



SELINUS UNIVERSITY
OF SCIENCES AND LITERATURE

THE IMPACT OF EMERGING TECHNOLOGIES ON PEACE SUPPORT OPERATIONS IN AFRICA

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A DISSERTATION

Presented to the Department of
Peace Building and Leadership
program at Selinus University

Faculty of Arts & Humanities
in fulfillment of the requirements
for the degree of Doctor of Philosophy
in Peace Building and Leadership

2025

ACKNOWLEDGEMENT

I wish to principally thank the Almighty God for His Grace and Mercy in seeing me through this research work. I register my sincerest and profoundest appreciation to my general supervisor, Professor Salvatore Fava, for providing continual support, advice and indefatigable guidelines in my research work. Sir, you are amazing and patient. I am most indebted to my dear wife and children for their constant love, encouragement, support and unceasing prayers for me. I could not have done this without them. I would also like to acknowledge the encouragement and support from the African Peace Support Trainers Association (APSTA), the African Union Peace Support Operations Department (AU-PSOD), and all who have peace support operations at heart. To my boss, Dr. Cecile Oyono Thom, my deputy boss, Mr. Christian C.M. Ichite, my colleagues Jane, Ibrahim, Samuel, Rikkia and Durant all of the APSTA Secretariat, I salute you and God bless you all. A special one to my friend in the Lord, Dr. Gilbert Ethamba and special gratitude to Mr. Bam Suviyile, the African Union Deputy SRCC in ATMISI-Somalia, I say may you increase in all that you do. I owe great gratitude and respect to all subject matter experts, consultants and senior level training officers from the military, police and civilian components working for the Regional Economic Communities (RECs) and Regional Mechanisms (RMs), who responded to my questionnaires and granted me the opportunity to interview them on the thesis topic. Your rich experience and views have greatly shaped my understanding, and expanded my knowledge and scope on Peace Support Operations in Africa. Am sincerely and deeply grateful to all, either directly or indirectly for their great support and guidance on this academic journey.

SPECIAL DEDICATION

I dedicate this research to God almighty. His sustaining and abiding Grace has kept me and brought me this far. His words and revelations are justly sure and true, and I am grateful for that. I dedicate this research to my wife for her understanding in my daily routines, my frequent travels and absence from home due to work. I further dedicate this research to all who are fighting for the peace and stability of this world and more especially to a peaceful and stable Africa.

To my beloved wife

Mrs. Patricia Abena Fosua Lamptey

To my beloved Mum

Mrs. Margaret Aku Shika Dimson

To my beloved Sons

Jesnefa Nii Lante Lamptey

Jeslord Nii Lantei Lamptey

Jeslove Nii Lankwei Lamptey

"Give thanks in all circumstances; for this is God's will for you in Christ Jesus."

1 Thessalonians 5:18, KJV

DECLARATION

I, Alexander Odartey Lamptey with student enrolment number UNISE2950IT do hereby attest that. I am the sole author of this research and that, its contents are as the result of the readings and research I have carried out with the African Union, UN, APSTA, RECs/RMs and other affiliated Member Institutions within the PSO domain. Where other written sources have been quoted, permission has been obtained from persons and institutions mentioned to include their interviews, data and document extracts for case studies, reviews and analysis. References and sources of materials used were duly acknowledged and referenced. The contents and results of this research is submitted for the award of Doctor of Philosophy in Peacebuilding and leadership Degree program at Selinus University of Sciences and Literature, Faculty of Arts and Humanities; and that no part of it has been presented for another degree in this university or elsewhere.

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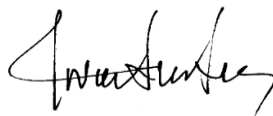
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ABSTRACT

Experts at round table meetings, reports from the United Nations (UN), African Union (AU) and the African Peace Support Trainers Association (APSTA) with available statistics from concepts notes, databases, combined with journals and articles all speak to the latest nexus of integrating technology in Peace Support Operations (PSO). It is not just a matter of digital transformation but establishing the needed capacity and capabilities to use them effectively, guided by working policies. Peacekeeping and peace support operations in Africa either through States efforts or joint coalitions from the Regional Economic Communities (RECs), Regional Mechanisms (RMs) or utilizing the capabilities of the African Standby Forces, must appreciate new and emerging technologies and leverage the advantages it offers for missions. The dynamics of peacekeeping and Peace support operations is fast evolving and this raises the flag that, the approach, techniques and strategies must also change from both the military, police and civilian dimensions. The emergence of new technologies has created new opportunities in the areas of peace and security operations especially in conflict prevention, joint coalitions and peacebuilding and Africa is no exception.

Peace Support Operations have undergone some significant shifts since their conceptualization few years ago. Additionally, they have transitioned from monitoring ceasefires in interstate conflicts to supporting the implementation of comprehensive peace agreements and strategies for a stable and peaceful Africa. Some Peace Support Operations have now transitioned to stabilization and protection of civilians as the main focus. These changes in the old mandates, coupled with transformations in the global digital order, calls for adaptation, integration and resilience. Peace Support Operations should ensure that they are “fit for purpose”, to meet present and future security needs in Africa. Central to these adaptation and resilience are the ‘tools,’ ‘technologies and ‘equipment’ peacekeepers use or deploy in their operations. The need for urgent integration and adoption of advanced technological tools to be leveraged to support greater situational awareness and early warning systems is key for successful missions. Strategic investment in knowledge systems and the acquisition of latest technological tools needed for Peace Support Operations has become relevant and strategic in recent times.

The purpose of this research is to investigate and analyze the impact of emerging technology on peace support operations in Africa. It further explains some of the latest known approach to integrating technology in PSO such as satellite communication, fast networks, better aerial surveillance, sophisticated targets and better situational awareness with digital transformation enablers. Understanding how these new digital tools function as force multipliers or digital enablers for peace support operations in Africa, and how it is changing the whole scope on conflicts and interventions creates a new platform for discussion and recommendations. The author addresses the issue by providing an overview of peacekeeping and Peace Support Operations in Africa, and discussed the fierce urgency of adopting and integrating technology through REC/RMs or via joint coalition efforts under the AU and UN policies on technology. Multi-stakeholders' approach to invest, train, deploy and monitor technologies suitable for Peace Support Operations in Africa as the focus, coupled with creating local ownership and logistical support through strategy remains appropriate if not mandatory. This research recommended ***a 10-steps technology integration model*** as part of its contribution to knowledge to broaden the scope and spectrum of the impact of emerging technologies on Peace Support Operations in Africa.

Keywords: *Peace support operations (PSO), Emerging technologies, African Union (AU), United Nations (UN), Regional Economic Communities (RECs), Regional Mechanisms (RMs), African Standby Forces (ASF) and African Peace Support Trainers Association (APSTA).*

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LIST OF ABBREVIATIONS

- ACCORD = African Centre for the Constructive Resolution of Disputes
- AFISMA = African-Led International Support Mission in Mali
- AI = Artificial Intelligence
- AMIB = African Mission in Burundi
- AMIS = African Union (AU) Mission in Sudan
- AMISEC = AU Mission for Support to the Elections in The Comoros
- AMISOM = AU Mission in Somalia
- APSTA = African Peace Support Trainers Association
- ASF = African Standby Force
- AU = African Union
- AUC = African Union Commission
- AULMEE = AU Liaison Mission to Ethiopia and Eritrea
- AU-PSC = African Union Peace and Security Council
- AU-PSOD = African Union- Peace Support Operation Department
- CADSP = Common African Defence and Security Policy
- CEN–SAD = Community of Sahel–Saharan States
- ECOMIB = Economic Community of West African States (ECOWAS) Mission in Guinea-Bissau
- ECOMICI = ECOWAS Mission in Côte d’Ivoire
- ECOMIL = ECOWAS Mission in Liberia
- ECOMOG = ECOWAS Monitoring Group
- ECOWAS = Economic Community of West African States
- EIFORCES = International School of security forces
- EU SSR = European Union (EU) Security Sector Reform
- EUFOR = EU Force
- EUFOR=RD Congo = EU Force Democratic Republic of the Congo
- EUSEC=Congo = EU Advisory and Assistance Mission for Security Reform in the Democratic Republic of the Congo
- EUTM Mali = EU Training Mission in Mali
- EUTM Somalia = EU Training Mission in Somalia
- FOMUC = Multinational Force in the Central African Republic (CAR)
- ICM = Independent Commission on Multilateralism

- IEMF = Interim Emergency Multinational Force
- IMU = International Monitoring Unit
- IPSS = Institute for Peace and Security Studies
- IPSTC = International Peace Support Training Centre
- JMC = Joint Military Commission
- KAIPTC = Kofi Annan International Peacekeeping Training Centre
- KIR = Key Informant Respondents
- MAES = AU Electoral and Security Assistance Mission to The Comoros
- MICOPAX = Mission for the Consolidation of Peace in CAR
- MINUCI = United Nations (UN) Mission in Côte d'Ivoire
- MINURCA = UN Mission in CAR
- MINURCAT = UN Mission in CAR and Chad
- MINURSO = UN Mission for the Referendum in Western Sahara
- MINUSMA = UN Stabilization Mission in Mali
- MIOC = AU Observer Mission in The Comoros
- MISSANG-GB = Angolan Technical and Military Assistance Mission in Guinea-Bissau
- MONUC = UN Mission in the Democratic Republic of the Congo
- MONUSCO = UN Stabilization Mission in the Democratic Republic of the Congo
- NATO = North Atlantic Treaty Organization
- NDC = National Defense College
- OAU = Organization of African Unity
- OLMEE = OAU Liaison Mission in Ethiopia-Eritrea
- OMIC = OAU/AU Mission in The Comoros
- ONUB = UN Operation in Burundi
- OSCE = Organization for Security and Cooperation in Europe
- PSC = Peace and Security Council
- PSO = Peace Support Operations
- RCI-LRA = Regional Cooperation Initiative for the Elimination of the Lord's Resistance Army
- RECs = Regional Economic Communities
- RMs = Regional Mechanisms
- SADC = Southern Africa Development Community
- SAPSD = South African Protection Support Detachment

- SME = Subject Matter Expert
- STISA= Science, technology, innovation and strategy for Africa
- TCEs = Training Centre of Excellencies
- UAV = Unmanned Aerial Vehicles
- UN = United Nations
- UNAMID = AU/UN Hybrid Operation in Darfur
- UNAMSIL = UN Mission in Sierra Leone
- UNAOC = UN Alliance of Civilisations
- UNISFA = UN Interim Security Force for Abyei
- UNMEE = UN Mission in Ethiopia and Eritrea
- UNMIL = UN Mission in Liberia
- UNMIS = UN Mission in Sudan
- UNMISS = UN Mission in South Sudan
- UNOCI = UN Operation in Côte d’Ivoire

CHAPTER 1

INTRODUCTION

1.1 Background to the study

Peace Support Operations (PSO), are organised international assistance initiatives to support the maintenance, monitoring and building of peace and prevention of resurgent violent conflicts. Many years after the advent of the Cold War, the United Nations peacekeeping efforts and mandates has changed from monitoring peace treaties to multidimensional peacekeeping operations that are tasked with reconstruction of states and their institutions during and after conflicts. The African Union has also re-strategized through various stakeholders' meetings to leverage the efforts of peacekeeping in their numerous ongoing missions in Africa. In the late 1990s, the former African continental organization, the Organization of African Unity (OAU), lost much of its credibility due to technical and policy challenges. The OAU was accused of indifference, bureaucratic paralysis, and lack of capacity to execute her mandates. Again, they were seen to have been disconnected from reality, and being too preoccupied with "lofty political ideals and declarations, which bore little resemblance to the challenges posed by extreme poverty, conflict, or the respect of human rights in vast areas of Africa" (Engel, and Porto 2010).

Africa is recovering from the global financial crisis faster than expected, demonstrating that African economic growth has accelerated and may continue at historically high rates (Cilliers, Hughes, and Moyer 2011). However, security issues, some of them rooted in the past continue to hinder a desired sustainable development. In June 2014, an Expert Panel on Technology and Innovation of the UN Peacekeeping, recommended investigating how innovative technology can strengthen peacekeeping missions by assessing its impacts and threats globally. The report suggested greater use of advanced technologies in all shape and forms. Since then, the African Union (AU), has leverage this directive to upgrade and salvage its technical challenges on peace support operations.

1.1.1 The need for technology in peace support operations

In many security meetings and specialized forums, it has been advocated that, African people have been looking for African solutions to their own security challenges, and are developing a continental security system within the context of the African Union (AU). The security architecture in Africa has evolved significantly over the past forty years. In the past, regional and sub-regional African organizations exhausted most of their time dealing with the aftermath of conflicts instead of prevention and early warning resolution. The creation of the African Union in 2002 was the most significant step towards achieving peace in Africa.



Figure 1.1 (Peacekeeping mission-AU). *“Peacemaking can sometimes be a conservative field. One area where this conservatism is apparent is the use, or non-use, of digital technologies. Favouring face-to-face interactions and emphasising the need for discretion, peacemakers have generally been reluctant to use digital technologies which they perceived as unsafe and too complex”. For example, three years ago, a senior mediator interviewed for the publication Peacemaking and new technologies noted that due to the sensitivity of his work, he was “almost anti-technology” (here, p.39). Yet, irrevocably, the field of peacemaking is becoming more and more digitised <https://tech-blog.zif-berlin.org/debunking-myths-around-digital-peacemaking>*

The African Peace Support Trainers Association (APSTA), a regional platform that has the mandate of coordinating, harmonizing, engaging and creating the avenue for discussions triggered a conversation on the need to embrace digital transformation for all police and military center of excellencies (<https://apstaafrica.org/2023/06/28/apsta-newsletter-june-2023-edition/>). Technology has emerged as a key new paradigm to aid peace keeping missions globally. The investment though expensive and huge must be embraced as the new order of saving deployed personnels and easing the complex nature of these missions. India, during its tenure of the presidency of the UN Security Council in August 2021, raised three significant issues. These were ‘Accountability of Crimes Against UN and associated Peacekeepers’, ‘Technology for Peacekeeping’ and ‘UNITE Aware Situational Awareness Technology Platform’. Progressively, these new revelations are made possible by advanced technologies and systems.

Unmanned aerial vehicle (UAV) is an aircraft that carries no human pilot or passengers. UAVs, sometimes called drones can be fully or partially autonomous but are more often controlled remotely by a human pilot. UAV imagery has shown the unauthorized presence of specialized military vehicles, including sophisticated jammers and have increased intelligence for combat missions. These Imagery are made possible by technology produced by 3D renderings to help ascertain security levels and possible ways to handle them. Monitoring technologies have proven useful to both AU and UN peace operations because they can increase the observation area and period, especially at night.

1.1.2 The digital Era

The technology age is evolving rapidly and has become a vital part of almost every aspect of life. Peace support operations carried out in joint missions, state missions or Specialised task force are currently taking advantage of new advancements in technology to save lives and account for safe missions. Technology has been added to strategy in military, police and civilian operations aimed at fostering peace mandates in peace support operations. The emergence of technology however comes at high cost and investments. African countries through sponsorships and grants are designing technology-driven approaches to execute operations and missions rapidly.



Figure 1.2 UAV Airforce and Military drones. **Source :**
(<https://www.linkedin.com/pulse/impact-emerging-technologies-peace-security-africa>).

The benefits of artificial intelligence and machine learning are still to be explored in these missions. Many organizations and states are moving forward in their technological and analytical capabilities, as they perform their important work to help develop peace in war-torn parts of the world. States and terrorist groups will increasingly weaponize the cyber domain, launching attacks on critical national infrastructure that cause widespread destruction and chaos. With power, communications and logistics systems down, organizations will lose the basic building blocks needed for doing business. So, what is the actual intention behind this technological advancement? Subject matter experts conclude with available statistics from concepts notes, databases, alongside

journals and articles that, the latest nexus of using technology in Peace Operations is crucial and timely.

The African perspective must understand new technologies, deployment of new technologies and having the skilled force and capabilities to execute such technologies effectively. Recent invasions and wars clearly show that, the approach and strategies are fast changing due to technological advancement and military capabilities. This raises the flag that, peacekeeping and Peace Operations must rise up to the occasion to execute their mandates using technology-driven equipment and skills. The Security Council of both African Union and the United Nations have encouraged in numerous meetings to make greater use of the swiftly expanding array of new technologies including digital technology to make its peacekeeping missions more effective and rapid.

Technology and intelligence are making peace operation mission faster, successful and effective. In the context of Africa, peacekeepers facing asymmetrical and complex threats, including those posed by terrorist groups, technological tools must be leveraged to support greater situational awareness and invest in knowledge in latest technological drive needed for Peace Operations. This research seeks to outline and encourage troop and police contributing countries and field missions to support technologies which are driven by the practical needs of end users on the ground and in ways consistent with international human right laws.

1.1.3 What are Peace Support Operations (PSO)?

Peace support operations involve the expeditionary use of uniformed personnel (police and/or military), with a mandate to:

- Assist in the prevention of armed conflict by supporting a peace process
- Serve as an instrument to observe or assist in the implementation of ceasefires or peace agreements
- Enforce ceasefires, peace agreements, or the will of the UN Security Council in order to build stable peace

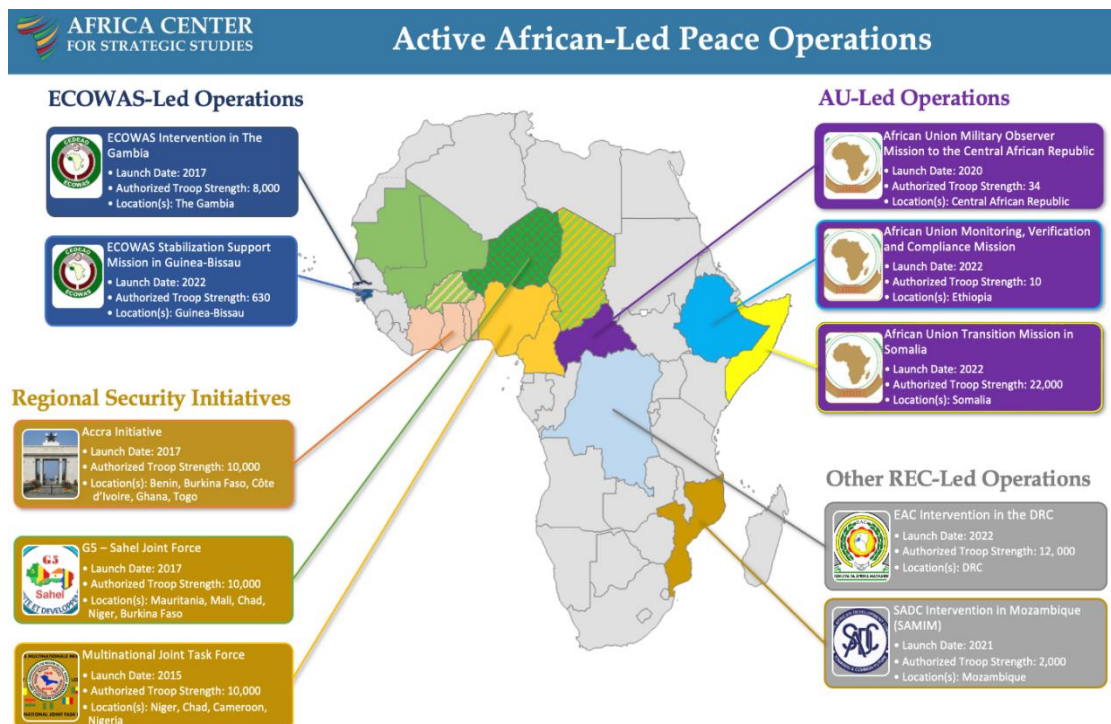


Figure 1.3 (Active African-led peace operations have been vital tools for managing Africa's complex array of security challenges, though continued reform is needed to intervene more decisively in the continent's most devastating conflicts).

Joint coalitions in peace support operations have become a more effective way to carry out missions. Such “partnership peacekeeping” has become the new norm in Africa whereby African states provide the majority of the personnel but other actors provide significant forms of assistance in terms of funding, training, logistics, and planning. Despite deploying into difficult environments and being given a long list of difficult tasks, many of these operations have proved to be effective tools of conflict management, and technology plays significant role.



Figure 1.4 AU Operations. *“While the AU is willing to mount interventions in the interests of peace and security in Africa, it does not by itself have the resources to sustain them”*

<https://www.crisisgroup.org/africa/286-price-peace-securing-un-financing-au-peace-operations>

Among other things, joint missions through effective coordination’s have assisted states during the risky transition from war to peace; helped mitigate humanitarian crises and protect civilians; changed the incentives for war and peace among the belligerents, sometimes by actively coercing spoilers; assisted in the reduction of uncertainty between various conflict parties; helped prevent accidents and control skirmishes that otherwise might have escalated to war; and facilitated political dialogue between belligerent groups. Again, too many peacekeepers have been accused of incompetence, corruption, or sexually exploiting the people they were supposed to protect. At the UN, the Secretary-General told the Security Council in August 2011 that, tensions and arguments will arise because “those who mandate missions, those who contribute uniformed personnel, and those who are major funders are separate groups” of countries. This has produced a significant mismatch between the states making the key strategic decisions about UN and AU peace operations and the states risking their personnel on the ground (United Nations, UN 2011).

While Western states have pushed to establish more and more ambitious operations in Africa, they have been reluctant to deploy their own soldiers, instead preferring to offer financial, logistical, and training assistance. The technology used, deployed or implemented also comes with important shortcomings and its effectiveness is dependent upon three critical ingredients: political will of AU Member States, developments at the

regional level, and by addressing the external threats much more consistently and promptly.



Figure 1.5 Action for Peacekeeping A4P (The vision for deeper internal capacities and exposure to new technologies is consistent with the [Action for Peacekeeping \(A4P\)](#) initiative; the [A4P Plus \(A4P+\)](#) priorities of 2021 emphasize the need for innovative, data-driven, and technology-enabled peacekeeping)

Finally, the Secretary General's Strategies on New Technologies and on Data set the stage for UN peacekeeping to forge its own path toward harnessing the potential of digital technologies and better deliver on its mandates, now and for the future. The African Union, AU has also commenced conversations on digital transformation for peace support operations in Africa. In all, the vision for deeper internal capacities and exposure to new technologies is consistent with the Action for Peacekeeping (A4P) initiative; the A4P Plus (A4P+) priorities of 2021 emphasize the need for innovative, data-driven, and technology-enabled peacekeeping. Recognizing the need for a deliberate and systematic approach to achieve digital transformation in field missions led the Under-Secretaries-General of the Department of Peace Operations (DPO), Department of Operational Support (DOS) and Department of Management, Strategy, Policy and Compliance (DMSPC) to initiate the development of the Strategy for the Digital Transformation of UN Peacekeeping in November 2020.

1.2 Statement of problem

With the withdrawal of military, political, and financial support by great powers, the failure of UN efforts, and the inefficiency of the AU, the trend toward regionalization of internal conflicts has accelerated (Besada, Goetz, and Werner 2010, 1). It has been argued that, one of the major obstacles for African peace operations missions has been the proliferation of armed conflicts, both inter-state and intra-state. Throughout these years the roots and typology of those conflicts has changed as a result of political and social alterations. Again, failure to detect arms smuggling, cyber and digital transactions that fund armed groups and the advancement of digital knowledge has accounted for increase crime and terrorism in Africa. After the end of the Cold War, it appeared that Africa would enter into a new era of “Afro-optimism” (Safaneta 2004), with the end of the civil wars inherited from the Cold War and with almost all military and dictatorial regimes undertaking electoral processes (Safaneta 2004). However, the lack of political capability and democratic culture contributed to subsequent social problems and unrest, especially in sub-Saharan Africa. The emergence of new technologies has created new opportunities in the areas of peace and security operations especially in conflict prevention, joint or ad hoc coalitions and peace building.

New technologies have made it possible to collect data in crime and conflict zones enhancing the efficiency of early warning and response. Peace operations can now be implemented in asymmetric threat environment and monitoring coupled with observation can be performed more efficiently as a result of this advancement. Similarly, they foster the peacebuilding efforts down to local level. Both the United Nations, and the African Union are working to improve their peace operations technologically. While the emphasis is more often placed on new collection tools (e.g., satellite imagery, UAV night-vision tools, target tracking, surveillance etc.), the challenge remains to exploit the imagery and the copious other data that has been collected and effectively use them. The need to understand the emergence of new technology in peace support operations is key to solving the latest technological approach used by armed groups, their financiers and terrorist.

By examining the capabilities, latest technologies, the human skills needed to handle them and the investment push to implement and push them into operation is significantly vital. African Union (AU) and its operation and joint coalitions must evaluate some neglected steps of the information/intelligence cycle. AU and UN missions still need to establish strong and effective data-analysis and e-sharing systems within their missions in Africa. One fact remains crucial and vital, the digital revolution's ultimate legacy will be determined not by technology, but by how it is used. Technology has advanced at an astonishing rate in the last decade and the pace is only set to accelerate. Capabilities that seemed impossible only a short time ago will develop extremely quickly, aiding those who see them coming and hindering those who do not. Developments in smart technology will create new possibilities for organizations of all kinds and the security sector is no exception. Technology will also create opportunities for attackers and adversaries. Who controls these technologies and how can we take advantage of these best brains for our peace and security? In financial terms, the cost of these operations has risen at a time when the recent global economic downturn has constricted resources (since mid-2008, UN peace operations in Africa have cost over \$5 billion per fiscal year). This major strategic and operational lessons learned from the more than 50 peace operations deployed to Africa since 2000 with the aim of making these and future operations more effective instruments of conflict resolution.

1.3 Research Objectives

Like other continents, Africa has embraced the so-called Fourth Industrial Revolution. Emerging technologies are defined as those that are radical or novel and may have disruptive effects in the sectors where they are deployed and used. Some of these emerging technologies are being researched and tested. Others have already been deployed, including mixed reality merging the virtual and the real world, Augmented Reality (AR) and Virtual Reality (VR), 5G, Artificial Intelligence (AI), and Blockchain, among others. Currently, Africa is also engaged in technological Research and Development and deployment. Some countries on the continent already have thriving AI hubs, such as Nigeria and Ethiopia. Google has its own AI hub in Ghana, and the United Nations (UN) has an AI center, the UN Global Pulse lab, in Kampala. More than 50 peace operations have been deployed in Africa since 2000, including multiple African-led or hybrid African Union/United Nations initiatives.

The frequency of these deployments underscores the ongoing importance of these operations in the playbook of regional and multilateral bodies to prevent conflict, protect civilians, and enforce ceasefires and peace agreements. Recent operations have featured increasingly ambitious goals and complex institutional partnerships. The achievements and shortcomings of these operations offer vital lessons for optimizing this increasingly central yet evolving tool for addressing conflict and instability in Africa. Peace operations have undergone significant shifts since their conceptualization. They have transitioned from monitoring ceasefires in interstate conflicts to supporting the implementation of comprehensive peace agreements. Some peace operations are now involved in stabilization and increasingly in the protection of civilians. Others are operating in areas experiencing violent extremism, terrorism, transnational organized crime, and violent intrastate conflict largely involving non-state armed groups. Acting with the fierce urgency of now through the adoption of technology is vital to winning the war on peace operations (Alghali, Zinurine Abiodu, and Mamadou Mbaye. 2008).

These changes, coupled with transformations in the global order, call for adaptation and resilience of peace operations to ensure that they are “fit for purpose” to meet present and future security needs. Central to this adaptation and resilience are the ‘tools,’ ‘technologies and ‘equipment’ peacekeepers employ. In 2000, the “Brahimi Report” concluded that once

deployed, peace operations must be based on robust doctrine, force posture, and ROE that do not “cede the initiative to their attackers.” This would enable missions to achieve their mandated tasks as well as deter antagonistic parties from using force against peacekeepers and civilians.

Considerable progress has been made at both the UN and the AU with regard to understanding the political, diplomatic and military tasks required to protect civilians and both organizations have now developed mission-wide civilian protection strategies for several of their operations in Africa. This research attempts to highlight these issues with possible solutions from the integration of contemporary technology and perspective Tech innovations that can be used on a larger scale by AU security forces in various missions for maintaining peace. Peace support operations either via joint coalitions or state led now rely heavily on advanced technological capabilities for their missions. This research further seeks to identify these new emerging technologies, the impacts it has on peace support operations in Africa and identify workable strategies for their implementations through a recommendation model.

1.4 Research questions

As the continent recovers from the COVID-19 pandemic, African leaders face a choice between harnessing emerging technology to improve government effectiveness, increase transparency and foster inclusion in security matters. The discussion on the role of digital and advanced technologies in peace support operations is supply-driven, with possible uses sought out just because digital tools are available. As an alternative, the key question is which high-tech solutions are actually suited for peace support operations? A whole range of emerging digital technologies are imaginable in the implementation of mandated tasks. Technological developments have always led to changes in the way wars are fought and lives saved. International organisations, including the UN, AU and other regional coalition forces have to contend with digital technologies that change the nature of conflict in Africa. At the same time, digital technologies open up opportunities for managing those same conflicts. As is the case with most technological change, the current developments present both opportunities and risks.

Primary and Secondary Research Questions

This research will be focused to answer the **primary question (PQ)**:

- i. To what extent is the African Peacekeeping Operations (Missions) prepared to embrace new technologies in their operations?
- ii. What digital tools and strategies are available for peace support operations in Africa?
- iii. What capabilities are available to support peacekeeping operations in Africa?

To address the primary research question, the following **secondary questions (SQ)** also require answering:

- i. What are the main security objectives of the African Union, within its African Peace and Security Architecture?
- ii. How do the different mechanisms of APSA take advantage of technology at their Regional Mechanism levels?
- iii. What steps should be taken to handle the threats technology poses to peace support operations?

1.5 Research Scope and organization

This research is analytical and descriptive in nature and is focused on using practical case studies and structured questionnaires to investigate the extent to which technology impacts peace support operations in Africa. The research explored available knowledge in the peace architecture, policy and strategy used in advancing technology in missions and established the contributions made in the knowledge of technology and peace support operations. The research was organised as follows:

Chapter 1 touched on the general overview of peace support operations and technology through a background study. The chapter provided the historical context necessary for understanding the subject of the thesis and presented the research questions, objectives and significance.

Chapter 2, Literature Review, consolidated various discussions on the significant literature about Peace support operations and emerging technologies in Africa. The reviews advanced on latest literature on the topic focusing on key thematic areas, documents available and papers published in that context. The African Union, United Nations and other Regional Mechanisms were the main source of literature.

Chapter 3, Research Methodology, presented the methodology used to collect the data required to answer the research questions and explained the procedure used to analyze the data collected and formulate their conclusions. Case studies selected from security Institutions and Center of excellencies in military and police colleges in Africa on the African Peace Support Trainers Association (APSTA) secretariat were utilized.

Chapter 4, Findings and Analysis described and explained findings on technology and peace support operations. Posteriorly it describes and analyzes the application of strategic approaches to military, police and civilian components and dimensions used in technology-driven peace support operations.

Chapter 5, Discussions of the results and findings and Chapter 6 covered Conclusion and Recommendations, summarizing the conclusions and present recommendations drawn from the research.

CHAPTER 2

LITERATURE REVIEW

2.1 The nexus of Technology and People

For over 75 years, UN and AU peacekeepers have worked alongside international partners, community leaders and Member States to save lives in the world's most fragile political and security situations. The human factor is vital and crucial and lives must be saved and preserved at all cost. Today, more than fifty thousand troops are known to have been deployed for UN operations in Africa, and thousands more deployed for regional missions in countries where civil wars, political instabilities and insurgencies have killed millions. The current instability rates within the sub-Sahara African regions call for trained people to be deployed using the best available technologies. The fact remains that, military, police and civilians who are deployed will rely heavily on technological capabilities to execute successful operations and missions. Many experts agree that peacekeeping missions help protect civilians and reduce some of the worst consequences of war.

The nexus between technology and people seeks to create the avenue for skilled and strategic personnels who have the capability to handle technology in the ever increasing and fast-moving world of security. Technology is useless if we do not have the skilled and trained expertise to handle and utilize them. Again, we must invest in training our personnel on which technology suits them and leverage its advantages for peace support operations in Africa. Emerging technologies and its impact on peace and security is also very sensitive since people are able to use Artificial Intelligence (AI) to harm, manipulate, hack, perpetuate, or cause chaos in politics, social media, journalism or even to a whole economy. In the quest for competitive pressure produced by automated digital machine systems and process such as artificial intelligence utilizing digital transformation, the reorientation from knowledge to power is no longer to shape us and make life easier, but to automate us and our behaviour.

Cameras installed on drones and helicopters helped identify M23 positions in the Eastern DR Congo before the rebel group was defeated in 2013 (Dorn and Giardullo, 2020). In Ukraine and Georgia, OSCE and EU monitoring missions also rely on drones (Hansen, 2020). The Security Council encouraged the United Nations to make greater use of the rapidly expanding

array of new technologies including digital technology to make its peacekeeping missions more effective and safer. Emerging technologies can also support the safety and security of both peacekeepers and civilians by enabling early warning and response systems. With peacekeepers facing asymmetrical and complex threats, including those posed by terrorist groups, technological tools must be leveraged to support greater situational awareness. The nature of conflict and interventions are changing rapidly hence the approach must change strategically.

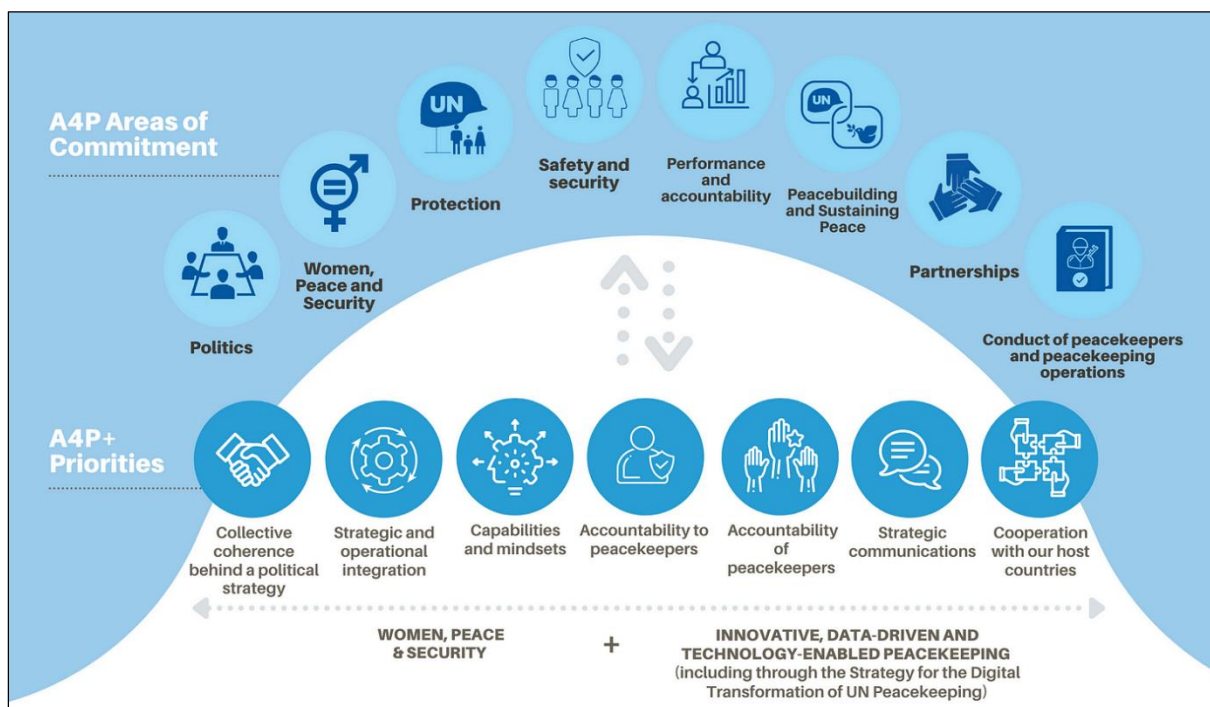


Figure 2.1 (A plan for progress: How A4P+ is boosting impact on the ground | by UN Peacekeeping | Medium)
Source: <https://unpeacekeeping.medium.com/a-plan-for-progress-how-a4p-is-boosting-impact-on-the-ground-8578aea24aa2>

The UN Security council unanimously adopted resolution 2589 (2021), through which members called upon Member States hosting or having hosted United Nations and Africa Union's peacekeeping operations to take all appropriate measures to protect deployed personnel. It further demanded the Secretary-General to establish a comprehensive online database of attacks against peacekeepers. The Council also took note of the Secretary-General's ongoing efforts at the intersection of technology and peacekeeping, including the Action for Peacekeeping (A4P) initiative and the UNITE AWARE situational awareness platform, and welcomed Member States' commitment to environmentally responsible solutions for peacekeeping operations, such as their increased use of renewable energy and safe

technology. It further encouraged the Secretary-General to keep working with Member States to explore technologies and best practices which can help improve the safety and security of peacekeepers and the protection of civilians, with a focus on solutions that are cost-effective and mission appropriate. Reports on the safety and security of personnel in United Nations (UN) peace operations have advocated for greater use of CCTV in AU and UN led peace operations (Willmot et al., 2015).

As we seek to explore which technology best suits missions and operations in Africa, experts further aim at outlining strategies to train troops and personnel with guiding principles on how to effectively use and deploy such technologies. Another report warns that parts of the UN peace and security infrastructure already appear to be suffering from “sensory overload” and that they “lack the capacity to sift through the massive amounts of information generated by social media analysis and data capture technologies” (Pauwels, 2020: 4). Technology in the wrong hand can be very catastrophic and dangerous. Now more than ever, Africa needs to understand these digital transformations and invest in talent refinement of its IT and digital gurus. Indeed, assembling the right team of technology, data, and process experts is crucial for peace support operations in Africa. Peace Support Operations have undergone significant shifts since their conceptualization some years back.

They have transitioned from monitoring ceasefires in interstate conflicts to supporting the implementation of comprehensive peace agreements. Some peace operations are now involved in stabilization and increasingly in the protection of civilians. Others are operating in areas experiencing violent extremism, terrorism, transnational organized crime, and violent intrastate conflict largely involving non-state armed groups. These changing security dynamics, coupled with transformations in the global order, calls for adaptation and resilience of peace operations to ensure that they are “fit for purpose” to meet present and future security needs in Africa. Essential to this adaptation and resilience are the ‘tools,’ ‘technologies and ‘equipment’ peacekeepers employ. Machine learning can be used to more effectively respond to ongoing or impending crises. For instance, deep learning a more complex method of machine learning that uses “neural networks” to “learn” a particular set of tasks has been used to identify the size and location of refugee camps in Syria, for improved humanitarian responses, and to prevent overcrowding (Lu et al., 2020).

Experts have argued that, the resilience of peace support operations from a technological and innovation angle, examining how technology is enhancing the resilience of peace operations and how peace support operations are adopting and leveraging new technologies to implement their evolving mandates, and adapting to changing conflict dynamics is apt now more than ever. In most of the African Union (AU) capacity training and review meetings, experts contend that agility, foresight, and anticipation, matched with timely adaptation to technological developments and innovative systems, are essential components in the resilience of peace operations amidst changing security dynamics for Africa. Latest technology trends needed for safe peacekeeping operations in Africa has created the needed nexus between peacekeepers and their capabilities to harness technology for missions. The emergence of AI also informs cutting-edge software programs to detect deepfakes (Mirsky and Lee, 2021; Nguyen et al., 2020; Agarwal *et al.*, 2020). Technology is now the game changer. From digital transformation through to virtual and augmented realities, cyber security through to aerial surveillance and long-distance range targets and advanced communication networks and command centers.

UN led missions in African with joint coalition with the African Union, could fruitfully apply machine learning techniques to the analysis of the fine-grained data gathered in the SAGE system (Duursma and Karsrud, 2019). Such analyses could provide insights for early warning and conflict prediction, and they could potentially benefit planning and resource allocation at the strategic and tactical level. Of course, the challenge of successfully translating early warning into timely action is beyond the realm of artificial intelligence. Technology though expensive must be calibrated into planning and strategy for peace support operations. Emerging technology revolutions joined with transformations in the global order, call for adaptation and resilience of peace operations to ensure that they are “fit for purpose” to meet present and future security needs. It must be noted that, main actors in peace operations and their national technological capabilities can strengthen or undermine the collective resilience of the wider peace operations’ architecture or framework. For example, new high-tech camera and sensor technology could potentially strengthen accountability, command and control, and guarantee AU and UN peacekeepers’ safety and security in the field. These cameras could also serve as useful aids in military training (Kenny, 2015) for peacekeeping operations. The research contends that agility, foresight, and anticipation, matched with timely adaptation to latest

technological developments and innovation, are essential components in peace support operations in Africa.

2.2 The Peace and Security Council of the AU

The Peace and Security Council (PSC) of the AU, is the central diplomatic instrument of the African Peace and Security Architecture (APSA). It is the point of contact with international organizations such as the UN Security Council (UNSC) and the Political and the Security Committee of the European Union (EU). The Protocol relating to its creation establishes that the PSC performs functions in the areas of preventive diplomacy and peace-making, including the use of good offices, mediation, conciliation and enquiry (AU 2002 8). It is a representative Organ of all regions and Governments of the AU, usually meeting at the level of Permanent Representatives. Moreover, the PSC is the standing decision-making organ for prevention, management and resolution of conflicts in Africa, conceived to timely and efficiently respond to conflict and crisis situations (AU 2002, 4). The PSC is empowered to take diplomatic initiatives and action it deems appropriate with regard to situations of conflicts.

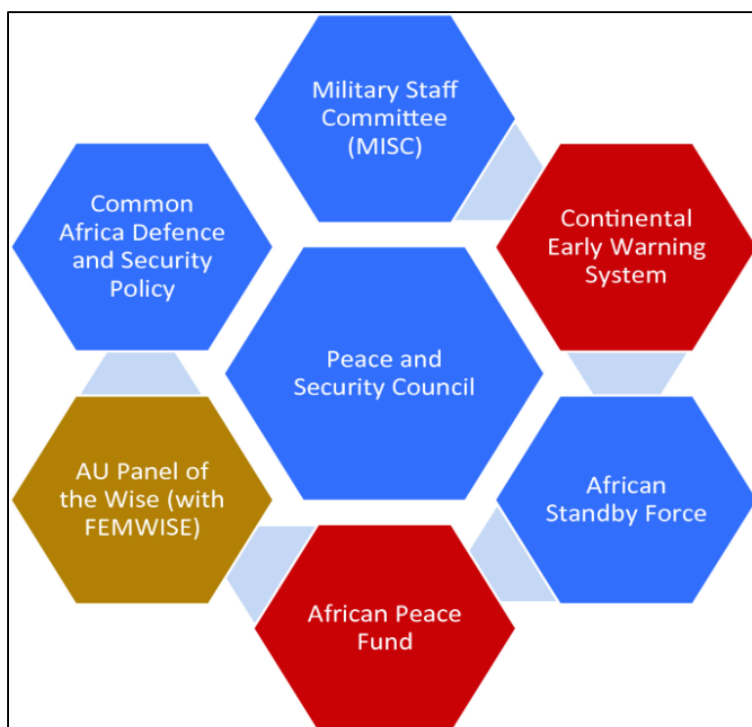
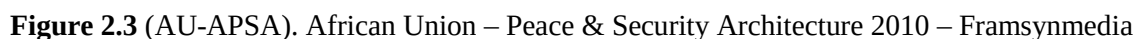


Figure 2 .2 (African Union Peace and Security Council). Source: Fit for purpose SpringerLink

The Peace and Security Council (PSC) is the organ of the African Union in charge of enforcing union decisions on security matters. The council is mandated to use its discretion to effect entry, whether through the collective intervention of the Council or through its chairperson and/or the Chairperson of the Commission, the PW, and/or in collaboration with regional mechanisms for conflict prevention, management and resolution (AU 2002, 14). The PSC may establish subsidiary bodies that include ad hoc committees for mediation, conciliation or enquiry, consisting of an individual State or group of States (AU 2002, 12). Presently, the PSC is fully operational, has already met more than 250 times, addressing conflicts and crisis situations facing the continent. It has acquired credibility. The focus of the decisions, so far, has been on conflict management and resolution, rather than conflict prevention. This is due to capacity limitations and the intensity and complexity of conflicts, but also due to lack of political will, reflecting the power politics and interests in Africa (Sturman and Hayatou 2010, 69). Nevertheless, the Protocol that creates the PSC took account of the need for regional balance so as to minimize tensions and increase the potential for consensus in dealing with combative issues such as military intervention (AU 2010a, 22).

To achieve the goals, mandate and task of the council, subsidiary organizations such as the Military Staff Committee and the Committee of Experts are involved in decision making. Members are elected by the African Union Executive Council and endorsed by the Assembly of the African Union so as to reflect regional balance within Africa, as well as a variety of other criteria, including capacity to contribute militarily and financially to the Union, political will to do so, and effective diplomatic presence at Addis Ababa, Ethiopia. Currently, the council is composed of fifteen countries, of which five are elected to three-year terms, and ten to two-year terms. Countries are immediately re-eligible upon the expiration of their terms. Consensus has remained the norm by which all decisions have been reached.

The role of Regional Organizations (ROs) in the new world order (characterized by intra-conflict that often transient borders), cannot be overemphasized. As a response to this burgeoning threat, the AU through the regional economic communities and regional mechanisms (RECs/RMs), in 2003 began the journey to operationalize the pillars of the African Peace and Security Architecture (APSA), notably the African Standby Force (ASF). However, operationalization of the APSA is not a natural process. In efforts to unlock the coordination discordance between AU and RECs/RMs, the principle of subsidiarity is central to the operationalization of APSA, ACCORD. (2013). African union panel of the wise: Strengthening relations with similar regional mechanisms.



The principle is grounded in the idea that sustainable peace is best achieved when conflict resolution mechanisms are driven by those actors who are geopolitically, culturally and logistically closer to the crises. Despite the existence of a regional security community arrangement, it is not always clear how the principle should address conflicts of interest between competing regional organizations and states. Besides unpacking APSA (the five pillars), this chapter critically examines the functional relationship between AU and RECs/RMs within the principle of ‘subsidiarity’. After the genocide in Rwanda in 1994, a growing need was identified among the African countries for a capability to intervene in similar emergencies in case the United Nations and the International Community should respond too slowly or not at all (Kinzle2008, 10).

African Union Member States agreed to establish a military instrument in order to enable the PSC to perform its responsibilities with respect to the deployment of peace support missions and intervention pursuant to Article 4 (h) and (j) of the Constitutive Act. What was envisaged for this military instrument were standby multidisciplinary contingents, with civilian and military components in their countries of origin and ready for rapid deployment at appropriate notice (AU 2002, 18). The final concept for the ASF adopted by Heads of State provided for five standby brigade level forces, one in each of Africa’s five regions (see figure 4), supported by civilian police (CivPol) and other capacities (Cilliers 2008, 1). The five Regional Economic Communities (RECs) serve as the building blocks of the ASF, contributing each one with a Regional Standby Brigade (Alghali and Mbayen2008, 34). As not all countries in a particular region are part of the same REC, and since some Member States belong to more than one economic grouping, the AU had to form Coordinating Mechanisms of the Regional Standby Brigades in the Eastern and Northern Africa. In Northern Africa, the North Africa Regional Capability (NARC) was created, because Egypt is not member of the Arab Maghreb Union (AMU) and Morocco not a part of the AU.

In Eastern Africa, the East Africa Standby Brigade Coordination Mechanism (EASBRICOM) was created, since Rwanda is not part of the Intergovernmental Authority on Development (IGAD). In West, Central and Southern Africa, since most of the countries in each region belong to the same economic grouping, the respective RECs only had to upgrade their structures to support requirements of their respective brigades (Alghali and Mbaye 2008, 34).

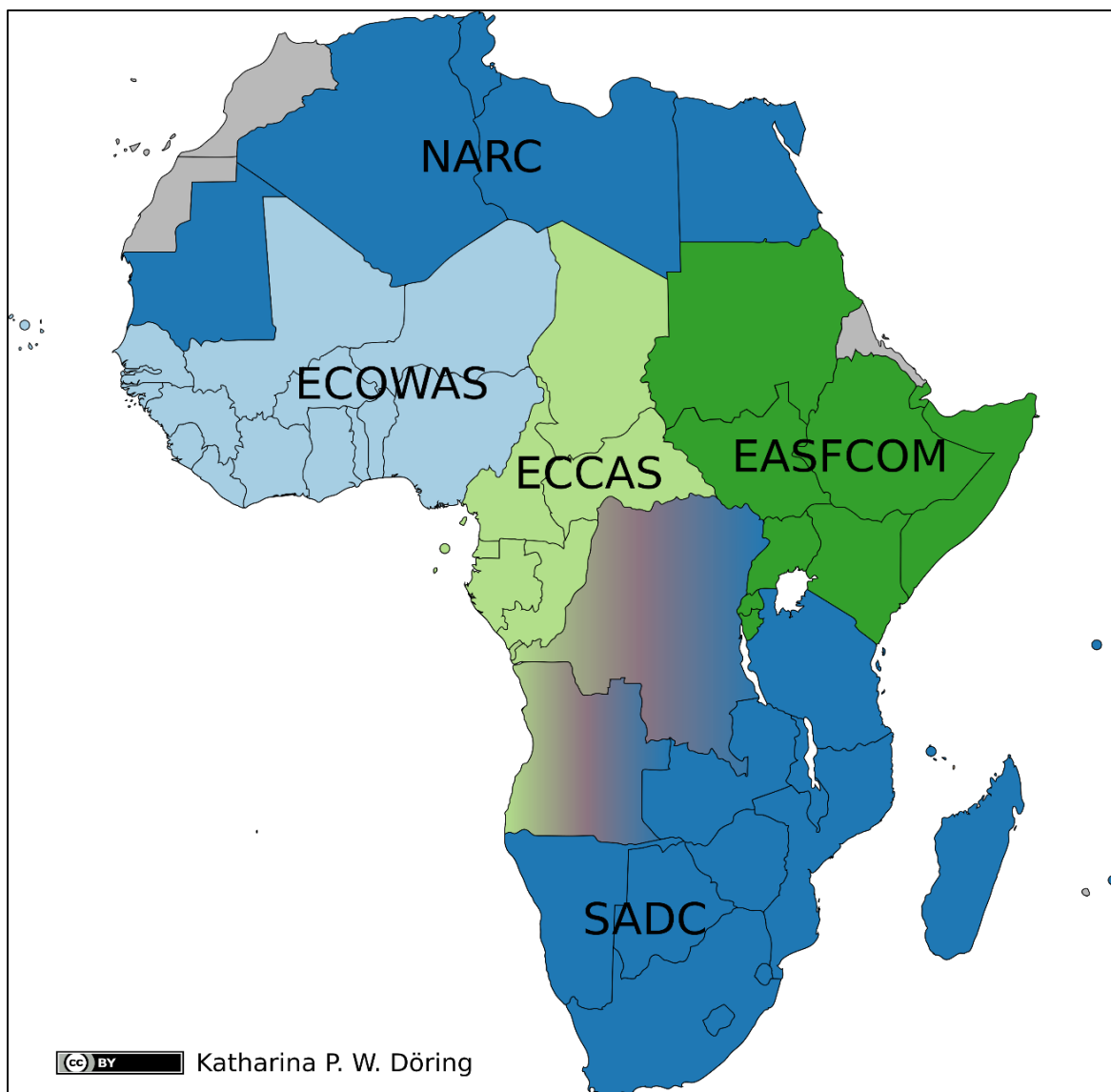


Figure 2.4 (ASF Maps). Source: ACRIC and ASF maps | Katharina P.W. Döring

2.4 The challenges of peacekeeping operations in Africa

There are often many dangers faced by peacekeepers during peacekeeping missions and operations. According to Kalle Kallio, ‘The risky, unpredictable, and unstable environments in which peacekeepers operate is essentially the reason for such dangers. Examples of types of political and governmental situations that precipitate conflict in a given country and therefore dangerous operational environments for peacekeepers include failed governance, conflict spillover, vulnerabilities in ungoverned strategic spaces and resource-rich territories, border disputes, extremism and uncontrolled migration’. The modern peacekeeping environment poses many new threats to peacekeepers, which were not present in the past operations until the end of the 20th century. Inevitably, the need for information systems to provide security to peacekeepers, largely achieved through delivering situational awareness, has never been higher.

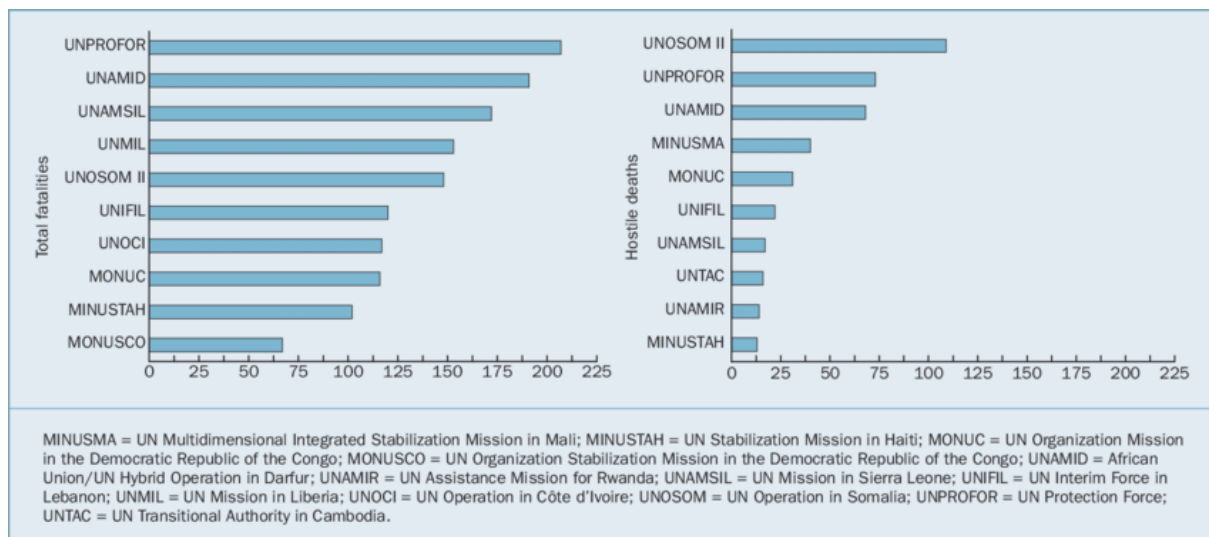


Figure 2.5 - United Nations peacekeeping operations with highest absolute numbers of fatalities and hostile deaths among uniformed personnel, 1990–2015. Source: United Nations Department of Peacekeeping Operations (DPKO).

Peacekeeping operations has never been easy or simple. The complex nature of missions coupled with high cost of logistics and technology has created various strategic steps to make Peace Support Operations cost effective yet productive. The increased threat to peacekeepers and the increased need for information systems to provide security are reflected through the significant increase in peacekeeper casualties (Figure 2.5). It has been argued that, quantitative

research evaluating the effect of peacekeeping operations usually links conflict reduction to the number of casualties in order to measure mission success. Such an approach is incomplete as security concerns extend far beyond the number of conflict related deaths and injuries. United Nations peacekeeping operations with highest absolute numbers of fatalities and hostile deaths among uniformed personnel, 1990–2015 (Source: United Nations Department of Peacekeeping Operations (DPKO)). Despite their success, African-led peacekeeping missions continue to face important challenges, according to analysts. The biggest challenge appears to be money. Large missions such as AMISOM/ATMIS depend almost entirely on funding from the United Nations, European Union and other international donors.

Emerging technologies has contributed to the success stories of peacekeeping operations. However, there are many limitations to the use of new technologies. The implementation of such technologies is not standardized across missions and the technical capabilities differs from States to contingents. Effective data analysis requires that the data input into existing platforms for operations are both accurate and relevant and that the database is adequately maintained, which is not always the case with in Africa. Troop-contributing countries may also lack the appropriate equipment, capacity, and mindset to implement new technologies for peacekeeping. In addition, there are risks related to potential breaches of data privacy and cyberattacks, an issue that requires guiding policy on usage and engagement. Other challenges such as “response gap” between data collection and responses to protect civilians, which are ultimately what matter. Ultimately, emerging technology should be embraced, correctly integrated into UN and AU-led missions in Africa and capacity of personnels augmented to maximize and safeguard civilians.

2.5 Peace Support operations in Africa

Roughly half of the UN peacekeeping missions operating around the world are in Africa. These include Abyei, an area contested by Sudan and South Sudan (UNISFA); the Central African Republic (MINUSCA); the Democratic Republic of Congo (MONUSCO); South Sudan (UNMISS); and Western Sahara (MINURSO).

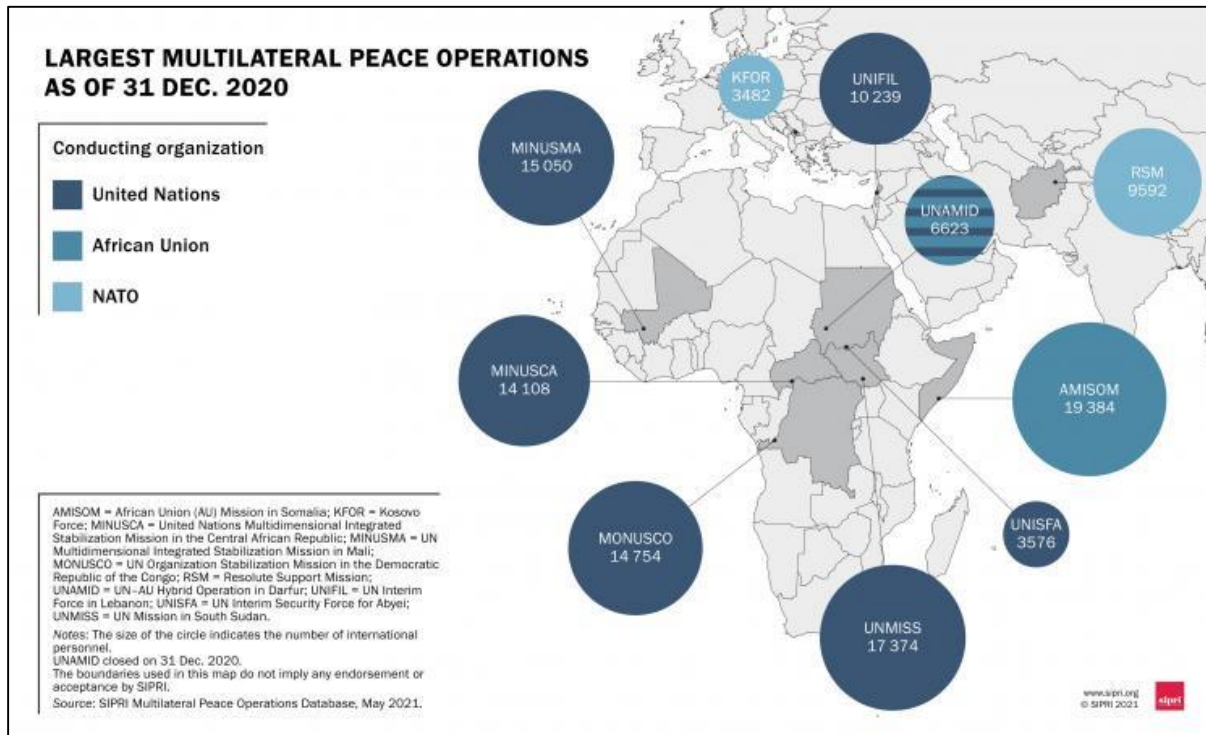


Figure 2.6 (Major multilateral Peace and Security Operations in Africa). Source: Data and trends for multilateral peace operations | SIPRI

Additionally, a growing number of peacekeeping or security missions under the auspices of regional blocs, such as the African Union (AU) and the Economic Community of West African States (ECOWAS), have emerged as alternatives to traditional UN peace operations. The AU and regional partners currently oversee ten operations across seventeen countries, comprising more than seventy thousand personnel. The largest are the African Union Transition Mission in Somalia (ATMIS) and the Lake Chad Basin Commission Multinational Joint Task Force (MNJTF). Most recently, in 2022, four African-led missions launched or revised their mandates in an effort to address worsening conflicts and support transitions to peace in the Democratic Republic of Congo (DRC), Ethiopia, Guinea-Bissau, and Somalia. The European Union (EU) also plays a role, though its presence has dwindled due to rising tensions between African

countries and former colonial powers. An EU counterinsurgency force led by France was pressured into withdrawing from Mali in 2022 after a military junta took over the Malian government, and several other efforts involving France in the Sahel have been met with hostility from the region.

In Africa, the spread of misinformation and disinformation on social media has affected peace support operations in so many ways. Technology though good, can have particularly harmful effects in conflict environments if not well controlled and managed. While both mis- and disinformation refer to false or misleading content, disinformation requires an intent to harm (Wardle and Derakhshan, 2017). Both can propagate confusion and intensify underlying tensions. In Gabon, rumors that the president was dead or had been swapped for a body double helped fuel an attempted coup (Cahlan, 2020). Warnings circulated on social media in 2020 that the World Bank had predicted Lebanon's economic "collapse," breeding panic in (World Bank, 2020). During South Sudan's peace process, rumors over the ill health of the president led to warnings about heightened risk of violence (Green, 2020). In 2020, the COVID-19 pandemic further increased the negative impact, as it leads to stigmatization of the sick and the spread of fake cures (MSF, 2020; Times of India, 2020). On a broader scale, researchers have sought to assess the benefits of peacekeepers on the ground.

2.6 Emerging technologies in Peace Support Operations

The current wave of technological change has created new opportunities for multilateral cooperation across a wide range of areas, including sustainable development, conflict prevention, humanitarian responses, peace operations, and state-society relations. At the same time, however, it has created an enduring “digital divide,” raised questions about Internet governance and privacy, and led to new forms of warfare that challenge existing international human rights and humanitarian laws. The UN has at times struggled to keep up with the pace of change, in part because private sector and civil society actors are often in the lead when it comes to technological innovation. This policy paper explores where the UN can play a useful role and where existing mechanisms and other actors are better placed.



Figure 2.7 (High-Tech Speed Drone) Source: <https://www.ipinst.org/2017/05/icm-new-technologies-peace-security-development>

According to Lamptey (2021), “Digital transformation is rapidly changing the world through cutting edge technology that is affecting lives”. He argued that, from new medical discoveries, through space and mobile interoperability, our economy, security and knowledge faculty are being shaped daily and life is getting better and simpler. He added that, “we are quite familiar with Internet of things, Robotics, big data, artificial intelligence, autonomic and cloud computing”. These augmented and virtual realities are emerging technologies that is capable of

shaping peace support operations in Africa if adopted promptly. According to Schwab (2016), “a new wave of technology is driving rapid global change. This is the latest of several “waves” of technological change that have taken place throughout modern history, driven by inventions ranging from steam power to electricity to the automobile and drones”. Figure 6 shows a high-tech military drone that is capable of delivery health aid equipment to mission zones and battle fields. Lamptey (2021), supports this conversation that, Digital transformation provides a valuable opportunity for core business functions, such as finance and HR, security and safety to move away from manual processes and automate key areas like payroll, enabling leaders, surveillance and more, to focus on wider business opportunities.

The use of e-learning and virtual meetings is now part of our daily business operations. Marketing and pulling customers online through the use of Social Media Apps has also taken a new wave. Transformative technologies have added intelligence to security and peace operations at all dimensions. Collaboration between enterprises, modern ways of engaging with the customer-base, more innovation within the workforce itself, and the ability to draw valuable insights from captured data, are just several of the key benefits helping businesses and security capabilities to grow. The current technological wave is remarkable for its speed and its level of impact on economic development, peacekeeping operations and social transformation. These digital tools sometimes called the “fourth technological revolution,” is characterized by a fusion of technologies that is blurring the lines between the physical, digital, and biological spheres. The following emerging technologies needed and used for peacekeeping operations have seriously changed the face of missions in Africa and beyond.

2.6.1 Unmanned Air Vehicles (UAV)

Turkey’s Bayraktar TB2 drone, which was deployed during the Libyan civil war, has attracted the interest of multiple African countries looking to add drone technology to their arsenals. The most effective security benefit that information systems can provide is the first step of threat identification. Satellite imagery, Unmanned Air Vehicles (UAV) and other forms of monitoring and surveillance technology, security cameras, and other devices connected to an information system are all examples of ways in which an information system can detect threats. Another essential requirement of information

systems in the modern peacekeeping environment is the ability to communicate effectively and reliably at all times. Therefore, it is one of the most outstanding and influential ways for an information system to contribute to peacekeeper security and threat identification when combined with the human component of the system.



Figure 2.8 UAV, Source: The Dizzying Possibilities of Drones - Africa Defense Forum. <https://adf-magazine.com/2023/09/the-dizzying-possibilities-of-drones/>

2.6.2 Situational awareness ecosystem

According to the 2015 report of the Department of Peacekeeping Operations-Department for Field Support (DPKO-DFS) Expert Panel on Technology and Innovation, ‘continuously improving camera resolution, the accuracy and availability of aerial and geospatial data, and movement detection sensors have been used for a wide range of intelligence and situational awareness purposes in missions ranging from ceasefire monitoring to camp security’. These capabilities have grown to the point where missions may now perform mass visual and digital surveillance in their operating environments, allowing them to conduct ‘human terrain mapping’ and develop ‘pattern of life’ assessments to identify and isolate dangers. The 2019 Department of Peace Operations (DPO) Policy on Joint Operations Centers (JOCs) defines situational awareness as ‘the tool for knowledge, understanding and anticipation of a situation through monitoring and reporting of current events, analysis and predictive assessments.

The use of digital technologies in UN peacekeeping operations for monitoring, surveillance, analysis and decision-making is not new. However, the capabilities of digital technologies available to peacekeeping missions today are orders of magnitude greater than those available a decade ago. The majority of the world's key powers have sent only a small number of troops to UN peacekeeping missions. This issue has been raised numerous times. Apart from the numerous political, diplomatic and military considerations, countries may be unwilling or incapable of contributing to UN peacekeeping. One of the primary reasons may be a fear of losing military personnel in perilous peacekeeping missions that are not deemed critical to national interest. The loss of support for peacekeeping is an unfortunate trend adding to human suffering.

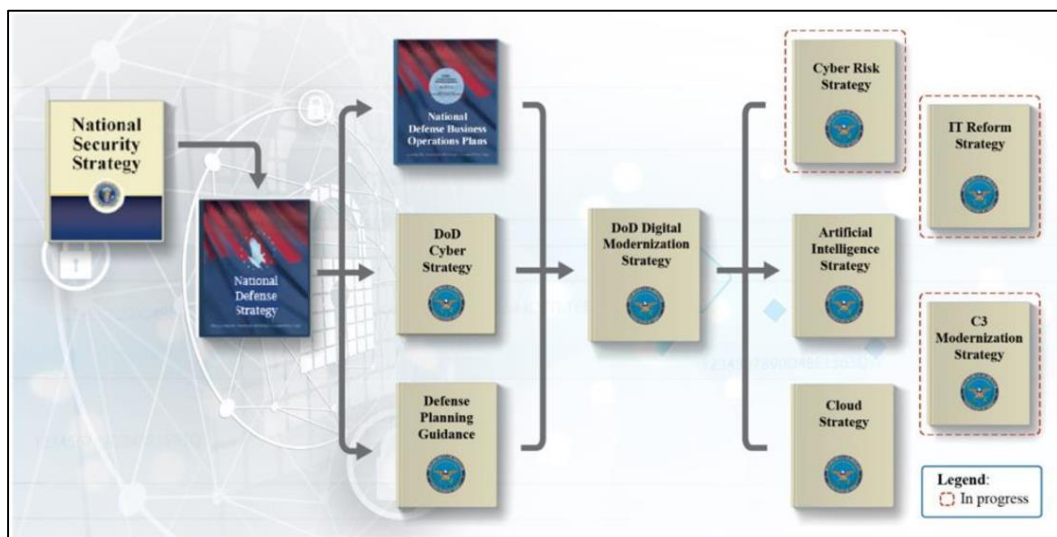


Figure 2.9 Situational awareness ecosystem for cyber security strategy and planning. Source: Developing Enterprise Cyber Situational Awareness | Semantic Scholar. <https://www.semanticscholar.org/paper/Developing-Enterprise-Cyber-Situational-Awareness-Gorham/43e439b5069a900265f6f26f83c7d01c074d585c>

2.6.3 Security Surveillance Cameras

Vision and alertness are core area of peace operations. A simple security camera is one technology that can help with this problem. With the widespread use of security cameras in homes and businesses worldwide, there have been significant advancements in these devices lately used for peace support operations. Following in the footsteps of Panels of Experts that have relied on satellite monitoring to determine the extent of

nuclear weapons development in the DPRK and Iran (Convergne and Snyder, 2015b), UN peace operations could also leverage satellites to fulfill tasks related to sanctions monitoring. In addition, the AI capabilities has been enhanced to help detect moving and hidden objects thousands of miles away. Video feeds can be filtered with motion and person detection so that only clips with action and people are recorded and presented to monitoring personnel. Aligning security camera capabilities to command centers can reduce casualties. In addition, the security technology aids in the resolution of the problem of information overload, which occurs when there are so many data sources and long static videos captured through primary security cameras.

The proliferation of camera sensors, when combined with AI, can be a massive force multiplier for peacekeeping operations. These sensors can be used to protect troop facilities, vital government and utility facilities, refugee camps, and other civilian populations vulnerable to violence. Low-cost security technology could also be installed along transportation corridors to deter and detect IED placement. Advancement in low-cost security cameras for peacekeeping is that many cameras can now be wirelessly connected and run on batteries for extended periods. It allows them to be much more flexible in their placement without incurring the additional cost and effort of running wires to each device. The cameras can be used in dash-cams for vehicles and bodycams for troops, making them highly mobile and can be easily moved to different locations.

Such devices can be game-changers in peacekeeping operations. As peacekeepers patrol in vehicles and on foot, cameras provide accountability and improve troop behaviour because they are aware that their actions are being recorded. Following that, if a video is live-streamed back to the operations headquarters, it can provide a comprehensive situational awareness of what is going on in the field. It is especially true if the troops are also equipped with personnel locator devices, which allow the command-and-control centres to track the location of all blue forces. Mobile cameras' recording facility makes it easier to prosecute bad actors and protect good actors from false accusations. In addition, as peacekeepers work to build positive relationships with the local population, it is critical that people see the peacekeepers as accountable and doing good for them. Having a large number of cameras to help secure the people and

record the efforts of peacekeepers could provide the evidence and accountability required to build positive relationships.



Figure 2.10 Advanced AI Video surveillance cameras with IED detection capabilities. Pan-Tilt-Zoom (PTZ) cameras with AI capabilities offer enhanced surveillance by autonomously tracking moving objects, individuals, or vehicles. **Source** : <https://cloudcamera.medium.com/9-advanced-ai-based-cctv-surveillance-cameras-to-protect-24-7-89d24ed30fed>

2.6.4 Peacekeeping Communication Systems

The United Nations has selected Ericsson to supply LTE based networks for mission-critical communications required for their global peacekeeping missions. Alongside the partner Danoffice IT ApS, Ericsson will lead the implementation of mission-critical LTE networking equipment as well as professional services and training. The LTE networking equipment is from the 5G-ready Ericsson Radio System portfolio, including the MINI-LINK microwave backhaul solution, in combination with Ericsson Cloud Packet Core. The UNHCR asked the Standby Task Force to crowdsource the location of IDP shelters in a drought-stricken part of Somalia, and provided volunteers with instructions and satellite images to geolocate shelters (Puig Larrauri, 2012). Communications technology is crucial because it can significantly improve peacekeeping operations. Many peacekeeping operations rely on communications such as messaging, phone calls, video and multimedia.

Unfortunately, most peacekeeping missions are carried out in underdeveloped and turbulent areas with limited or no local communications and internet access. Most modern militaries can bring their own communications equipment, but it can be challenging to use with patchy network coverage, thus, making it unreliable and an expensive proposition. Furthermore, interoperability issues can arise when various forces join for peacekeeping operations. Therefore, a need for robust communication such as the newly developed Starlink System could be the solution. Currently there are 14 peacekeeping operations around the world led by the UN. These missions typically have permission to use radio spectrum for planning, coordination and implementation of their activities. The first live UN Private LTE networks are expected to be up and running in 2019. By standardizing their communications in this way, the UN ensures peacekeeping troops will have the latest communications systems as well as a cost-effective way to add new digital broadband services, such as HD video for real-time situational awareness, mobile positioning and cellular Internet of Things (IoT), including asset management and connected logistics solutions.



Figure 2.11: LTE networking equipment . Ericsson to Provide Mission-Critical Communication Systems for UN Peacekeeping Missions. Source : <https://www.everythingrf.com/news/details/7109-Ericsson-to-Provide-Mission-Critical-Communication-Systems-for-UN-Peacekeeping-Missions>

2.6.5 Information Sharing and Command Control (C2)

Command and Control (C2) is defined by the US Department of Defense (DOD) as “the exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission” Technology has tremendous potential for improving peacekeeping mission command and control structure. Data must be coordinated, compiled and filtered from overhead visualisations, aerial data, satellite imagery, sensor inputs, and personnel location information to derive actionable information. These data points can be combined in geospatial information systems (GIS), allowing anyone in the mission area to access and analyse data relevant to their own local or regional sphere of operations. Improved situational awareness would result from increased information sharing. The lack of system-wide information sharing protocols and standards, secure information technology and communication platforms discourages information sharing. It exposes employees to allegations of data security breaches because it is rarely clear what information is permitted and expected to be shared with whom and how.

The technologies mentioned earlier can help mission planning at the C2 Centre at the operational and tactical levels. Individual units on the ground can see what is happening around them and identify what is ensuing in a nearby neighbourhoods. Geographic Information System (GIS) platforms can improve situational awareness and identify patterns and relationships by overlaying data and tracking changes over time. GIS platforms are instrumental in peacekeeping missions for observing borders, monitoring ceasefire lines, assisting electoral processes, protecting civilians, providing humanitarian aid, spotting force buildups and overseeing demobilisations. Such information will enable faster decision-making by the C2 center. For example, WFP and Mozambique deployed drones to capture aerial images for high resolution maps of areas damaged by tropical storms (WFP, 2021).



Figure 2.12. The first VIRTUAL FLAG exercise dedicated to training the Joint Air Ground Integration Center's command and control was successfully executed at the 705th Combat Training Squadron's Distributed Mission Operation Center located at Kirtland Air Force Base, New Mexico, Aug. 23-27. Source : <https://www.af.mil/News/Article-Display/Article/2844831/air-force-discusses-modernization-of-operational-c2-systems/>

2.7 New Technological enablers for Peacekeeping

Walter Dorn writes in *UN Chronicle* that; the United Nations is relying heavily on information and communications technology (ICT) to respond to peace operations and missions. United Nations leaders made the wise decision to move most of the organization's information technology to the cloud and rely on large corporations for cloud services half a decade ago. That decision has paid-off now, as the industry has demonstrated its ability to handle a massive increase in Information and Communications Technology (ICT) demand during the pandemic, allowing the UN and many other organisations and businesses to continue operating. During and after the crisis, technology can be used to accomplish much more. Table 2.1 identifies UN adoption of new technologies seen as enablers to be used for Peace Support Operations.

Partnership for Technology in Peacekeeping	2014	Brings together a range of stakeholders, including governments, civil society organizations, companies, and academic institutions, to develop and deploy innovative technological solutions to address the challenges faced by peacekeepers in the field ⁱ
Expert Panel on Technology and Innovation in UN Peacekeeping	2014	Published a report acknowledging that “United Nations peacekeeping remains well behind the curve” in adopting and applying new technologies; the report included POC as a programmatic priority for the use of new technologies in peacekeeping and proposed the concepts of “digital peacekeepers” and “Technology-contributing countries” ⁱⁱ
High-Level Panel on Digital Cooperation	July 2018	Convened “to provide recommendations on how the international community could work together to optimize the use of digital technologies and mitigate the risks” ⁱⁱⁱ
UN Secretary-General’s Strategy on New Technologies	September 2018	Launched “to define how the United Nations system will support the use of these [new] technologies to accelerate the achievement of the 2030 Sustainable Development Agenda and to facilitate their alignment with the values enshrined in the UN Charter, the Universal Declaration of Human Rights and the norms and standards of International Laws” ^{iv}
UN Secretary-General’s Data Strategy	May 2020	Developed “to generate more value from the UN’s wealth of data,” including “stronger decision-making and policy advice, greater data access and sharing, improved data governance and collaboration, robust data protection and privacy, enhanced efficiency across our operations, greater transparency and accountability, and better services for people and planet” ^v
Roadmap for Digital Cooperation	May 2020	Set out actions to build an inclusive digital economy and society, build digital capacity, protect digital human rights, promote digital trust, and foster digital cooperation ^{vi}

Action for Peacekeeping Plus (A4P+)	March 2021	Includes data and technology as a cross-cutting priority across eight priorities for strengthening UN peacekeeping ^{vii}
Strategy for the Digital Transformation of UN Peacekeeping	September 2021	Aims “to enable missions to implement their mandates more effectively and to enhance the safety and security of peacekeepers by harnessing the potential of digital technologies as well as mitigating risks, while positioning peacekeeping to continue to evolve in its use of technology” ^{viii}
Information and Communications Technology (ICT) Strategy (2023–2028)	September 2022	Outlines five strategic technology areas and aims “to create the conditions conducive to the effective, efficient, secured, interoperable and innovative use of technology” across the UN ^{ix}
Action for Peacekeeping Plus (A4P+)	March 2021	Includes data and technology as a cross-cutting priority across eight priorities for strengthening UN peacekeeping ^x
Strategy for the Digital Transformation of UN Peacekeeping	September 2021	Aims “to enable missions to implement their mandates more effectively and to enhance the safety and security of peacekeepers by harnessing the potential of digital technologies as well as mitigating risks, while positioning peacekeeping to continue to evolve in its use of technology” ^{xi}

Table 2.1: Selected UN initiatives and frameworks on new technologies. Source: UN Department of Operational Support (DOS), “Partnership for Technology in Peacekeeping,” 2023, available at <https://operationalsupport.un.org/en/partnership-technology-peacekeeping>

2.7.1 APSTA-AU technological initiatives.

The African Peace Support Trainers Association (APSTA), was founded in 2001 as an independent international organization to facilitate the development of African capacity for peace and security through coordination, advocacy, harmonization and standardization of training, research and policy implementation support among member institutions, towards a peaceful and stable Africa. APSTA has a vision to “facilitate the development of African capacity for peace and security through coordination, advocacy, harmonization and standardization of training, research and policy implementation amongst member institutions and in support of the African Peace and Security

Architecture (APSA) and the African Standby Force (ASF)” (<https://apstaafrica.org/in-brief/>). The main functionality of APSTA is to provide a one-stop Platform for regional and continental engagement with African peace and security training, research and capacity building centres and institutions in the five (5) African Union designated regions of Africa. Through that mandate, APSTA developed and uploaded unto their webservers, three Resources to help researchers, Centers of Excellence and the learning community to get access to data and information on Peace Support Operations in Africa.

2.7.1.1 Experts Database

The database of experts was designed and built on the Database Management System (DBMS) Framework. Secured with a four-layer tier security feature architecture, the database holds information on list of experts, trainers, consultants and research fellows on Peace Support Operations drawn from various Training Center of Excellencies (TCEs), Regional Mechanisms (RECs) and Member Institutions (MIs) of APSTA. The DBMS manages the data, the database engine, and the database schema, allowing for data to be manipulated or extracted by authorized users and other programs linked to other digital tools at APSTA. This helps provide data security, data integrity, concurrency, and uniform data administration procedures. Creating a network of experts through a digital framework that stores and validates experts for easy access, informed the creation and design of the APSTA-AU Experts database. So far, over 300 experts have been captured into the database to help peace operations with their skills in missions, trainings, reviews and analysis.

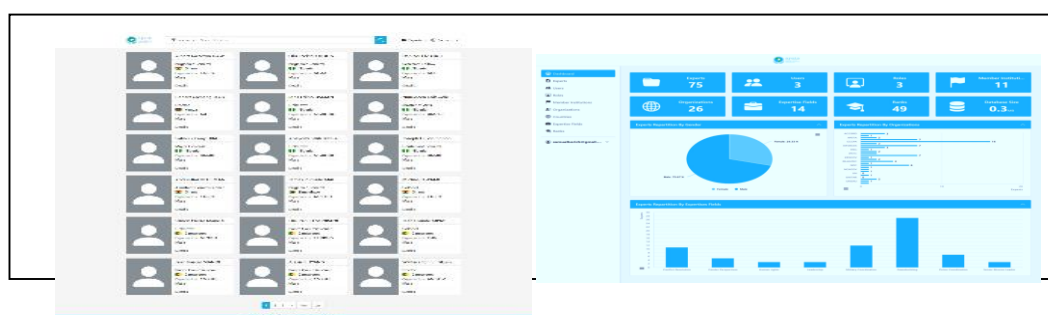
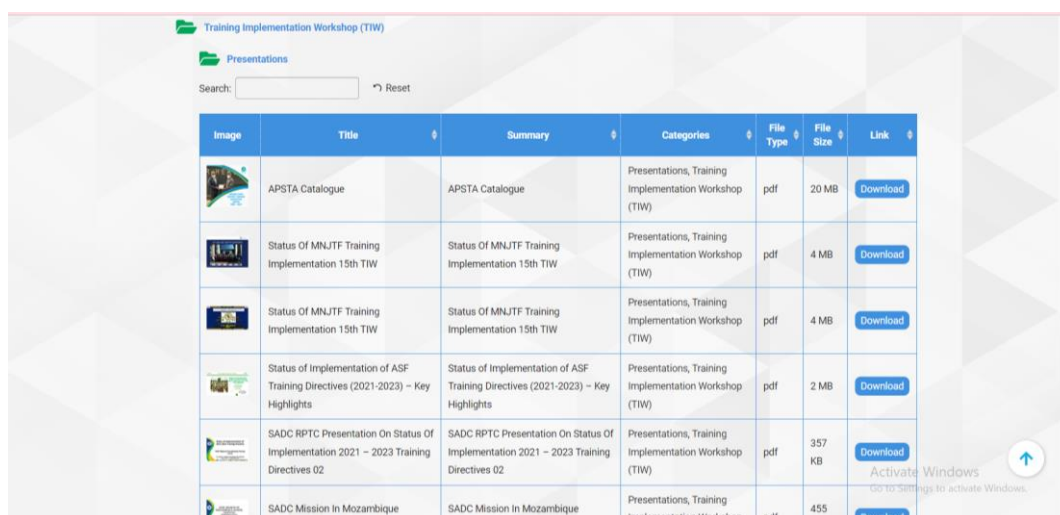


Figure 2.13 (Interface of APSTA-AU Database of Experts). Source : <https://experts.apstaafrica.org/?page=4>

2.7.1.2 Document Library

Document libraries provide a more digitized and streamlined approach to document management, ensuring that users can easily find and access individual records amid substantial amounts of data. The collaborative nature of document libraries also proves advantageous for managing large volumes of content. APSTA-AU Document library was created to ensure that all stakeholders have digital access to Peace Support Operations related materials. APSTA-AU Document library project was created to provide a stock of all documents in the form of articles, reports, policies, journals, brochures and newsletters. Creating this stock of knowledge management framework is to help with research and data on conflict and interventions as well as peace support operations in Africa.



The screenshot displays the 'Training Implementation Workshop (TIW)' interface. At the top, there is a 'Presentations' tab and a search bar with a 'Reset' button. Below this is a table with columns: Image, Title, Summary, Categories, File Type, File Size, and Link. The table lists six documents, each with a thumbnail image, title, summary, category, file type (pdf), file size, and a 'Download' button. The documents are: APSTA Catalogue, Status Of MNJTF Training Implementation 15th TIW (two entries), Status of Implementation of ASF Training Directives (2021-2023) – Key Highlights, SADC RPTC Presentation On Status Of Implementation 2021 – 2023 Training Directives 02, and SADC Mission In Mozambique. An 'Activate Windows' watermark is visible in the bottom right corner.

Image	Title	Summary	Categories	File Type	File Size	Link
	APSTA Catalogue	APSTA Catalogue	Presentations, Training Implementation Workshop (TIW)	pdf	20 MB	Download
	Status Of MNJTF Training Implementation 15th TIW	Status Of MNJTF Training Implementation 15th TIW	Presentations, Training Implementation Workshop (TIW)	pdf	4 MB	Download
	Status Of MNJTF Training Implementation 15th TIW	Status Of MNJTF Training Implementation 15th TIW	Presentations, Training Implementation Workshop (TIW)	pdf	4 MB	Download
	Status of Implementation of ASF Training Directives (2021-2023) – Key Highlights	Status of Implementation of ASF Training Directives (2021-2023) – Key Highlights	Presentations, Training Implementation Workshop (TIW)	pdf	2 MB	Download
	SADC RPTC Presentation On Status Of Implementation 2021 – 2023 Training Directives 02	SADC RPTC Presentation On Status Of Implementation 2021 – 2023 Training Directives 02	Presentations, Training Implementation Workshop (TIW)	pdf	357 KB	Download
	SADC Mission In Mozambique	SADC Mission In Mozambique	Presentations, Training Implementation Workshop	pdf	455	Download

Figure 2.14 (Document Library Interface APSTA). Source: <https://apstafrica.org/document-library/>

2.7.1.3 Situation Room (SR)

Having data for conflict and analysis was rare and inaccessible. Aside facts of data collected through data mining using various databases and research hub, APSTA-AU Situation Room was designed using state of the technology-driven and communication systems. The room provides analysis on conflicts and intervention across Africa in timely manner. New technology based on data Science and analysis were deployed to provide fast, accurate and reliable information for stakeholders. Seen as a tech-enabler,

APSTA is contributing to providing data and knowledge for Peace Support Operations in Africa.

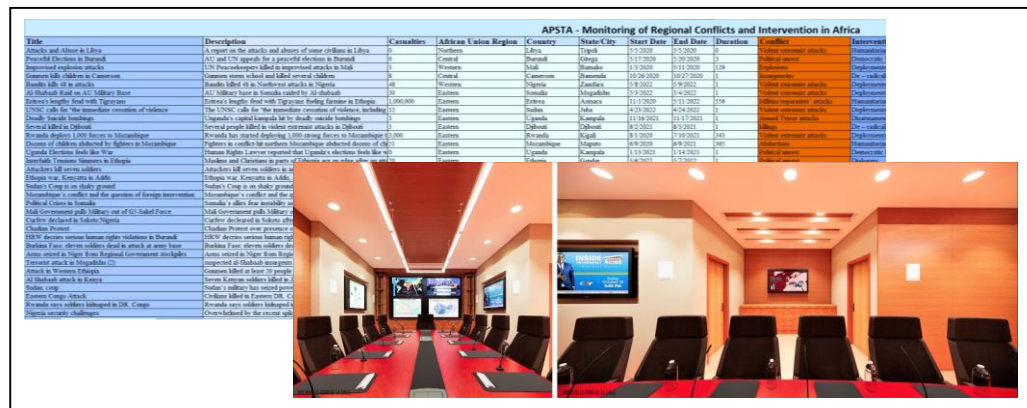


Figure 2.15 (View of Situation Room of APSTA). Source: <https://apstaafrica.org/apsta-situation-room/>

2.7.2 Detectors and Sensors

Specialised and high-tech sensors are used to safeguard AU and UN workers. The idea is to reduce or eliminate dangers and accidents or attacks. Using video and two-way audio monitoring systems positioned a few manned observation posts away in congested areas could trigger alerts and warning signals of any incoming threats. As a technology enabler, peacekeepers stationed at remote stations would be able to monitor tense situations and take action, such as dispatching an unmanned aerial vehicle to scan the area, if necessary. Armed peacekeepers could then be deployed based on the images and information received in addition to the space cameras. Thermal hotspots could be used to alert intrusions using 360-degree infrared cameras and scanners with monitoring feed from command centers. Sensors are also useful to detect intrusions and prevent them from happening. They are seen as one of the best early warning machines or tools for peace operations and missions. Unmanned aerial and land vehicles (UVA), both in the air and on the ground, may be dispatched to the most hazardous mission areas in the future. Onboard loudspeakers could be used to send warning messages, and laser signals could be used to communicate using symbols.

2.7.3 Global Internet (5G and beyond)

The question has always been, how can reliable and heavy information be shared amongst international, military, and non-governmental organizations in any peace support operations or any peacekeeping operations? Wireless alternative via satellite of fiber has been the major form of consideration. When assessing the need for wireless and making a determination of its use, a study of its markets, trends, future growth, policies, and regulations must be taken into consideration. SpaceX, Google Fiber, Lumen Technologies, Frontier Communications among others are the world's fastest internet and wireless technologies available now. Wireless technology via satellite communications can offer a great advantage of information exchange. Taking advantage of this technology enabler does not only provide communication channels but boost the technology capability within seconds. SpaceX, has launched Starlink, the world's largest satellite network. Its goal is to bring low-cost Internet to rural areas.

According to SpaceX, this so-called mega constellation could eventually have as many as 42,000 satellites. It is claimed to provide high-bandwidth, low-latency data connections across the entire globe, including functionality at high latitudes, across oceans, and across large areas of underdeveloped continents like Africa. The United States Air Force has already expressed special interest in using the Starlink network for some of its operations and weapon systems. Known as "The Groundbreaker," the relatively small, 22-pound (10-kilogram) orbital data relay, designated Sateliot_0, is the first of a constellation of over 250 spacecraft designed to communicate with terrestrial cell towers and fill gaps in data networks worldwide. SpaceX launches world's 1st 5G satellite to bring global connectivity to Internet of Things. This represents the speed, capability and communication channel needed for Peace Support Operations in Africa.



Figure 2.16 (An illustration of a Sateliot Groundbreaker satellite in orbit above Earth.) Image-credit : Sateliot - Source : <https://www.space.com/spacex-launches-1st-5g-satellite-internet-of-things>

2.7.4 Artificial Intelligence (AI)

Artificial intelligence technology is rapidly dictating the pace of technology. Added to human intelligence, almost anything is possible. Exploring the capabilities of AI in peace support operations is a needed collaboration for Africa. Though still under research, the most common application is currently surveillance software. At least 75 countries operate some form of AI surveillance, often with the goal of improving public services through automatically generated data (Feldstein, 2019a). However, concerns have intensified that AI technology and particularly facial recognition technology may be used to identify and suppress government opponents. China has allegedly developed a predictive policing program in the heavily Uighur province of Xinjiang to analyze and aggregate multiple sources of data, including biometric information and closed-circuit TV feeds.

As part of this initiative, the government has reportedly developed facial recognition software and is building a national image registry, which could be used to track individuals (Feldstein, 2019b). It has allegedly sold its CloudWalk facial recognition software to Zimbabwe (HRW, 2018). Google has launched its AI Gemini. A technology that can support peace operations rapidly. It will help translate language and sounds fast

for actions to be taken. Google Gemini AI is the most advanced and synthetic AI model today, the only AI that can process multimedia instead of only processing text like current conventional AIs. Unlike other popular large language models in recent times, Gemini is built to be multimodal, meaning it can generalize, operate, and combine on many different types of information including text, code and audio. According to test results published by Google, Gemini Ultra scored 90% in the Massive Multitask Language Understanding (MMLU - Massive Multitask Language Understanding) test. This is the first time an AI model has outperformed humans at the expert level, scoring 89.8% in the same test. The GPT-4 result was 87%, LLAMA-2 reached 68% and Anthropic's Claude 2 reached 78.5%.



Figure 2.17 Google AI Gemini- (New AI Language App). Source: <https://www.facebook.com/photo/?fbid=382811977947601&set=a.123130830582385>

2.7.5 Social Media Networks

Social media's role in polarization and conflict has attracted enormous scrutiny, particularly after high profile acts of violence. In recent times, Facebook hate speech algorithm only works in certain languages, for example, and content moderation often requires local knowledge (Perrigo, 2019; Crisis Group, 2020). In Cameroon, a contested election caused a rise in hate speech on Facebook and growing intercommunal violence (ICG, 2020). Even in areas without deep-seeded religious or ethnic conflict, online content can turn deadly: rumors of child organ-harvesting led to the lynching of two

2.8 Summary

The emergence of new technologies has created new opportunities in the areas of peace and security operations especially in conflict prevention, joint coalitions and peace building. New technologies have made it conceivable to collect data in crime and conflict zones enhancing the efficiency of early warning response. Peace support operations can now be implemented in asymmetric threat environment and monitoring coupled with observations. Technology has rendered and enhanced the efficiency of peace support operations. Both the United Nations, and the African Union are working to improve their peace operations technologically. The rapid progress of digital technologies will open up a number of potential opportunities for tomorrow's AU peacekeepers. As AU peace operations increasingly draw on digital technologies to gather and analyze information, and also access data generated by other users of digital technologies, the cost and benefit of sharing this wealth of information beyond the mission is vital. The acquisition and integration of technology is a crucial element and so is the training of peacekeepers on the application of technologies and innovations on sophisticated security issues like cybersecurity, surveillance and combat missions.

There is a need for ongoing training and in the field during service to enhance peace operations' resilience amidst the growing security threats. There is also a need to address the challenge of technology in the wrong hands. Moreover, the UN Security Council and the African Union Peace and Security Council may further consider how this information can enrich its own deliberations and to what degree information sharing should feature in peacekeeping mandates and missions. The fact also remains that, technology has become the core and force multiplier for many successful missions. Coupled with strategy and policies, peace support operations in Africa would write a new chapter on their mandates by involving all actors and stakeholders. All literatures and journals authorize the use of emerging technologies to fight crimes, stop cyber threats, aid peacekeeping operations and enhance safety and protection of civilians.

CHAPTER 3

DATA AND METHODOLOGY

3.1 Introduction

The current technological wave is remarkable for its speed and its level of impact on economic development and social transformation (Jeffrey, 2015). Security and Peace Support Operations has equally received its share of this technological advancement. The new emerging trends promises to change the dynamics, approach and safety of peacekeeping. This research requires reliable and accurate data and experts' views to communicate technological insights that will reform policy and implementation. According to Best and Kahn (1998), good research uses valid and reliable procedures of data-gathering, instruments and techniques. This chapter will explain the reason for choosing the methods and procedures for this research work. Resources on data collection, compilation and analysis will be emphasized and examined thoroughly. The chapter also took into cognizance of the research design, research pattern, sampling method used, to ensure reliability of the research instruments, its limitations and problems encountered. This research work considered all ethical principles and processes to ensure standardization.

3.2 Research Design

This chapter defined the appropriate research design suitable for data collection and usage. It helps to identify and address the problem that may rise during the process of research and analysis. The approach adopted for this research elucidated vividly how data was collected, organized and investigated. It further clarified the strategy for answering the research questions using empirical data. Guided by the overall research objectives, the sampling methods deployed, the validity of data, data analysis, ethical principles and limitation together with reflexivity were all taken into account.

3.3 Research Pattern

According to Thomas (2003), research pattern or paradigm is a broad method of connected procedure and thoughts that explains the dimension of enquiry based on the three major research process which are ontology, epistemology and methodology and it is a system of scientific and academic ideals, values and assumptions with regards to the nature and conduct of the research. As shown in (Figure 3.1 research pattern or paradigm model). This research will cover all the six steps. A research paradigm or pattern defines the perspective of the researcher and guides the researcher on the types of research methods to be used in the course of the research and in the analysis of data collected (Kivunja and Kuyini, 2017). This research work adopted a case study and qualitative paradigm which involved a structured gathering, presentation and analysis of data on Emerging Technologies and their Impact on Peace and Security in Africa (a TANA forum) organised through a virtual and hybrid interaction meeting by IPSS.

The 10th edition of the Tana High-Level Forum on Security in Africa took place on 25-28 November 2021 in Bahir Dar in hybrid format under the theme, ***“Managing Security Threats: Building Resilience for the Africa We Want”***. In line with this, the Institute for Peace and Security Studies/IPSS, as the Tana Forum Secretariat, with the Mission of Japan to the African Union jointly organised a Joint Virtual Multi-stakeholder’ Pre-Tana forum on the topic: “Emerging Technologies and their Impact on Peace and Security in Africa.” The virtual session was held on 14 September 2021. The methods involved the collection of data texts, literatures, documents and the use of interviews to collect relevant data and analysing them based on qualitative techniques and a case study research approach. The qualitative approach gives broad insights to the research work and it explained how data is collected and investigated through the usage of purposive sampling, semi-structured and open-ended interviews. This served as an effective model that can be used to analyse the actual situation of things in a natural way. It also takes into consideration the different observations and interpretations of participants to have a complete understanding of the situations on ground (Mohajan, 2018). While a case study approach to research is a qualitative research method that gives an in-depth explanation of a complex situation. It allows the researcher to choose a particular geographical spread and a limited numbers of respondents as the research participants to be able to gather data within a particular context (Zainal, 2007).

The qualitative research approach on the other hand allowed this research to be able to investigate and narrate the nature and quality of the behaviour of people, experience and understand in relation to the subject matter of this research (Hamza, 2014). Qualitative method used allowed this research to examine the impact of new technologies peace support operations in Africa. The United Nations (UN), The African Union (AU), Peace Support Operations directorate of the AU-PSOD, Regional Mechanism such as the African Standby Forces (ASF), African Peace Support Trainers Association (APSTA), TANA forum 2021 to 2022, subject matter experts, Training Centres of Excellencies (TCE) played a crucial role by providing detailed information and expert views on the research topic. The method examined some factors such as the mandates, funding, the role of consent and legitimacy, roles of African Economic Regional communities, the impact of armed non state actors and the complex nature of the African environment and their impact with regards to the technology, policies and strategies for peace support operations.



Figure 3.1 Research pattern or paradigm model

3.4 Sampling Technique

It is very difficult to study the entire population hence this research adopted a sampling method of data collection. Ogunbameru and Ogunbameru (2010:43), agreed to the fact that, sampling represents a smaller part of a larger population and the importance of sampling is to avoid the various difficulties faced by researchers in their attempt to study the whole population. Since researchers cannot make direct observations of the entire population, data is collected from a set of individuals and used to make inferences about the entire population. For selection of respondents for this research work the following sample method were adopted. Purposive sampling was adopted by selecting key informants and this presented this research with important data relevant to the research questions. The purposive sampling which allows for the selection of respondents whose experience is valuable for a proper understanding of the focus of attention of this research was selected because the objectives of this research required the knowledge of experts in peacekeeping missions and peace support operations in Africa. Senior research fellows, subject matter experts, RECs and RMs and consultants on PSO matters were targeted. Therefore, a total of 31 key informants' respondents (KIRs) were purposively selected for this research. The choice of these respondents was based primarily on their specialization, expertise, experience and participation in peace support operations from APSTA, AU, RECs and REMs and Centre of Excellencies/Training Institutions (TCEs).

Numbers of Respondents	Positions/Expertise	Institutions/Affiliations
6	These are specialized experts, consultants and senior officers on matters of conflict and peace support operations in Africa.	Selected from Centre of excellencies of APSTA and Member Institutions such as: • NDC, • KAIPTC, • ACCORD • IPSTC
10	Experts on emerging technologies used in missions and Peace Support Operations by AU, UN and joint coalitions	• AU • UN • EIFORCES • APSTA • NDC, • ECOWAS • SADC • TANA Forum (IPSS)

5	These are field and desk officers of the peacekeeping operations of the African Union and the United Nations.	• EIFORCES • APSTA • NDC, • ECOWAS • SADC • MINDEF
10	These are researchers with expertise in the field of Peacekeeping operations in Africa with publications in the field of peacekeeping and peace and security in Africa.	• APSTA • TANA Forum • IPSS • CCCPA.

Total Number of Respondents (31).

Tabel 3.1: key informants' respondents (sample size).

3.5 Sources of Data

This research focused on primary and secondary sources of data. The secondary data were collected through the existing information from national and international sources like the African Union database, journals and conference papers, articles, books, reports and thesis of students who have done similar work on the subject matter. Extracts on papers from subject matter experts on peace and security in Africa were also used. The Primary data sources used were interviews and official documents of the peacekeeping operations of the African Union and the United Nations.

3.6 Interviews

The use of interviews was one of the primary sources of collecting data for this research. The importance of the interview is that accurate and reliable information can be obtained, and on time from subject matter experts and senior officers' researchers and training officers on peace support operations. Instead of writing the response, the subject or interviewee gave the needed information orally face-to-face via zoom. The second set were carried out through survey monkey. The two approaches adopted increased the sample size from the anticipated 20 to 30. It also presented the opportunity to evaluate the sincerity and insight of the interviewee. According to (Hitchcock and Hughes, 1989:83) interviews that are semi-structured make it possible for inclusiveness to be achieved by presenting the chance on the interviewer's part to

investigate and enlarge the responses of the interviewees. This also can result to development of some sort of balance between the interviewer and the interviewee, leading to space for negotiating, discussing and expanding of the responses of the interviewees. In recent times, Artificial Intelligence (AI) has generated the ability to transformed a questionnaire into a form on interview where various options or feedback are collected in real time. It allows for multiple choice selection, check list, upload of audio and video files and a scale bar slider that can give a vivid view of the interviewee. (Bernard, 1988) argued that the benefit of the semi-structured interview is allowing the interviewer to be in control of the procedures of getting information from the interviewee, while equally following new leads as they emerge.

Adopting these two interview options were flexible and easier to collect feedback quickly. The survey platforms aided in data analytics by presenting scientific analysis for the researcher timely. Some few challenges were encountered. Getting the right questions on technology and peace support operations that rightly fits into the context of new nexus of peace operations in Africa. The second major challenge was getting the right respondents with specialization in the field of this research work across the Regional Mechanisms, African Union, Centre of Excellencies and think tanks on Peace Support Operations matters. However, taking advantage of participant list from APSTA-AU meetings, and making use of the database of experts, some links were created to get access to those who have experience on the topic. The third challenge was having the right time to engage the respondents. These are experts who are very busy with their daily routines. Booking a face-to-face interview with experts took some time. Additionally, these experts were stationed in different countries across Africa.

Social media platforms such as Zoom, Team and Google Meets came in handy. Coupled with the survey monkey gave way to fast and easy access to feedback virtually. They were held online and exported through encrypted formats for analysis. The videos were also recorded for further listening and understanding. At least one each expert from APSTA, ACCORD, KAIPTC, IPSTC and EIFORCES were interviewed face-to-face whiles the others trickled in via the digital portal. The time zones were challenging since I am stationed in the Central part of Africa. As the interview process progressed, I learnt several lessons about interviews, data gathering and analysis. I learnt the importance of allowing the respondents the freedom to

speak. I also learnt the importance of asking short and precise questions straight to the point. It is also important to reassure the participants about the confidentiality of the interviews. The interview guide were questions directed at several classifications of respondents with regards to their experience in the field of peacekeeping and peace support operations and arranged correspondently across respondents to enhance uniformity in the gathering of data and allowing the researcher to compare the data collected from the different respondents. As shown in Table 3.1 gives details of the category of interviewee targeted. The interview questions comprised of 15 questions each for the face-to-face and 25 survey questionnaires carried out online. Both set of questions were divided into two sets. Demographic data and questions bordering on African Union and UN peacekeeping operations in Africa, RECs/RMs, Technology and preparedness of integrating technology in Peace Support Operations in Africa.

3.7 Instrument for Validation

According to (Bamisaye, 2001) validity is “the process by which a researcher actually measures what he claims to measure, it is the extent to which differences among individuals, in scores reflect true differences among individuals and the characteristics being measured”. To ensure validity and reliability in this research work, the results were based on qualitative data. The instruments used such as the semi-structured interview were subjected through scrutiny so that any form of bias or prejudice will be detached or eliminated. According to (Fafare-Olumide, 2020), data collected should be cross checked with self-reliant sources for the purpose of fair assessment and authenticity. I made the attempt to separate facts from personal views using comprehensive analysis with regards to oral interviews.

3.8 Methods of Data Analysis

The research work adopted an in-depth content analysis and descriptive analysis method. According to (Prabad, 2008:173) “content analysis is the scientific study of the content with reference to the meanings, contents and intentions contained in messages or document”. Many scholars have argued that content analysis may be seen as a procedure where the content of an analysis forms the premises for illustration of reasoning and conclusion. Content analysis further means researchers make use of systematic and fair ways of describing and quantifying phenomena, giving way to examine issues relating to theories to improve an understanding of

the data. Though the approach may be too simplistic, however, the advantage of content analysis is: The method is content sensitive, the research design is flexible which can be used to enhance a grasp of communication. This gives clarifications intentions, consequences and context. Figure 3.2 indicate the model of content analysis as a data analytical approach. The method was adopted because the analysis approach is structured, objective and quantitative. It offers a way of calculating communication variables in the study making it simplified. This method also involves extensive reading, prognosis, review and representation of conclusions from the review of every important data collected from the two sources of data, the primary and secondary sources. To deal with the risk of bias of sources of data, critical analysis of data from both primary and secondary source was used. This method helped to describe, analyze and examine the TANA forum as a case study and the feedback received from experts and views from the interviews.



Figure 3.2 Data Analysis model (Content Analysis)

3.9 Research Reflexivity

Reflexivity is the act of examining one's own assumption, belief, and judgement systems, and thinking carefully and critically about how this influence the research process. The practice of reflexivity confronts and questions who we are as researchers and how this guides our work. According to (Shacklock and Smyth, 1998) reflexivity refers to the responsive disclosure of the part of beliefs and values which researcher hold in the choice of research methodology, for generating knowledge and its making as a research account. (Patnaik, 2013:100) argued that reflexivity is the awareness, assessment and reassessment by the researcher of the researchers' own contributions and the consequent research findings. Reflexivity as shown in figure 3.2 plays a significant role in qualitative methodologies and of great importance in this research work. With regards to this research, the interviews I conducted led to a process of reflection about my initial assumptions and preconceptions about this research topic.

To deal with the issue of reflexivity in this research, the bracketing tool was used. Before the commencement of this research my past knowledge with my personal experiences, previous findings of the research topic were set aside and written down. This was followed by taking notes and chronicling an article to solicit for views and comments on the topic. Finally, during the analysis of the data collected my biases and preconceived notions about the research topic were made known in the interpretation of the data. According to (Koch and Harrington, 1998) bracketing is the deferment of all biases and beliefs with regards to the circumstances being researched before the commencement of the collection of data. The three phases of bracketing defined by (Wall, 2004) which are bracketing pre action, bracketing in action and bracketing on action were applied. The researcher engaged in self-critique with self-appraisal periodically in the process of this research to ensure that a distance is maintained between preconceived ideas, biases, beliefs, feelings and intentions about the subject matter and study area.

The research findings according to (Van Manen, 1984) help rid the research of value judgments and to achieve this indifference, the researcher undertook a pre-field record of all personal beliefs, ideas and biases as regards the subject matter with the study area. Reflexivity was also considered at every stage of this research work through the examination and making clear the decisions made and making a review of the political and context conditions surrounding the research.

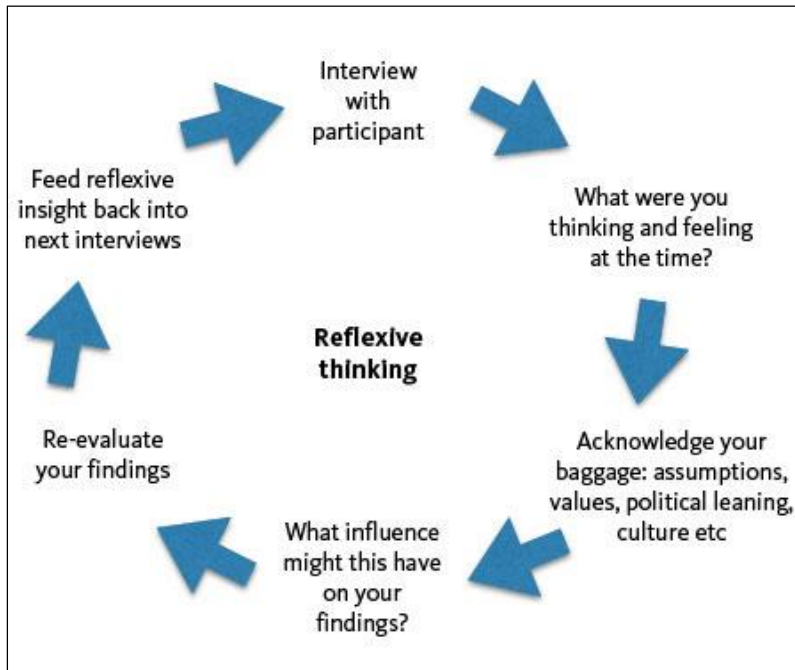


Figure 3.3 Reflexive thinking model

3.10. Ethical Principles.

There are general ethical principles that guide and underpin the proper conduct of research. The term “ethical principles” refers to those general rules that operate as a foundational rationale for the numerous specific ethical guidelines and assessments of human behaviour. The National Statement on ‘ethical conduct in human research’ states that ethical behaviour entails acting with integrity, motivated by a deep respect and concern for others. According to (Asante-Kissi, 2012) the only way participants protection can be guaranteed is if nothing in the research is traced to specific individuals or groups. Respondents were given a data gathering consent form indicating voluntary participation, guaranteeing their anonymity while protecting their confidentiality. In the analysis of data collected, statements or quotations made were not associated with the respondent’s name. To ensure that ethical principles were upheld in this research, the researcher made adequate efforts to present the research in such a way that it did not suppress, falsify or invent evidence.

3.11. Summary

Modern technologies present opportunities for mutual cooperation across a wide range of areas globally. According to Independent Commission on Multilateralism (ICM, 2017), contended that the potential of modern technologies to support and promote sustainable peace, security and development is widely acknowledged, and this is the area where the UN and the AU has come to the extreme in integrating them into its discussions and work (ICM, 2017). While modern technologies offer comprehensive opportunities to improve people's lives, they also present challenges, many of which require multilateral and joint-multi-stakeholders' solutions. Data collection is very crucial in research, as it determines the overall objectives of the research study. This chapter provided an in-depth information on the study and it established the facts, views and opinions, thereby ensuring the validity of the objectives intended. The response from Subject Matter Experts (SME), researchers in the field of peacekeeping, senior training officers of the African Union and selected officers from the training institutions and Centre of excellencies (TCEs) via interviews and questionnaires, provided their general opinions and rich views on the research objectives. Their responses further provided an overview of the African Union and the United Nations Peace Support Operations in Africa and the technology nexus that must be integrated and guided.

The data collected further provided detailed information on all the objectives, showing the challenges confronting Peace support operations in Africa, the role of technology, the technical capabilities, views on policies and strategies and guiding directives for integrating technology in Peace Support Operations with support from the Regional Mechanisms. Several factors were examined such as the role of consent and legitimacy of peacekeeping operations, the role of African Economic communities and the impact of non-armed state actors in the context of technology and their knowledge on emerging technologies available globally. These findings gave the researcher an in-depth analysis of the situations on ground, a major advantage of the qualitative method of approach. The data collected from the interviews and the case study of the Tana Forum are analysed and discussed in chapter 4.

CHAPTER 4

CONTENTS AND RESULTS

4.1 Introduction

Chapter four examines the integration of technology into peace support operations in Africa. The content and results were collected from 31 respondents made up 10 face-to-face interviews via zoom and Team while the other 21 from online/digital response using a survey monkey instrument. This chapter analysed and discussed the finding and results. In presenting the findings, this chapter is divided into two (3) parts. **Part A** case study of The Tana High-Level Forum on Security in Africa, **Part B** entails a tabular description of the respondents' profiles via digital tools while **Part C** captures views of top ranked respondents via zoom and teams interviews. It must be noted however that, the United Nations has increasingly focused on the modernization of peace operations, including through the Strategy for the Digital Transformation of UN and AU Peacekeeping efforts. Nevertheless, the full potential of the link between digital transformation, new technologies, and peacekeeping has not yet been realized, particularly when it comes to the protection of civilians (POC). Platforms like SAGE and Unite AWARE can help missions analyze data on threats and violence against civilians. Intelligence, surveillance, and reconnaissance tools like satellite imagery and unarmed aerial vehicles (UAVs) can aid in the collection of such data. The monitoring of communication platforms can also provide contextual information and insight into trends in public opinion, giving clues about future waves of violence.

Just like the rest of the world, emerging technologies are becoming highly influential on the security and stability of African states. Among others, the rapid spread of the internet across the African continent has been signaled as a key driver of prosperity and a sign of the continent's technological nexus coming of age. By comparing notes and taking feedbacks from the TANA forum and results collected from interviews and structured questionnaire in this research, experts' views, practical points and opinions were gathered scientifically. The results presented represents how technology affects Peace Support Operations in Africa and further tackles the threats it presents using case study and expert views.

4.2 The TANA Forum (Case Study)

The Institute for Peace and Security Studies (IPSS) of the Addis Ababa University serves as the Tana Forum's Secretariat. The Tana High-Level Forum on Security in Africa is one of the Institute's major outreach activities. IPSS is the Tana Forum's executive arm and has an important role in the implementation and agenda setting for the deliberative and decision-making entities (Tana Forum board and Technical Committee). With the aim of playing a crucial role in bringing about sustainable peace and contributing to the implementation of the African Union Tripoli Declaration of August 2009, the Institute for Peace and Security Studies (IPSS) at Addis Ababa University convenes an annual forum on security called the Tana High-Level Forum on Security in Africa, or Tana Forum in short. This initiative is a response to the declaration's appeal for "African-centered solutions", and its call for the treatment of peace and security as a collective "intellectual challenge". As a result, the annual Tana Forum emerged as an independent platform initiated by IPSS and eminent African personalities. The Forum is an informal gathering of African decision-makers, peace and security stakeholder groups, and their larger constituencies for an open discussion of security issues and challenges faced by the continent.

4.2.1 Objectives of the Forum

The overall objective of the Tana Forum is to facilitate a platform where African peace and security issues are discussed and followed up by African decision-makers and peace and security stakeholder groups in an open and unceremonious setting. Specifically, the Forum aims at:

- Providing opportunities to decision-making leaders and institutions to exchange experiences and insights on peace and security issues among themselves with a view to taking home inspiration and practical lessons;
- Giving opportunities to political decision-makers to interact and consult with a broad-based African constituency as well as with key global actors;
- Contributing to a substantive open debate on peace and security issues of key and strategic importance to the continent and its regional institutions;
- Communicating with and listening to "profound African voices on the ground" on various dimensions and components of peace and security on the continent, thus

facilitating an inclusive dialogue among governments and other African security stakeholder groups; and

- Sensitizing and mobilizing other stakeholders, actors and the overall African opinion for larger ownership of African-owned solutions on peace and security.

4.2.2 Expected results

In achieving its main and specific objectives, the Forum will result in:

- The conceptualization of peace and security matters from an African perspective. In that endeavour, substantial attention will be given to the emerging body of African-grown approaches to peace and security challenges and prospects;
- The building of a strong and broad-based constituency for peace and security through the establishment of nonthreatening platforms for dialogue, networking and exchange of information between policy-makers, researchers and the building of a strong and broad-based constituency for peace and security through the establishment of nonthreatening platforms for dialogue, networking and exchange of information between policy-makers, researchers and practitioners;
- To sustain such platforms, a cross-section of leaders from different sectors will be called upon to act as champions with a view to building an African voice for both the African and global security agendas;
- Progressively engaging Africa in the strategic and pro-active management of peace and security in the continent. Key to that effort will be the development of foresight capacities throughout relevant African organizations in the realm of public, private and civil society sectors. Equally important will be the development of strategic planning capacities and skills for the operationalization of national, sub-regional and continental long-term visions.

4.2.3 Forum strategic Participation

The Forum will bring together high-level decision-makers on peace and security from the government/political spheres (HoSGs, AU organs and RECs), non-AU regional institutions, the private sector, critical segments of continental/regional civil society networks, as well as peace and security experts/resource persons. Representatives of selected stakeholders in global peace and security will also be invited.

4.2.4 Forum discussion format: Discussions will be designed in order to:

- Share views and experiences in an informal and independent manner,
- Be action-oriented and forward looking and, most importantly,
- Keep the essence of its concept: a consultative forum that is not intended to become a decision-making forum,
- The main format will be panel discussions and interaction with the floor.

4.3 Discussions on Peace Support Operations and Technology (TANA dialogue)

Guided by the overall research objectives, the TANA forum focused on managing security threats: building resilience for the Africa we want. The case study presents a perfect dialogue platform to follow discussions on emerging technologies in Peace Support Operations in Africa. The case study delved deeply into the impacts, threats and recommendations proposed by stakeholders drawn from different and sensitive security establishments in Africa. The 10th edition of the Tana High-Level Forum on Security in Africa will take place on 25-28 November 2021 in Bahir Dar in hybrid format under the theme, “Managing Security Threats: Building Resilience for the Africa We Want”. In line with this, the Institute for Peace and Security Studies/IPSS/, as the Tana Forum Secretariat, with the Mission of Japan to the African Union jointly organised a Joint Virtual Multi-stakeholder’ Pre-Tana forum on the topic: “Emerging Technologies and their Impact on Peace and Security in Africa.” The virtual session was held on 14 September 2021.



Figure 4.1 (The Pre-Tana Regional Multi-Stakeholders dialogue)

The emergence of new technologies has created new opportunities in the areas of peace and security especially in conflict prevention, peace operations, peace building. New technologies have made it possible to collect data in crime and conflict enhancing the efficiency of early warning and response. Peace operations can now be implemented in asymmetric threat environment and monitoring and observation can be performed more efficiently as a result of this advancement. Similarly, they foster the peacebuilding efforts down to local level. In addition, changes in technology have always impacted theatres of war and peace. With such advancement comes the engagement of new technologies such as drones and other modern forms of hybrid warfare that introduces their own set of new challenges. They also carry the potential for adverse effects like the danger posed by the militarization of emerging technologies, especially if used in the context of terrorism. Moreover, cell phones and the Internet in addition to enhancing civic participation and empowerment are increasingly being employed to facilitate conflicts by serving as channel of communication, control public belief, raise awareness on new warfare techniques, documenting intelligence, and taking on cyber-attacks by violent extremists, organized crime and gangs etc.

4.3.1 Discussion Outcome

As the advancement in technologies expand, their benefits and shortcomings foster areas of cooperation at the international level renewing and expanding existing partnerships. Such an opportunity also comes the challenge of African member states and institutions determining and integrating the role of new technologies in their policies, work and interactions with their partners. It is an exceptional illustration of harmony among all African states on the perception that the continent's peace and security boldly depend on the new technologies such as Information Communication Technology (ICTs) since the peace and conflict dynamics changed rapidly. This is indeed indebted a great deal to the commitment of many experts and senior officials in the African Union (AU), RECs/RMs, Member States and partners. The following outcome has been paraphrased as key points and recommendations by the researcher:

1. One fact remains crucial, the digital revolution's ultimate legacy will be determined not by technology, but by how it is used. African countries that take advantage of the opportunities and limit the risks inherent in emerging technology may achieve greater peace and stability. Yet many countries could be left behind. As the continent recovers from the COVID-19 pandemic, African leaders face a choice between harnessing emerging technology to improve government effectiveness, increase transparency and foster inclusion, or as a tool of repression, division, and conflict.
2. The African continent has played a central role in deploying peacekeepers for decades, and not only through its substantial contributions of civilian, military, and police personnel to the United Nations. Africa has been particularly innovative and responsive through the deployment of a range of continental and regional-led peace operations, especially through the African Union (AU), Regional Economic Communities (RECs) and mechanisms (RM), as well as more recently through regional ad hoc security coalitions.
3. Despite such progress, the future of peace operations in Africa will be determined by the disposition of the international community towards developing better mechanisms that coherently bring together the various visions and approaches of global, continental, and regional peace operations initiatives.
4. Rather than competing for space with the UN, as one might think at a first glance, African peace operations have often been deployed when the international community has been unable or unwilling to intervene. "African solutions to African challenges" have been not

only a motto that evokes African claims to more regional ownership, but has also served as a reminder that the limited commitment often displayed by the international community has resulted in an increasing number of African-led responses.

5. Over 15 top new emerging technologies example Artificial Intelligence, 5G and Internet of things, Serverless Computing, Cloud computing, Biometrics, Augmented and Virtual realities, Robotics, Natural Language Processing, Blockchains, Quantum Computing, Data Analytics, Cyber Security etc. are available to be harnessed and integrated into Peace support operations.
6. Africa need to understand what efforts and mechanisms are put in place to take advantage of these technologies? Issues of policies, strategy and joint framework should be explored.
7. Creating a consolidated pool of technologically driven platform for data and information sharing that is very secured in Peace and Security Operations among stakeholders in Africa is urgent.
8. What plans and strategies do we have in place to integrate or infuse these high-tech digital solutions into Peace and Security operations especially during deployment, combat, gathering of intelligence and making peace keeping efficient?
9. Now more than ever, Africa needs to understand these digital transformations and invest in talent refinement of its IT and digital gurus. Indeed, assembling the right team of technology, data, and process who can work together for us is crucial and pivotal to that new Africa we all desire to see
10. Emerging technologies and its impact on peace and security is also very sensitive since people are able to use them (AI) to harm, manipulate, hack, perpetuate, or cause chaos in politics, social media, journalism etc. We have to be fast and up to our game in handling these securities and be able to handle the excesses.
11. Further, the principles of data protection and privacy, human rights compliance, and “do no harm” should remain at the forefront of the Strategy for the Digital Transformation of Peacekeeping.
12. Finally, further research is needed to take stock of the contributions of new technologies to peace support operations beyond enhancing situational awareness and to learn from other contexts and organizations that use new technologies and data to enhance protection outcomes.

4.4 Response and outcome (Digital Survey)

This section selected and highlighted on some respondent's profile such as educational level, job category, specialization, views on technology and scaling on the integration of technology into Peace support operations in Africa. Respondents were targeted from consultants, training experts, research fellows, international staff, desk officers, subject matter experts, senior coordinators and technology experts. All three components were covered, thus military, police and civilians. The African Union Commission, center of excellencies, police and military academies and international organizations with interest in Peace support operations. These outcomes were presented on dashboards as extracted from the digital tools used for data collection as shown in figure 4.2 below. 21 digital responses (semi-structured questionnaires - 25 questions) and 10 face-to-face interviews via zoom and teams. The diagrams dashboard captured below is associated with correlating tables and figures to explain and give clarity for analysis. The following response and outcomes were analysed:

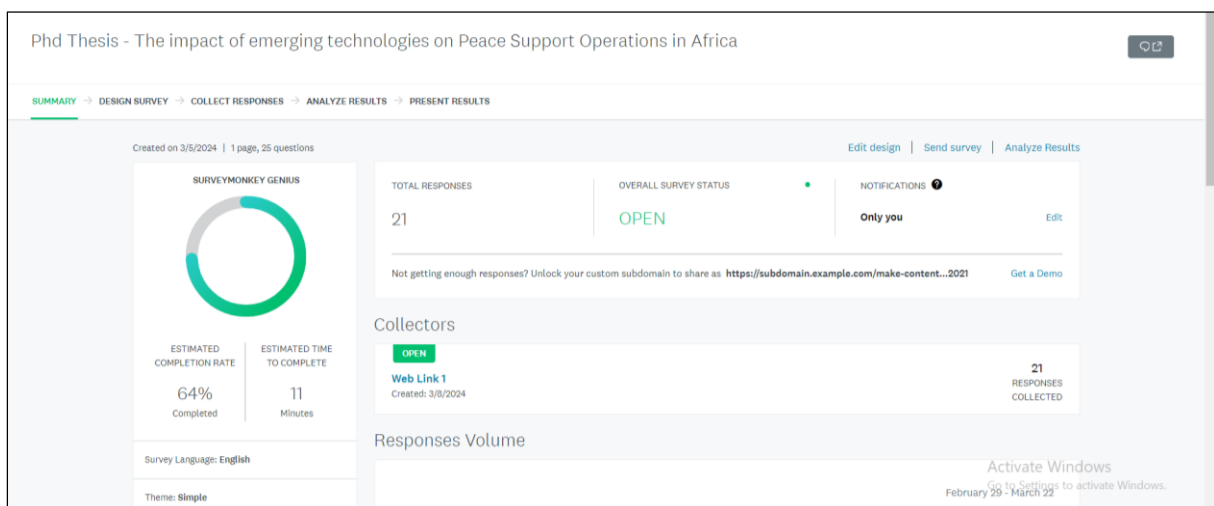
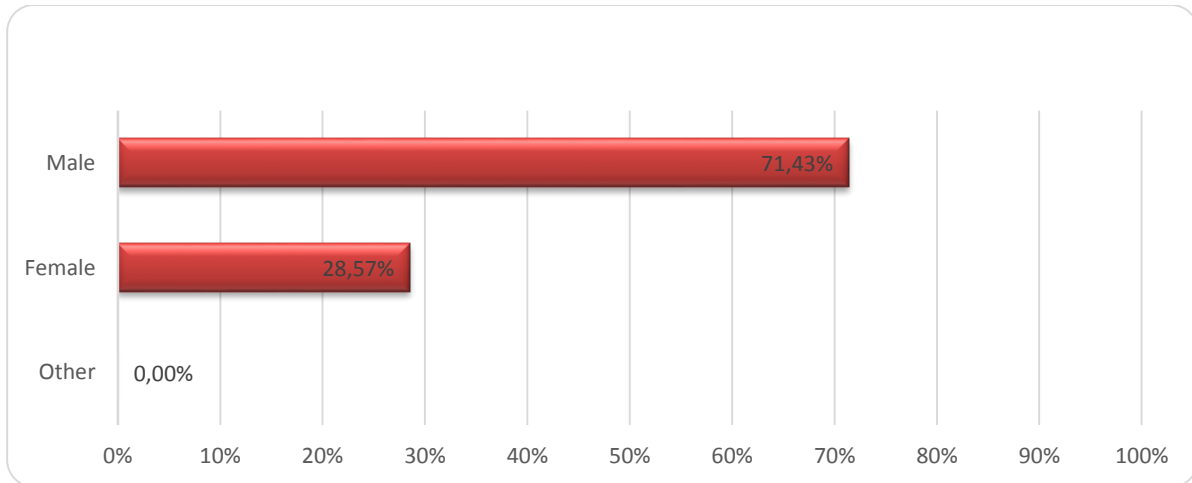


Figure 4.2 Screen shot of digital survey dashboard (Survey monkey)

4.4.1 Gender

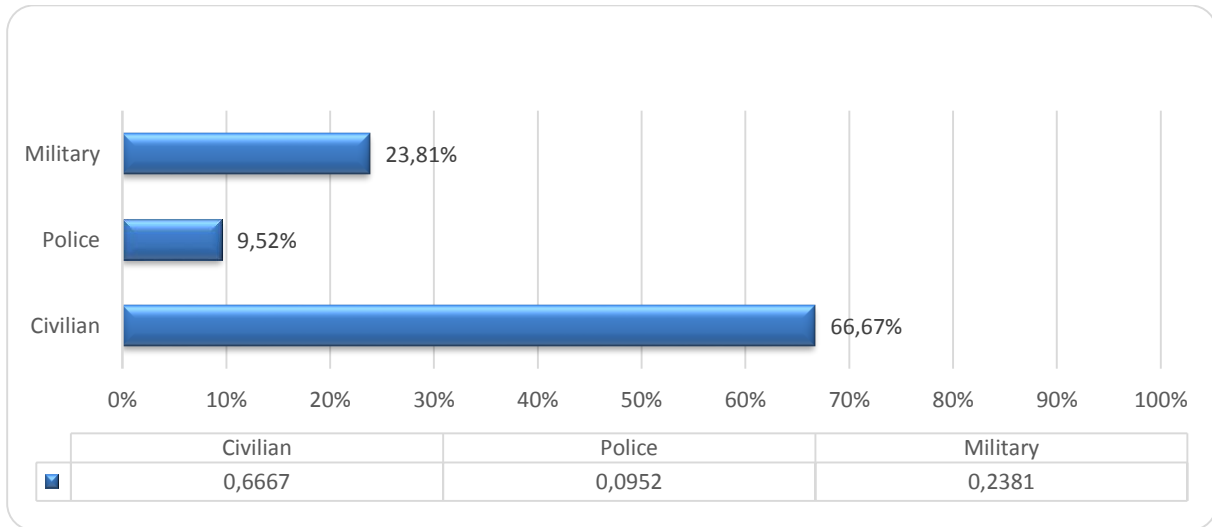


ANSWER CHOICES	RESPONSES	
Male	71.43%	15
Female	28.57%	6
Other	0%	0
TOTAL		21

Figure 4.3 Gender response pattern

Gender plays a vital role in all the three components of PSO. From figure 4.3 shown above, 71.43 percent indicating 15 males responded to the questionnaires, while the rest 28.57 percent representing 6 females. This signifies a fair representation from experts in PSO in Africa from a total of 21 respondents. However, it also indicates that leadership at the expert's level needs more room for women. Their involvements either from the military, police and civilian components are crucial for achieving results on integrating technology into PSO in Africa. The increase of women's participation in global peacekeeping operations has been shown to improve the effectiveness and stability of a mission. Missions with more women personnel are more likely to achieve their mandate and bring sustainable peace.

4.4.2 Job Category

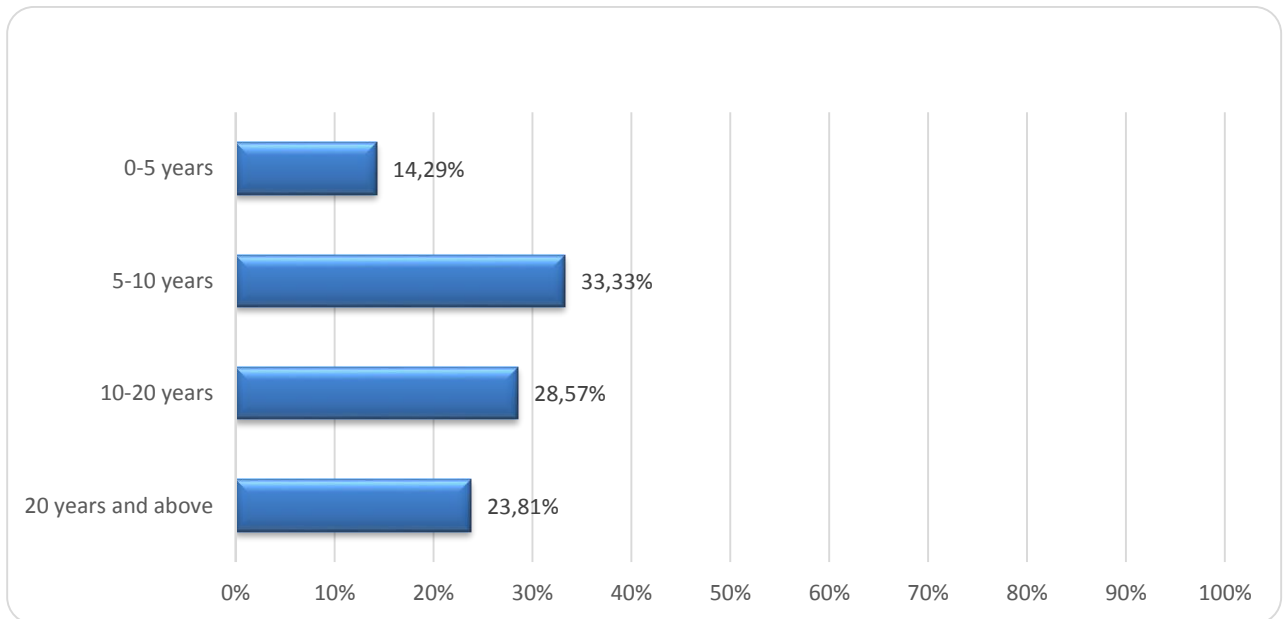


ANSWER CHOICES	RESPONSES	
Military	23.81%	5
Police	9.52%	2
Civilian	66.67%	14
TOTAL		21

Figure 4.4 Job Category from the various components

Out of the 21 respondents, 14 civilian experts, 5 military senior officers and 2 police commissioners all experts responded to the questionnaire. These are senior and executive level experts drawn from various center of excellencies, military and police academies and international civilian experts working at the various REXs/RMs. Have all the three AU-UN thus military, police and civilian components is very substantive and pivotal to compile opinions and experiences in PSO. This means that, various views on Technology, PSO and how it impacts peacekeeping missions would be displayed in this research, largely were derived from the civilian components. Additionally, these are experts serving as consultants or subject matter experts with over 20 years of experience working with their respective organizations.

4.4.3 Length of experience

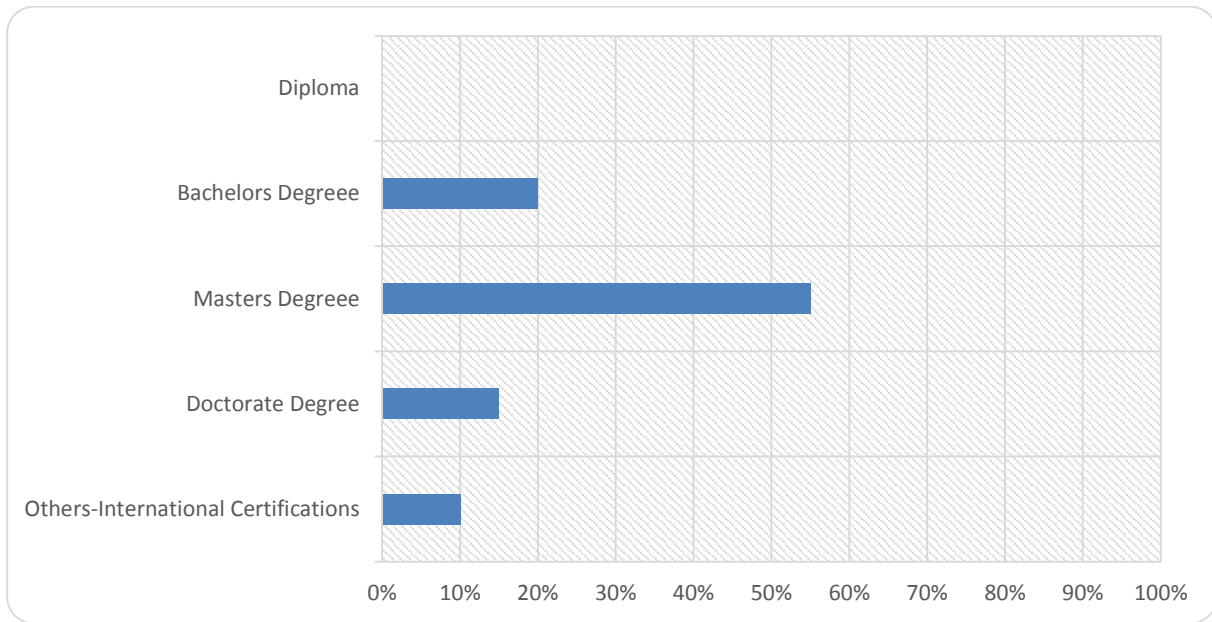


ANSWER CHOICES	RESPONSES	
0-5 years	14.29%	3
5-10 years	33.33%	7
10-20 years	28.57%	6
20 years and above	23.81%	5
TOTAL		21

Figure 4.5 length of job experience

One of the key and vital benefit of work experience is that it allows you to apply your skills and aptitudes in a professional environment and your skills can become developed in a way more suited to the world of work. From the figure above, 14.2 percent have 5 years work experience, 33.3 percent have 5-10 years' experience, 23.8 percent have between 10-20 years' work experience and 23.8 percent over 20 years of experience. An average of 18 years' experience was established. Selected from all three components clearly shows that, individuals who run the day-to-day affairs of the PSO ranging from the institutional, RECs/RMs up to the executive levels have a higher level of work experience. The duration in that position further shed more lights on their understanding of the work environment, the spectrum of task, policies and framework with regards to PSO.

4.4.4 Educational qualification



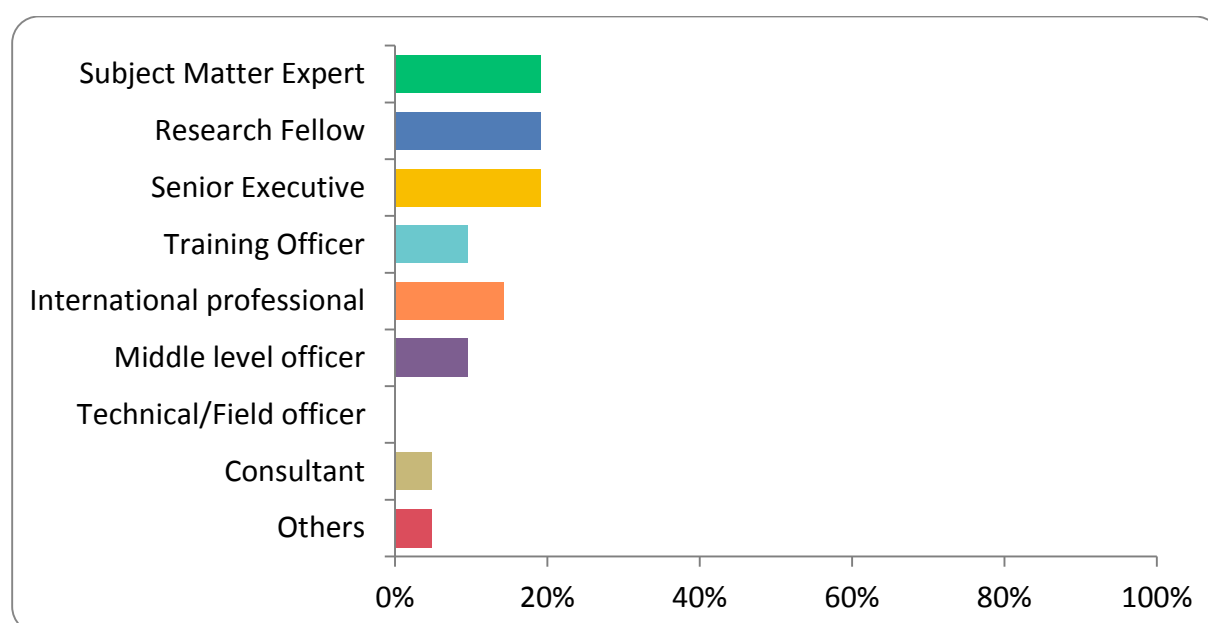
ANSWER CHOICES	RESPONSES	
Diploma	0%	0
Bachelor's Degree	20.0%	4
Master's Degree	55.00%	11
Doctorate Degree	15.00%	3
Others-International Certifications	10.0%	2
TOTAL		20

Figure 4.6 Educational qualifications

In figure 4.6, a clear and concise indication was established from educational qualifications. It indicates that, 60 percent of the 20 respondents have a Master's degree. Further investigations comparatively to the other educational qualifications showed that, almost 20 percent have advanced into the doctoral levels whiles 10 percent have acquired some other forms of international certifications and Specialised skills. Only 10 percent have bachelor's degree and this is considered as an entry level qualification. It shows the quantum of skills and education needed to understand the work mandates of PSO. All three components, thus Police, military and Civilians have these higher qualification sets.

It was established that, majority of them are civilian skilled experts, subject matter experts, consultants or Specialised trainers. The Police and Military categories are senior level executives or officers who have rose through the ranks alongside their experiences, understanding of the nature of work and serving on special missions or tasks. Employers often seek candidates with a solid educational background and relevant qualifications, making education an essential factor for individuals who are serious about building their careers. Again, the nature of work of PSO is technical, skill-mandated, strategy-demanding and technologically evolving. Educational qualifications and work experience is a major father that affects peace support operations.

4.4.5 Position at institution



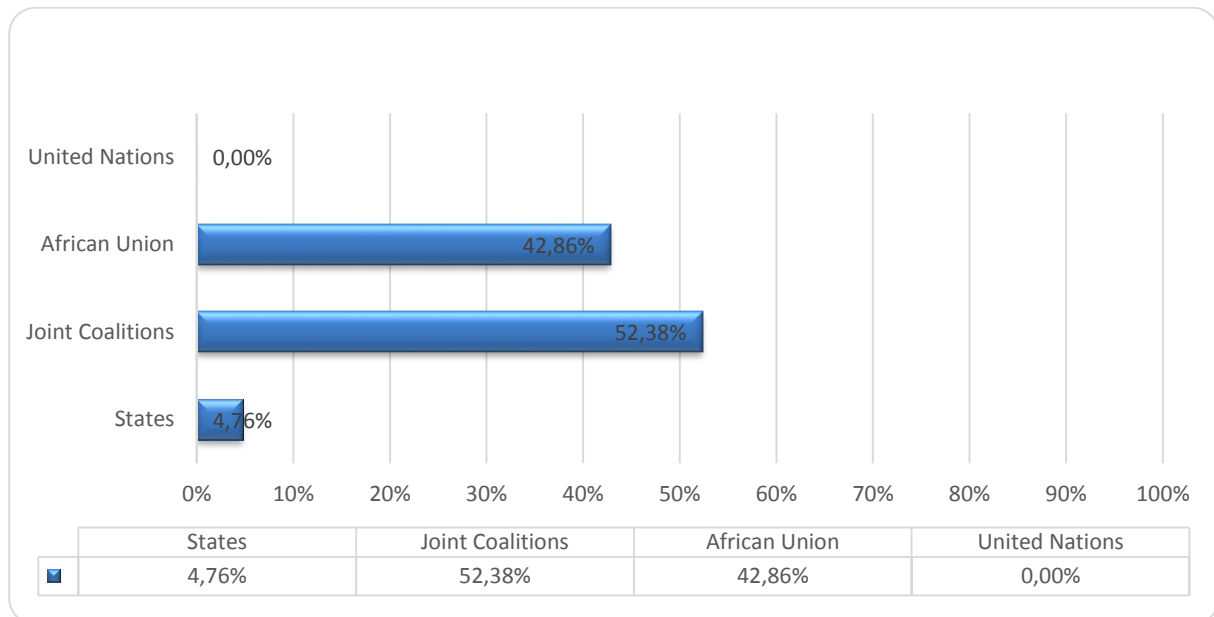
ANSWER CHOICES	RESPONSES	
Subject Matter Expert	19.05%	4
Research Fellow	19.05%	4
Senior Executive	19.05%	4
Training Officer	9.52%	2
International professional	14.29%	3

Middle level officer	9.52%	2
Technical/Field officer	0%	0
Consultant	4.76%	1
Others	4.76%	1
TOTAL		21

Figure 4.7 Positions at Institutions

In figure 4.7 shown above, the positions of respondents in their respective institutions were captured. 19 percent of the respondents are subject matter experts, research fellows and senior executives. 14 percent of the respondents are international professional staff working with the RECs/RMs across the African standby forces' secretariats. 9 percent are training and middle level officers at the Centre of excellencies. The rest representing 4 percent are holding other positions which were classified and as consultants. Clearly this shows that, the respondents are holding very top level and commanding positions at their institutions and have the authority to speak to the topic.

4.4.6 Best position to handle PSO in Africa

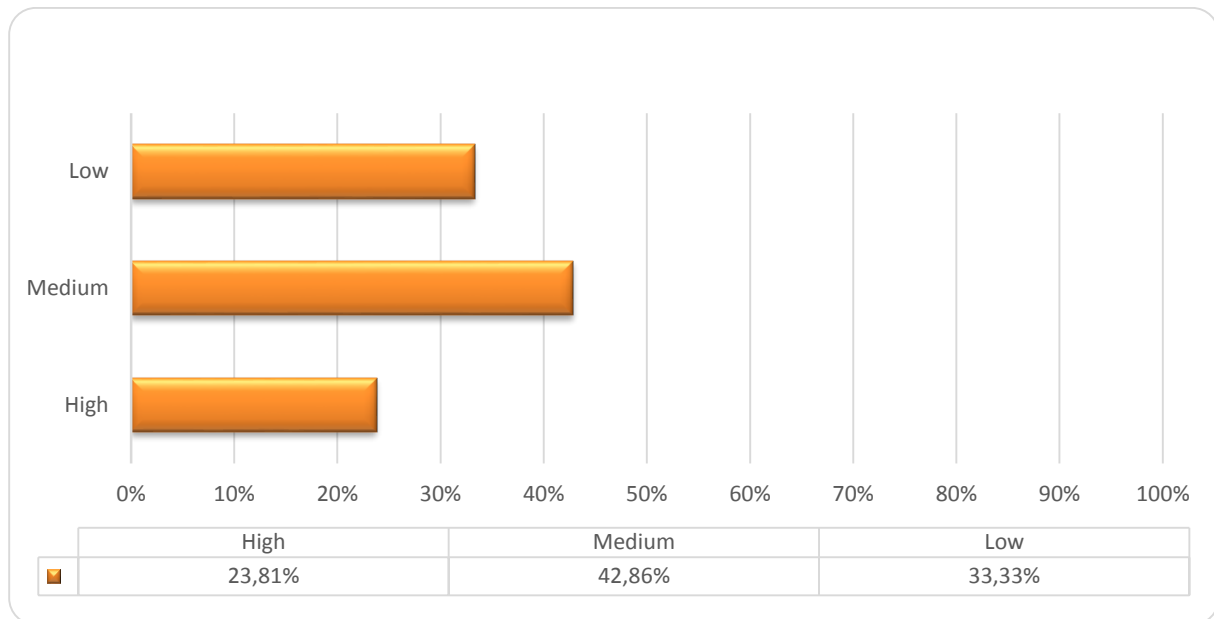


ANSWER CHOICES	RESPONSES	
United Nations	0%	0
African Union	42.86%	9
Joint Coalitions	52.38%	11
States	4.76%	1
TOTAL		21

Figure 4.8 Best position to handle PSO in Africa

In figure 4.8, it was established clearly that, 52.3 percent of the respondents were of the view that, joint coalitions of the AU and UN and RECs/RMs were in the best position to handle Peace support operations in Africa. Whiles some 42.8 percent see the African Union as the best unit or organization to handle PSO. Interestingly, a few representing 4.7 percent were of the view that, peace support operations in Africa should be handled by states. Relating these findings to the interview sessions, experts and subject matter experts expressively agree that, Joint coalition of AU, UN and RECs should be mandated to handle PSO in Africa. This is again largely due to logistical support, intelligence exchange, environmental knowledge, migration of best practices and components experiences at play.

4.4.7 Scaling of technology in PSO by RECs/RMs



ANSWER CHOICES	RESPONSES	
Low	33.33%	7
Medium	42.86%	9
High	23.81%	5
TOTAL		21

Figure 4.9 Scaling of technology in PSO by RECs/RMs

It has been recognized that PSO are best to handle and coordinate through the standby forces in all the five regions of Africa. The RECs/RMs are the operational ground forces who have the state support and environmental intelligence to support missions either through coalitions or joint missions. The REC/RMs scaled technology to low at 33.3 percent, 42.8 percent to be medium and 23,8 percent to be on a higher level. Averagely, REC/RMs see technology and digital tools to integrated into peace support operations by some 40 percent. This also shows that, the RECs/RMs must tech up their strategies in getting technology in their support or deployment plans.

4.4.8 Embracing technology in PSO

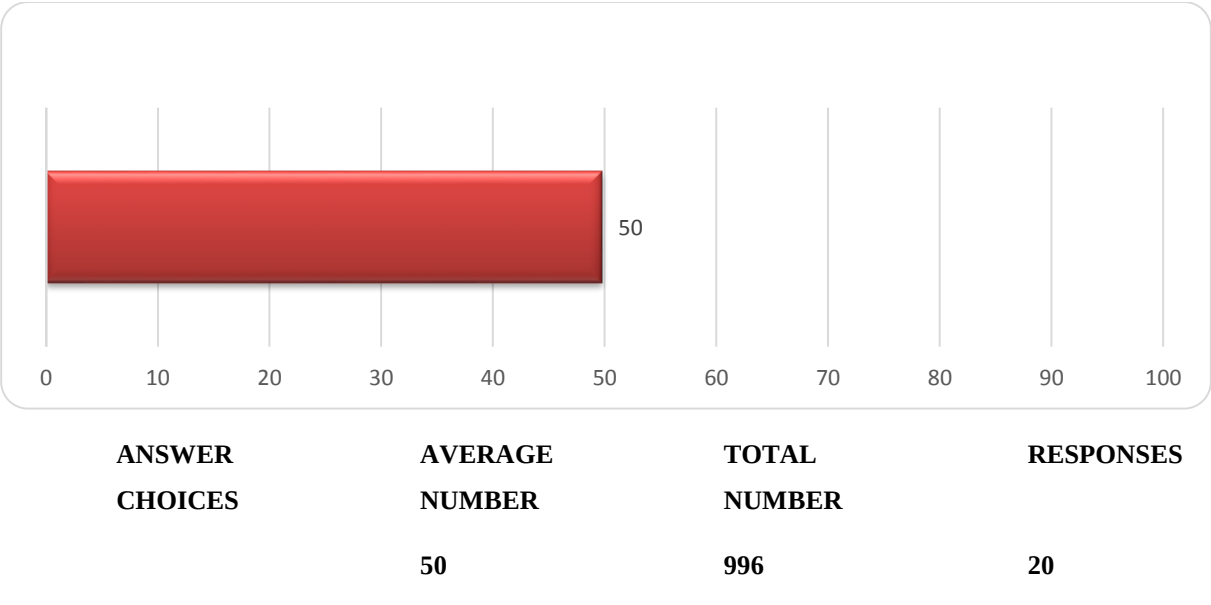
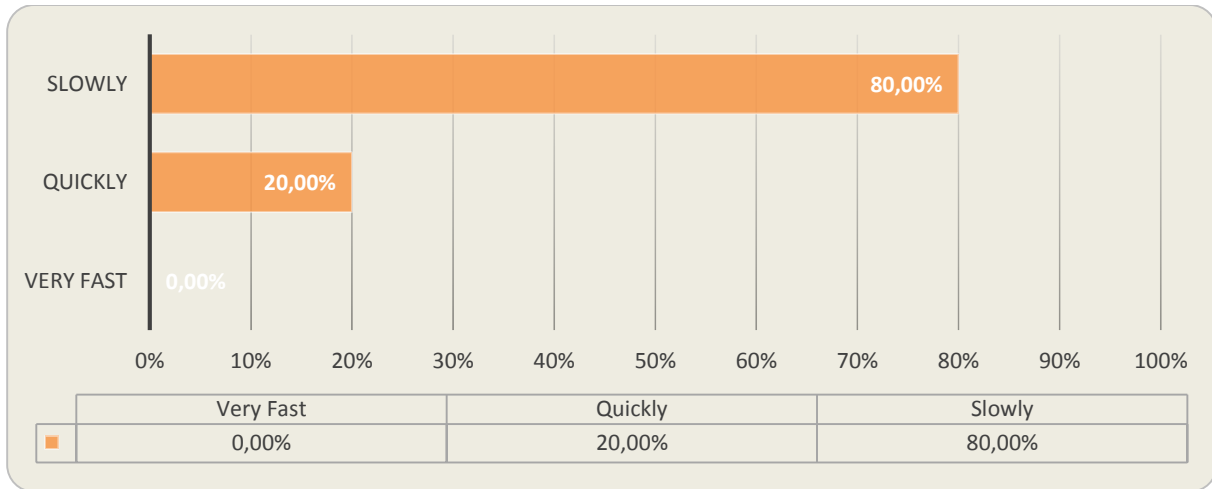


Figure 4.10 Embracing technology in PSO

Emergence of new technologies especially in peace support operations is vital and experts have argued and documented the impact it has in changing the phase of security matters. However, the preparedness to embrace technology in PSO will demonstrate how this game can be changed. 50 percent representing a quantum of 500 on 996 indicated that Africa is ready to embrace technology in peace keeping missions. What this shows is that, extra efforts are needed to calibrate the understanding, the relevance and the approach to integrating technology in PSO. Expert further expressed the views that, technology requires skills, funding, training and monitoring to ensure safe usage and efficiency. The posture of the RECs/RMs shows a slow acceptance of technology to be integrated in PSO. They are very much aware of the benefits and the readiness to integrate the very latest that will create the needed nexus of technology and PSO is still below the expected ratios. The UN on the other hand, has established all the needed strategies and perhaps, the AU working with REC/RMs must step up their efforts to integrate technology in their missions and operations. Digital transformation, AI revolution and adopting the latest sensors, detectors, cameras and a well equip C2 are needed as a matter of urgency. Actors and stakeholders who are well equipped, well oriented and have the requisite skills in technology surely makes an impact positively and timely.

4.4.9 Taking advantage of technology in PSO



ANSWER CHOICES

RESPONSES

Slowly

80.0%

16

Quickly

20.0%

4

Very Fast

0%

0

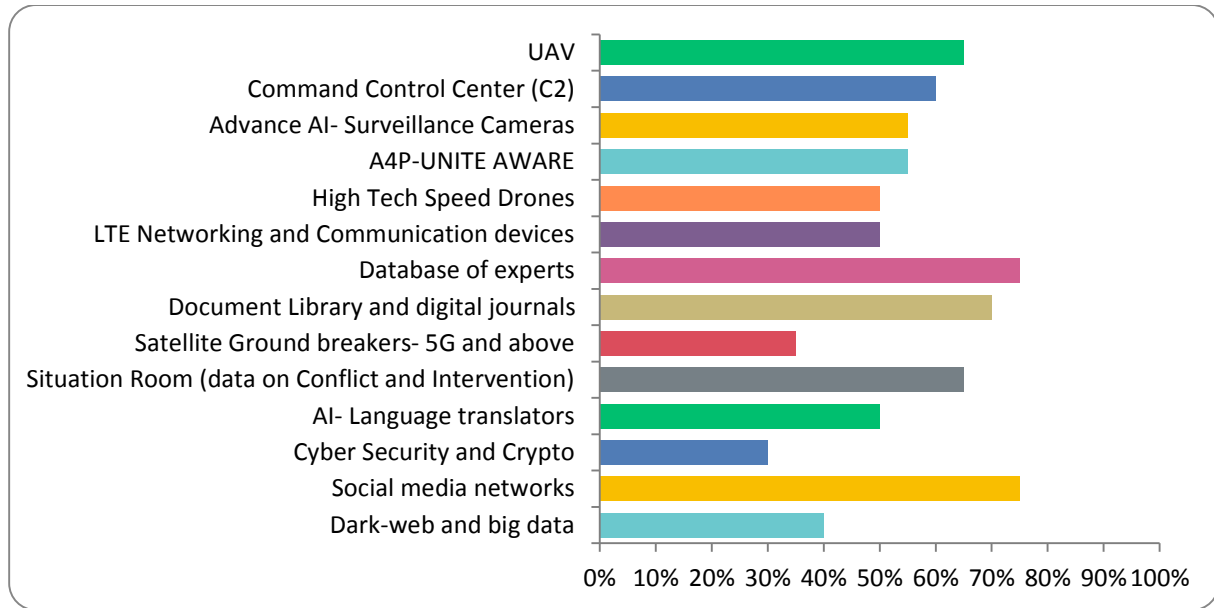
TOTAL

20

Figure 4.11 Taking advantage of technology in PSO

Figure 4.11 indicate a far-reaching implication of taking advantage of technology and digital tools. Most of the experts expressed the views that, AU and PSO in Africa are slowing showing interest to take advantage of technology. 80 percent representing 16 of the 20 respondents holds that accession. Whiles only 20 percent saw technology being used in PSO representing 4 out of the 20 respondents. The above percentages give more room to investigate the slow nature of taking advantage of technology. Consultants and subject matter experts have not seen or conceptualize the technology-integration spectrum of PSO yet. Comparing AU missions to UN led missions further shows that, AU or joint AU missions have not taken advantage of technology to the expected level. Ideally, it also shows that, preparedness to integrate and taking advantage of technology is linked to availability of the technology and digital tools in question.

4.4.10 Knowledge of available and emerging technologies in PSO



ANSWER CHOICES	RESPONSES	
UAV	65.00%	13
Command Control Center (C2)	60.0%	12
Advance AI- Surveillance Cameras	55.00%	11
A4P-UNITE AWARE	55.00%	11
High Tech Speed Drones	50.0%	10
LTE Networking and Communication devices	50.0%	10
Database of experts	75.00%	15
Document Library and digital journals	70.0%	14
Satellite Ground breakers- 5G and above	35.00%	7
Situation Room (data on Conflict and Intervention)	65.00%	13
AI- Language translators	50.0%	10
Cyber Security and Crypto	30.0%	6
Social media networks	75.00%	15
Dark-web and big data	40.0%	8
TOTAL		155

Figure 4.12 Knowledge of available and emerging technologies in PSO

Figure 4.12 clearly shows that all the 21 respondents have good and current idea of emerging technologies used in PSO. Of the 15 sampled technologies, respondents gave an average of 14 technologies namely UAV, Command Control, Advanced AI surveillance cameras, A4P-UNITE AWARE, High tech speed drones, LTE Networking devices, database of experts, Document libraries, Satellite breakers, Situation room, AI-language translators, Cyber security and crypto, social media and Dark web. Among the highly scored technology devices withing 65 percent average are UAV, Database, Document Library, Situation Room, Command control Centre and social media. This indicates that, they are very much needed for any PSO mission or joint coalition task. This was followed by High tech speed drones, surveillance cameras, communication devices and AI language devices scoring 50 percent average. Dark web management, cyber security, crypto and satellite ground breaker with 5G scoring an average of 30 percent.

The general understanding with these responses indicates that, technology is vital in peace support operations and experts either from the Military, Police or Civilian components are all aware or have good knowledge of them. The interview sessions clarified that, these devices and equipment were in use but were either inadequate, not well applied or some of the field and ground officers lack the general skills to handle them, especially the latest devices. Additionally, the nature of conflict, operation or environment will determine which technology to deploy. It must be noted that, there are new evolving technological themes that were not captured in the lists above. These forms part of the technological recommendations noted for future PSO missions.

4.5 Response and Outcome (Interviews)

The responses and outcome from 10 interviews conducted face-to-face were carried out via zoom and MS Team. Selected from reliable and reputable organizations, individuals with experiences in peace support operations and the new nexus in technology shared views, experiences and ideas on the subject. Their views were consolidated into practical themes that corresponds with the research questions, and screened to avoid repetitions. Their gestures also provided the researcher with rich and excellent understanding, that were factored into the recommendations for this work in the next chapter.

4.5.1 Experts opinions on PSO

Subject matter experts, International PSO staff, Senior executives at Centre of excellencies, senior training officers.	• African Union's peace operations include conflict prevention, conflict management and conflict resolution. peacemaking; peacekeeping; and peace-building. The AU Constitutive Act article 4j and 4h allow the AU to intervene under the regional arrangement on peace and security. • It is an operation launched to bring about peace in an area affected by violent conflict. • Joint effort towards peace and stability using all three components, army, police and civilians. • Peace Support Operations is an approach by a mandating authority under a regional or international arrangement, aimed at mitigating conflict or post-conflict in an effort to build, render humanitarian assistance and address a specific type of conflict, be it intra or interstate conflict. It focuses on peace building, peace enforcement and or peacekeeping. • These are operations that aim at accompanying authorities of the host State to restore stability and serenity after a crisis. • Peace support operations often involve a combination of military, police, and civilian components working together to address complex conflicts, mitigate threats to peace, and support post-conflict reconstruction and development efforts in war-torn or fragile states.
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	• Peace Support Operations (PSO), are organised international assistance initiatives to support the maintenance, monitoring and building of peace and prevention of resurgent violent conflicts • all activities done to empower all components of a peacekeeping personnel to ensure successful peacekeeping operations.
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Table 4.1 – Experts opinions on PSO

4.5.2 Perception of PSO and technology nexus

Subject matter experts, International PSO staff, Senior executives at Centre of excellencies, Desk officers, senior training officers, field and mission officers.	• Hostile environment characterizes peace operations. It is noted that many lives have been lost due to inadequate or lack of technologically driven operations. Therefore, peacekeeping in Africa is discouraging the country at war like Somalia and DRC due to war fatigue. Strategic employment of technology provides military advantage over spoilers. Fighting terrains like in DRC are difficult for the peacekeeping force. • Technology is a capacity multiplier, when appropriately applied, in PSOs. • Africa has done well but embracing technology has been slow largely due to lack of funding or technical capabilities. • Peacekeeping operations in Africa has evolved over the past decade or more, adjusting to modern-day challenges and responding according to the dynamic space. It translates to incorporating technology in a wide area as a way of responding to various aspects within the space of the operation or even technological advancement by the adversaries. • They are vital in the event where they satisfy their mandates. Emerging technologies in general sprout new security threats. • Peacekeeping operations in Africa have increasingly utilized technology to enhance the effectiveness, efficiency, and safety of peacekeepers in challenging and complex environments. By leveraging technology in diverse ways, peacekeeping operations in Africa can enhance their operational capabilities, adapt to evolving security challenges, and contribute to more effective and efficient peace support efforts in conflict-affected regions across the continent. • Africa needs the support, create the capabilities and integrate Technology in their PSO and missions • It is disjointed at the moment and lack resources needed to give it organization. Technology use is a huge problem
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	in itself across the continent, therefore PK operations itself not left out. • Peace Keeping in Africa, though has progressed over the years but it's still evolving due to changing conflict dynamics and entrance of new conflict actors. In general, the conflict environment in Africa is usually too hostile thereby requiring more of peace enforcement than just traditional PK. • Peacekeeping operations have been in Africa for over 2 decades, and in its presence, conflict has evolved and escalated especially in the last 2/3 years in the Sahel Region, North Kivu, South Sudan, Central Africa etc. One can attribute the escalation of conflict to the wide-reaching impact of COVID-19, however a driving factor that has been behind recent developments has been the increased usage and infusion of modern technologies, which has created a sophisticated network orchestrating acts violence and crimes. Unfortunately, governments and global institutes (including Peacekeeping Operations) have not been able to keep up to the pace of technological changes, especially in areas where peacekeeping operations are deployed. Though there have been efforts to institutionalize digital transformation in peacekeeping operations, more efforts need to be made to ensure that a comprehensive strategy is considered that will include host countries.
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Table 4.2 – Perception of PSO and technology nexus

4.5.3 Other known digital tools for PSO in Africa

Subject matter experts, Senior executives at Centre of excellencies, senior training officers, field and mission officers.	• Drones • C2 • web-based civilian roster of AU and regional database • Social media • Intelligence, Surveillance and Reconnaissance (ISR) system, • Integrated communication systems, • Integrated electronic based mission support systems • UAV Sensors Armored vehicles with surveillance Command centers • ICT equipment (laptops, desktops) • GPS Tracking devices • Voice recorder • Cameras Binoculars • Mobile devices • SAT phones CI3 • Training and simulation- virtual reality and other simulation techniques • Logistics and supply chain management. • Medical support and telemedicine. • Early warning systems. • Command controls • AI translators Communicators • Development of early warning systems. • Development of learning platforms
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Table 4.3 – Other known digital tools for PSO in Africa

4.5.4 Focus of AU-UN on PSO

Subject matter experts, International PSO staff, Senior executives at Centre of excellencies, Desk officers, senior training officers, field and mission officers.	• AU-UN should be complimenting each other in achieving international peace and security. • UNSC and AU PSC are not in a competition rather than mutual benefit in bringing about peace. • Local ownership rests with the capacity of a state that's being supported to operationalize public administration. This is very important because support to mandate implementation would be successful within a short time. • Coordination and cooperation amongst all actors, local ownership, local solutions, inclusive approach, integration of different thematic areas to complement and support each other. • Military deployments are not the only solution but are generally a stop gap measure to create space for other entities to provide support. • Saving lives for a peaceful and stable Africa through coordinated efforts. • The focus should be on finding a wide range of solutions through various means and not necessarily military solutions only. Its ultimate goal should work towards sustainable peace and reconstruction for developmental efforts and try to avoid a relapse of the conflict. • Protection of civilians and State integrity • Leveraging on various technologies and strengths of nations to navigate the complex nature of contemporary security threats in Africa. • Creating a stable and peaceful Africa • Training the Peacekeeping forces. More awareness creation among the civilian population on the need for Peacekeeping in the region. Also, resources must/should be mobilized urgently to support peace operation.
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	• Enhancing the capacity, capabilities and infrastructure of host nation so that they may assume the responsibilities of the missions. • Adapt to the changing nature of conflict, and the deployment of neighboring countries or approved states. • Develop a comprehensive digital transformation strategy with 3–5-year targets, which will include host state. • Combined efforts from global and region institutes, and member states should focus on complementarity and comparative advantage in operations.
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Table 4.4 – Focus of AU-UN on PSO

4.5.5 Roles of RECs/RMs on PSO

Subject matter experts, International PSO staff, Senior executives at Centre of excellencies, Desk officers, senior training officers, field and mission officers.	• Deployment to crisis zones to stabilize the country. • Build mediation capacity at both local and national level to enhance resilience and sustainability. • Violent conflicts will always take place in regional spaces so regions should be the first responders. • External entities to the region should be involved in providing support to regional initiatives. • Regions are symbiotically tied to the conflict and cannot afford not to have the conflict resolved as it impacts on them negatively, whether it is in the form of refugees or displaced people, missed economic development opportunities resulting in low economic growth rates, degradation of the environment, etc. • There is no one size fits all approach on how REC/RMs need to get involved, however, diplomatic solutions inclusive of silent diplomacy should always be promoted. Use of tools of war should always be discouraged. • Ensuring clarity of political objectives to be attained should also be encouraged. Exclusion on the basis of ethnicity, religion, gender, should always be discouraged. Conflicts in the 21st century have shown no respect for borders thus one cannot be secure if the neighbour is insecure. Common security is the key • They should be able to strategize on dealing with security issues • Yes, as most regional blocks have unique challenges. They should provide strategic guidance. • Yes, as we continue to create ownership. Regional organisations understand the regions and would be quick in responding to issues. They would also be able to support long-term stability. • Yes and no. Most of the time there is usually a reason why UN missions are deployed, instead of African-led
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	peace operations, this could be due to funding, capabilities, resources, structures, political will etc. • However, RECs/RMs should be included in the development of strategies and mandates of missions, due to the unique capabilities and strategies that may have been developed, such as strategy in combating violent extremism.
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Table 4.5 – Roles of REC/RMs on PSO

4.5.6 Strategies to explore on PSO and technology

Subject matter experts	• Conduct research or rapid assessment for use. • Building capacities of local populations on the use of such technologies. • Training of personnel prior employment to the mission area. Sharing of information amongst personnel contributing countries and external entities on technology information, innovation, utilization, developments. • Local ownership will always provide solutions to challenges encountered as it is better informed about the root causes. Technology therefore should be able to be a capacity multiplier (force enable) when used by locals. • The personnel and ICT systems need to be integrated in the home countries of the Personnel Contributing Countries. It is a challenge when personnel only meet "new" technologies in the mission area as this poses a problem about their understanding and utilization of the platforms they encounter. • ICT systems should also be designed to be user friendly, portable and easy to maintain. They should also be less demanding on power sources. • Adjusting the existing doctrines and approaches and update guiding documentation to suit the current space of peacekeeping. Keep up with the latest technology and apply digital tools to its maximum capacity, particularly when it is used by the adversaries in the same conflict. • Communication and information sharing. • Surveillance and monitoring. • The strategies, doctrine and mechanisms must be those consistent with national interests and security.
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Table 4.6 – Strategies to explore on PSO and technology

4.5.7 Technological threats to PSO

Subject matter experts	• Monitoring trained administrators • Remote and controlled security • Data and equipment handling in the right hands • Mitigating and or counter approaches to the threats • Recruit specially and well-trained personnel • Avail supporting resources for always keeping the technology up to date • Holistically keep up with the technology • Regulatory norms should be implemented • Improve on all tech security aspects- cybersecurity, network security etc. • Improve awareness among stakeholders/participants of a mission. • Emplacement of legal and regulatory frameworks. • Simple investment and trainings to empower member states, AU and training centers would help tremendously. • Joint digital strategies need to be developed between PSOs and host nation. • Information and knowledge sharing should be an institutionalized common practice in preventing, responding and resolving threats. • Systems need be developed to counter 'fake news' and incorrect narratives that can compromise efforts of operations. • Systems need to be developed to communicate the achieved milestones and the positive impacts of such.
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Table 4.7 – Technological threats to PSO

4.6 Summary

While the future of peace operations will be intrinsically linked to Africa's future, this does not mean that the UN will lose its central role in Africa. African solutions to African challenges are not referring only to those responses led by the AU or the RECs/RMs. The UN is already an integral part of these African solutions and sharing technological ideas are very crucial towards security operations. However, in order to adapt and succeed, the AU and UN needs to further understand that it cannot do everything alone, or always be the lead. Instead, it needs to develop stronger triangular coordination mechanisms that bring together the UN, the AU, and RECs, by better supporting, complementing, and strengthening the variety of tools that assist the international community in achieving sustainable peace.

The findings and results presented above confirms the urgency in the acquisition and deployment of technology as a crucial element in training of peacekeepers and understanding the application and use of such technologies. The sophisticated nature of security issues in the context of technology such as cybersecurity, surveillance, command control, sensors, UAVs or even advance language AI language translators calls for proper supervisions and policies. There is also a need to address the challenge of the rotation of troops to ensure troops in the field bear the requisite technological capabilities for specific missions. However, there are many limitations to the use of new technologies for PSO. The implementation of such technologies is not standardized across missions and often depends on the willingness and capability of individual staff members. Troop-contributing countries may also lack the appropriate equipment, capacity, and mindset to implement new technologies for peacekeeping.

Consolidated opinions from the above responses indicates that, as AU-led PSOs have declined over the past ten years, Regional Economic Communities (RECs) or alliances of member states have been more active in deploying troops on the ground and calls for the integration of emerging technologies in operations. The PSC aptly emphasized that the ASF is "the primary home-grown model in the Continent, to enable Africa to enhance its defense and security arrangements". Technology remains critical to consider the implication of such forces on the development and consolidation of pan-African security structure and the continent's long-term stability. How decision-makers thread pragmatism and flexibility together on the one hand, and standardize responses in integrating technology on the other, will determine the sustainability and effectiveness of peace support operation efforts in Africa.

CHAPTER 5

DISCUSSIONS

5.1. Introduction

Chapter five scrutinizes and examines the African Union and the United Nations collaborative efforts in peace support operations in Africa in general, and their strategies in embracing and utilizing new technologies in particular. Central to this research is the impact of technology in PSO in Africa and how to leverage it for a peaceful and stable Africa. The objective of this chapter is to also discuss the findings and results collected from 31 respondents made up of 10 face-to-face interviews via zoom and MS Teams, and 21 views obtained from structured questionnaire collected digitally via a survey instrument in chapter (3-4). The data collected from the semi-structured interviews were transcribed and categorised into themes based on the research questions. During the findings, some new themes emerged and these were analysed accordingly.

Aside mandate of the African Union and the United Nation's integration of technology in almost every aspect of PSO, funding and training were among the new themes that needed further investigations. Guided by clear and achievable mandates and the impact of the United Nations Peacekeeping doctrine on the African Union peacekeeping missions in Africa, technology remains crucial for discussions and expansion in the context of integrations and strategy. The stimulus engagement of external actors and the regional dimension of the conflict on Peacekeeping operations in Africa coupled with the right policies and joint efforts for achievable mandate were discovered from the interviews from subject matter experts. And finally, the preparedness of REC/RMs to integrate technology and their level of understanding and available skills to handle those technologies also surfaced. The issue of legitimacy, acceptance and local ownership of the African Union and the United Nations Peacekeeping Support Operations in Africa also needed attention and further discussions or conversations. Roles of Africa Regional Economic Communities and coordination with the African Union was acknowledged as very pivotal in achieving full integration of technology in PSO in Africa.

5.2. Funding and logistical support for Peace Support Operation in Africa

According to (Bamidele, 2013), over 70 percent of the United Nations peacekeeping operations were attributed to Africa with the cost of over 300 million dollars, and (Deconing, 2018) added that, over 75% of the United Nations peacekeepers are positioned in Africa with approximately 75% of the United Nations Peacekeeping budget also spent on peacekeeping operations in Africa. (Ajayi, 2008) argued that although the African Union has a wide-ranging instrument and strategies on peace and security, inadequate resources impact on its ability for effective utilisation. Also, while the African Union is doing its best to intervene in peace and security in Africa, it cannot sustain its peacekeeping operations because of inadequate funding, logistical and administrative systems to back up peacekeeping operations across Africa operating on a long-term basis (ICG 2020; Stephen and Kristen 2018).

Several reports on the peacekeeping operations such as that of the AMISOM mission in Somalia, UNAMID mission in Darfur and MINUSCA mission in the Central African Republic further sanctions the respondent's argument that inadequate funding and availability of technology especially on the part of the African Union limit the effectiveness of the peacekeeping operations of the African Union and the United Nations in Africa. According to (Williams, 2013), the agreement associated with the formation of African Union Peace and Security Council (2002), stipulated a method of funding, with members sending troops bearing the participation cost for the first three months, and then go ahead to fund the operation. This system has never been effective in practice as each peacekeeping operations of the African Union had to develop its own ad-hoc financial mechanism which create unpredictable sources of funding which invalidate planning assumptions (Williams, 2013). In answering the research question, what capabilities are available to support peacekeeping operations in Africa? Experts and senior level offers spoke about the availability of funding and technological logistics and equipment.

It was clearly established that, the United Nations is bringing to an end its many major multidimensional peace operation in Africa, such as its mission in Sudan. The UN has stated plainly that, it wishes to pass responsibility for conflict management to regional organisations, thus the RECs/RMs and their standby forces. This is something welcomed by the African Union, whose administrative logic is "African solutions for African problems". Again, both the UN and the AU support this revolution in principle and African members of the UN Security

Council aimed to reach an agreement by the end of the year 2023. But money and logistics remains the main roadblock to this agreement. The AU is diplomatically, seeking direct financial support from the UN to run peace support operations in Africa alongside partner agencies. The AU already runs its own such missions, such as ATMIS/AMISOM in Somalia, but it relies almost entirely on external financial support from the European Union for this mission. Challengingly, the funding it receives from international donors is highly ad-hoc and provides inconsistent and unreliable funding streams to achieve this task. In the past, efforts to resolve the issue of UN funding for AU missions failed.



Figure 5.1 African Union Mission in Somalia (AMISOM) peacekeepers from Burundi patrol after fighting between insurgents and government soldiers erupted on the outskirts of Mogadishu

After several meetings and stakeholders' forums, the UN has decided, in principle, to give the AU access to UN funding (known as "UN-assessed contributions") to finance AU-run missions. Yet, there is a stumbling block. Giving the AU access to this funding requires approval from the UN Security Council. This creates a string of challenges in ensuring adequate logistical funding timely. The UN Security Council permanent members the United States, the United Kingdom, and France are insisting on the AU sourcing 25 per cent of the funding for each operation and clearly, the AU and its members will struggle to meet this target. They want this because they believe existing operations such as ATMIS/AMISOM represent a case of moral hazard. In their view, the disconnect between the funding, logistics and ownership of missions

does not sufficiently incentivise the AU to effectively implement their mandate. The rationale is that, the AU will be more invested in the results of such missions if it pays 25 per cent of the cost of its own peace support operations. In the view of permanent UNSC members, the disconnect between the funding and ownership of peace support operations does not sufficiently incentivise the AU to effectively implement their mandates.

All the respondents agreed that, despite a range of valid criticisms and serious imperfections and challenges confronting peace support operations in Africa, PSO still remain a primary tool of international conflict management and have helped reduce the burden of armed conflict and tackle spoiler groups across the African continent. Accordingly, policymakers and analysts alike should work to ensure that peace support operations either carried out by joint coalition, regional bodies or states are given sensible operational directives, supported by clear mandates coupled with the right technological capabilities to achieve those objectives.

5.3. Embracing technology for Peace Support Operation in Africa

This research seeks to identify new emerging technologies, the impacts it has on peace support operations and identify workable strategies for their implementations. As set out in Chapter one (1), the three major aims of the thesis are to: Highlight the impact of emerging technologies and strike possible solutions from contemporary technology that can be used on a larger scale by AU security forces in various missions for maintaining peace. To establish, how Peace support operations either via joint coalitions or state led rely on advanced technological capabilities for their missions and finally make practical recommendations that will be a game changer for Peace Support Operations in Africa and the way forward. To what extent is the African Peacekeeping Operations (Missions) prepared to embrace new technologies in their operations? And further to determine the extent to which PSOs in Africa were ready to embrace technology, and how clear views and opinions from the respondents on the role of the REC/RMs were captured. Subject matter experts all agree that, deployment to crisis zones to stabilize the continent was vital and relevant. This must be done timely especially using the roster system of trained and skilled contingents or groups. They added that, building a mediation capacity at both local and national level to enhance resilience and sustainability, allowing the REC/RMs to have their regional spaces to operate as the first responders.

External entities and actors to the region should be involved in providing support to regional initiatives. The Regions are symbiotically tied to the conflict and cannot afford not to have the conflict resolved as it impacts on them negatively. There is no one size fits all approach on how REC/RMs need to get involve, however, diplomatic solutions inclusive of silent diplomacy should always be promoted. Use of tools of war should always be discouraged. Ensuring clarity of political objectives to be attained should also be encouraged. Exclusion on the basis of ethnicity, religion, gender, should be discouraged. Conflicts in the 21st century have shown no respect for borders thus one cannot be secure if the neighbour is insecure. Common security is the key for safety and stability. They should be able to strategize on dealing with security issues, most regional blocks have unique challenges hence they should provide strategic guidance. Regional organisations understand the regions and would be quick in responding to issues. They would also be able to support long-term stability. Most of the time, there is usually a reason why UN missions are deployed, instead of African-led peace operations. This could be due to funding, capabilities, resources, structures, political will etc. However, RECs/RMs should be included in the development of strategies and mandates of missions, due to the unique capabilities and strategies that may have been developed, such as strategy in combating violent extremism.

Experts highlighted that; hostile environment characterizes peace operations. It is noted that many lives have been lost due to inadequate or lack of technologically driven operations systems. Therefore, peacekeeping in Africa is discouraging the country at war like Somalia and DRC due to war fatigue. Strategic deployment of technology provides military advantage over spoilers. Fighting terrains like in DRC are difficult for the peacekeeping force. Technology is a capacity multiplier, when appropriately applied, in PSOs. Africa has done well but embracing technology has been slow largely due to lack of funding or technical capabilities. They added that, Peacekeeping operations in Africa has evolved over the past decade or more, adjusting to modern-day challenges and responding according to the dynamic space. It translates to incorporating technology in a wide area as a way of responding to various aspects within the space of the operation or even technological advancement by the adversaries. Technologies and digital tools used in PSO are vital in the event where they satisfy their mandates. Emerging technologies in general sprout new security threats but when well managed with guiding doctrines, the results are comforting.

Senior level officers and field personnel from all three components were of the view that, peacekeeping operations in Africa have increasingly utilized technology to enhance the effectiveness, efficiency, and safety of peacekeepers in challenging and complex environments. By leveraging technology in diverse ways, peacekeeping operations in Africa can enhance their operational capabilities, adapt to evolving security challenges and threats, and contribute to more effective and efficient peace support efforts in conflict-affected regions across the continent. Africa needs the support, create the capabilities and integrate Technology in their PSO and missions as a matter of urgency. It is disjointed at the moment and lack of resources needed to give it organization and clarity has affected some major missions. Technology and digital transformation if well integrated create a winning strategy one step ahead of militant and terrorist groups. Finally, Peacekeeping operations and peace support operations in Africa, though has progressed over the years but it's still evolving due to changing conflict dynamics and entrance of new conflict actors. In the words of the UN Secretary General, António Guterres "Future generations will judge whether the present generation seized the opportunities presented by the age of digital interdependence. The time to act is now". (Roadmap for digital cooperation, 29 May 2020)

5.4. Applying strategic efforts towards Peace Support Operation in Africa

Strategy plays a vital role in any endeavour. Strategy in this context requires all stakeholders, external and internal actors and regulators to reach a decision that plainly defines roles, mandates and authority. Reaching a deal will require addressing the interests of both parties, and not just focusing on finance and logistics or technological equipment and tools. To do so, both the permanent members of the UN Security Council and the AU should pursue a range of measures that resolve the issue of moral hazard, protection of civilians and creating a stable and peaceful Africa. These include: the use of in-kind troop contributions; paying more to place more experienced troops in missions; and benchmarking AU financial contributions to performance along the lines of technology. These arguments by experts from all three components has been discussed at various security meetings and round tables. In answering the question on the impact of technology on peace support operations as the main objective of this research, senior level executives again are of the view that, the AU and UN all require novel solutions to many conflicts and instability in Africa. Technology through upgrades, new designs, capabilities and connectivity has created a new nexus in missions and operations.

Experts further explained that, one way could be to include African peacekeepers as in-kind contributions. If AU troop-contributing countries send their troops at their own cost, the financial amount they receive can be counted towards the 25 per cent target discussed on finance and budget constraints above. This measure cannot close the gap on its own, but it has won support in previous conversations between the two organisations. Integrating or factoring technology to the cost element of PSO is the new ideal solution. This approach would help close the funding gap and alleviate the issue of moral hazard, as the responsibility and cost of operations would still shift towards the AU and sponsoring agencies. It would also incentivise troop-contributing countries to deploy better trained peacekeepers in the field of technology, thereby increasing the effectiveness of AU peace support operations as a whole. Additionally, a new funding system on technological integration and support, could vary how much AU peace support operations receive based on their performance. To do this, the UN and the AU could set up an independent expert panel to assess how well the peace support operations are implementing their mandates.

Technology in its diverse form, from digital transformation, speed, surveillance, early warning signals, monitoring, control command through to communication speed and sharing of intelligence rely heavily of funding and training capabilities. The UN is known to already use the “concept of operations”, thus clear roadmaps for deliverables which through proper dialogue could be extended to future AU peace support operations and provide a framework for assessing the performance of AU-led missions. This should also offer the benefit of ensuring that the mandates for AU peace support operations are more realistic, in contrast to the ‘Christmas tree’ mandates of UN peace operations, which try to do too much. AU is already pushing for the agenda of “solving African problems by Africans”. A clearly defined concept of each mission would also help focus the political strategy of AU operations in the context of technology. Subject matter experts are of the view that, the UN and the AU should use all options at their disposal to find a mutually agreeable solution for funding, management, technology and reporting.

Strategic efforts in deploying technology and having access to funding should also consider the need for comprehensive research or rapid assessment for use. Building capacities of local populations on the use of such technologies for support services and ensuring that, training of personnel prior to deployment to the mission area. Sharing of information amongst personnel contributing countries and external entities on technology information, innovation, utilization, developments are essential. On the question of Local ownership, experts were of the view that, such arrangement if well guided will always provide solutions to challenges encountered from the root level. Technology therefore should be seen as a capacity multiplier (force enabler) when used by locals. The personnel and ICT systems need to be integrated in the home countries of the Personnel Contributing Countries. It is a challenge when personnel only meet "new" technologies in the mission area as this poses a problem about their understanding and utilization of the platforms they encounter. Simulations and scenario systems powered by advance technology should be the part of every training before deployment. ICT systems should also be designed to be user friendly, portable and easy to maintain with effective monitoring and administrative controls. They should also be less demanding on power sources.

Finally, respondents from all three components on the issue of strategy in technology and peace support operations supported the idea of adjusting the existing doctrines and approaches and update the guiding documentation to suit the current space of peacekeeping or PSOs. Keeping up with the latest technology and applying digital tools to its maximum capacity, particularly when it is used by the adversaries in the same conflict should be well understood and executed. The strategies, doctrine and mechanisms must be those consistent with national interests and security objectives of the AU and Africa in general. The resulting success stories would help reduce violent conflicts in Africa and salvage the problem of armed nonstate groups. This would again, in turn, open the door to more dynamic and sustained development across the continent.

5.5. Understanding the impact of technology in Peace Support Operation in Africa

The focus here was on the Peace support operations in Africa and the expected impact of technology on peacekeeping missions and conflict preventions. African Union and its components such as the Peace and Security Council, Continental Early Warning System, African Standby Force, the Regional Economic Communities (RECs) and the Regional Mechanisms (RMs) define clear policies and mandates for PSOs. The integration of technologies has created a new paradigm and attention on funding technologies, training on technologies and having control of emerging technologies in peace operations. The general view is that, there is a deepening relationship between the African Union and the United Nations in their efforts to respond collectively to Africa's security challenges through collaborative multidimensional peacekeeping operations, Peace support operations plays a significant role in peacekeeping. Understanding the latest technology and how to leverage its potentials in PSO is a game changer for peace missions. From experts and senior or field level officers, the following technologies are in use;

- Drones
- C2
- web-based civilian roster of AU and regional database
- Social media
- Intelligence, Surveillance and Reconnaissance (ISR) system,
- Integrated communication systems,
- Integrated electronic based mission support systems
- UAV Sensors Armored vehicles with surveillance Command centers
- ICT equipment (laptops, desktops)
- GPS Tracking devices
- Voice recorder
- Cameras Binoculars
- Mobile devices
- SAT phones CI3
- Training and simulation- virtual reality and other simulation techniques
- Logistics and supply chain management.
- Medical support and telemedicine.
- Early warning systems.
- Command controls
- AI translators Communicators
- Development of early warning systems.

- Development of learning platforms

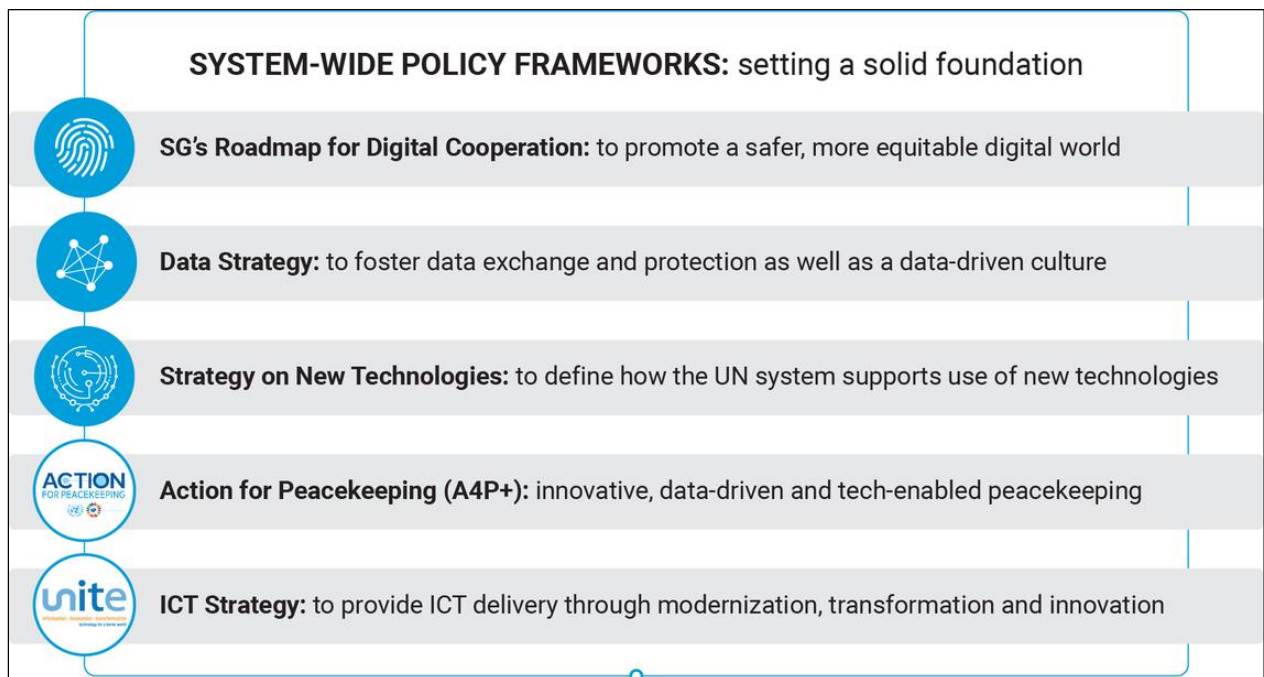


Figure 5.2 Strategy for the Digital Transformation of UN Peacekeeping | United Nations Peacekeeping

These new technologies have defined new approach and, in most cases, have resulted in saving lives of both civilians and troops. It must be placed on record that, deploying these technologies comes with high cost and funding requirements. Changes in technology have led to changes in the ways war is fought and peace is won and this is evident. As seen in figure 5. 3 above, thus the Strategy for the Digital Transformation of UN Peacekeeping, International organisations, including the UN and AU alongside many others, have had to cope with emerging digital technologies that change the nature of conflict and shape the global geopolitical landscape. This in turn has changed the way Peace Support Operations are carried out. Looking at the horizon and beyond, peace support operations can couple technological developments with human innovation and cooperation will determine their ability to successfully manage conflicts and maintain peace. Adopting the system-wide policy framework of the UN is a strategic step for embracing emerging technology and its impact on peace support operations in Africa.

5.6. Dealing with the threats of technology in Peace Support Operation in Africa

In the last two decades, the wide availability of ICT in the wake of the digital revolution or digital transformation has generated speed, space, limitless and fast access to information, data or equipment. Making this technology available to groups or institutions with limited financial resources and technical skills was a turning point for peacebuilders using technology. This transformation was amplified by the explosion of social media and the internet that mobilised people to challenge their governments, fake news, e-mail phishing, digital propaganda. A typical example was the uprisings that led to the Arab Spring. Citizens use ICTs to have their voices heard and to coordinate actions that challenge their relationship with governments or groups. The same technology offered others to use them to share initiatives that promote better knowledge of local circumstances that can be used to prevent conflict or conflicts that can escalate into wars. Technological innovations have widened and changed the horizons of peacebuilding, and peace support operations. The impact is astronomical and impressive, but also comes with several challenges if not well aligned or used. The UN Alliance of Civilisations (UNAOC) and UN Development Programme, with support from social enterprise Build Up, have launched PEACEapp, a competition that promotes digital games and apps to encourage cultural dialogue and conflict management.

Though the above initiatives have broken important ground, considerable work on norm development remains to be done regarding offensive state action in the cyber domain, internet usage, high-tech equipment usage and unguided hacking and digital spying including on issues such as cyberespionage by states and state responsibility for actions emanating from their territory. The question thus continues to be raised whether existing international laws, even if applicable, are sufficient to deal with cyber threats and digital threats. Some experts argued that, while ICT and associated technologies have driven economic growth, they have also contributed to environmental pollution. Storage of data in the “cloud” may seem clean and efficient, but it is stored in massive digital warehouses that require enormous amounts of energy some to the volume of about 30 billion watts of electricity, roughly equivalent to the output of thirty nuclear plants. “Big” data also present a largely untapped opportunity for sustainable development. It has been documented that, a report from UN Global Pulse, retain that, big data are not a panacea, but they could “allow decision makers to track development progress, improve social protection, and understand where existing policies and programmes require

adjustment. The following bullets below represents experts' views on how technological threats could be handled for integration is PSO:

- Remote and controlled security surveillance
- Monitoring trained administrators for high tech systems
- Data and equipment handling in the right hands
- Mitigating and or counter approaches to the threats by joint coalitions
- Recruit specially and well-trained personnel only
- Avail supporting resources and always keeping the technology up to date
- Holistically keep up with the technology advancement
- Regulatory norms should be implemented on all missions
- Improve on all tech security aspects- cybersecurity, network security etc.
- Improve awareness among stakeholders/participants of a mission.
- Positioning of legal and regulatory frameworks.
- Simple investment and trainings to empower member states, AU and training centers.
- Joint digital strategies need to be developed between PSOs and host nations.
- Information and knowledge sharing should be an institutionalized common practice in preventing, responding and resolving threats.
- Systems need to be developed to counter 'fake news' and incorrect narratives that can compromise efforts of operations.
- Systems need to be developed to communicate the achieved milestones and the positive impacts of such systems.

Figure 5.3 below, suggests the use or adoption of the risk management role in technology risk. The model emphasizes on strategy, process, systems and people as the main elements that requires functional attention and guideline. Without an appropriate response, any technology risk has the potential to cause financial, reputational, regulatory, or strategic disruption. As such, it is very critical for PSO in Africa to have an effective technology risk management strategy that anticipates potential problems and supports a strong security posture.



Figure 5.3 Risk Management role in technology risk

5.7. The focus of Peace Support Operation in Africa

The focus of peace support operations has been the primary objective of the UN and AU. Creating a peaceful and stable Africa through strategic effort or joint coalition has been advanced into the involvement of REC/RMs and other key actors. On February 28, 2004, during the second extraordinary session of the African Union in Sirte, Libya, the continental body adopted the Common African Defence and Security Policy (CADSP), which set out to consolidate a continental architecture capable of advancing peace and security by addressing domestic and foreign threats. The security landscape has changed since then with the emergence of new threats, the core tenets of the policy continue to be relevant, if not central, to Africa's pursuit of collective security. Yet, despite being a critical instrument, the CADSP has not achieved much policy and academic attention in discharging its vision and set objectives, especially considering their applicability in the current peace and security context. Experts at various security meetings, have advocated that, policymakers should put more resources into designing effective peace processes that address the causes as well as the symptoms of armed conflicts.

The merits of deploying a particular peace operation should be assessed with direct reference to the prospects for constructing a successful peace process. Technological capabilities should be part of the new requirements. The difficulty of conducting effective peace operations amid stalled and unsustainable peace processes in Sudan, Somalia, the DRC, and Côte d'Ivoire emphasize the importance of this point. For instance, the UN has only a small standby team of mediation experts while the AU has none at all. Moreover, mediators and their teams who are permanently based in conflict regions will be more likely to have a positive impact than special envoys who make only fleeting visits to the conflict zone in question. AU-UN should be complimenting each other in achieving international peace and security. The UNSC and AU PSC are not in a competition rather than mutual benefit in bringing about peace. Local ownership rests with the capacity of a state that's being supported to operationalize public administration. This is very important because support to mandate implementation would be successful within a short time. The focus of PSO should be that of coordination and cooperation amongst all actors, local ownership, local solutions, inclusive approach, integration of different thematic areas to complement and support each other.

Military deployments are not the only solution but are generally a stop gap measure to create space for other entities to provide support. Saving lives for a peaceful and stable Africa through coordinated efforts is a mandatory objective of the AU. The focus should be on finding a wide range of solutions through various means and not necessarily military solutions only. Its ultimate goal should work towards sustainable peace and reconstruction for developmental efforts and try to avoid a relapse of the conflict. Protection of civilians and State integrity, leveraging on various technologies and strengths of nations to navigate the complex nature of contemporary security threats in Africa, and training the Peacekeeping forces rapidly and digitally. More awareness creation among the civilian population on the need for Peacekeeping in the region. Also, resources should be mobilized urgently to support peace operation thereby enhancing the capacity, capabilities and infrastructure of host nation so that they may assume the responsibilities of the missions.

Additionally, the focus of AU on PSO should be to adapt to the changing nature of conflict, and the deployment of neighboring countries or approved states. The need to develop a comprehensive digital transformation strategy with 3–5-year targets, which will include host states. Having a combined efforts from global and region institutes, and member states should focus on complementarity and comparative advantage in operations. Again, it must be noted that, the CADSP is an expression of African agency in advancing collective security, and it makes a case for comprehensive and principle-based peace and security responses. Although the policy does not extensively address the emerging and non-traditional security threats that are more prominent in the current global and regional security landscape, it takes a holistic approach in defining security and defense beyond the military dimension. Hence technology and its new sophisticated devices and usage should be leverage in current policy discussions on PSO. Almost 20 years ago, Ambassador Omar Touray, former Gambian Permanent Representative to the AU and current president of the Economic Community of West African States (ECOWAS) commission, noted that the CADSP “represents the determination of African leaders to take charge of the peace and security agenda.”

Today, that determination is tried by numerous challenges, although there is a clear acknowledgement that Africa’s best interest is served through its collective pursuit of peace and security. The issue of Force generation should also be seen as a matter of focus and attention. Force generation has always been a crucial component of peace operations. Combined

with the latest emerging technological capabilities creates a new playground for peace support operations. But in order to be successful in this context, peace support operations must do more than deploy certain numbers of personnel into operations or missions. Rather, they must achieve particular political effects on the ground such as to coerce spoilers, protect displacement camps and supply routes, demobilize armed factions, or promote the rule of law generally. Policymakers and key stakeholders or even actors must therefore move beyond a narrow preoccupation with numbers of personnel for each mission and focus instead on what capabilities are necessary to generate the desired political effects. Subject matter experts emphasized that, integrating technology to this agenda is key. The more complex the tasks given to peacekeepers the more specialist technological capabilities and logistics and training they will require. Among the most important for multidimensional operations are digital and technology experts, engineer and medical units, sophisticated communications and logistics capabilities, field intelligence, and formed police units.

5.8. Leveraging technology partnerships for PSO in Africa

This research themed partnership as local Ownership of the African Union and the United Nations Peace support operations in Africa through the involvement of the ASF or the REC. The theme was added to the survey to explore experts' views on local ownership of the African Union and the United Nations Peacekeeping Operations in Africa and finding solutions to conflicts on the African continent. The respondents interviewed argued that an accustomed face is always better and therefore local ownership for keeping peace in Africa is very important. Sharing strategic focus to partners with the prime objective of obtaining a resultant solution was the main point raised. Afterall, this effort corresponds to the African Union and the United Nations peace and security architecture framework. Key players such as the African Standby Force (ASF), the Continental Early Warning System (CEWS), the Panel of the Wise (POW), the Peace and Security Council (PSC) and the Peace Fund (PF) as were suggested by experts and argued that, this can be fully effective through adequately funding and support mechanism. Again, any discussion of multilateral cooperation on local ownership or partnership on new technologies must take a multistakeholder perspective.

The private sector and civil society actors, in particular, have often played a leading role in developing and revolutionising innovative uses of these technologies, as well as in governing their use. International governance of the Internet and policies, monitoring, regulations and information sharing all requires multistakeholder dimension. Experts and subject matter executives further added that, in adapting to new technologies, the AU must determine where it can play a useful role and where existing mechanisms and other actors are better placed. For instance, the UN has been seeking not only to find its role in addressing new technologies but also to integrate these technologies into its other areas of work. This integration is more advanced in some areas than in others. The AU must approach this partnership and local ownership with the same tact and strategy. Again, the growing role of technology in sustainable development was highlighted in the outcomes of a number of major UN conferences in 2015. It has been argued that, aside mandate, one of the impacts of technology to peace support operations lies within improving access to ICT in developing countries and missions carried out within that domain.

Forging strong partnership to share and exchange technology through increasing investment, transferring technology from the developed to the developing world, and building the capacity of developing countries to research and develop new tech-innovations are vital and crucial factors to consider. As argued in chapter two with regards to mandates of the African Union and the United Nations Peacekeeping operations in Africa, mandate plays a vital part in the effectiveness of any peace support operation. Partnership through multistakeholder approach must define, establish and understand these mandates in all its operations. This research argues that, the impact of technology on PSO in Africa calls for comprehensive and urgent collaboration between the African Union and the United Nations through their RECs and RMs supported by financial, logistics and prompt training to integrate technology in their operations. All stakeholders have vital roles to play via a well-defined mandate following all accepted and verified doctrine and policies for all three components.



Figure 5.4 Leveraging technology partnerships for competitive advantage

Figure 5.4 focuses on adopting a practical model that will leverage technology as a competitive advantage in PSO. Leveraging technology partnerships can provide stakeholders with a viable advantage in the rapidly evolving business and security landscape. By identifying the right partner, collaborating on innovative solutions, sharing knowledge and resources, extending market presence on technology, and enhancing product offerings all aligned in peace strategy.

5.9. Summary

The impact of emerging technology on peace support operations in Africa is a game changer but calls for partnership among all multi-stakeholders in peacebuilding and conflict prevention. Although conflict prevention does not get the attention or funding it deserves on the global stage, this may be changing with the availability of new technological tools. ICT driven tools and platforms provide better and advanced opportunities to collect data about crime and conflict and reduce the gap between warning and response. The whole approach to peace support operations has transitioned and changed in recent times. Sophisticated equipment and joint strategic efforts keep popping up daily in the use of technology for security. Technology now enables digital simulations and scenario for training and capacity building. As the use of new technologies in peace support operations expands, their benefits and downsides have attracted growing attention from researchers and policymakers. For example, while UAVs can improve data collection, transportation, and communication in peace support operations, they also become part of the conflict dynamic, with all the attendant risks and cost.

While the use of 5G network and high-tech camera resolution keeps advancing, others are using them for terrorist and cyber-spying, hence the ways these new technologies are used can also be controversial if not regulated or controlled. This research argued that, funding and logistical support, readiness to embrace technology, strategic efforts in PSO, understanding the actual impact of technology on PSO, knowing the latest and trending technology in PSO, dealing with technological threats, what the focus on PSO should be in the integration of technology and finally leveraging technology through local ownership and partnership represents the spectrum of technology on Peace support operations in Africa. The African terrain and approach to PSO is both technical and diplomatic. Emerging technologies complicate the application of existing international legal frameworks from many different vantage points, greater clarity and consensus on how to apply these frameworks is needed and should be integrated into PSO mandate and doctrines.

The research established that, as in the physical domain, a considerable role can be foreseen and shared among the multilateral system in determining the norms and rules that govern offensive state action in all forms of technological use and application for peace and stability.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

6.1. Contributions to knowledge

Currently, the UN deploys the largest number of peacekeepers internationally, and Africa receives the biggest share. However, the African strategy through the capabilities of the ASF and the RECs in peace support operations have increasingly taken the frontline in supporting peace and security efforts on the continent. The impact of technology on these operations and missions are great but comes with high cost of funding coupled with logistics and artilleries. Strategic collaborations in changing the scope and dynamics of conflict prevention are defining new norms with technology. The research contends that agility, foresight, and anticipation, matched with timely adaptation to latest technological developments and innovation, are essential components in peace support operations in Africa. This thesis has added to the spread of knowledge in peace support operations, particularly in elaborating and analysing the impact of technology on PSO in Africa and highlighted the roles of key stakeholders in transforming the approach in the context of technology. These contributions are as follow:

- i. Impact of Technological Limitations and the gap it creates in PSOs.
- ii. Futuristic Technologies for Peace Support operations and readiness for integration by stakeholders especially RECs and the ASF.
- iii. Revolutionizing Operations with Technology by understanding emerging technologies and their capabilities.
- iv. Technologically advanced future of Peace Support Operations in Africa through local ownership and partnership quest for sustenance and improvement.
- v. Understanding technological threats in general and its effects on PSO in particular.
- vi. Sampled practical recommendations for transforming peace support operations in Africa using technology as a game changer.

6.2. Conclusion

When it comes to conflicts, predicting the future is impossible, but closely monitoring these emerging trends with the right trackers, intelligence systems and tools helps to establish the relevance of peace support operations. Making the right choices with technology and having the support needed further creates better operation mandates and resilience. It is very important to take note that, these implications are not uniform; they vary based on specific contexts and technology-powered dynamics and ideologies has created a new digital platform system for enhancing the capabilities of all three components, thus military, police and civilian in peace support operations. By considering these variations, we can better prepare for and anticipate potential challenges in our rapidly changing world on peace and security matters. Embracing technological innovations in PSO in Africa, could offer unprecedented opportunities for transformative change, enabling us to ultimately build a safer and more peaceful Africa. With collaboration from diverse interdisciplinary partners and joint negotiations, Peace support operations in Africa can be attuned to both the risks and the possibilities, always mindful of the unique circumstances that shape their impact.

The collaboration on Peace Support Operations in Africa using the many templates and support structures from the United Nations and the African Union have revealed several of the contemporary challenges and attendant strategies. Africa has become very volatile in security matters in recent times and technology has been identified as a force multiplier needed to enhance force capability systems already in place. This research identified the mandate of the African standby forces, the expected roles of the Regional Mechanisms and how to take advantage of available and emerging technologies. The technological spectrum keeps offering new and better tools and system each day. Advancing and training the human factor to use these technological tools is apt and fit for purpose. Being many steps ahead of terrorist or armed groups strategically changes the whole dynamics of conflicts and interventions in Africa. This study again reviewed, the nature of the peacekeeping collaboration of the African Union and the United Nations in Africa, by examining some few experiences on some missions. Using the TANA Forum as a case study was an eye opener that delved into how vital technology is in shaping peace support operations in Africa.

Since 2002, peace and security efforts have attempted to deal with the several violent conflicts on the continent with solutions arrived at from the African continent to respond to problems of Africa, through the formation of the Peace and Security Architecture of the African Union (APSA) and its components which are the African Union Peace and Security Council (PSC). This body with the authority to respond in situations where human rights are grossly abused and government is changed unconstitutionally, called for a Panel of the Wise, to enhance the objectives of the Peace and Security Council and to promote high level mediation efforts. An African Standby Force (ASF), developed around five sub-regional brigades, which are Southern, central, Eastern, Western and Northern Africa, planned to be stationed within thirty (30) days in response to conflicts on the continent, in addition to the Continental Early Warning System (CEWS) and a Peace Fund established to make peace support operations relevant and strategic. It must be placed on record that, the coordination between the African Union and Africa's Regional Economic Communities reduced hostilities and atrocities in Darfur, Somalia and the Central African Republic just to mention a few.

In strengthening the cooperation in peace support operations of the United Nations and the African Union, there is the need for the adoption of peacekeeping doctrines suitable to the nature and dimension of the conflict through a proper assessment of the host country's political, social, security and physical environment. Technology has been the new addition to these strategies to make operations safer, swift and fast. Saving the lives of both personnel's and civilians is key to any mission. Having the right technological capabilities being guided by the right doctrine and policy makes it a must for all to take advantage thereof. The research identified over 25 new technological systems, tools and equipment that has changed the dynamics of peace support operations in recent times. From high-tech security cameras, surveillance systems, fast networks, strong command centers, AI systems through to tractors and detectors. Other enablers like databases, situation rooms, experts list, data mining centers, digital online training platforms and virtual simulators has added to operations preparation. Experts identified several other relevant factors that affect PSO in the context of technology.

6.3 Recommendations for Effective Integration of new technologies in PSO in Africa

This thesis makes recommendations on policies, ideas, framework and collaborations to integrate technology into PSO in Africa, taking into cognizance the numerous opportunities and benefits it offers. As a force-multiplier and capacity enabler, technology promises to change the scope and posture of peace support operations in Africa. Mindful of the threats associated with technology, a well guided policy and controlled mechanism could still offer Africa the opportunity to be well transformed in its security matters and response. This thesis suggests these recommendations as a **10-steps technology integration model** (Figure 6.1), for Peace Support Operations in Africa through the integration of technology as follows:



Figure 6.1 10-steps technology integration model for PSO

6.3.1 Clear technology mandate for PSO:

Peacekeeping mandates should be properly and clearly stated out especially with the advent of emerging technologies. The framework for technological usage differs per capabilities and availabilities. The mandate must explain vividly the adoption, usage requirement, integration process and joint effort via systems, levels of control and security authorization. The entire vision, concept, doctrine and procedures should not be restricted to only peacekeeping and peace support operations aimed at saving lives, protecting peacekeepers and making the work efficient, but by explaining to the understanding of PSO task force or field officers their capabilities and limits in any operation. Mandated authorization and uses should be monitored and controlled so as not to infringe or cause harm to people or countries. The concept of the operations of

PSO should be clearly stated before deployment, with adequate knowledge and information about the operational environment and which technology suits that operation. Only those trained, skilled and capable of using those technologies should be deployed in peacekeeping missions. In addition, a greater consensus should be sought from the host countries and warring parties and neighboring countries before deployment with a broader mandate through the problems identified. Technological mandates guided by clear policies are the best option for any operation or task.

6.3.2 Policy on technology and innovation:

As part of ongoing efforts to ensure safe and guided use of technology and innovation, the AU developed the STISA-2024. As a matter of policy, the focus of the STISA-2024 is to address the ambitions identified under the agenda 2063 and to link those achievements realized under the CPA implementation, focusing on current and future opportunities in recognising Science, technology and innovation development in the African continent. STISA-2024 should integrate other emerging technological innovations to create the needed short-term incremental strategy designed to address Africa's challenges, with the ultimate goal of contributing significantly to the AU vision especially on matters of security. STISA-2024 responds to the demand for science, technology and innovation to impact on critical sectors including agriculture, energy, environment, health, infrastructure, mining, security and water among others creates a core path that encourages the integration of technology and innovation in PSO. In addition, policymakers should put in place different rules for different actors and situations, and they must be able to attribute each act to determine which set of rules applies. Attributing cyberattacks and hacking is difficult, however, by simply determining an attack's source may not be enough to determine who is responsible. Policymakers must address the relationship between cybersecurity, technology usage and human rights. The first would be to use properly defined policy on technology framework to springboard fresh discussions about how to end wars, attacks, cyber bullying etc. using technology. African countries should now focus primarily on what new AU-led peace enforcement or stabilization missions are on the table and define a suitable framework that works for all. The policies on technology should be extended

to cover wider range of mission models, including operations with ceasefire monitoring mandates or ones with predominantly political mandates.

6.3.3 Collaboration and partnerships:

The United Nations and the African Union peacekeeping operations must develop a multifunctional force. Creating a sustainable and firm partnership alongside the local ownership concept of integrating RECs forms a strong alliance and force to share, support and exchange ideas practically. Aside funding support, collaboration also triggers ease and makes every mission robust and resilient. Collaboration and partnership create balance in capabilities and strengthen all contributing party's ability. There should be a balance of both military, police and civilian component in each mission or operation. It should have a blend or mix of support that are focused on Humanitarian affairs, civil affairs, logistics, political and technological systems. Enforcing the 21 December 2023, UN Security Council unanimous resolution on a framework for the global body to fund peace operations led by the African Union (AU) and all partner agencies is a major step towards success. It is a fact noted again that, where the political agendas of the UN and the AU coincided, pragmatic divisions of labour evolved whereby African states provided troops and the UN and other partners provided increasingly comprehensive logistical and financial support packages. These collaboration and partnership opened a support mechanism were *ad hoc* and authorized operations by the UN Security Council and the AU can be implemented effectively. A practical example is AMIS. AMIS was largely paid for through direct donor support (primarily the EU) but TCCs also benefited from in-kind enabling support from a number of bilateral partners as well as UN 'light' then 'heavy' support packages. The re-hatting of the AU mission as the AU-UN Hybrid Operation in Darfur (UNAMID) gave it access to the UN's assessed peacekeeping budget in addition to other forms of UN assistance. Applying the same collaborations in technology and logistics creates a long-lasting mission success.

6.3.4 Prioritize peace support operations:

The AU security council must ensure that, all peace support operations have all the needed mandate that will ensure success. Policymakers should put more resources into designing strategic and effective peace processes that addresses the causes as well as the symptoms of armed conflicts in Africa. Technology must be a core part of their strategy and plan, and it should be highly prioritized. The advantages of deploying a particular peace support operation should be assessed with direct reference to the prospects for constructing a successful peace process. Taking into account logistics, funding and technological support, every PSO must be a win. For example, the difficulty of conducting effective peace operations amid stalled and unsustainable peace processes in Sudan, Somalia, the DRC, and Côte d'Ivoire emphasize the importance of this point. Constructing effective peace processes is never solely about providing more money, although funds spent wisely will usually help. Rather, it requires the provision of better and sustained mediation from senior political figures and actors or stakeholders, as well as greater organizational support for them. The AU standby force working through the RECs should comprise of all needed units and teams. Beyond the question of effectiveness, African diplomats framed the funding issue as a moral question and a vital need. African countries provide considerable numbers of troops for UN peacekeeping operations in Africa as well as to all the continent's own operations should receive great funding support and it must be a priority. It is recommended, that the UN, which oversees international peace and security, should help these efforts timely.

6.3.5 Design better entry and exit strategies:

The African continent's security landscape is constantly changing. Technology has transformed PSO in a dynamic way that allows for rapid deployment coupled with new logistics and support system. However, the way peacekeepers are recruited, trained and deployed till they exit from missions' needs more transformation and strategy. The whole idea of PSO should be understood by all stakeholders from all three components. They need to know when to enter and when to exit is very crucial. With regard to getting in, more thought needs to be given to the issue of consent, mandate, capability and capacity. All forms of engagement must be explored and used with strategy as the

benchmark. In the context of technological strategy, only the needed technology must be deployed. Technology that supports entry and exit must be understood by all stakeholders in that mission. The greater the level of international consensus and understanding on these fundamental issues, the better the operation. A lack of consensus complicates the design of exit strategies for peace support operations, an issue that needs more systematic analysis, particularly on the best benchmarks to assess mission performance and accountability. Additionally, there is a need to deal with disarmament, demobilization and reintegration of combatants, reform of the security sector, and improve state and local governance structures and government institutions. Thus, African-led PSO's needs to serve and support a politically led project or peace process that consists of a comprehensive set of dimensions across the political, social, economic and local spectrums focusing on entry and exit.

6.3.6 Invest more on technology resources:

Peace support operations requires a great deal of funding. Technology and its associated parts or systems by design and capabilities comes with high cost of installation, usage and control. Maintenance and upgrade are constant routine part of deploying technology in any sector. Investing more on technology and its resources requires not only a missions' budget but various financial support for sustainability and efficiency. Failed peace operations seriously damage the credibility and reputation of the organization(s) involved. This even affects local civilians, and endanger the notion, perception and trust they have in peacekeeping efforts. Following the resolution for sustainable and predictable financing, it is very advisable that, the AU and UN should have access to a large pool of money for missions that have perpetually faced financial losses. The framework for investment in technology requires the Security Council's explicit authorization and funding. Diplomats on the UN's budget committee for Africa, will need to agree on how to apportion the up to 75 per cent split when preparing and reviewing mission budgets, and which UN entity would collect and distribute the said funding. Specifically, resources are needed to ensure missions avoid overstretching their personnel, assets capabilities, finances, and headquarters or command and control. Shortfalls in personnel and capabilities of the kinds discussed above should be relatively

easy to overcome if the world's most advanced military powers made a more serious commitment of their specialist capabilities to UN peace operations in Africa. Integrating technology for PSO in Africa needs lots of funding, investment and constant financial monitoring for every mission.

6.3.7 Recruit more civilians:

Technology without people is useless. All technology requires skilled and trained experts to handle and implement them. Building a self-sustaining peace support operations in Africa through technology requires more than carrying out specific military tasks or joint missions. It also requires a wide range of civilian skills and capabilities. This research identified over 20 civilian subject matter experts across various disciplines all offering some support or skill to PSO in Africa. Contemporary peace support operations therefore must strengthen their civilian components, especially police and civilians with expertise in rule of law, engineering, civil-military affairs, and development issues. Civilian technology experts are needed to support the police and military components in missions. Both the UN and AU are working on enhancing their civilian and policing standby rosters and rapid deployment capabilities. But much more needs to be done and it is often difficult to find significant numbers of well-qualified civilians who are willing and able to work in peace support operations. The strategy on pre-deployment training should factor in a good number of civilian experts with desired skills. First, it would make sense to hire more locals to address some of the cultural, linguistic, and knowledge-based deficiencies that often limits peace operations, this is the REC agenda. Second, more of them should be women: local women to help female empowerment in these conflict zones, as well as internationals, in part for the reasons cited above, thus Gender balance. And third, it is important to develop a bigger pool of highly qualified senior mission staff, which would go a long way to addressing these capacity challenges. Continued training and exercises should always be emphasized as this is an important factor in capability preparation. Technology should be used to lessen the costs of conducting training whilst at the same time enhancing its value, accessibility and utility.

6.3.8 Standardize tech platforms:

The Security Council continue to encourage the United Nations and the African Union in their efforts. Although the modern technological developments are important for mankind, there is a need for a coordinated regulatory framework to mitigate their negative effects. One fact remains crucial, the digital revolution's ultimate legacy will be determined not by technology, but by how it is used and implemented. African countries that take advantage of the opportunities and limit the risks inherent in modern technology may achieve greater peace, stability and development. Having a standardized tech platform to make use of all previous and new innovations is crucial and critical for future missions. Many missions have used SAGE to develop their own dashboard on PSO. In particular, the analytical capabilities of SAGE have been enhanced by the introduction of Power BI, a Microsoft-powered app that enables users to superimpose and visualize data, allowing for the identification of trends and spatial correlations between events. Another tool that has been developed by building on SAGE is the early-warning rapid-response app, which has been available in several missions, including MONUSCO and MINUSMA. This app allows users to disseminate an early warning to all relevant mission components based on an incident input into SAGE and to call for them to generate recommendations for action. As states increasingly assert their sovereignty over the Internet, it is important to disentangle what can be decided locally and what needs to be decided globally. With the completion of the WSIS+10 in December 2015, questions regarding the role of the multilateral system in governing cyberspace have gained a particular salience. The use of all the 15-20 technological systems identified in this research for PSO should have a standardised tech platforms taking into account usage, control, maintenance, integration, upgrade etc.

6.3.9 Understand artificial intelligence:

Artificial intelligence is the new order of technology. All other systems, Apps and applications are utilising this amazing feature to innovate their technology and its uses. These new mechanisms need to be connected to one another to accelerate progress toward achieving the 2030 Agenda and the Paris Agreement without hurting people,

duplicating efforts and competing for resources. Understating how AI works, leveraging its benefits to integrate technology in PSO for Africa, is the new mega order. Generative Artificial Intelligence represents a subset of AI technologies focused on creating original content autonomously, marking a significant advancement in the broader field of AI. Knowledge in AI for security and PSO is very vital in fighting wars and protecting civilians. This cutting-edge technology holds the potential to elevate political analysis by identifying patterns and trends that might otherwise elude human detection. However, generative AI is not without risks. Though it has predictive capabilities, inaccurate or incomplete training data may result in biased insights and the technology could be weaponized for large-scale disinformation campaigns. Hence the need for experts to understand how AI works is a step in the right direction for PSO and future conflict prevention efforts.

6.3.10 Adapt to the changing dynamics of PSO

The dynamics of peacekeeping and Peace support operations is fast changing. This raises the concern that, the approach, techniques and strategies must also change from both the military, police and civilian dimensions. As stated in the previous chapters, the emergence of new technologies has created new opportunities in the areas of peace and security operations especially in conflict prevention, joint coalitions and peace building. Peace Support Operations have undergone significant shifts since their conceptualization few years ago. They have transitioned from monitoring ceasefires in interstate conflicts to supporting the implementation of comprehensive peace agreements. An overall enabling environment for STI must be created by Members States and RECs to achieve the priorities identified in the strategy. The creation of such an environment involves Member States, RECs and the AU having evidence-based policies and programmes that encourage STI development. Every Member State requires a coherent national framework for actions that directly affect the promotion of STI. Technology has become an integral part of human existence and the world is moving towards a digital space. Peacekeeping should be no different as adversaries are equally embracing sophisticated warfare and technological incorporated tactics.

Peacekeeping doctrines should be amended to incorporate technology including legal frameworks and all necessary policies.

APPENDICES

Appendix 1: Template of informed consent for data collection



SELINUS UNIVERSITY
OF SCIENCES AND LITERATURE

To whom it may concern,
It is attested that the student:

ALEXANDER ODARTEY LAMPTEY, resident in Yaoundé, Cameroon

Registration number: UNISE2950IT - Date of enrollment: 07-02-2024

Is enrolled in the faculty of **Arts & Humanities** of Selinus University and is about to pursue a **Dual Degree (Master's degree and PhD) in Peace Building & Leadership**.

This letter will formalize the process of gathering the necessary information and data for his research thesis through questionnaires and interviews. Since his research work will be his PhD thesis, you are kindly requested to provide the information he needs. We assure you that there will be no misuse of this information and the source of this information will be kept concealed.

The student will carry out his research work with constant commitment in order to defend his final doctoral thesis that is about *THE IMPACT OF EMERGING TECHNOLOGIES ON PEACE SUPPORT OPERATIONS IN AFRICA*.

This letter is issued for permitted uses in each country.

Selinus University of Sciences and Literature,

4th March 2024

Dr. Salvatore Fava - President of Selinus University



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Appendix 2: Interview Instrument (Face-to-face)

Section A: Demographic Data:

1. Institution Name -----
2. Gender. -----
3. Please indicate the length of your experience in the field of Peace Support Operations in Africa.

4. Please indicate your highest qualification. -----
5. Present position in your institution. -----

Section B: Questions to be asked:

1. Please tell us briefly who you are and the nature of your job?
2. What do you think Peace Support Operation is?
3. What are your perceptions about Peacekeeping operations in Africa?
4. What should be the focus of the AU-UN peacekeeping operations in Africa?
5. And who is in the best position to carryout effective peacekeeping operations in Africa?
6. To what extent is the African Peacekeeping Operations (Missions) prepared to embrace new technologies in their operations?
7. Can you list some of the latest and emerging technological advancements and digital tools used for peace support operations?
8. How do the different mechanisms of APSA take advantage of technology at their Regional Mechanism levels?
9. In your opinion, what digital tools and strategies are available for peace support operations in Africa currently?
10. What capabilities are available to support peacekeeping operations in Africa?
11. What steps should be taken to handle the threats technology poses to peace support operations in Africa?

12. Should the AU-UN cooperation on peacekeeping operations in Africa make space for local ownership of the peacekeeping operations technologically? Is this very important? And why?
13. Should Regional Economic Commissions such as ECOWAS, EASF and SADC play more prominent roles in peacekeeping operations in Africa? What kind of roles and how?
14. What are the right strategies, doctrine and mechanisms for effective peace keeping operations in Africa with regards to technology and accompanying digital tools?
15. In what ways can the AU-UN cooperation on peacekeeping operations in Africa be improved for future effective cooperative interventions in Africa in the context of technology?

Appendix 3: Interview Instrument (Digital portal)

Dear Sir/Madam,

I am Alexander Odartey Lampitey working with the African Peace Support Trainers Association (APSTA) as a Senior knowledge Manager. I am currently working on my PhD thesis at the Selinus University of Science and Literature-Italy via distance learning. I would be very grateful if you can take 15 minutes of your time to respond to this questionnaire on the topic “*The Impact of emerging technologies on Peace Support Operations in Africa*”. Attached is a letter of consent from the school for authorizing data collection and the survey link.

Counting on your usual support.

Q1

Title

Q2

Name

Q3

Institution Name

Q4

Gender

Q5

Job Category

Q6

Please indicate the length of your experience in the field of Peace Support Operations in Africa

Q7

Please indicate your highest educational qualification

Q8

Present position in your institution

Q9

Please tell us briefly who you are and the nature of your job?

Q10

What do you think Peace Support Operation is?

Q11

What are your perceptions about Peacekeeping operations in Africa and the technology nexus?

Q12

What should be the focus of the AU-UN peacekeeping operations in Africa?

Q13

Who is in the best position to carryout effective peacekeeping operations in Africa?

Q14

To what extent is the African Peacekeeping Operations (Missions) prepared to embrace new technologies in their operations?

Q15

How would you scale the integration of Technology in Peace Support Operations in Africa?

Q16

Can you list some of the latest and emerging technological advancements and digital tools used for peace support operations?

Q17

How do the different mechanisms of African Peace and Security Architecture (APSA) take advantage of technology at their Regional Mechanism levels?

Q18

In your opinion, what digital tools and strategies are available for peace support operations in Africa currently? Kindly list a few

Q19

What capabilities are available to support peacekeeping operations in Africa? Kindly list a few

Q20

What steps should be taken to handle the threats technology poses to peace support operations in Africa?

Q21

Should the AU-UN cooperation on peacekeeping operations in Africa make space for local ownership of the peacekeeping operations technologically? Is this very important? And why?

Q22

Should Regional Economic Commissions such as ECOWAS, EASF and SADC play more prominent roles in peacekeeping operations in Africa? What kind of roles and how?

Q23

What are the right strategies, doctrine and mechanisms for effective peace keeping operations in Africa with regards to technology and accompanying digital tools?

Q24

Which of the following digital tools for Peace Support Operations are you familiar with? Kindly select those you know.

Q25

Any recommendations for effective integration of technology in Peace Support Operations in Africa with regards to policies, strategies and framework?

Appendix 4: Ethical Clearance Letter- Selinus University of Science and Literature

REFERENCE

1. Africa Center for Strategic Studies. Security issues. 2011. <http://africacenter.org/security/topic/> (assessed December 11, 2023).
2. African Centre for the Constructive Resolution of Disputes (ACCORD). 2009. Mediating peace in Africa: Securing conflict prevention. http://www.accord.org.za/downloads/reports/ACCORD_Mediating_Peace_Africa.pdf (assessed December 11, 2023).
3. African Peace Support Trainers Association (APSTA) <https://apstaafrica.org/>
4. African Union (AU). 2002a. The Constitutive Act. http://www.africaunion.org/root/au/AboutAu/Constitutive_Act_en.htm (assessed November 16, 2023). ———. 2002b. Protocol relating to the establishment of the peace and security council of the African union. http://www.africa-union.org/rule_prot/rules_Assembly.pdf (assessed November 16, 2023).
5. Alghali, Zinurine Abiodu, and Mamadou Mbaye. 2008. Fact file: The African standby force and regional standby brigades. http://www.humansecuritygateway.info/documents/CONFLICTTRENDS_Factsheet_AfricanStandbyForce.pdf (assessed July 10, 2021).
6. Arce, Alberto. 2015. “[In frightened Mexico town, a mob kills 2 young pollsters](#).” *San Diego Union Tribune*, October 22.
7. Asante-Kissi, E. (2012) “Electoral Commission and Election Management in Ghana (19932008)”. Mphil Thesis. University of Ghana
8. Bamidele, O. (2013), The challenges of peacekeeping in Africa. Strategic review for Southern Africa. Vol.35 No.2 November 2013.
9. Bamisaye, O.A. (2011) Readings on Political Inquiry and Analysis. MacGrace Publisher, Palm Groove, Lagos.
10. Besada, Hany, Ariane Goetz, and Karolina Werner. 2010. African solutions for African problems and shared R2P. In *Crafting an African security architecture: addressing regional peace and conflict in the 21st century*, ed. Hany Besada, 1-14. Farnham, Surrey, England: Ashgate Pub.

11. Best, T.W. and Kahn, J.V. (1998) *Research in Education*. Boston. Allyn and Bacon.
12. Cahlan, Sarah. 2020. "[How misinformation helped spark an attempted coup in Gabon](#)." *Washington Post*. February 13.
13. Convergne, Elodie and Michael R. Snyder. 2015a. "Making Maps to Make Peace: Geospatial Technology as a Tool for UN Peacekeeping." *International Peacekeeping* 22(5): 565-586.
14. Deconing, C. (2007) Civil-Military coordination in United Nations and African peace operations. The African center for the constructive resolution of disputes (ACCORD).
15. Deconing, C. (2008) Moving beyond the Four Ps, An Integrated conflict management system for the African Union. Security in practice.
16. Deconing, C. And Peters, M (2019) United Nations peacekeeping operations in a changing Global order, Norwegian institute of international affairs
17. DFRLab. 2020. "[New accounts, old tricks: pro-Maduro regime propaganda on Twitter](#)." The Atlantic Council.
18. Dorn, Walter and Cono Giardullo. 2020. "Analysis for Peace: The Evolving Data Tools of UN and OSCE Field Operations." *Security and Human Rights* 30: 1-12.
19. Duursma, Allard and John Karlsrud. 2018. "Predictive Peacekeeping: Strengthening Predictive Analysis in UN Peace Operations." *Stability: International Journal of Security & Development* 8(1): 1-19.
20. Engel, Ulf, and João Gomes Porto. 2010. Africa's new peace and security architecture: an introduction. In *Africa's new peace and security architecture: promoting norms, institutionalizing solutions*, ed. Ulf Engel and João Gomes Porto. Farnham, Surrey, England: Ashgate Pub.
21. Fafore-Olumide Adetokunbo (2020) "The African Union and the United Nations corporations on peacekeeping in Africa"
22. Farah, D (2000) "Internal disputes mar UN mission". *Washington post*, September 10, 2000.
23. Feldstein, Steven. 2019a. "[The Global Expansion of AI Surveillance](#)." *Carnegie Endowment for International Peace*. 30(1): 40-52.

24. Green, John. 2020. "[Managing Misinformation to Build Peace in South Sudan.](#)" The Sentinel Project.
25. Hamza, A. (2014) "Interviewing as a Data collection method. A Critical Review". English Linguistic Research. Vol.3, p. 39-45, Sciendu Press.
26. Hansen, Annika. 2020. "[Digital technologies in peace operations.](#)" *About Intel* (blog). March 16.
27. <https://apstafrica.org/2023/06/28/apsta-newsletter-june-2023-edition/>(assessed November 9, 2023).
28. Jones, Benjamin T. and Eleanora Mattiacci. 2017. "Media as a Tool of Rebel Diplomacy." *British Journal of Political Science* 49(2): 739-761.
29. Kenny, Ryan. 2015. "[Disruptive By Design: Body Cameras Could Be a Win for the Military.](#)" *Signal*. December 1.
30. Kivunja, C. And Kuyini A.b (2017) Understanding and applying research paradigms in educational context, international journal of higher education, vol 6, no.5.
31. Klaus Schwab, "The Fourth Industrial Revolution: What It Means, How to Respond," World Economic Forum, January 14, 2016, available at www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond.
32. Koch, T. And Harrington, A. (1998) "Reconceptualising Rigour. The Case for Reflexivity" *Journal of Advanced Nursing*. Vol. 28. No. 4. P 882-890.
33. Lamptey Alexander Odartey – 2021 "The Digital growth for Africa, understanding Augmented and Virtual Reality, https://www.linkedin.com/pulse/digital-growth-africa-understanding-augmented-virtual-nii-odartey?utm_source=share&utm_medium=member_android&utm_campaign=share_via
34. Linzer, Isabel. 2019. "[An Explainer for When the Internet Goes Down: What, Who, and Why?](#)" Freedom House.
35. Lu, Yan, Krzysztof Koperski, Chiman Kwan, and Jiang Li. 2020. "[Deep Learning for Effective Refugee Tent Extraction Near Syria-Jordan Border.](#)" *IEEE Geoscience and Remote Sensing Letters*.

36. Mirsky, Yisroel and Wenke Lee. 2021. "The Creation and Detection of Deepfakes: A Survey." *ACM Computing Surveys* 54(1).
37. Mohajan, H.K (2018) Qualitative research methodology in social sciences and related subjects. *Journal of Economic Development, Environment and People*, vol 7, issue 01, 2018.
38. Morozov, Evgeny. *The Net Delusion: The Dark Side of Internet Freedom*. Public Affairs: New York.
39. Ogunbameru, O.A. and Ogunbameru, B.O. (2010) Contemporary methods in social Research (1st Ed.) Kuntel Publishers, Ile-Ife, Nigeria.
40. Patnaik, E. (2013) "Reflexivity. Situating the Researcher in Qualitative Research". *Humanities and Social Sciences*. p. 132-139. UK. Edward Arnold.
41. Pauwels, Eleonore. 2020. "Artificial Intelligence and Data Capture Technologies in Violence and Conflict Prevention Opportunities and Challenges for the International Community." *Global Center on Cooperative Security*.
42. Perrigo, Billy. 2019. "[Facebook Says It's Removing More Hate Speech Than Ever Before. But There's a Catch.](#)" *Time*, November 13.
43. Prasad, D.B. (2008) "Content Analysis. A method of Social Science Research'. In Lai Das, D.K (Ed). *Research Methods for Social Work*. P. 173-193. New Delhi. Rewat Publications.
44. Puig Larrauri, Helena. 2012. "[Conflict sensitive crowdsourcing.](#)" *Let them talk* (blog). 5 July.
45. Safaneta, Marisa Abreu. 2004. Conflitualidade em África: o caso da Costa do Marfim [Conflicts in Africa: the case study of Ivory Coast]. http://www.janusonline.pt/2004/2004_1_1_9.html (assessed June 30, 2020).
46. Shacklock, G. And Smyth, J. (1988) *Being Reflexive in Critical Educational and Social Research*. Psychology Press.
47. Thomas P.y (2003) Chapter 4 Research methodology, University of Pretoria. Retrieved from <https://repository.up.ac.za> Accessed 2024-01-12.
48. UN General Assembly, *Information and Communications Technology Strategy—Report of the Secretary-General*, UN Doc. A/77/489, September 30, 2022. UN Peacekeeping, "A4P+: Priorities for 2021–2023," 2021, available at

- <https://peacekeeping.un.org/en/a4p-action-peacekeeping-priorities-2021-2023> ;
United Nations, “What Is Action for Peacekeeping Plus (A4P+)?” October 22, 2021,
available at
https://peacekeeping.un.org/sites/default/files/a4p_fact_sheet_221021_final.pdf .
49. UN General Assembly, *Road Map for Digital Cooperation: Implementation of the Recommendations of the High-Level Panel on Digital Cooperation—Report of the Secretary-General*, UN Doc. A/74/821, May 29, 2020.
50. UN Peacekeeping, “A4P+: Priorities for 2021–2023,” 2021, available at
<https://peacekeeping.un.org/en/a4p-action-peacekeeping-priorities-2021-2023> ;
United Nations, “What Is Action for Peacekeeping Plus (A4P+)?” October 22, 2021,
available at
https://peacekeeping.un.org/sites/default/files/a4p_fact_sheet_221021_final.pdf.
51. UN Peacekeeping, “Strategy for the Digital Transformation of UN Peacekeeping,”
September 17, 2021, available at <https://peacekeeping.un.org/en/strategy-digital-transformation-of-un-peacekeeping> .
52. UN Peacekeeping, “Strategy for the Digital Transformation of UN Peacekeeping,”
September 17, 2021, available at <https://peacekeeping.un.org/en/strategy-digital-transformation-of-un-peacekeeping> .
53. United Nations (UN). 2011. Support to African Union peacekeeping operations authorized by the United Nations: Report of the Secretary-General. http://reliefweb.int/sites/reliefweb.int/files/reliefweb_pdf/node-371965.pdf (assessed November 9, 2023).
54. United Nations, “Data Strategy of the Secretary-General for Action by Everyone, Everywhere,” May 2020, available at
<https://www.un.org/en/content/datastrategy/index.shtml> .
55. United Nations, “UN Secretary-General’s Strategy on New Technologies,”
September 2018, available at <https://www.un.org/en/newtechnologies/> .
56. Van Manen, M. (1984) “Practicing Phenomenological writing. Phenomenology and Pedagogy. Vol. 2, No. 1. P. 36-69.

57. Wall, C. And Glenn, S. and Mitchinson, S. and Poole, H. (2004) "Using a Reflective Diary to develop Bracketing skills during a phenomenological investigation. Nurse Researcher. Vol. 11, No.4. p. 20-29.
58. Wardle, Hannah and Hossein Derakhshan. 2017. *Information disorder: Toward an interdisciplinary framework for research and policy making*. Council of Europe.
59. Williams, P.D (2013) Peace operations in Africa, lessons learned since 2000, Africa Security Brief No 251, July 2013
60. Williams, P.D. (2013) The African Union mission in Somalia and civilian protection challenges. Stability. International journal of security and development, 2(2).
61. World Food Program. 2021. "[WFP boosts global co-operation on humanitarian drone use](#)." February 4.
62. Zainal, Z. (2007) Case study as a research method, Jurnal Kemanusiaan, bil 9, June 2007.

United Nations Publications on Selected UN initiatives and frameworks on new technologies

- i. UN Department of Operational Support (DOS), “Partnership for Technology in Peacekeeping,” 2023, available at <https://operationalsupport.un.org/en/partnership-technology-peacekeeping> .
- ii. Expert Panel on Technology and Innovation in UN Peacekeeping, “Performance Peacekeeping: Final Report of the Expert Panel on Technology and Innovation in UN Peacekeeping,” December 22, 2014.
- iii. United Nations, “Secretary-General’s High-Level Panel on Digital Cooperation,” 2020, available at <https://www.un.org/en/sg-digital-cooperation-panel> .
- iv. United Nations, “UN Secretary-General’s Strategy on New Technologies,” September 2018, available at <https://www.un.org/en/newtechnologies/> .
- v. United Nations, “Data Strategy of the Secretary-General for Action by Everyone, Everywhere,” May 2020, available at <https://www.un.org/en/content/datastrategy/index.shtml> .
- vi. UN General Assembly, *Road Map for Digital Cooperation: Implementation of the Recommendations of the High-Level Panel on Digital Cooperation—Report of the Secretary-General*, UN Doc. A/74/821, May 29, 2020.
- vii. UN Peacekeeping, “A4P+: Priorities for 2021–2023,” 2021, available at <https://peacekeeping.un.org/en/a4p-action-peacekeeping-priorities-2021-2023> ; United Nations, “What Is Action for Peacekeeping Plus (A4P+)?” October 22, 2021, available at https://peacekeeping.un.org/sites/default/files/a4p_fact_sheet_221021_final.pdf .
- viii. UN Peacekeeping, “Strategy for the Digital Transformation of UN Peacekeeping,” September 17, 2021, available at <https://peacekeeping.un.org/en/strategy-digital-transformation-of-un-peacekeeping> .
- ix. UN General Assembly, *Information and Communications Technology Strategy—Report of the Secretary-General*, UN Doc. A/77/489, September 30, 2022.
- x. UN Peacekeeping, “A4P+: Priorities for 2021–2023,” 2021, available at <https://peacekeeping.un.org/en/a4p-action-peacekeeping-priorities-2021-2023> ; United Nations, “What Is Action for Peacekeeping Plus (A4P+)?” October 22, 2021, available at https://peacekeeping.un.org/sites/default/files/a4p_fact_sheet_221021_final.pdf .
- xi. UN Peacekeeping, “Strategy for the Digital Transformation of UN Peacekeeping,” September 17, 2021, available at <https://peacekeeping.un.org/en/strategy-digital-transformation-of-un-peacekeeping> .

Webography

1. <https://apstaafrica.org/>
2. <https://tech-blog.zif-berlin.org/debunking-myths-around-digital-peacemaking>
3. <https://www.linkedin.com/pulse/impact-emerging-technologies-peace-security-africa>
4. <https://www.crisisgroup.org/africa/286-price-peace-securing-un-financing-au-peace-operations>
5. <https://unpeacekeeping.medium.com/a-plan-for-progress-how-a4p-is-boosting-impact-on-the-ground-8578aea24aa2>
6. <https://www.ipinst.org/2017/05/icm-new-technologies-peace-security-development>
7. <https://adf-magazine.com/2023/09/the-dizzying-possibilities-of-drones/>
8. <https://www.semanticscholar.org/paper/Developing-Enterprise-Cyber-Situational-Awareness-Gorham/43e439b5069a900265f6f26f83c7d01c074d585c>
9. <https://cloudcamera.medium.com/9-advanced-ai-based-cctv-surveillance-cameras-to-protect-24-7-89d24ed30fed>
10. <https://www.everythingrf.com/news/details/7109-Ericsson-to-Provide-Mission-Critical-Communication-Systems-for-UN-Peacekeeping-Missions>
11. <https://www.af.mil/News/Article-Display/Article/2844831/air-force-discusses-modernization-of-operational-c2-systems/>
12. <https://operationalsupport.un.org/en/partnership-technology-peacekeeping/>
13. <https://apstaafrica.org/apsta-situation-room/>
14. <https://apstaafrica.org/document-library/>
15. <https://apstaafrica.org/apsta-situation-room/>
16. <https://www.space.com/spacex-launches-1st-5g-satellite-internet-of-things/>
17. <https://www.facebook.com/photo/?fbid=382811977947601&set=a.123130830582385>
18. <https://www.singlegrain.com/social-media/pros-and-cons-of-social-media-networking-how-it-affects-your-business-growth/>
