# Disaster Management Preparedness in the Education Sector in Kenya – A Case of the COVID-19 Pandemic.

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## Abstract

This study examined the disaster management preparedness in the education sector in Kenya, with a focus on the COVID-19 pandemic period. The study adopted destktop literature review for data collection. The collected data pertains e-learning in Kenya and in other countries during the time of the novel coronavirus pandemic. Notably, the education sector, like in many other countries, seeks to actualise the Millennium Development Goals (MDGs) in line with the United Nations and the Education for All (EFA) movement lead by UNESCO (MacEwen, et al., 2011). Examples of these events are; accidents such as the one evident in Kakamega Primary School where the school closed for about two weeks (Daily Nation, 2020), attack by militia groups as was the case of Garissa University in 2015, intercommunity wars that lead to displacements, famine, and fires. These disasters and events, whenever they strike, have led to the closure of affected institutions of learning to pave the way for interventions. Garissa University is a leading example since it had to close for about nine months in 2015-2016 (BBC, 2016). In Kenya, disasters and other events disrupt the progress towards achieving MDGs and EFA time to time, and that was the inspiration for this study. The study concludes that disasters like nature patterns, militia groups, electricity faults, and those instigated by learners can derail learning in education and cause loss of lives. As such, online learning comes in handy to lessen such disasters. The possibility of such learning model has been tested and proved during COVID-19 pandemic and it has been successful in many institutions of higher learning and middle level colleges.

**Key terms:** Disaster Management, Preparedness, Education Sector, COVID-19 Pandemic

## 1.0 INTRODUCTION

Kenya's education sector is managed by the Ministry of Education (MOE) and comprises of basic and higher education. The basic education encompasses Early Childhood Education (ECDE), the primary schools and the secondary schools, while the higher education includes the colleges and universities. Likewise, the Kenya Institute of Special Needs Education (KISE) deals with special needs education. The Ministry of Education (MOE), when trying to counter the disasters, has always portrayed lack of preparedness since affected schools are fast temporarily closed, Kenyans suffering losses of lives and destruction of property worth millions. Attacks by militia and accidents cause insecurity amongst victims, making teachers shun the affected counties, further disrupting learning. Lamu, Tana River, and Garissa counties are lead examples in Kenya (Alfano, & Görlach, 2019).

To counter disaster, the MOE has always collaborated with other ministries such as the ministry for interior and that of defense, when it is already late, and the impact devastating. The effect of a disaster in the educational institutions and the closure of affected institutions has always frustrated the stakeholders in the education process. The trade unions such as KUPPET and KNUT have though stepped in, their problem being encouraging victims to transfer to secure counties, for instance, the case of Northern Kenya, further hampering attainment of the educational objective. The COVID-19 pandemic has proved to be the main disaster of all times globally. It is the causation for the indefinite closure of schools nationally since the week March 16th - 20th, 2020.

This has severely disrupted learning. The MOE announced the continuation of teaching and learning using online platforms on computers and smartphones in addition to technology-mediated learning on mobile applications, televisions, and radios weeks after the national closure of schools. The parents and guardians were mandated to facilitate the learning through collaboration with the MOE and other stakeholders to provide learners with digital equipment. They were to further provide an enabling environment at home for the learners. The implementation of this directive started immediately. Instructors teach on televisions and radios (KBC radio and TV).

Channels like Akili Kids and Edu began to air, and mobile applications with learning content were placed in android or windows App-stores. This, however, lacked a plan for inclusivity in learning, since marginalized groups have been left unattended. No single program is catering to special education. The ones for regular learning should have sign language interpreters at least to aid the deaf. Besides, there are few programs of learning, which to date are undergoing development or refining (Al-Samarrai, et al., 2020). Further, there seems to be no direction in learning platforms and programs. Assessment is just self and not guided, unless future developments slot it in the programs. Stakeholders, especially learners and teachers in their feedback cite the insufficiency of curriculum digital content and flaws in the delivery of content.

Challenges reported so far by stakeholders in the Kenyan Education System prove the MOE's lack of preparedness. The decision to offer online learning was hurried, therefore characterized by numerous challenges. These challenges, according to Al-Samarrai et al. (2020), include inconsistency in syllabus coverage, minimal supervision by teachers, limited access by learners, the disparity in content offered from program to program, and lack of learner assessment at the basic education and even in higher education. These online platforms are new to parents and teachers; hence, guidance and support to learners are minimal. Further, the marginalization of minority groups speaks a lot. To date, the minority groups access to education using the

COVID-19 period alternatives has not been addressed, yet the constitution of Kenya, 2010, article 53 (1) provides for inclusivity in the education system, meaning it is a prerogative for all Kenyans to access education.

Globally, there has been an emphasis on digitizing learning to ensure learning fulfils the goal of MDGs and EFA (Akcil, et al., 2017). Governments should equip schools with technological tools and secure infrastructure, create awareness, train tutors on handling and using the technological tools and infrastructure, develop and technologically present to learners curriculum content and activities that are in line with the syllabus, and finally create an enabling environment for e-learning. The MOE and school heads have had all the time to implement e-learning learning, but it is evident little or nothing has been done in Kenya in the basic education. Schools have been caught off-guard as most tutors lack the knowledge in using e-learning tools for teaching, many schools in the rural areas lack electricity connection.

In addition, most primary and secondary schools in rural areas have not been supplied with computers and other equipment to support digital technology and learning, and finally, digital content developed so far by KICD is insufficient to support distance learning (Akcil, et al., 2017). Institutions of higher learning so far have very few online modules. Technology in the education sector happens to be just data capture and management tool as Learning Management Software in platforms like NEMIS and campus websites. These impediments, among others, have rendered learning institutions incapable of providing inclusive education in Kenya in this COVID-19 period. Learning has not continued as was expected by stakeholders in education.

## 2.0 LITERATURE REVIEW
### E-learning in the COVID-19 Period
The COVID-19 period is globally characterized by closure of all social institutions where people congregate, to curb the spread of the coronavirus. Learning institutions in Kenya were indefinitely closed in the second week of March. The MOE announced teaching and learning would be technologically mediated on the television and radio programs, in addition to online platforms. Further, the heads of institutions were tasked to innovatively come up with online platforms to foster learning. Heads of institutions creatively adopted online platforms such as zoom, Microsoft word teams, WhatsApp groups, google classrooms, websites, among other innovations. The media was mandated with creating awareness and slotting education programs in their program lists. These initiatives and developments by the MOE have all been implemented; therefore, e-learning is being conducted, though not in a structured manner. However, only about 25% of the 17 million Kenyan learners are participating and benefiting from this mode of teaching and learning (Al-Samarrai, et al., 2020). The MOE's goal is, therefore, at stake. What are the contributing factors to the low participation of learners in the technologically mediated teaching and learning mode?

Firstly, according to the ministry of energy 2019 report, about 25% of the Kenyan population is not connected to electricity. This means that the learners in these areas cannot use technological devices since digital devices are powered by electricity. They also lack other sources of energy including solar power among others. Further, the government has not installed electricity in some public and secondary schools in semi-urban areas. There are learning institutions in Kenya, especially in the remote counties, such as Turkana, Samburu, West Pokot, Northern Kenya, that do not even have standard structures for classrooms and offices. Consequently,

these learning institutions cannot procure or use e-learning devices for the learning process because they do not have anywhere to store them. In some remote counties, power fluctuation is rampant, disrupting performance of the gargets used in e-learning in a continuous and consistent manner. Secondly, about 40% of the Kenyan population lives below the poverty line (below US$1.90 per day PPP) (Mariara, & Kiriti, 2020).

These Kenyans cannot, therefore, manage the cost of electricity for their children to benefit from the technologically mediated teaching and learning. Their children, especially the families in remote, rural areas that are hunger-stricken, are even motivated by the school feeding programs to attend school. This means affording digital devices to learn, purchasing the internet to access online teaching and learning programs, and concentrating on learning is out of reach to these Kenyans. Thirdly, tariffs are not affordable, the internet service tariffs, power tariffs, and digital boxes bouquet tariffs (Ndung'u, 2019). Therefore, most children are unable to access the ministry's technologically mediated learning. Fourthly, the barrier is inevitable.

The content is aired in English, and most learners, especially in primary schools, are unable to comprehend. Areas with poor network coverage have signals or frequencies fluctuating. Audio, visual, or audio-visual content is therefore unclear and not eloquent; these factors contribute to the communication barrier. Pace also is a barrier. The way content is delivered does not favour slow learners. Factors that reinforce learning also are missing, hindering learning using media and technology. Fifthly, the COVID-19 closure coincided with Kenya's planting season. Parents took advantage of the situation, using their children on farms, or encouraging them to seek casual labour. The learners are thus too occupied to sit and learn. Finally, Kenyan learners are used to tutor-learner interaction in the learning process. In the technologically mediated learning, their teachers are not there to address their individual needs. The learners, therefore, lack interest and motivation. Teachers are mainly locked out, as most teachers are not technologically empowered.

**Kenya's E-learning compared with E-learning in Developed Countries**
In the 19th century and a more significant part of the 20th century, technology was used to facilitate and assess learning in the military institutions and some institutions of higher education using mailing or postage (McCarty, 2019). The discovery of the World Wide Web and the internet has intensified open learning in the 21st century (fig. 1), enabled by Open Education Resources (OER) and Massive Open Online Courses (MOOCs).
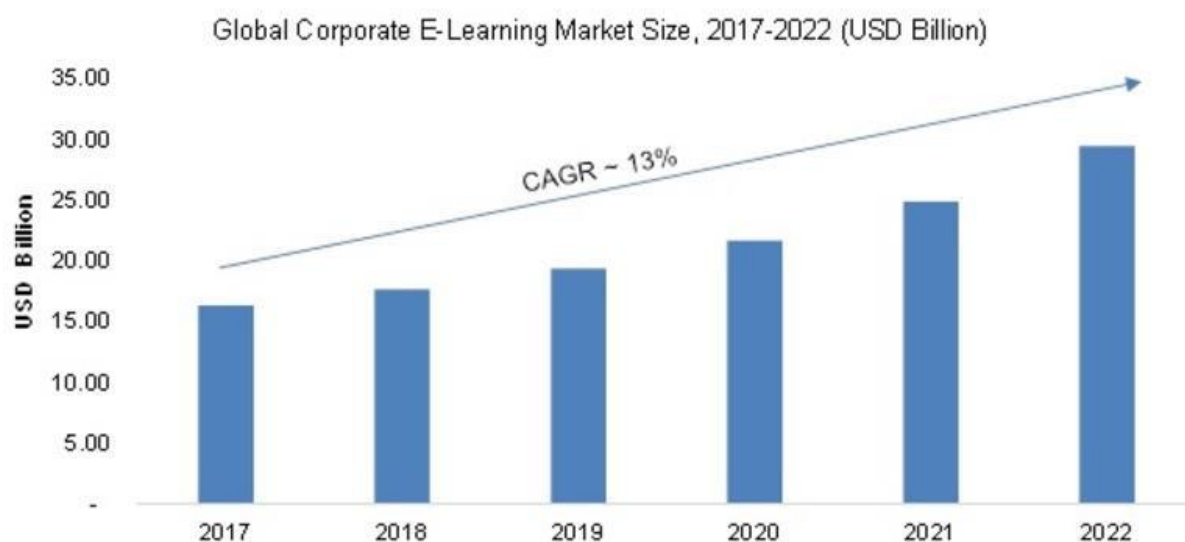


Global Corporate E-Learning Market Size, 2017-2022 (USD Billion)

**Figure 1. Global Growth in e-learning (McCarty, 2019)**

Synchronous learning (Direct-Broadcast Satellite DBS) takes place in the first world countries through telerobotics, videoconferencing, Web conferencing, Educational Television, and Instructional Television in the developed countries (Brown, et al., 2007). The tutors and learners share an interactive platform, all gathered remotely at the same time, powered by communication technologies such as 5Gs. There is a direct exchange between the learners and tutors in the learning activities. Kenya's e-learning is generally asynchronous through audio recordings, e-mail, print materials, fax, and gamification, among others.

In asynchronous e-learning, the learning process is not interactive. Learning materials are developed, prepared, and printed or released in online platforms such as websites and accessed as a softcopy. The digital content is also distributed in the form of digital course-parks on drives or compact disks. Technological platforms such as Moodle, Sakai, Design2Learn, Blackboard, Canvas, EdTech, etc. provide support for creating webpages and plug-ins where learning content is uploaded. They support textual, graphical, audio, visual, and audio-visual content offering unlimited cloud storage. Learners create user accounts in the platforms, log in the accounts, and read the materials online or download it to use it offline. Content is offered either free or charged. E-learning in Africa's giant countries is implemented in institutions of higher learning that offer degrees, masters, and PHD programs. South Africa is Africa's lead country in e-learning, recording about a quarter of total Africa e-learning statistics (Newman, et al., 2019). Other countries that follow are Morocco, Nigeria, Tunisia, and Kenya (fig. 2).
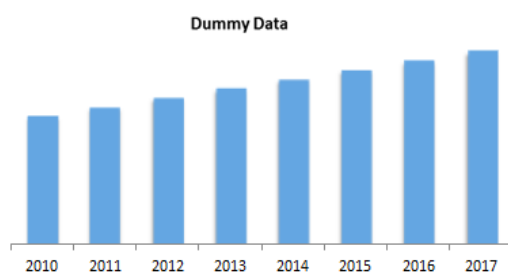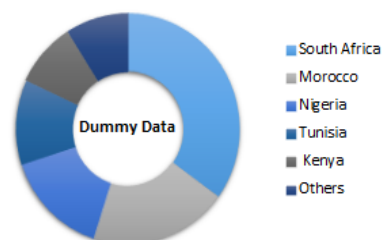


**Figure 2. E-learning in Africa (Newman, et al., 2019)**

Asynchronous e-learning is the norm in Africa, following a challenge by poor network and inability to afford by most Africans. EBooks are created and facilitated online. South Africa has reported success in e-learning, especially in institutions of higher learning, where the Learning Management Software (LMS) is incorporated with the social media networks through Social Software Web 2.0 to create a collaborative environment for learning (Al-Samarraie, et al., 2018). In South Africa's universities, technology is used for virtual learning, mainly to perform learning activities that include content delivery, learner assessment, and data management. Enrolment in e-learning is in hundreds of thousands, and active participation of learners and tutors in discussion using technologically-mediated learning mode is higher.

Further, South Africa uses the EdTech, Sakai, Blackboard, Canvas, and Moodle technological platforms interchangeably across its universities and colleges, though EdTech has bigger popularity (Bagarukayo, & Kalema, 2015). Bagarukayo and Kalema (2015) note that South Africa is struggling at infancy to use e-learning in basic education. In Kenya, leading online basic education platforms include Chuoni, Eneza education, Kusoma, Zydii, Moringa School, Mymlango, Imlango, e-limu, eshule, kytabu, ekitabu, usomi, and swapkitabu. These platforms are mainly in the institutions of basic education, which is at the infancy stage (Makokha, & Mutisya, 2016). Makokha, and Mutisya (2016) notes that universities in Kenya lack Senate-approved guidelines and policies on Open Learning. Only about 10% of courses are offered online and are not interactive, with 87 per cent of uploaded modules consisting of plain lecture notes only. Therefore, unlike Nigeria, South Africa, and Morocco, both higher learning and basic education are at the infancy stage of e-learning in Kenya. Kenya's MOE manages data and reports using media platforms such as the National Education Management System (NEMIS), just like her fellow African countries.

The United States, Europe, and Asia are the global technological lead regions, with e-learning as mainstream (Palvia, et al., 2018). Palvia et al. (2018) further note the government policies and reinforcements actualise digitised learning in these regions. Such reinforcements include federal legislation, reduction in physical classrooms and offices, massive investment in e-learning programs, development and procurement of requisite infrastructure, development of appropriate learning content among others. The US leads with 75 per cent in synchronous e-learning both in institutions of basic and higher learning (Palvia, et al., 2018). Gamification is rampant as it brings fun in learning. MOOC is the US major e-learning platform, with e-learning being interactive. Other e-learning platforms include Blackboard, Adobe, D2L, Pearson, and McGraw-Hill Education. Sophisticated technological and internet infrastructure, federal policies, reinforcement of e-learning, citizens' perceptions and attitudes, functionality and flexibility of e-learning foster e-learning in the US.

## 3.0 RESULTS
**How Kenyan Learning Institutions can be Better Prepared**
Kenya's schools and learning institutions can be prepared better for uneventualities like the COVID-19 pandemic through the following interventions:

*(i)    Acquisition of E-learning Infrastructure that Ensures Inclusivity*
In e-learning, technological devices are used together with Information and Communication Technology (ICT) to perform activities of teaching and learning (Bates, & Bates, 2005). ICTs for use in 21st-century e-learning include laptops, projectors, Visual Display Units (VDU), tablets, desktop computers, smartphones, digitalizes, smart boards, digital cameras, and a range of databanks and back-up drives. The Learning Management Software (LMS) and the Social Networking Software power the hardware. The impact of e-learning cannot be ignored anymore, especially with 21st-century learners who are ICT cautious and dependent (Tunmibi, et al., 2015). The MOE should procure technological devices and up-to-date software appropriate for e-learning. They should be adequately distributed in schools. In addition, learning institutions should be empowered on safety and protected from risks that discourage heads of institutions from acquiring ICTs. Such risks include theft of the

devices, exposure of institutional data to wrong targets, and loss of data and data back-ups. Further, electricity should be availed reliably.

The software Infrastructure and protocols such as online and web platforms that harbour learning functionalities learning content and links to the educational stakeholders require proper planning. Through collaboration with ICT sectors locally and internationally, platforms such as Chuoni, Eneza education, Kusoma, Zydii, Moringa School, Mymlango, Imlango, e-limu, eshule, kytabu, ekitabu, usomi, and swapkitabu are already existing and operational in Kenya. However, very few stakeholders have knowledge about them; therefore, awareness is important. Further, the ministry should settle on one or two, the utmost three to be used so that confusion is avoided. A standard interface should be created to lighten the burden of training stakeholders. Multiple learning systems in a single institution cause monitoring problems. Institutions should use single learning platforms for everyone in order to reduce multiple learning and difficulties of multiplicity of such that require learners to keep abreast with many platforms.

Important also about the technological infrastructure is making the e-learning ICTs affordable and within reach by Kenyans of all walks. This will be actualized when the MOE collaborates with the government so that e-learning facilities are made cheaper or subsidized (Wanga, et al., 2012). The government should equally facilitate internet penetration and lower internet and electricity tariffs. Schools have hefty budgets that discourage them in sourcing reliable and affordable internet service providers. Most internet service providers are exploitative; the government distancing being to blame. It is worth noting that many institutions receive no tuition or subsidy for paying their staff. This brings the problem of affordability. In an emergency, all learners should equally benefit is the cost of learning, either in government or private institution because they are all taxpayers.

### (ii)  *Development of Adequate Suitable Content*
The various arms or stakeholders of the MOE should harmonize e-learning content so that it aligns with the syllabi. Tutors have cited numerous gaps and unreliability in the existing e-learning content; for example the different institutions is left on itself to manage the content, which brings variability in a standardized curriculum, especially in basic education. They should be brought on board to advice about the e-learning content. E-learning content should meet basic qualities namely; use of inclusive language, allow user-friendly and easy navigation, enable personalization, provide opportunities for self-reflection, respond to needs that are individual, include scenarios which are real-life, relevant, relatable (3Rs), and finally, it should allow connection by multi-sensory interaction. The MOE should control or discourage private e-learning content developers who jeopardize e-learning content authenticity, appropriateness, and reliability especially in areas where students take national examinations and content is standardised. Where the curriculum is not standardized like in tertiary education, the quality assurance departments should monitor the credibility of the content. E-learning content developers should ensure inclusivity. Minority groups are always left out or serviced with insufficient e-learning content.

To further enhance asynchronous e-learning, the e-learning content should be provided with removable media in softcopy. Stable and reliable hard drives like CDs, DVDs, hard disks, and flash disks, should be loaded with digital content and made available to local markets. They should be affordable and protected from common risks that face digital devices.

### (iii) Education Management Using Technology

NEMIS is the MOE's web-based platform for managing learning. Apart from collecting data, processing it, and reporting to stakeholders, NEMIS's core business should be online registration of all learners for easy management, access, monitoring, accountability, and proper planning. The Teacher performance and appraisal development tool (TPAD), on the other hand, is used to monitor teacher performance. NEMIS and Tpad should be made more effective to discourage manual operations in the MOE and schools to foster e-learning and application of ICT skills and facilities in schools and within the ministry. Learning institutions should be encouraged to technologically provide crucial institutional operations so that learners, tutors, and parents can see the need for ICT skills. Examination bodies should be facilitated too to operate technologically in the administration and marking of examinations. This is the best practice in mitigating for situations like COVID19 in ensuring continuity of learning in such extraneous circumstances.

### (iv) Mainstreaming E-classes

The MOE here requires real collaboration with stakeholders' right from ECDE, basic education, higher learning, and special needs education in order to provide equitable learning for all cadres of learners. This will be the only strategy to actualize e-learning mainstreaming. E-classes should start with learner and tutor training on digital literacy and the 21st-century core skills (Griffin, & Care, 2014). The collaboration will involve the empowerment of stakeholders, building requisite e-learning infrastructure, development of content that is inclusive and motivating. Every learning facility should establish a digital literacy class that is effective, and the Ministry of Education and other equation regulators should examine digital literacy in the national examination.

### (v) Government Involvement

Nations such as India that have catapulted in e-learning attribute their success to government involvement in e-learning (Palvia, et al., 2018). The government's role is investment in e-learning, policing on e-learning, and enforcement of e-learning initiatives (Palvia, et al., 2018). Initiatives that made India scale heights in e-learning are the Digital India and Skill India that saw digital literacy spread in India like bush fire. Further, the Indian government invested and guided in the development of e-learning platforms such as the MOOC, SWAYAMS, NandGhars, etc.

Similarly, the government of Kenya should actively involve itself to actualize e-learning. The government should foster growth in ICTs and Internet penetration, lowering the cost of open learning and internet tariffs, develop and enforce enabling digital-friendly policies, and raise the demand for furthering education by the working class. E-learning centres should be opened in all institutions of learning. Educational operations should be done online, and all learners and stakeholders are registered and managed using technology. When management goes technological, all the stakeholders will be forced to acquire and apply ICT skills. Vicariously, the government will be enforcing the use of ICT skills and e-learning.

The government's law enforcers should also be mandated to put more effort into enforcing cyber security. Further, enactment should spell out more guidelines on prosecuting cybercrimes. Websites should be regulated

to filter and prohibit erotic contents. Government operations should be digitized, too, so that ICT application is realized. Furthermore, all learners should be registered on both face to face and e-learning platforms to ensure smooth symbiosity of the two tier learning.

### (vi) Tutors' Empowerment through Education

Most teachers in Kenya are resistant to change from their traditional teaching methodologies for fear of the unknown, among other factors (Fryer, & Bovee, 2016). According to Fryer and Bovee (2016), teacher support is vital to the motivation of learners to actively and appropriately participate and benefit from e-learning. Besides, learners ought to be guided through because of exposure to online risks. Technological tools for use in e-learning advance every day. Most of the technological devices are always new, and using them requires learning first how to handle and feed with content. Because of differences in background and exposure, there are learners who come to school better equipped with the knowledge of the technological devices than their tutors. Once the tutors feel threatened for lack of knowledge about theses technological tools, which students already know, they feel resistant. First, tutors should be encouraged to acquire the devices to enhance their interaction with them. Second, they should be trained in handling the technological tools, their safety, manipulating, and feeding them with appropriate learning content. Third, benchmarking is essential for teachers to learn best practices and improved teaching methodologies. This should be a norm by the ministry of education to ensure that the tutors are always abreast of e-learning trends. It is therefore imperative that teacher training at all levels need to enhance the e-learning technology for seamless fitting in the education careers.

## 4.0 CONCLUSION AND RECOMMENDATIONS

**Conclusion:** Disasters in the Kenyan education sector disrupt learning, cause destruction of property and loss of lives. Nature patterns, militia groups, electricity faults, and learners themselves are the chief causes of the disasters. The MOE should strategically organise and manage responsibilities and resources to ensure preparedness to respond to and recover from emergencies to mitigate the impact of a disaster. Though disease outbreak in the past have distantly affected teaching and learning and attracted milled attention, the COVID-19 situation has proved that all stakeholders in the education sector should factor in an action plan for diseases.
**Recommendation:** The study recommended that strategies such as e-learning can help stupendously to carry on learning even in the event of a disaster. A 21st-century trend uses ICTs and ICT skills to provide teaching and learning activities. It requires real collaboration amongst stakeholders. Besides, planning and investment are crucial. The government through policing, financing, and law enforcement must adequately support the MOE. The Ministry of Education should have an established disaster prepared departments at the national and county levels.

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