the participants from the security and commercial stakeholder groups exceeded the intended stratified sample size for each category. The participant distribution, alias and interview duration for each interview is provided in Table **2**.

Table 2: Participant distribution

Category	Alias	Interview duration	Stratum total interview time
Governance	GOS1	00:59:49	02:20:19
	GOS2	01:02:30	
	GOS3	00:18:00	
Commercial	COS1	00:56:03	07:49:44
	COS2	00:40:03	
	COS3	00:46:47	
	COS4	02:05:40	
	COS5	01:14:03	
	COS6	01:10:25	
	COS7	00:56:43	
Support	SUS1	00:57:52	07:28:00
	SUS2	01:03:26	
	SUS3	01:26:01	
	SUS4	01:24:20	
	SUS5	02:36:21	
Society	SOS1	00:19:49	03:28:54
	SOS2	00:23:30	

Category	Alias	Interview duration	Stratum total interview time
	SOS3	00:47:45	
	SOS4	01:34:31	
	SOS5	00:23:18	
Security	SES1	00:55:36	04:19:48
	SES2	01:12:45	
	SES3	00:32:24	
	SES4	00:17:08	
	SES5	00:15:50	
	SES6	01:06:08	

Source: Developed by the researcher, based on the fieldwork

Data analysis

Data analysis followed qualitative content analysis procedures which allow for thematic categorisation of the dataset (Bengtsson, 2016). Thematic categorisation in qualitative content analysis supports the development of insight into both the unit of analysis and the context, and it explores the variation of meaning that manifest through the interrelationship between the context and unit of analysis (Mayring, 2014). It promotes the use of a coding process to simultaneously identify meaning in the data and classify the data into related groups for further analysis (Bengtsson, 2016; Cho & Lee, 2014; Hsieh & Shannon, 2014). The researcher recruited a consultation agency specialising in data analysis to perform the coding process to increase objectivity and support reliability of the empirical conclusions (Bazeley & Jackson, 2013). The consultant used NVivo software to facilitate the analysis of the dataset provided by the researcher. Computer assisted qualitative data analysis increase validity and accuracy of data analysis, but also adds to the coding efficiency (Creswell, 2014). Initially, the transcripts were checked through lexical queries as a flexible approach to gathering and exploring subsets of the data. The coding principles described by Saldaña (2015) were incorporated throughout the process.

A coding taxonomy derived from previous research outcomes was applied to identify emergent themes. These included multi-disciplinary concepts and keywords from extant texts such as with from the ISO quality management principles (International Organization of Standardization, 2016), The King IV framework for Corporate Governance (Institute of Directors Southern Africa, 2016), cornerstones of organisational resilience (Patriarca, Bergstrom, Di Gravio & Constantino, 2018), properties of a resilient sociotechnical system (Futura, 2015), and the framework for organisational resilience developed by Stephenson (2010). As a result, a cohesive framework emerged from the data to harmonise quality assurance and corporate governance principles supporting organisational resilience. Further data analysis allowed for the identification of emergent themes to supplement the framework revealed by the data, and to simplify the data by merging related themes.

Results

Current manifestation of quality assurance

Although the data indicates the manifestation of quality assurance in the contemporary South African aviation industry, the findings revealed the perception that it is implemented in a fragmented manner. Quality assurance was identified as a vital component of a successful business, but some participants indicated a negative perception towards its function and mandate. This negative perception is rooted in the idea that quality assurance becomes an unnecessary internal policing function and increases bureaucracy within organisations. Despite supporting its necessity, some stakeholders noted that the quality assurance function is seen to inhibit efficiency.

The data indicated that the effectiveness of an organisation's quality assurance system depends on the support and commitment from the organisation's leadership. Furthermore, the data suggests that, where leadership do not fully support quality assurance in the organisation,

its application becomes superficial. The data revealed that unsustainable corrections are implemented to merely satisfy the short-term quality assurance requirement, and subsequently move on to daily activities. The notion that this practice contributes to the superficial application of quality assurance emerged from the data. This approach becomes a quick fix and not a sustainable improvement that is to be embraced for advancement.

A lack of comprehensive understanding of the processes, requirements and benefits of quality assurance throughout the organisation was evident from the findings. Data analysis suggests the underlying paradox that organisations perceive their implementation of quality assurance to be robust, but that it is actually only applied superficially as a result of lacking understanding and appreciation of quality assurance. Similarly, participating stakeholders stated that quality assurance is not seen as a mechanism to support sustainable commercial development, but merely to satisfy the regulatory requirements in terms of operating standards. The data also revealed that, although quality assurance is integral to an organisation's operating and safety standards, it is not fully embraced with the industry and thus not integrated into strategic and commercial management.

Necessity and potential value of quality assurance

Participants stressed the necessity of an effective quality assurance system to maintain consistent and efficient service delivery. Given the high-risk nature of the aviation industry, participants argued the purpose of the quality assurance system as a platform through which safety, security and reliability of the operation can be developed. The findings indicate that, although quality assurance contributes to the management of risks associated with aviation operations, it is applied to solely satisfy regulatory requirements. Only a small number of participants viewed the implementation of quality assurance to contribute to commercial viability and an increased competitive advantage. However, the participants who perceived quality assurance to enhance commercial competitiveness had very strong views on its benefits. These views included that an effective quality assurance system could underpin profitability and sustainability. In addition, these participants argued that a quality assurance system that is highly manifested in an organisation could improve company culture and staff morale as it creates a space of integrity, respect and inclusiveness among all staff.

The prerequisite of compliance to legislative requirements and operational standards was identified as a factor supporting turnaround-time and the price of the product/service. However, the data revealed that compliance to legislative prescripts and required operating standards cannot be compromised. Participants argued the significant negative impact of consequences to non-compliance in the aviation industry. This perceived cost of non compliance emerged as a factor in the economic sustainability of an organisation, since a temporary cessation in operational activity could lead to permanent termination of operations due to high operating costs and low profit margins.

Current manifestation of corporate governance

The findings revealed that corporate governance is regarded as the continuous commitment to manage all stakeholders in a responsible and ethical manner. This suggests the importance of corporate governance since it aligns business operations with regulatory compliance through balanced business values and operational sustainability. Despite the probable value of corporate governance, the data indicates inadequate understanding and emphasis on its principles and implementation in the South African aviation industry. Because of inadequate attention to corporate governance, a lack of consideration to the consequences of immediate habitual decisions on human capital and the expected outcome of a process is ever-present.

The notion also emerged that inadequate emphasis on transparent, fair and inclusive business conduct is not specific to the aviation industry, but rather influenced by a larger scale acceptance of corruption and biased business conduct within the South African context. This study revealed that corporate governance does not manifest sufficiently in the aviation industry as it is not mandatory in the legislative framework. However, some stakeholders noted that the principles associated with corporate governance is expected where supervisors and managers engage with staff, other entities and their own accountabilities.

Relationship between quality assurance and corporate governance

Despite acknowledging the theoretical stance that quality assurance and corporate governance should work in synergy, participants indicated that these control systems are working autonomously from each other. The data revealed an agnostic relationship between the two control systems as they are, at times, in conflict with one another. Despite this view, participants added that there is secluded evidence of effective cohesion between these systems in the industry. The data suggest that deliberate attempts towards bridging the gap between quality assurance and corporate governance were noted over the past five (5) years. The distinct need to harmonise these control systems into optimal synergy emerged from the data. Participants also echoed previous research indicating that these systems seek to serve the central purpose of all-inclusive monitoring and control to enhance excellence and stakeholder value.Although the majority of stakeholders argued absence of harmony between quality assurance and corporate governance, some argued that the effectiveness of the one is dependent on the effectiveness of the other. It was evident that a collaborative relationship between quality assurance and corporate governance could result in effective control and practical strategies to overcome disruptions, thereby stimulating resilience in the aviation industry. The data also revealed that that cohesion between these two control systems can increase an organisations ability to manage and overcome fluctuating pressures from the macro-environment.

The data provided the insight that fragmented interact and a lack of cooperation between quality assurance and corporate governance inadvertently results in declining safety assurance. In turn, the data revealed that an organisation's embedded resilience capacity develops from a synergised interaction between quality assurance and corporate governance. Participants argued that the advantageous unintended consequence of harmonised management control systems, such as quality assurance and corporate governance, is not sufficiently valued or embraced in the South African aviation industry.

Drivers of organisational resilience

The data indicated an association between the purpose, characteristics, advantages, and principles of management control processes, such as quality assurance and corporate governance, to organisational resilience. Further data analysis identified that organisational resilience emerges from the all-inclusive and effective implementation both management control systems. Although organisational resilience, quality assurance and corporate governance are deemed separate disciplines, the data revealed that the principles and properties stimulating organisational resilience aligns with optimal integration between quality assurance and corporate governance. Through the application of qualitative content analysis, these management control system properties emerged into drivers of organisational resilience in a two-dimensional classification. The first-level classification includes the properties of strategic management and company culture, monitoring and awareness, management of exposures, and responsive adaptation. Table 3 provides the description of each of these concepts as it emerged from the data.

Table 3: Drivers of organisational resilience

Indicator	Description
Strategic management and company culture	An all-inclusive approach to resilience across all levels of the organisation that connects an organisation's strategic decision-making by embracing internal and external connectedness and expertise to develop an ethical and pro-active approach to excellence, adaptation and improvement at all times.
Monitoring and awareness	Developing an exact understanding of the status of an organisations internal and external environment, it's potential positive and/or negative influence on the organisation and the desirability of its own performance in expected and unexpected circumstances through monitoring and analysis of past and potential future events across the hierarchy.
Exposure management	Proactive management and treatment of potential exposures necessitating various levels of change and adaptation in the organisations system that could either promote development or threaten sustainability of the organisation through consideration and involvement of various internal and external dimensions of the interconnected system.
Responsive adaptation	Stimulating the embedded capability and capacity for continuous adaptive evolution to efficiently address regular and irregular needs of the organisation and its operating environment and contain disruptive losses before those needs become critical through prepared mobilisation of resources.

Source: Developed by the researcher, based on the fieldwork

Each of the abovementioned drivers of organisational resilience are supported by contributing principles as outlined below.

Strategic management and company culture
The data suggests that the principles outlined in Table 4 support strategic management and company culture.

Table 4: Strategic management and company culture supporting indicators

Supporting indicator	Definition
Strategy and management	Success depends on ethical, competent and effective leadership with accountability for sustainable outcomes and the effective integration, communication, control and execution of the organisation's goals and ethos throughout the hierarchy in the short-medium-, and long-term.
Network perspective	The senior leadership's acknowledgement of interconnectedness between functions within the organisation and with entities in the external environment and that success depends on the active management of the all relationships.
Resource and structure planning	The recognition of diversity in expertise and experience in the organisation's resources and the balancing of interaction, duties, responsibilities and authority throughout the workforce.
Informed decision-making	The strategic approach to decision-making on the basis of accurate and up to date information with respectful consultation and involvement of multiple functions to strengthen decision-making processes and communicate the expectations throughout the organisation.
Improvement, creativity and innovation	The organisations encouragement of improvement, creativity and innovation throughout the organisation to advance its resources and create a competitive advantage through a culture of autonomous improvement.

Source: Developed by the researcher

Monitoring and awareness

Table 5 reflects the principles supporting monitoring and awareness in the realisation of organisational resilience.

Table 5: Monitoring and awareness supporting indicators

Supporting indicator	Description
Responsibility and capacity awareness	The continuous awareness of all role-players on what the reporting structures, authority, duties and responsibilities, and capacity requirements are and to what extent it interrelate to the input and output of other functions during normal and unexpected circumstances.
Internal protocols and procedures	The clear and concise formulation and effective distribution of internal protocols and procedure by incorporating the experience and expertise throughout the hierarchy that focusses on the inputs, processes, expected outcomes and customer satisfaction.

Challenge identification	The proactive identification and analysis, and communication of potential challenges and weaknesses in the organisation's system and its interaction with internal and external parties to create awareness on the challenges and its potential effects by all levels of the hierarchy.
Event analysis	The practise of reviewing challenges identified and in recorded past events from the internal and external environment to trigger non-punitive self-evaluation to improve knowledge on the cause, associated risk and probable mitigating practises and encouraging all roleplays to learn from mistakes.
Crisis management network	The awareness of how a crisis could affect an organisation and its sustainability and how the external and internal environments expertise and capacity can support the management of a crisis.
Internal audit	The structured process of continuous and objective monitoring the organisations performance against best practices, published requirements, desired efficiency levels to identify and act on required corrections as well as possible improvements.

Source: Developed by the researcher, based on the fieldwork

Exposure management

The data revealed the principles reflected in

Table **6** to support exposure management.

Table 6: Exposure management supporting indicators

Supporting indicator	*Description*
Intraoperative control and supervision	The discharge of management responsibility to effectively monitor and control the activities of an organisation or department to maintain the efficiency and expected outcomes and appropriate distribution of tangible and intangible resources.
Capability and capacity of internal resources	The expertise, experience and capacity of internal resources must be applied appropriately and considers if the need for adaptation to changes or the management of unexpected circumstances occur.
Activation of external resources	The relationship and agreement with external resources to supplement internal resources during management of disruptive changes and the awareness of what support the organisation can provide to another organisation when needed.
Staff engagement and involvement	The active involvement of experience and expertise from all levels of the hierarchy in the identification of possible exposures, the analysis and management thereof.
Contingency plans and recovery priorities	The clear definition and effective distribution of authority, responsibilities, communication channels, expected procedures, the required resources and prioritisation of actions during disaster management for varied scenarios to enable swift and effective action.
Participation in exercises	The involvement of all applicable personnel in the simulation of disaster management exercises to ensure all-inclusive awareness and expectations of the required actions during disaster management and the subsequent review of the effectiveness of the simulation to identify improvement areas in the contingency plan.
Insurance awareness	The awareness of the required timeframe and extent to which insurance policies will cover disasters in a variety of circumstances and allocation of reserve funds to prevent insufficient funding to manage a crisis.
Training and mentorship	The continuous development of staff expertise through training on essential aspects related to their functions, but also the encouragement to develop themselves continuously through the acquisition of knowledge and practical skills through mentorship and development programmes.

Source: Developed by the researcher, based on the fieldwork

Responsive adaptation

Table 7 indicates the principles supporting responsive adaptation as revealed by the data.

Table 7: Responsive adaptation supporting indicators

Supporting indicator	*Description*
Silo mentality	Diffusing the barriers between departments or functions to stimulate increased understanding of the interrelationship of functions and increased effectiveness.
Communication and relationships	The active involvement of an organisation in the industry or community and management of internal relationships to ensure respectful and efficient interaction by valuing all participants.
Information and knowledge	The effective and timeous distribution of correct information and knowledge to support staff involvement and awareness expectations when critical decisions are made.
Innovation and creativity	The encouragement of creative and innovative, but responsible decision-making and problem-solving within the barriers of best practices to the benefit of all parties during expected circumstances and increase efficiency during crisis management.

Devolved and responsive decision-making	The awareness throughout the hierarchy on where the authority lies for decisions during a crisis, the availability of accurate information and the prompt communication of such decisions and its associated expectations.
Improvement, new technology and equipment	The introduction of improvement activities, new technologies and new equipment must be viable and appropriate to the expected outcome and should consider staff capacity and expertise as well as the customer's expectations.
Pre-operative examination	Before a specialised service or significant change in the organisations operations is introduced, pre-assessment should consider capacity, expertise, possible challenges and should involve consultation throughout the hierarchy.
Post-operative check	The effectiveness of changes in operational activities or the introduction of improvements, new technologies or equipment must be assessed to determine retrospective areas of future improvement.

Source: Developed by the researcher based on fieldwork

Conclusion

The nature of the South African aviation industry needs multi-level congruence between management control systems to develop a capacity for fluid and autonomous adaptation to incremental changes and relative disruptive circumstances. Although the implementation of a quality assurance system is required by the South African Civil Aviation Regulations, it does not address multi-level inclusivity and cohesive cooperation within functions. Although stakeholders view quality assurance as a necessity, this study identified a negative and cumbersome association to quality assurance within the South African aviation industry.

Corporate governance, as an organisational control system stimulating transparent, ethical and sustainable business conduct, manifests inadequately in the South African aviation industry. Although theoretical constructs promote the interrelationship between quality assurance and corporate governance, the relationship between the two control systems in the South African aviation industry manifests as fragmented and problematic. However, stakeholders identified the necessity to employ deliberate action towards a cohesive relationship as both strengthen an organisation's sustainability by overcoming and embracing changes and challenges.

To simultaneously overcome changes and challenges and advance sustainably, increased attention to organisational resilience is required in the application of management control systems. This study provided a framework promoting organisational resilience derived from the fusion of participants' perceptions on quality assurance and corporate governance principles in the South African aviation industry. This contribution harmonised multiple disciplines of existing management systems into a practical and synergised unit to simultaneously overcome fragmented cooperation between quality assurance and corporate governance and stimulate resilience. Where traditional research on resilience focused on failure-avoidance in a specific contained system, this study embraced its contextual placement to illustrate the pragmatic establishment of this multi-disciplinary concept in a complex sociotechnical system by reconfiguring existing management control systems.

References

Amankwah-Amoah, J. (2018). Why are so many African companies uncompetitive on the global stage? Insights from the airline industry. *Africa's Competitiveness in the Global Economy,* 8 (1), 195-216.

Amir, S. & Kant, V. (2018). Sociotechnical resilience: A preliminary concept. *Risk Analysis,* 38 (1), 8-16.

Annarelli, A. & Nonino, F. (2016). Strategic and operational management of organizational resilience: Current state of research and future directions. *Omega,* 62 (1), 1-18.

Bazeley, P. & Jackson, K. (2013). *Qualitative data analysis with NVIVO.* 2nd ed. London, UK: Sage Publications Ltd.

Bengtsson, M. (2016). How to plan and perform a qualitative study using content analysis. *NursingPlus Open, 2*, 8-14.

Chialastri, A. & Pozzi, S. (2008). Resilience in the aviation system. In M. D. Harrison, & M. A. Sujan (Eds), *Computer Safety, Reliability, and Security*. Berlin, Germany: Springer.

Cho, J. Y. & Lee, E. H. (2014). Reducing confusion about grounded theory and qualitative content analysis: Similarities and differences. *The Qualitative Report,* 19 (32), 1-20.

Cliffe Dekker Attorneys. (2002). *King Report on Corporate Governance for South Africa,* Johannesburg, South Africa: Cliffe Dekker Attorneys. Available at https://www.mervynking.co.za/downloads/CD_King2.pdf%0A [Retrieved July 15 2018].

Creswell, J. W. (2014). *Research Design - Quantitative, Qualitative and Mixed Method Approaches.* 4th ed. Los Angeles. Sage Publications Inc.

Cristancho, S. (2016). Lessons on resilience: Learning to manage complexity. *Perspectives on Medical Education,* 5 (3), 133-137.

Department of International Relations and Cooperation. (2003). *International Civil Aviation Organization (ICAO).* Available at http://www.dirco.gov.za/foreign/Multilateral/inter/icoa.htm [Retrieved July 06 2018].

Department of Transport. (2017). *White paper on national civil aviation policy,* Pretoria. The Government Printing Works.

Etikan, I., Musa, S. A. & Alkassim, R. S. (2016). Comparison of convenience sampling and purposive sampling. *American Journal of Theoretical and Applied Statistics,* 5 (1), 1-4.

Futura, K., 2015. Resilience Engineering A New Horizon of Systems Safety. In J. Ahn (Ed.), *Reflections on the Fukushima Daiichi Nuclear Accident*. Cham, Germany: Springer.

Gill, M. (2016). *Report: Value of Aviation (2016),* Geneva, Switzerland: Air Transport Action Group. Available at https://aviationbenefits.org/downloads/%0A [Retrieved September 09 2018].

Hamel, G. & Välikangas, L. (2003). The quest for resilience. *Harvard Business Review,* 81 (9), 52-63.

Hashemnezhad, H. (2015). Qualitative Content Analysis Research: A review Article. *Journal of Applied ELT and Linguistics,* 3 (1), 54-62.

Hickford, A. J., Blainey, S. P., Hortelano, A. O. & Pant, R. (2018). Resilience engineering: theory and practice in interdependent infrastructure systems. *Environment Systems and Decisions,* 38 (3), 278-291.

Hsieh, H. & Shannon, S. (2014). Three approaches to qualitative content analysis. *Qualitative Health Research,* 15 (9), 1277-1288.

Industry High Level Group. (2017). *Aviation Benefits 2017,* Montreal, Canada: Industry High Level Group. Available at https://www.iata.org/policy/Documents/aviation-benefits-web.pdf [Retrieved October 20 2018].

Institute of Directors Southern Africa. (2009). *King III,* Johannesburg, South Africa: Institute of Directors Southern Africa. Available at http://www.iodsa.co.za/?kingIII%0A [Retrieved July 24 2017].

Institute of Directors Southern Africa. (2016). *King IV,* Johannesburg: Institute of Directors Southern Africa. Available at http://www.iodsa.co.za/?kingIv%0A [Retrieved April 28 2017].

International Air Transport Association. (2018). *Aviation Economic Benefits - summary report,* Geneva, Switzerland: International Air Transport Association (IATA).

Available at https://www.iata.org/policy/promoting-aviation/Pages/index.aspx%0A
[Retrieved September 14 2018].

International Air Transport Association. (2018). *International Air Transport Association - value of aviation.* Available at: https://www.iata.org/policy/promoting-aviation/Pages/index.aspx [Retrieved September 09 2018].

International Organization for Standardization, 2012. *Quality Management Principles,* Geneva. International Organization for Standardization.

International Organization for Standardization, 2015. *ISO 9001:2015 - Quality Management System Requirements,* Geneva. International Organization for Standardisation.

Itani, N., O'Connell, J. F. & Mason, K. (2014). A macro-environment approach to civil aviation strategic planning. *Transport Policy,* 33 (1), 125-135.

Kahn, W. A., Barton, M. A., Fisher, C. M., Heaphy, E. D., Reid, E. M., & Rouse, E. D. (2018). The Geography of Strain: Organizational Resilience as a Function of Intergroup Relations. *Academy of Management Review,* 43 (3), 509.

Kurapati, S., Lukosch, H., Verbraeck, A. & Brazier, F. M. T. (2015). Improving resilience in intermodal transport operations in seaports: a gaming approach. *EURO Journal on Decision Processes,* 3 (3), 375-396.

Kvalnes, Ø. (2017). Fallability at work. Cham. Palgrave Macmillan, Switzerland.

Latham, J. (2018). *Qualitative Sample Size – How Many Participants is Enough?.* Available at http://johnlatham.me/many-participants-enough/ [Retrieved August 10 2018].

Lazur, B., Jagadeesh, L., Karthikeyan, B. & Shanmugaraja, M. (2014). An Approach to Improve Aviation Quality Management Using Total Quality Management Principles. *Innovative Design, Analysis and Development Practices in Aerospace and Automotive Engineering*, 4, 69-78.

Le Cordeur, M. (2017). *Gigaba will engage with FNB CEO over SAA boycott.* Johannesburg: Media24.

Lee, A. V., Vargo, J. & Seville, E. (2013). Developing a Tool to Measure and Compare Organizations' Resilience. *Natural Hazards Review,* 14 (1), 29-41.

Linnenlueckle, M. (2017). Resilience in Business and Management Research: A Review of Influential Publications and a Research Agenda. *International Journal of Management Review,* 19 (1), 4-30.

Marx, B. & Mohammadali-Haji, A. (2014). Emerging trends in reporting: An analysis of integrated reporting practices by South African top 40 listed companies. *Journal of Economic and Financial Sciences,* 7 (1), 231-250.

Maurice, L. Q. & Burleson, C. E. (2012). Aviation Policy and Governance. In O. Inderwildi & D. King (Eds.), *Energy, Transport, & the Environment: Addressing the Sustainable Mobility Paradigm.* London, UK: Springer.

Mayring, P. (2014). *Qualitative Content Analysis: Theoretical Foundation, Basic Procedure and Software Solution.* Klagenfurt. Gesis, Austria.

Mhlanga, O. & Steyn, J. (2016). The aviation industry in South Africa: A historical overview. *African Journal of Hospitality, Tourism and Leisure*, 5 (4), 1-13.

Nakpodia, F., Adegbite, E., Amaeshi, K. & Owolabi, A. (2016). Neither Principles Nor Rules: Making Corporate Governance Work in Sub-Saharan Africa. *Journal of Business Ethics,* 6, 1-18.

Njoya, E. (2013). Air Transport and Destination Performance - A case study of three African countries (Ethiopia, Kenya and South Africa). *Aviation Research Workshop*, 14, 1-15.

Oxford Economics. (2017). *The Importance of Air Transport to South Africa,* Geneva, Switzerland: International Air Transport Association (IATA*).* Available at

https://www.iata.org/policy/Documents/benefits-of-aviation-singapore-2017.pdf
[Retrieved August 01 2018].

Patriarca, R., Bergström, J., Di Gravio, G. & Costantino, F. (2018). Resilience engineering: Current status of the research and future challenges. *Safety Science,* 2018 (102), 79-100.

Patriarca, R., Di Gravio, G. & Constantino, F. (2016). Resilience engineering to assess risks for the air traffic management system: A new systemic method Resilience engineering to assess risks for the air traffic management system: a new systemic method. *International Journal of Reliability and Safety,* 10 (4), 323-345.

Pies, I. & Koslowski, P. (2011). Corporate Citizenship and New Governance - The Political Role of Corporations. *Corporate Governance and Business Ethics,* 40 (1), 402.

Pirie, G. H. (1992). Southern African Air Transport After Apartheid. *The Journal of Modern African Studies,* 30 (2), 341-348.

Saldaña, J. (2015). *The Coding Manual for Qualitative Researchers.* 3rd ed. London: Sage Publications Inc.

Schmidt, J. (2017). *Commercial Aerospace Insight Report - Q417,* s.l.: Accenture. Available at https://www.accenture.com/us-en/insights/communications-media/commercial-aerospace-report%0A [Retrieved May 24 2018].

South African Civil Aviation Authority. (2011). *South African Civil Aviation Regulations,* Pretoria. Government Printers.

Stephenson, A. (2010). *Benchmarking the Resilience of Organisations.* Doctoral thesis, Christchurch, New Zealand: University of Canterbury (Civil and Natural Resources Engineering Department). Available at https://ir.canterbury.ac.nz/bitstream/handle/10092/5303/THESIS_BENCHMARKING THERESILIENCEOFORGANISATIONS.pdf?sequence=1&isAllowed=y [Retrieved June 22 2018].

Tjorhom, B. B. (2010). Risk governance within aviation. *Risk Management,* 12 (4), 256-284.

Vogus, T. J. & Sutcliffe, K. M. (2007). *Organizational Resilience: Towards a Theory and Research Agenda.* Montreal, Canada: Institute of Electrical and Electronics Engineers, 3418-3422.

Whitney, K., Bradley, J. M., Baugh, D. E. & Chestermna, C. W. (2015). Systems theory as a foundation for governance of complex systems. *International Journal of System of Systems Engineering,* 6 (2), 15-32.

Xiao, L. & Cao, H. (2017). Organizational Resilience: The Theoretical Model and Research Implication. *ITM Web of Conferences,* 12 (1), 1-4.

Yin, R. K. (2018). *Case Study Research and Applications - Design and Methods.* Los Angeles. Sage Publications.