

# Role of Electronic and Computing Technology in Music

Neha Dogra\*, Dr. Dharam Veer Sharma

Department of Computer Science, Punjabi University, Patiala, Punjab, India

## ABSTRACT

Music has long been the subject matter of numerous analysis; many have contributed to our understanding of music, and of all the phenomena, which surrounds it. Indian classical music has gone through several changes in not only its form and content but also the context and patronage. From temples to Moghul courts and homes of rich landed gentry, it has moved to homes of people and auditoriums. The middle class community has also begun to embrace it. On other hand, electronic technologies are profoundly altering the way people produce, transmit, and consume music. Furthermore, technological developments are contributing to a sea change in the social organization of musical practices, challenging earlier paradigms of Ownership, creativity, and human agency. The omnipresence of music culture combined with the omnipresence of technology is particularly salient.

**Keywords:** Computer music, Electronic devices, Technology, Music

## I. INTRODUCTION

“The Old Computing was what computers could do; but new computing is about what users can do.”

- Ben Sheinderman

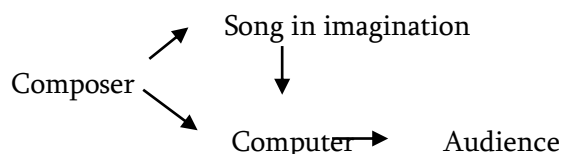
Many people attempted to show that the computer is just a tool but they failed to understand how powerful this tool is. This tool has not only impacted on the accomplishments of the task but it also provides unprecedented opportunities to create music. Nature has been providing ideas for musical or aesthetic utility for many years, usually based on visual and physical properties of the natural object or phenomenon being observed. Recent scientific research, relating to art and music, has thrown up a plethora for new experiments and aspects into technologies. The digital technology is a broad field, encompassing highly technological areas such as sensors and electronic technology, processing techniques and sound synthesis, software engineering etc. and disciplines like physiology, psychology, human computer interaction components related to the study of human

behaviour[1]. With the widespread availability of digital technologies, music composers and producers too have embraced this modern technology for making music. They can set up their own studios, in home, to enjoy a significant degree of freedom for creating high quality music and these homely created soundtracks can literally be sent to record company for finalization, which was unimaginable few years ago. But sometimes, just listening to and studying the genre is not enough for the producers. All the necessary knowledge such as knowledge of how music works as language is essential for becoming a successful producer or composer. It is very important to learn music as language and consider the ramifications of emerging technologies on creating and producing music through computer. The Musicologists need to be proficient and knowledgeable with the changes in technologies to use the various appropriate tools in advancing music [2].

## Music making process before introduction of computer technology:

Composer → Song in imaginations → Score → Performer → Audience

## Music making process with use of computer technology:



## II. WHY WE NEED TECHNOLOGY?

- ✓ Indian Classical Music is around for thousands of years.
- ✓ It is a fading art.
- ✓ It is not so popular among the younger generation.
- ✓ Classical Music is difficult to understand.
- ✓ Most of the information regarding music exists in books with Indian languages and scripts.

## III. ELECTRONIC AND COMPUTING TECHNOLOGY USED IN MUSIC

### 3.1 Gramophone

The invention of the Gramophone by Emile Berliner in 1887 revolutionized the world of audio recording. When recording came to India it was women who took the lead, disregarding several social prejudices and stigmas associated with this new technology and going ahead to record. This trend was seen all over India and thus, women became pioneers of the music industry in the country [3].



### 3.2 Radio and Television

Like any other country, Indian Classical Music has been greatly influenced by global technological advances which rapidly developed since World War



II. The emergence of technologies of music production after World War II had a significant impact on the Indian Classical

Music. Radio and television broadcasting began in this country as public service broadcasting networks. Radio - traditionally a passive vehicle that creates a powerful connection with the listener by sharing stories and presenting new and interesting talent and material - now has a new dimension through its online presence. Their objective was primarily to educate, inform, and entertain in doing so. All India Radio, in the days when there was no television, played a very major role in bringing the finest in music, both vocal and instrumental, to listeners. Doordarshan too has worked to these ends, and has tried to present the best of the country's dance and music, and other performing art forms [4].

### 3.3 Recording System

In the 20th century, recording and distributing music was an economically viable industry. It satisfied the needs of the consumer (to have access to recordings of artists and repertoire) and it compensated the performers, composers, labels and distributors for their efforts. When voice recording became a reality in the early part of the 20<sup>th</sup> century, the traditionalists were completely opposed to it. But voice recording brought about a major change in the rendering of art music. Musicians who spent hours exploring a raga were now forced to shorten their presentations to minutes. More importantly, recordings of the great masters of classical music today serve as a reference to the musical legacy of the bygone years. Recordings these days have become digital. Lots of studios and recording company's require sound recordists. The person, who knows music and also computers, can be good at recordings. For classical artists and



ensembles, recordings served many purposes. For the most popular performers recordings could provide significant income. For others the income was secondary to the promotional value of being recorded [4].

### 3.4 Web

The internet above all is flooded with recorded material of Maestros. You can go on YouTube and find everything you want with very few



exceptions. That musicians are putting more and more recorded material out there, especially online, so that there is an almost endless reference library for listeners and performers alike, is fantastic. Each recording becomes part of an incredible and easily accessible library, more so than ever before. Many classical music lovers today listen to their favourite pieces of maestros in digital formats, the most popular of which is MP3. Computers and iPods are taking the place of record and CD players; music downloading and file-sharing sites such as iTunes and LimeWire are taking the place of record stores and music publishers. But the digital revolution is not just changing the way people listen to their music: it is also transforming the way people create.

### 3.5 Online Teaching System

In the earlier days, Indian music was an art, which was learnt through face to face sitting in front of a Guru for many years. This was known to as Guru-Shishya Parampara. A similar system was also exists under the title Gharana. These are still an appreciated way to learn Indian music and most of the learners still prefer it. But due to the impact of globalization, livelihood has become competitive and needs a lot of efforts to sustain and grow. This made the human life very congested and timeless. In result, people are finding easy and money saving methods to learn anything of their interest. This naturally applies to learning Indian



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music also. At this step the modern technology entered the music field. Internet has become an affordable way to learn the music. Teachers are now establishing themselves as 'Web Gurus' on internet and video calls are becoming platform to teach the music. Students, who stay in remote cities or abroad, nowadays wish to learn music lessons through Internet [4].

### 3.6 Facebook Live

“Live is like having a TV camera in your pocket. Anyone with a phone now has the power to broadcast anyone in the world.”

Facebook accelerated recently into the world of ‘Live Streaming’ making it possible for all users to broadcast videos of almost anything to a huge



audience. Facebook Live is also playing an important role for promoting classical music. Indian classical musicians can broadcast their performance live from Facebook. Harivallabh and

5<sup>th</sup> Shri Satguru Jagjit Singh Ji Sangeet Sammelan streamed live recently on facebook to the thousands of classical music lovers. This also reduces the cost being paid to everyone involved in the recording of live music.

### 3.7 Musical Devices

Most of the technological innovations in the field of music have witnessed radical changes. The technology gave space to electronic products that are becoming substitute to the Tanpura, Tabla, Lehra, Swaramandal, Harmonium instruments. There are affordable, as computers and smart phones now have the software of above mentioned electronic instruments. There are several advantages of these things and such use is not to be discouraged. However, electronic Tabla and Lehra are only can be used for practice and this made the practice of music



at affordable cost because it is not easy to find and call an accompanist for daily practice. Also there are lot of software companies which are involved in making softwares for tanpura, lehra, tabla etc [5].

### 3.8 Hyper-instruments

“The basic idea of hyper-instrument is where the technology is built right into the instrument so that instrument knows how it’s being played literally what the expressions is, what the meaning is, what the direction of music is.” - Tod Machover

The hyper-instrument project was started in 1986 with goal of designing expanded musical instrument, using technology to give extra power and finesse to virtuosic performer. A hyper-instrument is “a musical instrument designed to be used with electronic sensors whose output controls the computerized generation or transformation of the sound.” The research focus of all this work is on designing computer systems (sensors, signal processing, and software) that measure and interpret human expression and feeling, as well as on exploring the appropriate modalities and innovative content of interactive art and entertainment environments [6].



### IV. CONCLUSION

In conclusion, electronic technology has provided a means of capturing musicians’ ideas, composing and editing them, and distributing and performing the works. The development of recording technology, software applications, the internet and portable music have created a world where a song can go from a musician’s head, to being available to an audience of millions within hours. There is no doubt that Indian music is impacted by tremendous technological changes. Every technology has

advantages and disadvantages, but it is our choice to accept only good things. World famous Tabla Maestro Ustad Zakir Hussain says; “change is inevitable, but it is for us to decide what we are going to do with globalization and technology.” These words indicate to the unchangeable part of Indian music that is the depth of improvising methods of music and the unique traditional knowledge. This should not be affected through the global changes. In essence, the musician has not become an instrument for the technology; rather, the technology has become an instrument for the composer.

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