

TECHNOLOGY, EDUCATION AND INNOVATION IN AFRICA: NEED FOR REVOLUTIONARY TRANSFORMATION

Abel Adeleke, PhD

Department of Music Technology,

The Polytechnic, Ibadan

abeladeleke@yahoo.com

olufunkeadeniyi83@gmail.com

O. T. Adeniyi

Department of Music Technology,

The Polytechnic, Ibadan

abeladeleke@yahoo.com

olufunkeadeniyi83@gmail.com

Abstract

One of the disparaging problems of the music industry in Africa is the poor economic environment of the artistes and musicians. An average performer is artistically illustrious but economically below average. Undoubtedly, the ripple effects of this are observable in low creative acumen, professional incompetence and unwarranted social struggles. Consequent upon which artistes' social images are battered, portraying them as customized underdogs, irresponsible dropouts and wild personalities. As such, most artistes and musicians have not been able to reach their full potentials, let alone reaping the dividends of their creative investment. This paper investigates the remote and immediate causes of the hostile environment and suggests plausible remedy. Relevant information was drawn through oral interview from the clusters of music enthusiasts, artistes of different genres, music studio operators, music promoters and Tape/CD distributors, as well as art music composer/performer. The paper adopts pragmatic model as the theoretical framework, which underscores the great importance attributed to the artistes' ability to interpret their economic environment and shift their focus if need be. The paper concludes that artistes' economic transformative revolution will positively impact on the instinct for survival that ties the creative artistes to some social disorder and create some equitable standard that would help them to reap considerably, the dividend of their creative efforts.

Introduction

Modern technology is an important factor influencing the socio-economic and institutional transformation in any sector. It triggers changes within economic structures in an organizational and business model and immensely contributes to the constitution of new markets and market relations. Modern technology also has capacity to shift existing constellations of cooperation and competition, expand the scope of action, open to new actors and make the readjustment of regulatory frameworks necessary, as well as producing modifications in consumption patterns. In many societies, technology has helped to develop more advanced economies. Modern technology is defined as using the knowledge of tools, machines, techniques, crafts, systems or methods of organization to solve human numerous problem or perform specific functions (Adélékè, 2011; Ulrich, 2011; Steve & Tony, 2006).

The paper identifies some nagging problems in the study of music in Nigeria. Some of the plausible factors responsible for music student being theoretically illustrious but below average in skill acquisition were identified to include poor or hostile environment, both for teaching and learning; poor funding – lack of support from home for ethical reasons; and inadequate facilities for proficiency in skill acquisition. The ripple effects of the problems include poor creative acumen on the part of the students, professional incompetence leading to unwarranted social struggles. The consequences of the effects is that the social images are battered: People portray them as customized underdogs, irresponsible dropouts and wild personalities. The thrust of this paper is how to ameliorate the problems improve on the enrolment of students for music related field. The paper is an advocacy for the following:

Using the Internet for music business and education (*Internet Usage Statistics for Africa: ITU, 2011*); refocusing the programme of music education towards by promoting the nexus between the music industry and scholarship, through *promotion and sale of compositions, recordings and performances of music; introducing the improved production technology through the copious use of softwares – Finale, Sibelius, Cakewalk Sonar, Fruity Loops, etc.*; encouraging mass and qualitative production through the new media revolution, especially the use of digital technology: digitized sound signals to capture sound and images and digital electronics to compress and store sound signals on devices for preservation and further processing.

The research approach adopted was through **collection of data, using relevant information drawn principally from Oral interview in selected relevant school subject teachers, music enthusiasts, artistes of different genres, studio operators, CD promoters and distributors**. Books, journals and internet sources were also used, serving as secondary means of data collection. The paper adopts pragmatic model as the theoretical framework, which underscores the great importance attributed to the artistes' ability to interpret their creative environment and shift their motivation if need be. Pragmatism postulates that true reality does not automatically exist in human society; it is actively created toward the social structures. People remember and base their knowledge of the society on what has proven useful to them and they are likely to alter what no longer works for them in any sector. People define the social and physical objects that they encounter in the world according to their use for them. If we want to understand performance economics, we must base our understanding on what people actually do in the music industry in Africa. Therefore, there should be a focus on the interaction between the performers and the superstructure of the economy. There should be a view of both the artistes and the industry as dynamic processes and not static structure. We should attribute great importance to the artistes' ability to interpret their economic environment and turn the prospects of their creative efforts into more financial viability.

The paper identified music technology as the science of music and sound production, taking its bearing from sound engineering and transmission in the digital studio. The study of music technology has capacity to inject the much desired revolution that can transform the music education and industrialisation of music production and management in Nigeria and elsewhere. The paper also postulates the impeccable impact of music software development on contemporary approach to music creativity and education, through sound engineering programmes, software for music notation and publishing and tutorial software. The paper emphasizes the impact of softwares on sequencing at any given digital recording studio and their brunt on quality music production for sustainable development.

Through the historical sequence of music scholarship and industrialisation of music production in Nigeria we learnt that in the last three decades, the music industry has experienced some kinds of revolutionary changes: from the level of artiste rating to the choice of the production studio, record label, social networking, internet promotion and distribution of creative by-products. The relationship between music industry and technology defines the latitude of music technology and the by-products of all the above segments in the industry culminate into what is regarded as the revolutions that reserve the capacity for

transformation of the music industry. Music technology is a development in musical arts, particularly the use of electronic devices and computer software to facilitate playback, recording, composition, storage and performance. It encompasses the technical and scientific aspects of music, such as digitizing, acoustics, web designing, social networking, internet marketing, as well as music industry business practices.

The use of the Internet facilities in particular, has brought new opportunities to music business operation, music education and performance economics in Africa. Its use has also grown tremendously since its inception in the 70s and has doubled in size every 9 to 14 months. Available records reveal that in Year 2000, the number of the internet users had grown to more than 400 million across the globe. It has been predicted that the number of users is expected to grow up to 1 billion by the end of 2005. Internet Usage Statistics for Africa (IUSA) reveals that in Nigeria alone, the internet caters for over 43 million users, 28% of Nigerians population and 37% of African's users of the internet. This number is likely to triple in the next two years (Reuters 2010). With this trend, coupled with the vast opportunities that come with it and its visible impact on the global music industry, it is wise to take a critical look at the impact of the internet on music business operation in Africa and how, by extension, it can rob its positive impact on performance economics in the continent.

System Operation in the Industry

The Music Industry is a branch of commercial trading, dealing with the production and sale of musical recordings, music publishing and related merchandising. The industry promotes and sells musical compositions, recorded tapes and compact discs; embrace the operation of disc jockey, as well as promoting live performances of music. Among many individuals and organizations that operate within the industry are the musicians, who compose and perform the music; the companies and professionals, who create and sell recorded music (e.g., music publishers, producers, studios engineers, record labels, retail and online music stores, performance rights organizations); and those that present live music performances (booking agents, promoters, music venues, road crew). Others may include the professionals, who assist musicians with their careers (talent managers, business managers, entertainment lawyers); those who broadcast music (Satellite/social Networkers and Broadcast Organizations); journalists; music educators; and musical instrument manufacturers. The activities of all these sub-sectors intertwine on complimentary and pragmatic models. The success of one affects the operation of the other. Revolutionary changes are collectively appraised and the economic environment of one determines, to a large extent, the operation of the other. Unfortunately, the nitty-gritty of the discourse so far on the system operation in the industry is not reflected in the curricula for the music programme, thereby creating a gap in the study. Inclusion of such is necessary, so that the revolution could be totally approach from the level of training to the level of implementing it in the industry.

History of the Industry

Until the 18th century, the processes of formal composition and of the printing of music took place for the most part with the support of patronage from aristocracies and churches. In the mid-to-late 18th century, performers and composers such as W. A. Mozart and his contemporaries began to seek commercial opportunities to market their music and performances to the general public. After Mozart's death, his wife (Constanze Weber) continued the process of commercialization of his music through unprecedented series of memorial concerts, sale of his manuscripts and so forth. In the 19th century, sheet-music publishers dominated the music industry. In the United States, the music industry arose in tandem with the rise of blackface minstrelsy. In the later part of the century, the group of music publishers and songwriters, which dominated popular music in the United States, were known as Tin Pan Alley.

At the dawn of the 20th century, the recording of sound began to function as a disruptive technology in music markets. With the invention of the phonograph by Thomas Edison in 1877, and through the onset of widespread radio communications, there was an unprecedented revolution in the way music was heard and appreciated. Opera houses, concert halls, and clubs continued to produce music and perform live, but the power of radio allowed obscure bands to become popular on a nationwide and sometimes worldwide scale. As a result of this revolution, the record industry eventually replaced the sheet music publishing as the industry's largest force. A multitude of record labels came and went. Some note-worthy labels of the earlier decades include the Columbia Records, Crystalate, Decca Records, Edison Bell, The Gramophone Company, Invicta, Kalliope, Pathé, Victor Talking Machine Company and many others. In Nigeria many record companies died out as quickly as they were formed and by the end of the 1980s, the "Big 6" — EMI, CBS, BMG, PolyGram, WEA and MCA — dominated the industry. Sony bought CBS Records in 1987 and changed its name to Sony Music in 1991. In mid-1998, PolyGram merged into Universal Music Group (formerly MCA), dropping the leaders down to a "Big 5". They became the "Big 4" in 2004 when Sony acquired BMG.

The revolutionary changes in the industry within those periods also made music entrepreneurs to expand their industry models into areas like folk music, in which composition and performance had continued for centuries on an ad hoc self-supporting basis. Forming an independent record label continued to be a popular choice for up-coming musicians to have their music heard, despite the financial backing associated with major labels. At the turn of the century, consumers spent less money on recorded music than they had in 1990s, in all formats. Total revenues for CDs, cassettes and digital download in the world dropped 25% from \$38.6 billion in 1999 to \$27.5 billion in 2008 according to IFPI. Same revenues in the U.S. dropped from a high of \$14.6 billion in 1999 to \$10.4 billion in 2008. The Economist and The New York Times report that the downward trend is expected to continue for the foreseeable future. Forrester Research predicts that by 2013, revenues in USA may reach as low as \$9.2 billion. This dramatic decline in revenue has caused large-scale layoffs inside the industry, driven retailers out of business and forced record companies, record producers, studios recording engineers and musicians to seek new business models.

New Music Business Structure

The music industry is a complex system of many different organizations, firms and individuals and has undergone dramatic changes in the 21st century. However, the majority of the participants in the music industry still fulfil their traditional roles. Artists and composers are the main actors in the music business and they pursue the business with faculty. They source for and perform their music for commercial purposes. Songs created by composers are originally owned by those who compose them. However, the composer may sell the copyright to another party. Artists and musicians need great songs that will sell in great quantity; and that's where composers come in. A great song should make the composer rich, if there is indeed an effective music business structure in the industry. It is however incredible that such composer/performer responsibility sharing is not thriving in the music business structure, especially in Africa. Piracy and other social vices have beclouded the system and there are no laws in the land that can stop the menace. People should be made to benefit from any aspect they are competent to handle, other than groping for survival in other areas for the sake of making ends meet.

In order for enviable transformation to take place in the new system order, some of the key transactions in the business environment should be legalized. Managers should also be appointed to represent artistes and composers in their dealings with recording and publishing companies and all other necessary industry bodies. Managers understand the business structure and language of the music business in ways that artistes often do not. Managers will employ, on behalf of their artistes, accountants, lawyers, agents, and tour managers and deal with the day to day running of their artistes' career. In return, a manger will typically receive 20% of an artiste's income. Managers deal with all of the problems and receive none of the glory, except for his pay. Other actors in the business transactions will also record open-minded dealings.

New music business structure will thrive well if there is a functional and purposeful music business forum, where business review and sensor could be done by the relevant authority. This should comprise an alliance of managers, producers, musicians, composers and artistes, who should sensor people's productions and sell the package to the most appropriate record companies. This is necessary because it is not all production companies that are competent and viable enough to produce great works that are created by great composers. The forum can transform the predicaments of many fine artistes who are always at the mercy of smaller independent organizations. Most of such up-coming artistes have their aspirations ruined in the process of not having competent production outfit, and there is usually nobody to sympathize with their predicaments.

Publishing companies should be the composition rights owner who will collect performance income, mechanicals and try to secure synchronizations/covers and other opportunities for the songs. A composer assigns their copyrights to a publisher in a publishing deal. Publishers license the use of these copyrights to record companies who

record them. Every CD manufactured and sold generates a mechanical publishing royalty, which is paid by the record company, who then pass it on to the publisher who takes a cut and passes the rest to the composer. Typically a publisher will take between 35% and 15% of the royalty, depending on their deal with the composer. A publisher will also try to license their copyrights to film and commercial makers in order to generate as much income as possible. A composer will benefit in three ways from such a deal: through a structure of sub-publishing deals, the publisher will be able to collect royalties on behalf of the composer. Should a copyright infringement take place, the publisher will have the financial might to sue the pirate on behalf of the composer. The publisher will promote and seek additional utilization of the copyrights thereby generating additional income for the composer.

The record companies should be the recordings rights owner, who will market and promote the artistes' works and pay royalty on sales. A recording contract specifies the business relationship between a recording artiste and the record company. Record companies exist to either facilitate an artiste's creativity by providing financial and organizational structures to support the recording, manufacturing, distributing and promoting the artiste's recorded work. In authorizing a new artiste, a record company's financial risk is great. Large sums of money will be invested to support the initial recording, filming and promotional activities that accompany expend on the launching of a new artiste. The success or failure of a CD release is largely determined by a record company's ability to secure exposure on TV, Radio and Print Media and then to distribute copies effectively to retail shops. It's no good creating demand for a CD that remains unavailable for sale. Major record companies have manufacturing and distribution structures in place. Without access to these structures through licensing deals, an independently produced CD is unlikely to succeed in the market place. If an independent label manages to generate a high level of broadcast and print media interest in their artiste's work through effective promotion, it will need to strike a deal with either a major record company or independent distribution company in order to ensure the widespread availability of its CDs in retail outlets. If you strike a licensing deal with a major record company most of the organizational issues to do with preparing a CD for retail will be handled for you. If one deals with an independent distribution company, one may probably need to bring-in some legal documents before the music production and CD master are handed over.

The place people buy records and digital products have changed dramatically, but retailing is still important to the music business. There are still major players in terms of retailing. Retail operation is the front line. Independent music maker can manufacture and sell CDs to customers' mail order, by promoting them in live performance, on the web site and through the print and broadcast media. When a recording is broadcast, performance rights organizations (such as the BON in Nigeria, ASCAP and BMI in the US or MCPS and PRS in the UK), enforce and collect revenues generated from copyrights in recordings and compositions a third type of royalty known as a performance royalty, which is paid to composers and recording artistes. Unfortunately, Nigerian artistes have not been able to push this legitimate right through with BON, compared to their European counterparts.

Print, Radio, TV and the Internet are the main channels that connect the performers and music with the consumer. However, the performance of live music is more important than ever and the significance of its revenue and supply chain is increasing. A promoter brings together a performing artiste and a venue owner and arranges contracts. A booking agency represents the artiste to promoters, makes deals and books performances. Consumers usually buy tickets either from the venue or from a ticket distribution service such as *Ticketmaster*. In the US, Live Nation is the dominant company in all of these roles. They own most of the large venues in the US. Apart from the fact that they are the largest promoter, they own Ticketmaster. Such revolution is highly recommended in Africa, in order to transform the economic environment of the musicians and art music composers.

Career revolution

Career is what one develops as long-term activity, vocation, profession and line of business. In other words, career is a chosen profession that lasts a person's working life. In African context, there is an on-going career revolution in the music industry, in such areas as musical performances; sound engineering, for generating tones, recording musical sound, editing and mixing of sound; computer music technology, for teaching performance techniques, sampling of tones, mixing, notating etc., using various music software; electronics, for playback, cutting master tapes, mass dubbing and editing (Adéléké, 2000). Some of the core areas that foster the revolution include music theory and composition, music therapy, music business operation and management, sound recording engineering, sound system and electronics, technical design and drawing, material science, acoustic principles and tone production and telecommunication.

In African, the on-going revolution may require a more systematic study of music, both in formal and innovative settings. This, of course, must be career inclined. An English philosopher, Francis Bacon said, "Young people are fitter to invent than to judge, fitter for execution than for counsel, and fitter for new projects than for settled business". The writer identifies and traces the societal ill feelings towards orthodox approach to musical studies in schools to inability of the trainers to define innovative career path to the trainee in particular and the teeming population in general. The sharp reaction of people against musical studies goes beyond technical complexity as observed by Grove's Dictionary of music and musicians. It also goes beyond unethical comparison as identified by Adéléké (1997). It has more far-reaching consequences than the inadequate facilities and competent teaching personnel as observed by Samuel (2002). It is more of the feasibility of earning a living through it after the training. If this is fail-safe, more people will come into the line of work.

Music technology has boosted people's ability to conceive music ideas and create musical compositions without the need to know myriad of the complexities of tonal harmony and standard western notation. Technology, through sequencing and printing software, eliminates traditional barriers to creative arts, such as music composition, by giving students tools to transform their ideas into actual sound, listen to other people's creative works, self-critique and rehearse music at will. There are many opportunities for greatness in the world of

music for those who are truly passionate. In this paper, six career revolutions are made that can be undertaken by those whose passion is music-related vocations:

Performance Revolution

The performance revolution in Africa is quite explosive. So many forms of entertainment have been incorporated into what used to be concert environment. It includes ability to do or say something that other people think is funny or entertaining, either in a concert environment or on the television shows. It also includes extemporization, ability to perform or produce something without preparing or practising. During performance, people invent words or musical notes without preparing them or learning them before hand; especially in front of a mixed audience, in order to entertain them. Those who sing, dance, mime, rap, make jokes with extra ordinary sense of creativity draw a large number of people coming to watch their shows. In the contemporary time, most of the drivers of the revolution prefer to use media figures as panel of judges to the orthodox academic gurus. Several talent hunt programmes, such as *Big Brother Africa* on African Magic, *Goge Africa*, *African Pot* (both on NTA), are examples of the New Performance Orientation. Unless innovative approach is added to school performance curricula, in few years to come, music classrooms might become empty, in favour of the New Innovative Approach recently introduced by the Federal Ministry of Education in Nigeria. Some of the innovative approaches to performing music with serious commercial undertone are tabulated as follows:

1.	Disc Jockey	These are not necessarily music artistes, but operate on one-man show with jockey discs of different artistes.
2.	Orchestral Musician	These are trained musicians performing with orchestral instruments. They perform mostly from orchestral scores under a conductor. Such performances are concert based with literate audience.
3.	Opera performer	The musicians and artistes in this category perform music drama on stage. In most cases the actions and conversations are sung and orchestra is used to accompany the music renditions.
4.	Musical theatre	This is similar to the operatic performance, but this time is more often restricted to soap version and the settings are less formal, compared to a real opera that we know in music history.
5.	Band Musician	This term refers to various dance band operators. The actors are not necessarily trained musicians, but some of them are versatile on their instruments as amateur performers.
6.	Solo Singer	We are in the age of "one-man band". Late Dipo Sodipo created the awakening in the southern part of

		Nigeria. Many Nigerian youths have made fortunes with its revolution.
7.	Chamber ensemble	This refers to young talented groups of performers using a cappella and its variants in some kind of indoor activities. In most cases, keyboard instrument is programmed to supply the instrumental accompaniment.
8.	Studio musician	The new revolution in the studio has expanded the activities beyond recording and mastering tapes and CDs. Serious training have been incorporated. Software is used to give instructions.
9.	Conductor	The career progression of choral and orchestra conductors has attracted greater patronage in the last two decades. They train and lead performance in the Arm forces, Cathedral, Media organizations, and so forth. Some raise choral or orchestral organizations for State and the Nation.
10.	Radio announcer	In the recent years trained musicians have built worthwhile career in media organizations as producers, presenters and social critics/commentators.
11.	Entertainers	The horizon of the entertainment industry has witnessed some transformative revolution to include comedy, modern dance, dance drama, motivational speech, rap, monologue, etc.
12.	Jazz Band	Those who raise popular band to perform styles like Swing, Bebop, Funky/Soul, Avant-garde, Rock, Afro Jazz etc.

Teaching Revolution

Outstandingly, the revolution that has come into music teaching calls for innovative and motivational approaches to the orthodox teaching methods. Inspirational nuggets are used to explain musical concepts in such ways that the youths, who happen to be the main actors and the beneficiaries of the trend, are stimulated to learn fast. In the new approach, concepts are related to the words *Non Scholae Sed Vitae* (Not for school but for real life). Music educators are teachers who engage in private or public teaching of music as home lessons, at studios, schools, colleges and universities. They are responsible for the writing of curriculum for the subject, teach it and examine the students from time to time.

In Nigeria, the innovative teaching is brought to the fore by the Federal Ministry of Education's recent introduced National Innovative Diploma in vocational subjects, such as music. The approach and syllabus in music for the Innovative National Diploma programme illustrates the discourse on innovative teaching approach better. The writer was invited for the reaccreditation of the Innovative National Diploma in Music Technology at PEFTI Film Institute, Lagos, Nigeria, in December, 2011. His personal experience in that exercise impels the writing of this paper. Music educators are responsible for carrying out government policies, as related to music as part of Creative Art subjects. Music educators are expected to improve on their approach to teaching with proper simulative techniques, innovative insight, entrepreneurship and wealth of ICT revolutions. In the table that follows, four of such teaching thrusts are identified.

1.	Music (classroom) teacher	Those who teach music in schools as a subject area or organize private music lessons for artistes and enthusiasts. by training and practice, they live on music teaching
2.	Sound Studio teacher	Those who use software to teach performance, compositions, recording techniques, and other forms of sound engineering.
3.	Music therapist	Those who teach music related therapy to would-be trainers or patients in the hospital environment
4.	Vocational Studio teacher	Those who organize vocational music training for students in a studio environment. In most cases, they teach performance techniques as relevant to public music utilities. They de-emphasize theoretical foundation and encourage rote learning and playing by ear.

Management Revolution

Management theories describe a manager as someone who is skilfully diligent in economic management; someone who is addicted to scheming or assuming the direction of business affairs; or someone who has executive control over a business operation. We can borrow a leave from this descriptive statement of the social scientists, to define the innovative revolution that is coming into managing music business operations in African nations. Music business operation is a vast and complex industry, with diversified avenues and approaches. It includes acquisition of instruments for rental services and retail, gigging, demos, song writing, recording, studio work, music publishing, music and video promotion, to mention a few. Some of the interested academic musicians aspiring to go into music merchandizing, such as retailing and wholesaling of band and orchestral instruments, keyboards, printed music scores, amplifiers, tapes, compact disc records, and so forth, will do well to study management theory, in order to build competence that is strong enough for the emerging revolution. Visibility study and entrepreneurship is required for career competence in this regard. The table below presents some of the innovative business avenues for would-be entrepreneur in music related businesses.

1.	Concert promoter	Those who organize concerts of art, popular and folk music for commercial purpose and sell tickets to the attendees.
2.	Music Attorney	Those who are into music business law, such as business registration, copyright enforcement, litigation that ensue in the course of transacting music business, artiste national and international relations, etc.
3.	Promoter	Those who promote CDs and artistes; organize album launching and public performances of their artistes.
4.	Talent agent	Those who manage talented artistes, securing appointment for them for effective performance; and manage the artiste social image.
5.	Tour manager	They secure overseas performance tour for their musical organisation, contacting relevant agencies and handle the immigration tussles.
6.	Music retail assistant	They operate as the middle man between the operators of music stores, where musical instruments and sound equipment are sold and the prospective buyers.
7.	Band manager	Then manage the business empire of their band or a company of musicians.
8.	Stagehand	They superintend the production and performance of a music programme and regulate the arrangements of the stage. In modern usage, they are in charge of the technical side of a production

Revolution in Music training, production and Literature

Anything that has something to do with literature has acquaintance with letters or books, polite or humane learning and literary culture. Such works deal with literary production, as well as the activity or profession of men of letters. Literary works are produced in a particular field of study with consideration for the ground of beauty of form or emotional effect in that field. It also includes the body of books and writings that treat a particular subject in a given field. In literary sense, music critics and journalists are newspaper columnists and magazine subscribers. They write critical reports and reviews on concerts, records, video and audiotapes produced by artistes. They also write review on live shows, film production, for newspapers, magazines, journals and periodicals. They work as

music librarians, archivists, music biographers at schools, radio and television stations, as well as museums. Their trainings are inter-twined with music and mass communication. The combination of musical knowledge, ICT and Mass Communication strategies strengthens their professional competence. The table that follows describes some of their contemporary approaches and revolutionary trends.

1.	Music Critics	Music critics are involved in judging captiously or severely, censorious, carping, and fault-finding in music related vocations. They are skilful in judging, especially about literary or artistic work.
2.	Music Publisher	A music publisher publishes music books and other literary works. His business includes issuing of books, newspapers, sheet music and engravings. He is an agent of the author of such works as long as he undertakes the printing and distribution to the booksellers and the public.
3.	Music librarians	These are music scribes, copyists and keepers or custodians of music books in a library. Sometimes they combine the activities of dealers in books, as they undertake to distribute music books, records, compact discs to the public and schools.
4.	Music journalist	Music journalists earn their living by editing or writing for public journals. They also include those who journalize or keep a journal. Some of them buy air time on Television and Radio stations; or columns on print media to publish public opinions on cultural and creative arts.

Revolution Music Technology

Music technology in the archetype of this paper refers to a discourse or treatise on the scientific study of the practical or industrial arts of musical sound and its attributes. It includes a scientific study of the industry that produces or utilizes highly advanced and specialized technology for production and distribution of its productions, music in this sense. It also includes technology transfer, i.e. the transfer of new technological information from the developed to the less developed countries of the world. Music technology in particular is a specialization in music that requires designing, fabricating, manufacturing, repairing, tuning and servicing of musical instruments. It includes recording, reproducing and dubbing of audio and video music tapes and cassettes; using music software and exploring the dynamism of computer technology. Specializing in music technology require a vast training in electronics, acoustics, technical drawing, material science and general musicianship. Some of the aspects of music technology that are career inclined in Africa at large and Nigeria in particular are tabulated as follows:

1.	Instrument designer	Those who make artistic design of the construction of musical instruments. It includes those whose business is to invent or prepare designs for the manufacturing or construction of musical instruments.
2.	Music Software Programmer	Those who use music software to devise that automatically controls the operation of something in accordance with a prescribed programme, especially part of digitization on computer. It also includes those who devise a course of programmed instruction; choose programmes for broadcasting; or arrange something according to a programme.
3.	Recording technician	A person conversant with the technicalities of a particular subject, or skilled in the technique or mechanical part of music. It also includes a person qualified in the practical application of one of the sciences or mechanical arts, whose job is to carry out practical work in a laboratory or to give assistance with technical equipment.
4.	Piano tuner	Those who tune musical instrument, most specifically, whose preoccupation is to tune pianos or organs.
5.	Music Animation	The production of moving pictures with musical sound to accompany them; the technique by means of which movement is given on film to series of

		drawings, especially for an animated cartoon.
6.	Sound engineer	Those who contrive, design, or invent device for sound engineering. They record, mix and master musical production of music on audio tapes and compact discs.

Revolution Composing and Song Writing

By the virtue of their training, music composers are expected to write or arrange songs for play band, film, choir, television, radio and for specific groups of performers. Theory of music, tonal harmony, counterpoint, and studies in orchestration are the working tools of musicians in this category. The table below presents some of the revolutionary transformation in composing and other related ideas.

1.	Film music director	Those who direct, guide or conductor the production of film music. They superintend over the management of the work.
2.	Orchestrator or Composer	Those who compose music or other works of literary arts. An author or writer of music. They are also versatile in arranging music or orchestrating music to be performed by the orchestra
3.	Jingle writer	Those who write songs, instrumental music, prose or verse to advertise an article or propagate an ideology. Such writings sound with alliteration, rimes, or other figurative languages, in order to attract the attention of the people who listen.

Internet Revolution

Graham Jones (2003) describes the internet as a collection of computers around the world that can be connected to each other over the telephone line. The internet does not only exist as a discrete entity, rather it is a random collection of people, companies and organizations all joined together through the telephone system. Graham therefore concludes that the internet is simply a collection of computers that can easily link to each other and swap information. The introduction of the internet and the web (World Wide Web) as a tool has changed the structure of doing business. This is seen in the words of Canon (2000) who said, “To approach the web and expect anything less than success is to miss the potential of the World Wide Web as a business tool”. It was also pointed out by Jones (2003) that large multinationals are already doing business on the internet and small businesses are also taking advantage of the internet’s facilities. The use of the internet in doing business as described by

Cannon and Jones is christened Electronic-commerce, Electronic-business and Online business by Brian and Stacy (2001). They view it as conducting business activities online or buying and selling music products and services through computer network.

The use of the web and the internet as a business tool in various industries and businesses is also evident in the music industry. According to Brian and Stacy (2001), the World Wide Web is standing the system of music recording and distribution on its head, and in the process changing the financial underpinnings of the music industry. With effects such that internet retailers even compete with brick-and-mortar record stores by providing easy online shopping for music CDS". With this development, Brian and Stacy observe that some musicians, dissatisfied with the current structure of the industry, see the internet as a force that can democratize the market, bypassing record companies and radio stations and offering music directly to listeners. This, acceding to them, demonstrates the extent at which the internet has impacted the music industry/business and its structure across the globe. Apart from the structural changes in the music business, the internet has also brought new opportunities in the aspect of musical processes with the computer technology and the Internet. This has also introduced innovative transformation to global music teaching, research, marketing, audio/video recording, editing, mixing, mastering, harmonization and orchestration, as observed by Adédèji (2004).

Ethical revolution

Somewhere else, Adélékè (1999) identifies three contributory factors responsible for people's reactions to music as a career subject in schools, which include lack of background knowledge in music as a school subject, technical complexity of music theory and unethical comparison from people. Recent observation has shown that these are not exhaustive. Other factors include poor facilities in terms of teaching/learning environment. Schools where music is taught should be equipped with factors that make an environment conducive to music listening, performing and creating. These may include proper ventilation, low ambient sound, moderate in temperature, good illumination and acoustically adequate for aural skill acquisition. Inadequate teaching staff in terms of number on ground and technical competence can also discourage the students of music.

Well trained music personnel should be familiar with the theories of human development, musical plays and teaching/learning styles. He should be able to demonstrate whatever he teaches on the musical instruments, such as pianoforte, drums, shakers, flute and human voice. He is expected to be temperate, creative, resourceful and punctual. Furthermore, inadequate curriculum used in the schools where music is offered as a school subject should be child-cantered. A child-cantered curriculum offers instruction that is relevant to the child's experiences and abilities, social needs and personal as well as collective interests. The operators of such curricula should be familiar with the children they want to teach, begin the lesson where the children are familiar with, allow time for musical play and exploration. Those who would engage in the design of the curriculum and scheme of

instruction in music should always remember to call for a critic workshop among the stakeholders in order to compare ideas with their own practical perspectives. Relevant education ministries should tackle the perennial problems of weak and imprecise policies from the government, especially in cases of marginalizing music education, compared to other aspects of the creative and cultural arts at various levels of music education in Nigeria. The ripple effect of the above is loss of confidence in music as a worthwhile school subject, especially by the pupils in schools and the parents who could not see the career focus in the subject.

Computer revolution

This revolution includes the theory and application of new computer technologies to music, such as sound synthesis, digital signal processing, sound design, sonic diffusion, acoustics, and psychoacoustics. The field of computer music can trace its roots back to the origin of electronic music, and the very first experiments and innovations with electronic instruments at the turn of the 20th century. More recently, with the advent of personal computers, and the growth of home recording, the term computer music is used to describe any music that has been created using computing technology. Computer-generated music is composed with the extensive aid of a computer. Although any music which uses computers in its composition or realization is computer-generated to some extent, the use of computers is now so widespread, in the editing of pop songs, orchestration, music tutorials and so forth, that the phrase computer-generated music is generally used to mean a kind of music which could not have been created without the use of computers.

One can distinguish two groups of computer-generated music: music in which a computer generate the score, which could be performed by human players, and music which is both composed and performed by computers. There is a large genre of music that is organized, synthesized, and created on computers. Many systems for generating musical scores actually existed well before the time of computers. One of these was *Musikalisches Würfelspiel*, a system which used *throw of the dice* to randomly select measures from a larger collection of small phrases. When patched together, these phrases combined to create musical pieces which could be performed by human players. Although these works were not actually composed with a computer in the modern sense, it uses a rudimentary form of the random combinatorial techniques sometimes used in computer-generated composition.

The world's first digital computer music was generated in Australia by programmer Geoff Hill on the *CSIRAC* computer which was designed and built by Trevor Pearcey and Maston Beard in the 1960s and early 1970s, although it was only used to play standard tunes of the day. Subsequently, one of the first composers to write music with a computer was Iannis Xenakis. He wrote programme(s) in the *FORTRAN* language that generated numeric data that he transcribed into scores to be played by traditional musical instruments; an example is *ST/48* of 1962. Although Xenakis could well have composed this music by hand,

the intensity of the calculations needed to transform probabilistic mathematics into musical notation was best left to the number-crunching power of the computer.

Computers have also been used in an attempt to imitate or analyse the music of great composers of the past, such as Mozart, Beethoven, Mendelssohn and others. A present exponent of this technique is David Cope, who wrote computer programme(s) that could analyse works of other composers to produce new works in a similar style. He has used this programme to great effect with composers such as Bach and Mozart. His programme *Experiments in Musical Intelligence* is famous for creating Mozart's 42nd Symphony.

Observations and discussions

The research effort in this paper keenly observes that the transformative revolution is unfolding with regional public worship. For over a decade, Moji Alawiye, a gospel artiste of the revolutionary trend, has organized what she calls *Worship Experience* across the sore of Nigeria and other African countries. Such musical programme is blowing across the continent and it has capacity to make the creative avenue of music in the industry to be broad based and reduce importation of musical idioms from other cultures, which impart negatively on African cultural values. The innovative approach of Dipo Sodipo, a graduate of music from The Polytechnic, Ibadan, gave birth to functional *One-man Band* era. The innovative vocal arrangement of Shola Allyson-Obaniyi, popularly called *Eji Owuro*, has lifted the use of folk idioms in popular style to a world class perception of the Yoruba songs and styles. Goke Bajuwa, with his *folk jazz*, has innovatively used his Trumpet to lead praise and worship music and vocal lines were arranged to sing the refrain. Jersey King has turned the call and response vocal style to another kind of *jazz in folk idiom* and he is breaking new ground in *Highlife/Jazz* form. Sony Inaji's song *Oruka ti Dowo Na*, has lifted a scene from African Traditional Marriage consummation to a reputable musical.

One of the factors that brought about changes in African music is the development of radio, television and telecommunication industries, which has immensely promoted the growth of commercially oriented socio-cultural music in its varied forms in Africa. It has helped in shifting musical forms from their religious overweight to more liberal artistic phenomena. The trend is a contemporary step toward the emergence of new musical idiom and performance norm in Africa. This revolution is a boost to the entertainment industry in Africa at large and has placed African music on the world-map of excellence. There is the possibility of new performance idioms springing up more frequently than how it has been. Some of the thriving examples of these are *Disc Jockey, Modeling, Musico-Comedian Shows, Live Performance Auditions* and *Young Talent Creative Development* on Television Stations in the entertainment industry. However, there is a need, and it is urgent, to set new criteria for acculturation and aesthetics in African music to safeguard the incursion of mediocrity in the industry. This is achievable through promotion of musical concerts using the transformative revolutionary approaches. This should also include staging live musical performance and development of ethical values in the music industry. These are necessary in view of the divergent opinions that are trailing music appreciation around the world. Relevant authorities

in music should be more involved with the transformative procedure, in order to streamline the extraneous factors that may erupt.

Modern technology and the media can help in preserving the continuity and promotion of musical culture, formal musical training and development in this regard. This will produce more consummate musicians that could handle the transcriptions of music, analysis, packaging, or marketing the end product which has incredible export potentials. There is a need for professional artiste managers and agents who will run around on their behalf, securing engagements, recording contracts and organize public enlightenments with appropriate counseling from relevant authorities. These will ameliorate the unwarranted cultural castigation, which artistes suffer. In addition, there is an urgent need for a review of the cultural policy in Cultural and Creative Arts that will establishment government agency, which would be dedicated to packaging and promoting music, art and other cultural arts for export. This will not only serve as a catalyst for artiste promotion, it will also be a viable source of revenue generation for the country.

Conclusion

The paper has examined the revolutionary import of various on-going innovations in the production and management of music and how the innovative revolution has impacted the economic situations of artistes and musicians in Nigeria. The paper has discussed computer and internet revolutions in particular. The paper discussed the newly introduced National Innovative Diploma in Nigeria as a new approach to the required training package for upcoming artistes and music technicians. The paper identified the positive impact of the modern technology and the media in the preservation and promotion of musical culture. The paper noted that the development of radio, television and telecommunication industries have immensely promoted the growth of commercial music in Africa. From the foregoing therefore, the paper concludes that artistes' economic revolution is highly necessary. Various innovative revolutions will positively impact on their economic viability and address the instinct for survival that ties them to social disorder. The suggested transformative revolution will positively impact on the instinct for survival that ties the creative artistes to some social disorder and create some equitable standard that would help them to reap (considerably) the dividend of their creative efforts. Home-grown software can promote new market orientation for music production and develop sophisticated background music scenes. As more people develop interest in using music software, it will enhance quality music production and marketable music culture. The revolution will create equitable standard that would help the artistes and musicians to reap the dividend of their creative efforts.

References

- Adedeji, S O (2004), Computerizing and Inter-netting Music Education in Nigerian Tertiary Institutions, being a conference paper presented at the National conference of the Musicological society of Nigeria, held at the institute of Africa studies, university of Ibadan, Nigeria, June 1-5.
- Adélékè, Abel 1997 Comparative Study of the Creative Techniques of Ràrà and Ìrèmòjé Musician, M.A. Dissertation, OAU, Ile-Ife, Nigeria
- Adélékè, Abel 1999 The study of Music in Post-Secondary Schools in Nigeria: Prospects and Career opportunities; in Issues and Problems of Development in Nigeria in the 21st century, Journal of the School of Arts and Social Sciences, FCE, Abeokuta, Pg. 166-170
- Adélékè, Abel 2000 Issues and Focus of Music Technology for Nigerian Music Educators, Nigeria, JOCOMEN: Journal of the Conference of Nigerian Music Educator, OAU, Ile-Ife, Vol. 1 No.1 Pg. 67-76;
- Adélékè, Abel 2011 Creativity and Techniques in the Structure and Performance of Yorùbá Poetic Songs; Yorùbá: Journal of the Yorùbá studies Association of Nigeria, Vol. 6, No. 6; University of Ibadan
- Brian, K. W. and Stacey C. S (2001), Using information technology: A practical introduction to computers and communications, McGraw- Hill.
- Jeff, C. (2000), Make your website work for you: How to convert your online content into profits, McGraw-Hill and Commerce net Press.
- Graham, J. (2003), Using the internet: How to get started and find what you want for business, education, and pleasure, Grolier International.
- Steve, M. and Tony, T. (2006): Entrepreneurship; how to start and operate a small business, a guide to for the young entrepreneur, NFTE (the national foundation for teaching Entrepreneurship, Inc.)
- Ulrich, D.(2011) The Music Industry and the Internet: A Decade of Disruptive and Uncontrolled Sectorial Change, SOI Discussion Paper 2011/02 (April 2011)ISSN 219114990, University of Stuttgart Institute of Social Sciences, Department of Organizational Sociology and Innovation Studies.
- http://en.m.wikipedia.org/wiki/music_technology.
<http://www.internetworldstats.com/af/ng.htm>
Technology: [Http://en.wikipedia.org/wiki/Technology](http://en.wikipedia.org/wiki/Technology)
Technology: [Http://en.wikipedia.org/wiki/Technology](http://en.wikipedia.org/wiki/Technology)