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That was Then—This is Now

It is difficult to express how the experience of using electronics and computers in making music has changed over the past two decades, but there are important differences, and we can learn by exploring them. Some qualities of both the group and private experiences of the early computer arts are now gone; others have changed, or are altogether new. Though we've seen many of our early hopes and visions realized, some differences have been so unexpected as to be disorienting, or at least to have produced unforeseen consequences. To some of us "old timers," computer music today feels like the old exercise, "What's wrong with this picture?" despite the tremendous progress made by the community and within the technology.

Much of this "cognitive dissonance" may have less to do with the actual technology than with an unplanned but profound change in the socioeconomic and cultural context in which our computer music work takes place. In trying to identify elements of this change, we could ask general comparative questions, such as, What was different two decades ago? Why did we do computer art and music then? Why do people do them now? and, How do these reasons differ? It seems clear, however, that profound and powerful changes have resulted from the dissemination of computer-based technology for music through market channels—essentially, from computer music's commercialization.

What Do I Mean by "Commercialization"?

Karl Marx's differentiation between "use value" and "exchange value" is a helpful analogy in this discussion. Those of us who were creating computer music technology 20 years ago did so almost

exclusively for its use value. Though often difficult, given the technical limitations of the times, the process was inherently pleasing and was also the means to the end of doing our own musical work in desirable new ways. Only recently has the exchange value of music technology become the dominant reason for its creation, while the use value, namely, the ability to use the technological results of the work in one's own musical work, has become subordinate. By "commercialization" I mean the transition from use value to exchange value as the common and expected motivation for technological research and development for musical applications.

I am not against commercialization. As a user, or buyer, I'm very pleased to be able to own the tools I depend on, to have unlimited access and complete freedom with them, and to have the benefit of using many other people's technical work in doing my music. As a tool creator, I find it extremely gratifying that many people have eventually enjoyed using software I first wrote just for myself. At the same time, few would dispute that the expansion of commercial interests within this field has not been entirely beneficial.

Inherently, commerce may not be better or worse than any other tool, technique, or set of procedures. It can be either, or both (much like those oft-maligned digital contraptions we know so well). It makes sense that when those not employed or subsidized create something that others want and use, and devote time to their users' needs, they should be supported, at least to some degree, by those users. In this view, commerce is not an end in itself, but simply a means of sustaining and increasing the use value of what is created and made available. Commerce can facilitate a symbiotic arrangement in which users make it possible for a creator to continue spending time on what both users and creator want. Alas, commerce does not always work this way.

Three Stages of Three Streams over Three Decades

In the past three decades, I have been active in three areas in which innovation was followed by its commercialization: with analog synthesizers, personal computers, and computer software for music and art. Although one should always be skeptical of generalizations, I see the following dialectical pattern in all three.

First, each underwent a period of controversy in which it was commonly viewed by non-participants as almost diabolical (e.g., "dehumanizing").

Second, as each became more easily and widely accessible, it became highly publicized, and many people not previously involved saw opportunities to participate in its commercialization. Often unrealistic representations were made during sales efforts, or from the over-enthusiasm of those with limited understanding of the technology. Accordingly, near-messianic expectations became common throughout a much larger interested population.

Third, despite the disillusionment that ensued for many, often with "Luddite" backlash, many others have been genuinely pleased to find real value in the new technology. Eventually, the technology is commonly perceived as just another group of available tools.

Yes, But ...

The above descriptions are not scary. Instead, they appear almost reassuring, like descriptions of natural evolutionary processes. Yet, there is still a strange skeptical sense of discomfort, a feeling that computer music has gone off the path, or that we who have worked longest on it are no longer at home in it.

An examination of the shared premises of computer music practitioners then and now may shed some light on this. What were some of our basic assumptions, our subcultural premises, 20 years ago? What would today's typical users of computers for music assume instead?

Previous Common Assumptions

- The tool user and tool maker are usually the same person. If not, they almost certainly know and work closely with one another.
- Diversity and individuality are essential to the methods as well as the results of artistic processes.
- These technologies consist of handmade tools bearing the creative stamps of their makers' individual personalities, identities, values, methods, and goals.
- It is normal to experience adverse reactions from others not involved in this work, and for one's work to be controversial, often engendering much discussion and thought.
- Creative arts require tools designed with awareness that the primary need of most users is to design unique works in completely personal ways. The standard practice is that every user must do things differently from every other user.
- It's amazing that we've been able to get computers to do this and how rapidly the technology is evolving.
- Computer music practitioners are not just multispecialists but are generalists, seeking knowledge and understanding as well as new capabilities and materials.
- Tools, techniques, and information for making music with computers should be available to everyone who wants to try.
- Figuring out how my computer can do music, technically, is how I can make music the way I want to.

Common Postulates Today

- The tool user and the tool builder are different people who never interact, or, if they do, do so only indirectly.
- Whatever can be standardized should be, if consensus can be attained, because standardization simplifies manufacture and use, and therefore lowers cost.
- Tools should be impersonal and devoid of aes-

thetic bias. The users of a computer-based music-making tool should not feel they are using another artist's personal creative tool, or that they are being influenced in their own work by another artist.

- It is normal to use computers to do music. It often would be stupid not to use them.
- Product preference in the marketplace expresses user approval and shows increasing consensus. A new generation of musical common practice is being established in wake of the 20th century's chaotic diversity.
- It's amazing how long it's taking these companies to bring out the features we want and how slow progress is.
- Computer music practitioners are typically trying to substitute ready-made technology for real musical technique, skill, work, talent, and musicality, and frequently also want to appear more intellectual or "with it" than they really are.
- Tools, techniques, and information for doing music with computers are proprietary intellectual property that should not be divulged and can only be used by paying for them or by other special arrangements.
- Figuring out how computers can do music, technically, is too complicated. Fortunately, I don't have to, because it's someone else's job. Besides, it's mostly patented and copyrighted stuff, and we're not allowed to play around with it.

Comparing Consequents

Aspirations, actions, ideas, efforts, and all that may be thought or done will follow quite differently from these two sets of premises. Is it any wonder that, despite all the progress, something feels amiss? Please interpret these issues in light of your own experience as you wish.

Miscellaneous Observations

- What cannot be done at all today may not be possible now, but may be common and taken completely for granted very soon.

- What today has no conceivable imaginable purpose may be the solution to problems yet to be posed—and solved.
- The probability that something considered a waste of time today will eventually prove itself to have been time well spent increases with the length of time over which knowledge of it survives.
- What has become obsolete may have qualities, properties, characteristics, and unfulfilled potential that will later be considered prophetic (e.g., *musique concrète* being virtually reborn with the advent of low-cost, real-time digital audio samplers).
- Those who adopt a new technology that they themselves did not create tend to expect this new technology to solve problems inherent in whatever older, more-established technologies they were accustomed to using. The new is usually seen through the filter of the old, and may be invisible through that filter.
- People rarely adopt new technology to confront truly fundamental problems, but often do so to solve problems and overcome frustrations resulting from superficial characteristics of existing technologies—the value of which remains unquestioned. (Computer-based musical tools are not commonly acquired to model how humans can better express themselves in sound. They are often acquired to facilitate such tasks as making revision of printed instrumental parts or synchronization with film easier.)
- The furthest-evolved design that survives transition to the commercial marketplace will generally encompass only a "lowest common denominator" subset of the model's original functionality. Prototypes are often the most comprehensive and general instances of new inventions.
- Initially, invention and exploration tend to be done privately, out of basic joy and fascination, and for the use of an individual or small group. Only later are the reactions and involvement of others of concern.
- The desire for public approval can be as inhib-

iting to technological or scientific creativity as it is to other creative arts.

- Approval-seeking behavior aimed at the general public is considered inappropriate in creative individuals (such as artists, inventors, and scientists), but is seen as positive or even essential in commercial enterprises.

The Fundamentals Have Not Changed

Much can be learned from thinking about these past two decades (or at least we can enjoy the attempt). There has been incredible evolution and change. Yet, despite these transitions, for many of us, the value of our software or other tools continues to be inherent in the processes of making and using them, plus the newer pleasure of seeing many others use them, too.

Despite commercialization, working with computers in music is still both an end in itself and a means of creating music and expanding human understanding. Computer music is still art and science for their own sake, and for the pleasures of learning, discovery, expression, and communication.