Music and Technology

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Abstract

Outside of very broad definitions that might understand certain natural sounds, e.g. bird songs, as music, technology is inherent to music because of the simple fact that music is a phenomenon constructed by human beings. The relationship between music and technology is mutual and complex; their differentiation and symbiosis is recognizable from early history (e.g. *ars* and *techné* in ancient Greece). It is crucial to recognize a third component in this relationship, namely the sociocultural factors influencing music and technology throughout history. These three components and their hierarchical structure build up a triangle, and this *sociocultural-music-technology* relationship can be used to characterize different historical periods.

This relationship starts at the beginning of human history, when instruments like drums and simple recorders were used to signal messages from one individual to another. This nascent technological craftsmanship stretches from the very beginning of civilization to the present day under the name *instrument making*. Incidental music was later used in weddings, funerals, and religious events to address performative requirements. This long period is driven by sociocultural needs, which were answered by music through the development of necessary technical tools. These sociocultural needs gave a practical objective to music and defined its ontological presence. Here, music was a tool of agitation, excitement, exaggeration, celebration: a true part of the *life-world* (Habermas) and not the least bit secondary in relation to sociocultural needs and technology.

Through the Middle Ages, theoretical input on musical intervals and tones from the classical civilizations like Persia, Greece, China, Mesopotamia, and Egypt contributed to noticeable advancements in instrument-making technique. These advancements in turn contributed directly to the emergence of harmony in ninth-century France. The innovation of equal temperament in the eighteenth century further influenced the relationship between music and technology, initiating the invention of the piano and

restructuring other instruments. The relationship between sociocultural needs, music, and technology is changed here for the first time: theoretical inputs are initiated by musicians, without being triggered by sociocultural needs. Instead, music has created the needs and technology has responded to those needs.

The removal of music's visual component is another turning point in the history of the relationship between music and technology. The ancient Greek idea of *acousmatic* music was an inconspicuous beginning to this concept; its major realization was achieved during the nineteenth century with Richard Wagner's idea of the orchestra pit, which hid the orchestra and amplified the non-musical portions of the composition. Here, for the first time, music as an aural-visual experience was reduced to only an aural one. This de-visualization continued to have a huge effect on the relationship between music and technology with the invention of the Gramophone at the end of the nineteenth century, separating physical and virtual music and making it possible to listen to music without ever seeing the performer. The mass production of Gramophones and the immensely positive consumer response to the technology triggered scientific, educational, commercial, and technological research. This research enabled the emergence of electronic (Köln) and *musique concrète* (Paris) and, using computers and information technology, led to the advancements of the digital era beginning in the 1980s. The explosion in use of microphones, integrated audio systems, programming, processing, sampling, recording/mixing/mastering, and compact discs was seemingly inevitable.

The next step in this process is, without any doubt, the mobile technology that allows music consumers to listen to music *on the go*. MP3 players, smartphones, tablets, broadband, and streaming audio from Internet are the latest innovations solidifying a bond between music and technology that is stronger than ever. The hierarchy of our triangle is changed here again: technology has initiated the innovation. Music has adapted enthusiastically and sociocultural needs have been artificially created. Financial interests are directly central to the relationship between music and technology, with the markets for music in the USA and Japan each valued at $4.5 billion in 2012 according to the *International Federation of the Phonographic Industry* (IFPI). The dominance of technology is obvious in this era, so much so that it has initiated philosophical debates among philosophers of our time, notably Adorno, about the dichotomy of music and

technology in order to find a way to revive the epistemological objective of music as an original, individual, authentic, non-predicative, intuitive art.

This research will explore the relationship between music and technology from a historical perspective, with an emphasis on modern music since the beginning of the twentieth century. Styles such as futurism, dodecaphony, electronic music, musique concrète, serialism, and computer and postmodern music will be at the center of this research. Philosophers like Adorno, Heidegger, and Habermas will be also discussed and their work in this area will be analyzed. The results of this research can be summarized in four points: 1) Both the practical and epistemological objectives of music are challenged as technology brings them closer together. 2) The superiority of a materialistic view of music during the twentieth century has caused enormous changes in our systems of arts education. 3) The rivalry of sociocultural needs and metaphysical intuition has been resolved in favor of commercialism. 4) The sociocultural-music-technology relationship will never reach stability; rather it is a dynamic flow of ideas based on geographical, historical, and cultural context.