
A FRAMEWORK FOR QUALITY AND OPERATIONS MANAGEMENT PERFORMANCE DURING THE COVID-19 PANDEMIC PERIOD: A CASE OF SELECTED BUSINESSES IN PRETORIA, SOUTH AFRICA

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Abstract

Drastic and dynamic changes related to the COVID-19 pandemic have forced businesses to reimagine a sustainable way of ensuring business survival in the long term. The present study seeks to design a framework for quality and operations management performance during the covid-19 pandemic period following the case of selected manufacturing companies in South Africa. The regression analysis indicates a significant correlation together with the R square confirming that 98.1% of the performance elements are defined by the COVID-19 risk types, operations management structures, operations-based Risk management, operational practices, pandemic constraints and Business challenges. Efficient operations management structure should be tailored by the application of good governance policies business transformation, planning management, environmental adaptation, stakeholders' development. Businesses should enable digital adoption, quality management system, green operational management, stakeholder commitment and the integration of management system. The proposed framework includes upgraded business processes, operational practices, and operations-based risk management using successful operations management structure for business optimisation, especially during crises connected with drastic and dynamic changes. Policymakers should be proactive in developing and implementing business tragedy policies and regulations to tackle severe business penalties and thus ensure business sustainability.

Keywords: Operations, management, COVID-19, Framework, South Africa.

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1. INTRODUCTION AND BACKGROUND

Without any warning signs, the COVID-19 pandemic completely disrupts the traditional ways of running operations in all types of companies and organisations from the domestic to the global sphere. The question remains of how to develop effective operations techniques to ensure productivity during critical times associated with multiple and drastic changes. There is an urgent need for people and businesses to quickly adapt to change for the sake of maintaining a stable economy across the world. Business and operational risks occur when there is litigation, product failure, business interruption, loss of key stakeholders, health and safety issues and most importantly the failure of the digital management systems (Accenture, 2020). Besides exposure to disease and insecurity, the COVID-19 pandemic has caused drastic damage to the whole economy through business closure, loss of human resources, and loss of suppliers compromising the growth of many other businesses. Pandemic risks were so high that financial institutions struggled from low repository rate and devaluated currency rate leading South Africa to plunge into economic recession (Gov, 2020). Also known as the intelligence engine of companies, business operations should be well managed with continuous monitoring to ensure alignment to business objectives, risk management efficiency, productivity and profitability through the upgrading of dynamic techniques (De Marc and Thaheem, 2014). From risk management to enterprise risk management, integrated solutions have been carried out to optimise productivity at financial, operational, legal compliance and resources levels to ensure profitability achievement in the long term.

Although the COVID-19 pandemic was a sudden event with a high level of disruption, companies and organisations were not prepared for a change even a few months after the beginning of the crisis. Trend analysis could not talk much about potential projections that could help to define preventive measures. However, smart leaders took risks to protect their stakeholders despite further requirements for nosiness continuity (Accenture, 2020). They argued that new business operations should be tailored to the disaster recovery plans considering lockdown levels limiting the movement of people and goods between countries. The pandemic created negative exposure to properties, finances, personnel and operations inside businesses and the economic market in general. Although the duration and the impact of the pandemic on businesses and people were unknown, organisations failed to define dynamic solutions to tackle business continuity in a long run. Also, the fear of change brought different companies to develop the following methods compared to leading techniques for market positioning. Consequently, numerous business has shut down in South Africa, and many lives were lost and survived businesses struggle to stay competitive since they are losing key staff and cannot keep up with business contacts with different stakeholders (Accenture, 2020). Assuming that insurance companies are meant to assist during tragedies, the results were not as expected causing risk severity over months.

2. LITERATURE REVIEW

2.1 Operational Process

Internal operational guidelines are aligned to the laws, regulations and policies established by the government in each economic sector. Although operational procedures are centralised, businesses and institutions have the duty of tailoring them to their inside operational goals. From workplace safety to health management, valuable operational processes should include stages like policy knowledge, internal process planning, implementation of the updated plan, performance measurement and review and auditing (CISA, 2021). They argued that the process of implementing operations involves business structures and responsibilities; internal communication, documentation and process control, training, monitoring and assessment based on the predefined key performance indicators. According to Mintzberg and Waters, (1985), operational strategies should not be a static approach but a waterfall method that allows for constantly revising existing strategies from the intended, unrealized, deliberated, emergent and the realised strategy. Scandizzo (2007) added that operational strategies should be defined following the perspective of top-down and bottom-up as well as the operations-led versus market-led. The COVID-19 pandemic brought business managers to define a new approach to running operations in a context of continuity in crisis and the unknown next threatening to businesses, economies and people across the world (Accenture, 2020). Observations showed that only 12% of organisations are ready to face and tackle the negative impact of the Coronavirus on their long-term survival in addition to the fact that they hardly upgrade their operating model (Accenture, 2020). According to De Marc and Thaheem (2014), operational issues in business can be categorised as management and employee development, strategic and business planning, board operations, advertising and promotions, evaluation of products/services together with the financial management. Observations show that conservation of personnel and resources, prevention and mitigation of management losses limit damages caused by operational concerns.

2.2 Risk Management

The framework designed by Accenture (2020) stipulates that the maximisation of operational capabilities depends on the evaluation and minimisation of risks through identification, control and documentation of potentials hazard as well as the arising opportunities. Requirements for the operations are based on three pillars namely capacity, demand, and forecasting (Moran, 2020). Operational Capacities include analysis and management of capacity Constraints, adjusting Capacity, measuring Capacity as well as capacity Planning. Operational demand involves proper management of the demand compared to supply together with the anticipating change in the Demand process. Both operational capacities and demand require alignment to forecasting models to optimise the impact of operational change. Risk is part of the

management process at financial, operational and resource levels (Vinella & Jin, 2006). Operational risks involve issues related to business activities executed within a functional unit, structure, products/services, systems as well as processes. According to the definition provided by financial institutions under the Basel Committee on bank supervision, operational risk result from unsuitable or failed internal and external business processes (SARB, 2004). Leadership failure, employees' resilience, IT system failure together with weak supply chain, breakdowns and other business interruption types are sources of operational risks (Kornkaew, 2012). Wrong leadership, an uncondusive work environment as well as a questionable health and safety compromise business management in a long run. Employees sometimes applied fraud to increase their incomes causing litigation that slows down business continuity. This situation further leads to the resignation of key employees and a drastic change in the company's culture.

2.2.1 Risk Management Process

For Hopkin (2013), better risk management should follow steps like identification, categorisation, assessment, mitigation, and cancellation. Vinella & Jin (2006) rather believed that control of decisions and implementation risks are more relevant to ensure supervision and review of existing measures. Risk measurements are of big importance in the sense that it provides accurate information on a specific business type for a specific period. This suggests that business decisions will be made based on concrete measurements and not out of common knowledge. Although many authors find that risk management should start with hazard identification, evidence shows that hazards are mostly caused by management and leadership (Johnston, 2005). Consequently, business management should first apply its principles with success before engaging with the determination of potential issues. In the health and safety domain, the operational process includes policy definition, planning, implementation and operation, performance measurement and the audit and review phase (Hopkin, 2013). Risk assessment and risk management practices constitute the tools to tackle operational risks through internal control, good governance practices and insurance (Vinella & Jin, 2006). At a corporate level, risk management is effective when shared among relevant stakeholders namely managers, employees, suppliers, customers and the government (Corrêa, Ellram, Scavarda & Cooper, 2007).

2.2.2 Risk management models

The 5M model of system engineering indicates that effective operations management encompasses the definition of a suitable mission, human resource development, installation of hardware and software, proper management of business procedures and a presence in the media environment (Gov, 2020). The current digital world is indeed attached to social media but belonging to such an environment cannot be

seen as an objective since it now forms part of the standards. It equally happens that effective management is executed based on the business's position in the sphere of high to low relationships depending on the intensity of interaction, simultaneousness, the difficulty of assessment and the non-stockability (Collier, Berry, & Burke, 2006). They indicated that a delimited set of quality control and capacity management options go in hand with sophisticated performance assessment systems and a high level of requirements and flexibility is required on one hand. On the other hand, they established that a full set of quality controls and capacity management options match with simpler performance assessment systems and a lower level of soft requirements and flexibility is needed. This analysis approach appears with ambiguity and is less generalizable to other business sectors.

3. MODEL SPECIFICATION

This study aims to design a framework for quality and operations management performance during the covid-19 pandemic period using a case of selected businesses in Pretoria. A sampling population of 23 people randomly selected in the Pretoria province in July 2021 was used to collect quantitative data using a Likert scale questionnaire style where respondents provided their level of agreement from strongly disagree, disagree, not sure, agree and strongly agree. Descriptive statistics, correlational design and regression analysis were used to identify the degree of significance of connectivity between Quality and Operations Management Performance (QOP) and the following variables: COVID-19 risk types (CRT), operations management Structure (OMS), operations-based Risk management (ORM), operational practices (OP), pandemic constraints (PC) and Business challenges (BC). The demographic profile comprises the position and qualification level of respondents.

4. RESEARCH FINDINGS AND DISCUSSION

4.1 Demographic profile

Figure 1 indicates that the majority of the respondents have job positions of operations manager (27%), store manager (20%) and business risk manager (19%) matching the relevant profile required in this study. As highlighted by the Stats SA (2021), the low rate of education in the country is reflected in this study with more than 60% of respondents holding only a Matric or less and only 17% holding a bachelor's degree.

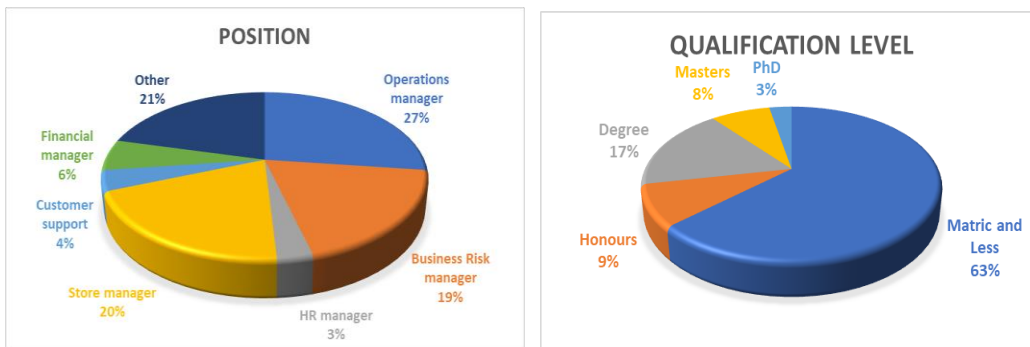


FIGURE 1. DEMOGRAPHIC PROFILE

Source: Authors' compilation

4.2 Statistical analysis

Table 1 shows that there is a strong and positive correlation between QOP and its sub-variables with coefficients of 95.2%, 98.4%, 95%, 95.5%, 98.2% and 94.1%. the r square confirms that 98.1% of the QOP elements are defined by the behaviour of its variables namely COVID-19 risk types (CRT), operations management Structure (OMS), operations-based Risk management (ORM), operational practices (OP), pandemic constraints (PC) and Business challenges (BC). The relationship appears to be very significant with a p-value of 0.000 at the significance level of 5% as indicated in the ANOVA table.

TABLE 1. STATISTICAL ANALYSIS

Descriptive Statistics										
		N	Minimum	Maximum	Mean	Std. Deviation	Variance	Skewness		Kurtosis
		Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic
CRT		27	1	5	3.48	1.369	1.875	-.492	.448	-.948
OMS		27	1	5	3.56	1.450	2.103	-.691	.448	-.881
ORM		27	1	5	3.52	1.252	1.567	-.617	.448	-.681
OP		27	1	5	3.48	1.312	1.721	-.674	.448	-.665
PC		27	1	5	3.67	1.359	1.846	-.629	.448	-.934
BC		27	1	5	3.41	1.309	1.712	-.616	.448	-.833
QOP		27	1	5	3.56	1.528	2.333	-.708	.448	-.985

Correlations										
		CRT	OMS	ORM	OP	PC	BC	QOP		
CRT	Pearson Correlation	1	.964**	.948**	.958**	.958**	.938**	.952**		
OMS	Pearson Correlation	.964**	1	.958**	.966**	.976**	.950**	.984**		
ORM	Pearson Correlation	.948**	.958**	1	.990**	.965**	.970**	.950**		

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OP	Pearson Correlation	.958**	.966**	.990**	1	.957**	.979**	.955**
PC	Pearson Correlation	.958**	.976**	.965**	.957**	1	.945**	.982**
BC	Pearson Correlation	.938**	.950**	.970**	.979**	.945**	1	.941**
QOP	Pearson Correlation	.952**	.984**	.950**	.955**	.982**	.941**	1

** . Correlation is significant at the 0.01 level (2-tailed).

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.990 ^a	.981	.975	.240

a. Predictors: (Constant), BC, CRT, PC, ORM, OMS, OP

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	59.511	6	9.918	171.578	.000 ^b
	Residual	1.156	20	.058		
	Total	60.667	26			

a. Dependent Variable: QOP

b. Predictors: (Constant), BC, CRT, PC, ORM, OMS, OP

Source: Authors compilation

Figure 2 shows that 18.5% and 7.4% of the respondents strongly disagree and disagree that QOP depends on CRT, OMS, ORM, OP, PC and BC. Although 11.1% were not sure, 25.9%, 37.0% agree and strongly agree with the cause-to-effect relationship between the two sets of variables. Hence the mesokurtic aspect and the asymmetry with a long right tail as indicated by the descriptive statistics in table 1 above.

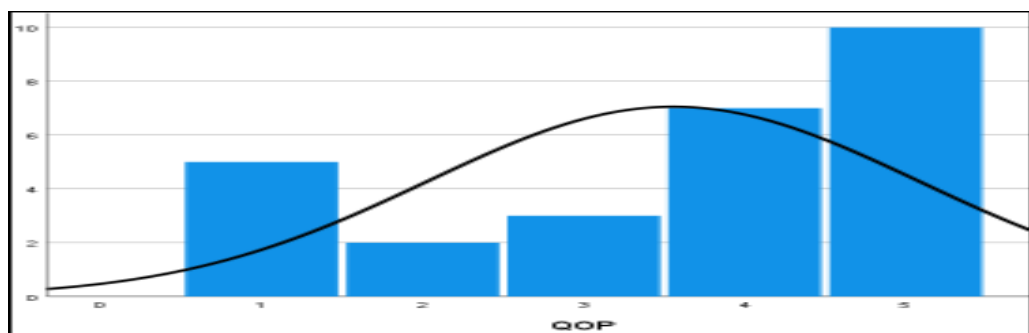


FIGURE 2. HISTOGRAM – QOP

Source: Authors compilation

4.3 Quality and Operations Management Performance

4.3.1 COVID-19 risk types

Figure 3 represents risk types associated with the pandemic including the followings:

- Loss of suppliers as agreed and strongly agreed by 54% of the respondents
- Loss of employees agreed and strongly agreed by 61% of the respondents
- Health issues as agreed and strongly agreed by 87% of the respondents
- Insecurity exposure as agreed and strongly agreed by 79% of the respondents
- Property and assets damage as agreed and strongly agreed 65% of the respondents
- Financial distress as agreed and strongly agreed by 80% of the respondents
- Digital disruption as agreed and strongly agreed by 77% of the respondents
- Business interruption as agreed and strongly agreed by 80% of the respondents
- Productivity failure as agreed and strongly agreed by 80% of the respondents

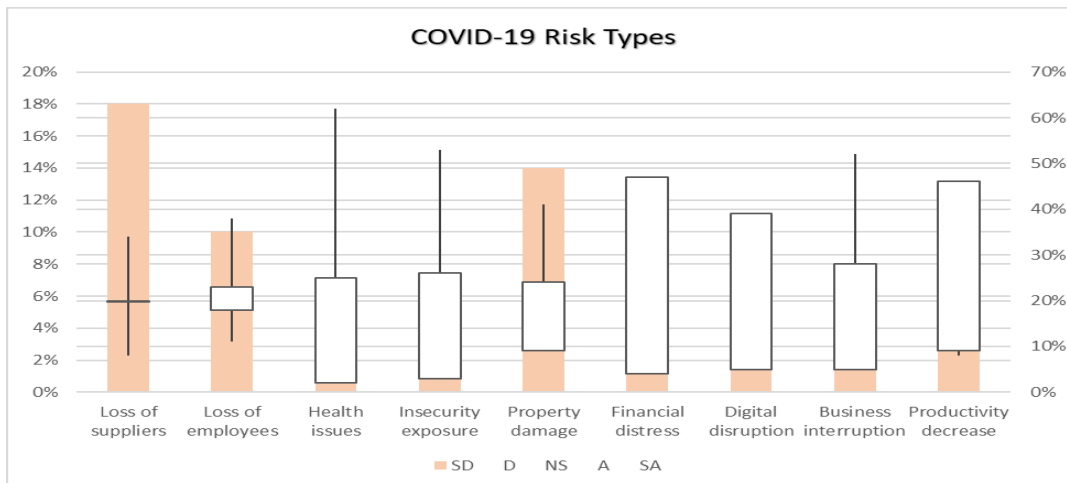


FIGURE 3. COVID-19 RISK TYPES

Source: Authors compilation

4.3.2 Effective operations management structure

Companies and organisations strive for an effective operations System for socioeconomic, financial and environmental reasons to achieve sustainability at national and global levels. By following these reasons for an effective operations system, organisations limit work-related risks for customer satisfaction and

long-term survival. Figure 4 depicts components of effective operations management system as elaborated below.

Good governance policies: Implementing best practices of governance policies in addition to a clear description of roles and responsibilities enables management of effective quality of operations.

Business restructuring: Considering the unstable nature of the business environment, businesses have to define restructuring techniques adaptable to potential changes whether planned or unplanned. Companies require remodelling of products, services and processes to achieve competitive advantage and continuous profitability.



FIGURE 4: EFFECTIVE OPERATIONS MANAGEMENT SYSTEM

Source: Author's compilation

Planning management: In the trajectory to meet the strategic vision of the organisations, businesses develop preventive techniques through planning to be ahead of market change and customers' expectations.

Environmental Adaptation: it includes good management of all external challenges that can compromise effective operations management. Operations should be aligned to the environmental compliance goals as defined by the UN sustainable goals agenda 2063.

Stakeholders Development: from customer experience to a solid supplier chain management, stakeholders such as the customers, suppliers, contractors, tax office, social media and... should be well-managed to ensure market positioning and productivity.

Performance enhancement: It includes both Productivity Increase and Profitability Improvement through the achievement of operations performance objectives that involve quality at low cost, dependability to customer needs, on-time delivery and flexible business operations.

4.3.3 Operations-based Risk management

Efficient management of operations is associated risk management process that includes steps of risk Identification, risk categorisation, risk assessment, risk mitigation and risk cancellation (De Marco & Thaheem (2014). Considering that achieving an efficient operations strategy required analysis of the intended and updated strategy, it is equally important to associate emergent strategy throughout the process to ensure flexibility and adaptation based on the environmental changes. The following mapping process should be observed for effectiveness purposes and best operational practices:

- Definition of key processes vs Identification of potential risks.
- Definition of business performance standards vs Risk categorisation and assessment.
- Definition of business goals vs risk measurement.
- Determination of business challenges vs risk mitigation and corrective actions.
- Identification of business opportunities vs risk revision.

Following the globalisation aspect, these analyses should be done at internal and external levels to assess the direct and indirect impact of change on the business strategy and operations. According to Accenture (2020), the operations strategy process should be top-down to apply business and corporate strategy, Bottom-up for traceability of actions and decisions engaged with operations, market-led to respond to market necessities or operations-led in response to resources requirements within its operations. Risk management practices should be carried out through internal control of processes, continuous staff training, roles and responsibilities and external support using insurance policies, bank loans and government subsidies for recovery and financial aid (Gov, 2020).

4.3.4 Upgraded operational practices

Figure 5 represents constituents that businesses should apply to achieve risk reduction and performance improvement in their operational activities during the pandemic.



FIGURE 5. CONCEPTUAL FACTORS

Source: Authors' compilation

Digital adoption: As one of the measures to limit the spread of the virus, social distancing enabled a fast-digital adoption where people could work from home using smart technologies. Innovative online solutions have been taken to optimise team communication and operational resilience. Workplace models have been therefore invented to control contamination while improving the relationship between humans and innovative technologies.

Quality management system: Enabling a quality management system allows the continuously enhance operational efficiency through the identification of valuable management processes, their integration with other functional units, the definition of performance standards for measurement, and the application of early corrective actions. In addition to supporting business culture, quality management also requires change adoption skills considering the rapid change occurring in this era of globalisation and digitalisation. Above all is the adoption of smart leadership governance that compliment change and demands customers.

Green Operational management: In compliance with the UN agenda 2063, organisations and institutions should develop a green thumb by protecting the environment to ensure the survival of the generations to come. Besides green buildings adopted in South Africa, manufacturing companies are evaluated based on CO₂ emissions and climate change.

Stakeholder commitment: The whole range of stakeholders has to be reduced to the staff and the customer and to optimise constraints associated with the expansion of the pandemic. Customers have developed a sense of entitlement leading to an increasing rate of demand. Such tendency consequently requires the involvement of all stakeholders, especially those in the supply chain to update their products and processes to effectively meet customer satisfaction. Sudden change due to the pandemic was required despite human resilience through the creation of a “work from home” environment, a well-coordinated communication team, a customer-orientated engagement team and mostly a lead response team (Accenture, 2020)

Management System integration: Although the pandemic is health-related, the impact has tentacles in other sectors like water, agriculture, and manufacturing. This suggests that actions should be taken at the national level besides adaption at the business and institutional levels. Inside businesses, cooperation between departments and functional units allow counterattacking the effect of the pandemic on the productivity through adoption of early measures based on the communique provided by the state president. Internal processes are therefore updated based on the time spent in each department considering the limited number of staff at work. The delivery process should be amended based on the new supply chain duration and the extra time required internally before launching customer delivery.

4.3.5 Pandemic constraints

Lockdown Implications: In the trajectory of limiting the number of contagions and ensuring people's safety, South Africa, as well as other countries, were declared in "Lockdown" with a limited movement of people as well as operational suspension of businesses. Manufacturing companies have to stop the production process with cost implications, delivery delays and even products lost due to the raw materials being unused for a long period. Although restrictions were uplifted depending on the lockdown level, factories could not start a production process because of a lack of sufficient raw materials; Supplying companies in complete lockdown; a limited number of staff and financial shortages due to customer business not operating.

Proactive versus Reactive approach: For businesses and institutions to cope with the restrictions associated with the lockdown situation, proactive, active and reactive mechanisms are required. Since the pandemic is global, businesses could be aware of the next step of the lockdown following measures adopted by foreign countries. It also happens that immediate methods were applied when sudden information came up like the new variant of the Coronavirus in South Africa causing instant corrective actions. Prediction of the future with an emphasis on the staff and customer protection allows preparedness for the uncertainty in all angles following a consistent set of leading best practices.

Peace Management: The incapacity of meeting fundamental human needs leads to violence and troubles compromising community and country development. The COVID-19 pandemic has generated a global economic recession whereby people have lost their job on top of the high employment rate recorded in South Africa (Gov, 2020). Such a situation has increased family issues and frustrations that created internal troubles experienced in South Africa. However, the South African government has initiated programmes to alleviate economic conditions while improving human protection. According to the statistics published by Accenture (2020), 76% of the management leaders agree that businesses must reengineer their operating model by integrating technology and people with a focus on human-centric.

For instance, the adoption of online tools like Microsoft teams, zoom meeting and private business applications.

4.3.6 Smart Operating Framework

Besides the above-mentioned variables, achieving successful operations management is also about embracing business challenges associated with risk management in South Africa as detailed below.

Crisis Forecasting: the likelihood of pandemic occurrence appears to be low and less probable limiting the possibilities of developing preventive and solid methods. However, the long time spent on pandemics can be used as a bridge to maintainable solutions using flexibility and adaptation.

Risk-based attitude: knowing that risk can impact businesses at property, financial, digital and personnel levels, they still fail to incorporate risk as an integral part of the daily business operations and develop resilience to change management. Managing operational risks involves risk acceptance, risk sharing, risk reduction and risk avoidance.

Post-digital adaptation: Few years after digitalisation quickly improve by the essence of globalisation, people and organisations still struggle to pick up the pace. The pandemic was made worse because of the requirement of social distancing that slowed down the easy training of people using face-to-face contact. To this date, the use of smart technologies for business has been relatively low compared to the adoption of social media digital platforms.

Upgraded operations strategy: effective operations strategy at corporate, business and function levels should be consistent in all business areas once productivity is optimised and it should contribute to competitive edge and market positioning through continuous and upgraded value-adding techniques.

Ensure alignment between resources and required competencies: employees with inadequate skills tend to reject change more than skilled staff that expect better work conditions. In the South African context, the high rate of unemployment and poverty in addition to laws and regulations enforcing the recruitment of locals lead to the misalignment of resources and operational competencies required for business survival.

Improve rigid and insufficient processes: organisations tend to stick to existing processes without any room for adjustments and value-added steps compromising possibilities of embracing the dynamic aspect associated with the COVID 19 change. Business processes should meet the vision and mission of the companies through alignment between core process systems and the strategic intent to improve competitive advantage and profitability.

Lack of due diligence limitations: decision-makers on risk and operations management tend to neglect some steps of the decision process to quickly implement measures forgetting that inconsistencies will

later jeopardise positive results and thus weaken operational and strategical core processes. Such missing forces businesses to readjust their core processes losing track of the key problem because of less communication and feedback consideration among stakeholders.

Information management: risk management is based on the ability to access and analyse key information promptly. However, the fear of making the wrong decision brings managers and executives to rather be followers than leaders in market positioning. Being ahead of the news enables a good foundation for

Business sustainability: Although the pandemic was a sudden shock for people and businesses, some organisations could not survive the change while others are still struggling to stabilise their core activities.

Figure 6 depicts the smart operating framework to attain quality and effective operations management during the recovery phase of the COVID-19 pandemic, especially for businesses in Pretoria, South Africa.

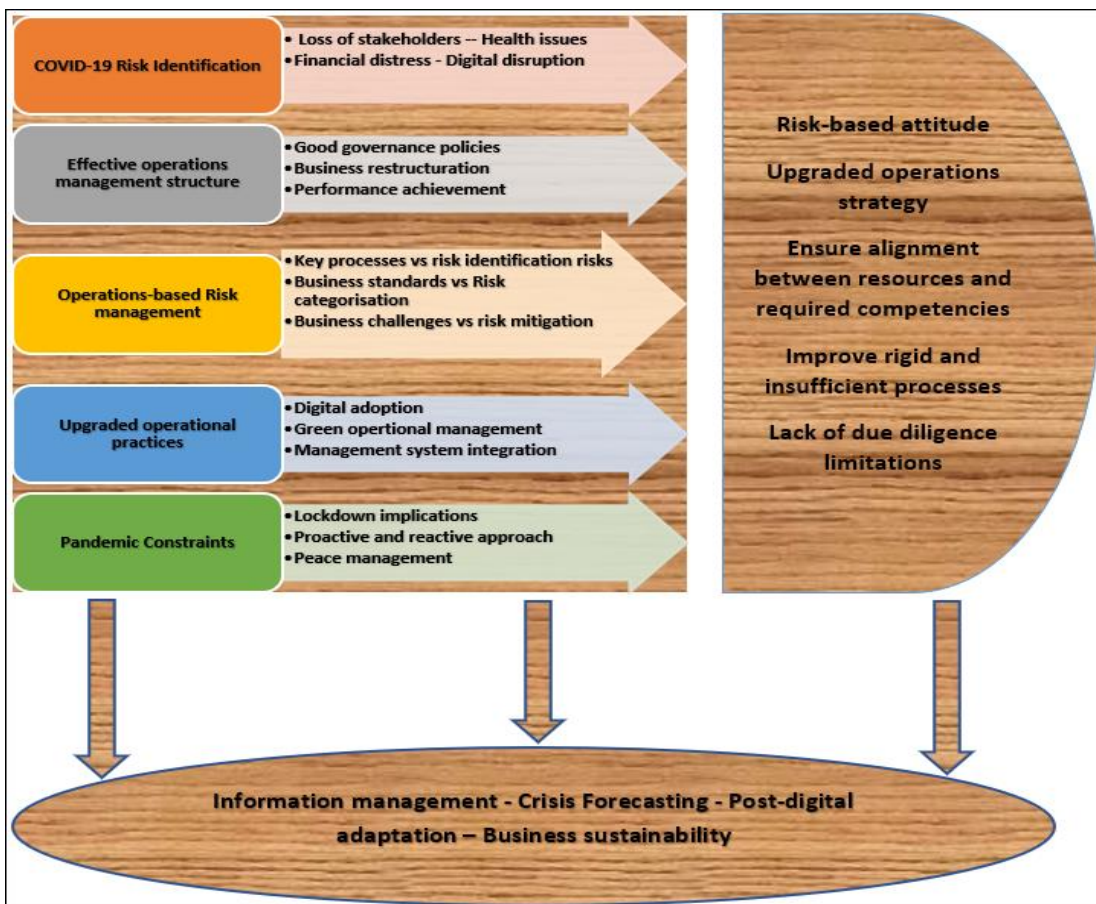


FIGURE 6. SMART OPERATING FRAMEWORK

Source: Authors' compilation

5. CONCLUSION

Besides a few positive sides of the COVID-19 pandemic, tremendous negative impacts have jeopardised socioeconomic and environmental stability due to multiple risk types. The majority of research respondents strongly agreed that the tragedy has caused loss of suppliers, loss of employees, health issues, insecurity exposure, assets damage, financial distress, and digital disruption in addition to business interruption due to many country lockdowns leading to productivity decrease. Effective operations management structure should include good governance policies' business Restructuration, planning Management, environmental adaptation, stakeholders' development and performance achievement. While following the operations-based risk management, businesses should enable operational practices through digital adoption, quality management system, green Operational management, stakeholder commitment and the integration of Management Systems. Also, pandemic constraints that can be assimilated to any market restrictions should associate lockdown implications, proactive versus reactive approach and peace management at the business level, especially in a country with a high level of poverty and constant strikes. However, one of the solutions resides in embracing operational challenges like crisis forecasting, risk-based attitude, post-digital adaptation and upgraded operations strategy. Additionally, businesses should ensure alignment between resources and required competencies, improve rigid and insufficient processes, lack of due diligence limitations, information management and business sustainability. The proposed framework includes upgraded business processes, operational practices, and operations-based risk management using effective operations management structure for business optimisation even during crises associated with drastic and dynamic changes.

Based on the limitations of the study, future studies should cover a large population and be categorised per company type and size with comparative analysis at the global level. Policymakers should be fast in developing and implementing business crisis policies and regulations at an early stage to limit severe consequences on businesses and the overall economic situation.

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