



SCHOOL SECURITY ARCHITECTURE IN AN ERA OF DIGITALIZATION

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Abstract

This research paper examined school security architecture in an era of digitalization. School security in Nigeria has been a significant concern for several years, particularly due to frequent incidents of kidnappings and attacks by various armed groups. There have been a reported cases of security threats on campuses of Nigerian schools.” A number of Nigerian schools have experienced so many cases of kidnap and abduction of members of the school community. School security architecture refers to the comprehensive framework designed to ensure the safety and security of a school's students, staff, and property. It encompasses physical, technological, and procedural measures that work together to prevent, detect, and respond to various security threats. Key components of school security architecture typically include, Physical Security, this includes barriers such as fences, gates, secure entry points, surveillance cameras, and alarm systems. Digitalization of school security refers to the integration of digital technologies and systems to enhance the safety and security of educational environments. This process involves leveraging various technological tools to monitor, manage, and respond to potential security threats more effectively. . The goal of digitalizing school security is to create a safer learning environment by leveraging advanced technology to prevent, detect, and respond to potential security threats more effectively and efficiently. It was recommended that implementing digital security in schools comes with several challenges requires a comprehensive approach, Government should make policies that support digitalization in school security, there should be step-by- step guide for schools to implement digital security measures, training and capacity building programs for staff and students on digital security tips and it was concluded that Security is a fundamental and necessary condition for the attainment of institutional goals and must not be compromised.

Key words: School Security, Architecture and Digitalization

Introduction

School security in Nigeria has been a significant concern for several years, particularly due to frequent incidents of kidnappings and attacks by various armed groups. There have been a reported cases of security threats on campuses of Nigerian schools.” A number of Nigerian schools have experienced so many cases of kidnap and abduction of members of the school community.” Unfortunately, some academic staff and students have died in the process while others are still missing.” A few incidences of kidnapping have also been reported in some school in the North and in virtually all parts of the country.” The rising insecurity in the country, which also affects our schools, is hindering



teaching and research activities and undoubtedly the general well-being of the institution. Schools in Nigeria consistently score poorly on security, and many have not yet installed top-notch security for schools. There are several crimes involving children, and criminals can abduct kids from schools using a variety of ruses. However, Nigerian schools have recently realized how important it is to have a robust security setup, and this is now being implemented, albeit a little slowly. The majority of the schools constructed in the past have lovely wide campuses tucked into neighborhoods with a number of convenient entrances and modest walls separating them from nearby homes and streets.

They feature various classroom buildings, each with a row of exterior doors and numerous corridors connecting them. While beneficial for our kids, these open areas can be challenging to maintain safety in our children's school. State officials and the majority of security professionals advise that schools be constructed with a "single point of entry" to help keep intruders out of classrooms and the kids safe inside. In addition to having an open architecture, relatively few schools also have any kind of technological security system, especially public/government-owned schools. There is no video surveillance equipment to prevent, detect, or identify unwanted intruders, nor is there an access control system to slow down or prevent unauthorized entry. While structural renovations are prohibitively expensive, there are practical and advanced electronic security measures that can improve school safety. However, given that so many schools are located in areas that are considered to be "secure" and to pose little threat, how do we encourage our school boards and administrators to examine these options (Bright, 2023).

The primary security issues include, kidnappings, one of the most alarming trends is the kidnapping of students for ransom. High-profile incidents, such as the Chibok girls' abduction in 2014 and the Dapchi girls' kidnapping in 2018, brought global attention to this issue, these incidents have continued, with several schools targeted by armed groups who abduct students and demand large ransoms. Boko Haram and Other Terrorist Groups, Boko Haram, along with its splinter group ISWAP (Islamic State West Africa Province), has been particularly active in the northeastern region of Nigeria. These groups target schools as part of their broader insurgency, attacking students and teachers, and sometimes destroying school property. Banditry, in the northwest and central regions, armed bandit groups have increasingly targeted schools. These groups often operate with impunity, conducting mass abductions and extortion. Ede (2020) stated that many schools lack adequate security infrastructure. This includes poor fencing, lack of surveillance systems, and insufficient security personnel. The preparedness and ability of local law enforcement to respond to attacks are also limited. Psychological impact, the constant threat of violence has a profound psychological impact on students, teachers, and parents. This affects attendance rates, with many parents withdrawing their children from schools perceived as unsafe. Government Response, the Nigerian government has made efforts to enhance school security, such as the Safe Schools Initiative launched in 2014. However, implementation has been inconsistent, and many schools remain vulnerable.

Some state governments have temporarily closed schools in response to security threats. Community and international involvement, local communities, NGOs, and international organizations have been involved in efforts to improve security. This includes providing resources for security infrastructure, training for staff, and advocacy for stronger governmental action. Addressing school security in Nigeria requires a multifaceted approach, including enhancing physical security measures, improving law enforcement capabilities, addressing root causes of violence, and ensuring adequate psychological support for affected individuals (Adie, 2024).

Conceptual review

Security

The concept of security defies a single definition as it encompasses many aspects of life such as social, physical, spiritual and psychological. In other words, security as a concept admits a lot of interpretations and relates to a number of other concepts e.g. national, International, personal/human. According to Collins English Dictionary, security refers to all the measures that are taken to protect a



place or to ensure that only people with permission enter it or leave it. To Tadjbakhish (2015) human security deals with the capacity to identify threat, to avoid them when possible and mitigate their effects when they occur. As stated by Wikipedia, it is freedom from or resilience against potential harm from external forces. Indeed, the beneficiaries of security may be persons, social groups, objects and institutions, ecosystems and any other entity or phenomenon, vulnerable to unwanted change in its environment, the source* maintained. This means that security is as important as its management in the school recognizing the fact that most Universities have turned into jungle and terror ground due to incessant cult activities and other related security threats. However, before we consider the importance of security management in the University, let us look at its meaning.

School security architecture

Adie (2024) opined that School security architecture refers to the comprehensive framework designed to ensure the safety and security of a school's students, staff, and property. It encompasses physical, technological, and procedural measures that work together to prevent, detect, and respond to various security threats. Key components of school security architecture typically include, Physical Security, this includes barriers such as fences, gates, secure entry points, surveillance cameras, and alarm systems. It also involves the design and layout of the school buildings to control access and enhance visibility. Technological Security, utilizes tools like access control systems, electronic visitor management systems, emergency communication systems, and cyber-security measures to protect digital information and infrastructure.

Procedural security, this involves policies and protocols for handling emergencies, such as lockdown procedures, evacuation plans, and drills. It also includes staff training on recognizing and responding to security threats. Behavioral security, this focuses on creating a culture of awareness and vigilance among students and staff. This includes programs for bullying prevention, mental health support, and conflict resolution. Coordination with law enforcement, establishing relationships and communication channels with local law enforcement and emergency services to ensure a rapid response in case of an incident. Emergency preparedness and response, developing and regularly updating emergency plans, conducting regular drills, and having clear communication strategies in place. By integrating these elements, school security architecture aims to create a safe and secure learning environment that minimizes risks and prepares the school community to effectively handle potential security incidents.

Digitalization of school security

Digitalization of school security refers to the integration of digital technologies and systems to enhance the safety and security of educational environments. This process involves leveraging various technological tools to monitor, manage, and respond to potential security threats more effectively. Key components of digitalized school security may include:

Surveillance Systems, the use of high-definition cameras, video analytics, and facial recognition software to monitor school premises and identify unauthorized individuals or suspicious activities. Access control, digital systems such as electronic locks, keycards, biometric scanners, and mobile access solutions that regulate and monitor who enters and exits the school buildings. Emergency communication, implementation of digital communication platforms that provide instant notifications and alerts to staff, students, and emergency responders during a crisis.

Cybersecurity measures, protection of the school's digital infrastructure, including networks, databases, and communication systems, from cyber threats like hacking, phishing, and data breaches. Incident management Systems, software that helps in documenting, tracking, and responding to security incidents, ensuring a coordinated and efficient response. Data analytics, utilizing data collected from various security systems to analyze patterns, predict potential threats, and improve overall security strategies. IoT devices, internet of things (IoT) devices, such as smart sensors and alarms, that provide real-time monitoring and alerts for various safety concerns, like fire or unauthorized access. The goal



of digitalizing school security is to create a safer learning environment by leveraging advanced technology to prevent, detect, and respond to potential security threats more effectively and efficiently (Akpam,2023).

According to Agba (2020) the rise of digitalization has significantly impacted security measures in our schools, both positively and negatively.

Positive Impacts of digitalization of school security

Enhanced Surveillance and Monitoring

Closed – Circuit Television (CCTV) Systems, advanced digital CCTV systems provide high-definition footage, remote access, and real-time monitoring, allowing for better surveillance of school premises.

Access Control Systems, digital access control systems, such as smart cards and biometric readers, ensure that only authorized individuals can enter certain areas, enhancing physical security.

Emergency Response and Communication

Mass Notification Systems, digital tools enable rapid communication with students, staff, and parents in emergencies through SMS, email, and mobile apps.

Real-Time Alerts, schools can quickly disseminate information about potential threats or emergencies, improving response times and coordination with law enforcement.

Cybersecurity Measures

Firewalls and Anti-Virus Software, Schools implement robust cybersecurity measures to protect sensitive information from cyber threats.

Training and Awareness: Regular training for staff and students on cybersecurity best practices helps mitigate risks related to phishing, malware, and other cyber attacks.

Negative Impacts of digitalization of school security

Cyber Threats

Data breaches, the increased use of digital systems for storing personal and academic data makes schools targets for cybercriminals seeking to steal sensitive information.

Privacy Concerns

Surveillance overreach, enhanced surveillance systems can raise concerns about student and staff privacy, particularly if monitoring extends beyond what is necessary for safety.

Data handling, the collection and storage of personal data necessitate stringent data protection measures to prevent misuse or unauthorized access.

Dependency on Technology

System failures, reliance on digital systems means that technical failures or cyber attacks can paralyze school operations, from security to daily educational activities.

Resource allocation, implementing and maintaining advanced digital security systems require significant financial and human resources, which may strain school budgets. The rise of digitalization has undoubtedly transformed security measures in schools, offering more sophisticated tools for protecting students and staff. However, it also brings new challenges, particularly in the realm of cybersecurity and privacy. Balancing technological advancements with adequate safeguards and ethical considerations is crucial for ensuring a secure and supportive educational environment (Odu, 2019).

Current security practices in Nigeria schools

There are various strategies to ensure security of schools assets. Physical security measures which consist of a broad spectrum of methods can deter potential intruders from having access to organization's environment. In other words, it protects the assets of an organization against theft, vandalism, natural disaster, sabotage and other malicious acts. Agba (2020) enumerated some physical security practices taken against potential threats in an establishment. They include: 1. Fence Walls, with razor wires that poses boldly harm to intruders, 2. Locks; that allow only persons with a key: 3. Protective barriers to detect force entry 4. Security lighting that renders visibility for guards that add



human intelligence to other physical security measures. 5. Sensors that record track, detector for firefighting etc

The above facts collaborate, with Juvonen (2021) that Administrators should implement programmes designed to curb school violence such as physical surveillance including weapon deterrence and presence of security guard in the campus. Schools all over the world faces handful of security challenges hence Nigerian schools are not an exception. The changing security of its environment places legitimate demand on their administrators to adopt flexible security measures to help reduce incidence of insecurity in the school. Sequel to the above facts, the question to address here is therefore, what are some of the practices school management team do or avoid, to secure school assets for improved school administration?

Stanley, Ezenwagu and Benignus (2020) posited that a school administrator's job involves both management and leadership, but the latter is more important than the former. An administrator does not successfully run the school primarily by crunching the numbers, redrawing organizational charts or applying the latest business school concepts and techniques. The key function of school administrator is to lead the school (Bain, 2014) to harness the social forces within it, to shape and guide its values, to build a management team, and to inspire it and others working in the university to take initiatives around a shared vision and a strategy to implement it. In short, a school administrator should be an enabler rather than a controller. In the same vein, Udeorah (2016) and Ojukwu (2020) viewd that school administrators in order to avert insecurity in the school for smooth running of the system should put in place among others the following security measures;

i. Deployment of highly intelligent retired security officers; they serve as Chief Security Officers. As Udeorah (2016) reasoned, Chief Security Officers must be knowledgeable in student's psychology to function properly. With their crop of experience in the course of service to the nation, they can effectively detect crime and handle it well. Influencing the establishment of police post near, the school. This will ensure intervention when and where ever there is a crisis or riot in the school to avoid its escalation and extended damage. ii. Establishment of volunteered students security/Man O' War in the campus and ensure they work in synergy with school security employees and government security agencies in what is referred to as security linkages. With this they ensure joint patrol for crime detection and prevention. This approach agrees with Ojukwu (2020) that the combating of secret cult requires collective efforts of all stakeholders to ensure that it is minimized or eradicated. iii. Punishment of crime peddlers in the school system. According to Atim (2016), Rules, schools policies and regulations that directly target violence are enforce in schools across the nation and a single violation results to violence. Any student suspected and arrested for cultism, stands suspended until the person gets clearance from the police and State Security Services. All suspected cultists and their associates are barred from participating in all categories of Students Union Elections. Any student arrested and confirmed to be a cultist should be summarily dismissed.

These agree with Juvonen (2021) emphasis that school should design security policy to punish those that perpetrate violence in school. Security policies are the top tier of formalized security documents. These high-level documents offer a general statement about the organization's assets and what level of protection they should have. Well-written policies should spell out who's responsible for security, what needs to be protected, and what is an acceptable level of risk. They are much like a strategic plan because they outline what should be done but don't specifically dictate how to accomplish the stated goals. Juvonen (2021) further emphasis the following design policy to punish those that execute violence in school. Establishment of Check Point: It is a common practice among Vice Chancellors to establish check points usually at the University main entrance and exit gates. With the aid of detector, visitors are checked to detect possession of dangerous weapon (<http://www.mu.edu.ng>). Unfortunately, students and staff even visitors on foot are not usually checked for similar purpose. Issuance of Identification Cards to Staff and Students This is highly endorsed as security threats to campuses are either from internal or external source. With this, those with no genuine business with the school can be sported out and treated accordingly. In addition to this, comprehensive data base of



members of the school community should be accessible to the security agencies for easy monitoring and locating of staff and students. This will help to identify and arrest easily crime peddlers in the school when there is crime in the school. Organization of regular orientation and reorientation programmes for staff and students.

First year students are usually given some days orientation to acquaint them with the approved culture of the school. Also, Students' Week is observed by the school management. During such occasion, some school administrators organize seminars through the Dean of Student Affairs during which moments; some security related issues will be communicated to the students in the interest of all. And for the staff, some are given opportunities to attend school sponsored workshops on security and other related issue to ensure the growth and development of the school. However, the staff does not benefit at large in this case and this is a problem, the school Management must device means of solving. The issue of proper orientation borders on the need for effective communication between management, staff and students. This is mainly because misinformation is a tool of recruitment drive for cult membership especially among students; it also leads to campus unrest such as staff/students riots to the safety concerns of the staff and students; some vice chancellors are proactive in communicating their employers, the constitutional demands of staff and students in the school and reporting back to them through appropriate channels-Heads of departments, Deans, Congregations meeting etc. This is necessary to avoid communication gap that may distort social harmony in the school. There are other security management practices employed by the school management such as, installation of close circuit Television view at strategic places to monitor people for onward actions, ensuring cordial relationship between school host communities and the school through awarding of honours and showing sense of recognition to some personalities in their host communities during convocation and matriculation ceremonies of the school.

Challenges of implementing digital security in schools

William (2022) asserted that implementing digital security in schools comes with several challenges, including: Budget constraints, schools often operate with limited financial resources, making it difficult to invest in advanced digital security technologies and the necessary infrastructure. Lack of expertise, many schools lack staff with specialized knowledge in cybersecurity, making it challenging to implement and maintain robust digital security measures. Keeping up with evolving threats, cyber threats constantly evolve, and schools may struggle to stay updated with the latest security measures and vulnerabilities. Balancing accessibility and security, ensuring that digital resources are accessible to students and staff while maintaining security can be a complex balancing act. Training and awareness, teachers, students, and staff may not be adequately trained on cybersecurity best practices, leading to vulnerabilities such as weak passwords or falling for phishing scams.

Data privacy concerns, schools collect and store a significant amount of sensitive data, including personal information of students and staff. Ensuring the privacy and security of this data is a critical challenge. Integration with existing systems, implementing new security measures often requires integrating with existing systems, which can be technically challenging and time-consuming. Compliance with regulations, schools must comply with various laws and regulations regarding data protection and privacy, which can be complex and require significant administrative effort. Physical security of devices, protecting digital devices from physical theft or damage is another layer of security that schools need to manage. Incident response and recovery, developing and maintaining effective incident response and recovery plans can be difficult, especially for schools with limited resources.

Lack of training and education, most of the security personnel are either not trained or ill trained. They lack necessary security skills and intelligence to ensure effective security management. The management team perhaps, has no option in deploying such caliber of people to serve their security need given the decried shortage of fund in their disposition. This approach is more dangerous than it is costly Bachmann, (2017) the attendant problem of poor training and education of the security personnel is poor security consciousness among the larger members of the school community. Staff and students



education on security issues is vital because to avert danger in the campuses, requires collective efforts, however, such efforts can be pulled together if people are well informed about the situation in the campuses. Those eschewed from sound and adequate pieces of information on an issue are threat to peace and order in the community. They are likely to act contrary to approved guidelines or not to act at all and constitute problem to conformity. On this note, school population should be exposed to security training and education through workshops, seminars and regular orientation programmes to be active in campus security management. Stressing on the need for training in security management, Pearson (2019) asserted that the best security policies are ineffectual if users do not understand their roles and responsibilities. Training, he concluded is the only way for users to understand their responsibilities.

Recommendations

Addressing these challenges requires a comprehensive approach, including securing adequate funding, investing in staff training, continuously updating security measures, and fostering a culture of cybersecurity awareness. Government should make policies that support digitalization in school security, there should be step-by- step guide for schools to implement digital security measures and training and capacity building programs for staff and students

Conclusion

Security is a fundamental and necessary condition for the attainment of institutional goals and must not be compromised. To ignore the need for security management in our schools, will terribly cripple meaningful activities of the institution. Security architecture at anywhere and all time requires continuous efforts and at no point of time it can be deemed perfect. There may be chances of unpredicted events that pose as security threats, taking place within the school system. Therefore, school administrators' continued development and utilization of more appropriate and adequate security mechanisms is very central to ensure drastic risks reduction within the school system. However, a balance security approach rooted in collaborative energies among efficient education stakeholders who see the Institution as incubator of quality citizens is lacking. This makes the realization of an environment, characterized by high degree of violence reduction where quality teaching and learning and Research flow uninterrupted, a difficult task.

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