Is Music Production now a Composition Process?

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Introduction

Over the past decade advances in music technologies have unleashed a phenomenon in virtual software instruments and digital audio workstations have become refined to the point where they are used by professional producers for recording, creating and editing audio.

Today 'VST's can be complex real-time generators and manipulators of audio, to the extent that some even 'play and produce themselves'. The availability and utility of professional Digital Audio Workstations has enabled pro studio quality production methods for everyone who wants to produce their music in the digital domain.

For music production this revisits old questions on the nature of craft including what levels of skill i.e. technical mastery and understanding, are or should be necessary in order that an audio product can be taken 'seriously'.

While some think software instruments and processing is good news for those that want tools to stimulate musical creativity, others more traditional in their composition and production methods consider this to be anathema as almost 'anyone' can produce what appears to be interesting audio by merely changing various controls.[1]

Though these issues are part of a wider discourse that includes the dialogue about what is and is not music, either in a commercial or academic sense and whether self taught digital music production is a valid enterprise to be considered in record production, this paper seeks to uncover where music production is going and how this will affect the nexus between composition, recording, engineering and production as a whole. In many senses this is answered by looking at the burgeoning selection of digital tools now available that blur the distinctions between these four processes. To the point where to use Cascone's (2002) paraphrase of Marshall McLuhan "the medium is no longer the message; rather, specific tools themselves have become the message."

The subject will be addressed by first considering whether the skill sets necessary for music production skills is changing from a shared group process to an individual one and what are the socio-technical differences in soft production processes that bring this about. This is elaborated by a discussion on interactivity as a way of understanding how the production process is mediated at the software level, which considers interactivity and performance, production and composition.

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[1] See Cascone (2002)

The changing nature of production skills

Though computer music as a form of electronic music itself is not new[2], it was considered in its orthodox manifestation to be the domain of experimental or *avant garde* musicians or computer coders using early *Trackers*[3] that almost by definition possessed a high level of technical skill and understanding. However, though the meaning of the term means different things to different groups of people, received general social perception of the term now commonly refers to the repetitive beats of commercial and underground forms of the dance music. Though the historical nexus of these two types has been located to the minimalist movement and its impact on disco in the mid seventies (Fink 2005), the relationship of influence and convergence has continued to impact on many genres of commercial music and the development of both hardware and software tools to generate, manipulate and process audio.

From a historical perspective, mainstream academic conceptions of the separation of technology and art have begun to look at the common practices involved in production processes (Century 2000) and that these contain a collection of "embodied skills, mastery of instrumentation and situated learning…" (Cambrioso & Keating 1998). Century calls this a process of 'techno-aesthetic mediation', involving

> *"mixed groups of human actors – artists, engineers, scientists, producers and managers- and artefacts, comprising tools, and instruments representational schemas and notational devices and especially art works."* Century (2000)

Though Century's writing concerns the digital visual arts, the practices involved in creating, editing and producing an audio artefact are essentially the same in that all digital arts involve mediation by hard or soft processing techniques. Similarly, the professional level of knowledge needed to record, engineer and produce or mix a piece of music involves a collection of specialists each with their own 'embodied skills' that engage with the artist(s) performance. Whereas up until the mid 1980's these skills were once predominantly centred and mediated around a variety of people using analogue production systems, there has been a convergence towards (albeit form a variety of systems and platforms) integrated digital methods of production that can be managed and operated by a single individual. Where these high level skills are displayed by a single perceptive individual interacting with and operating an integrated system comprising a DAW, using Century's terminology we could call these Techno-Aesthetic Intermediaries (TAI's).

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[2] For discussions on the historical development of electronic music and computers see for example (Cremaschi A., & Giomi F., 2004); (Lefford N. 1999).

[3] Trackers were and still are software programs originally for the Commodore Amiga, Atari and DOS but some now developed for Apple, PC and even modern handheld devices. These were used creating, controlling, sequencing and rendering audio files and synthesis algorithms by using different modules. Modules are generally controlled with a simple numeric interface. Examples include ScreamTracker, Buzz, Renoise, and ModPlug Tracker.

Social-Technical differences between hard and soft production processes.

Though to the listening public, the perceived outcome of the production processes may be the same, i.e. a piece of recorded music, the differences between production processes can vary considerably. According to Century (2000a) "works of art, as well as the tools used to fabricate them, may be understood in terms of the social relationships they mediate". To understand the skill differences between hard and soft production processes it may be useful to consider them as characterised stereotypes at this socio-technical level. A basic typology of this kind will uncover a 'who, what, where and how?' of the production processes for an analogue studio and a digital workstation. The discussion can then be refocused with a look at what is the existing reality.

Analogue People, Digital Individuals and Digi- Kiddies?

Analogue processes are commonly about people and songs. This begins with social interaction between musicians; the band members who write the songs and rehearse them, probably playing them live over a period of time. The songs that survive public performance may be album potential. In the studio, there are more people, producer and the engineer, tape operator– what is a musicians 'signature sound'? How does this fit in with the current project? What's the best way to capture it? Creating a commercial product in this way requires an informed knowledge of hardware technologies used to record and or manipulate sound with instruments, amps, microphones, room choices desks and recording equipment etc., but always mediated (chosen and configured) through a *group of people*, though it may be the producer that makes the decisions, he is surrounded by and is working with *people*. A term that describes the attributes of this group is *Analogue People*

Almost the opposite appears to happen with soft production processes. At base, level this begins (or continues endlessly) with a single individual, a computer and hard drive, an input device (mouse or other controller) and a digital audio workstation, perhaps supplemented with high-quality external ADC-DAC hardware. Though only one person can operate and interact with the main control interface at a time numerous input devices can create and control data simultaneously, and music can be created and produced entirely in the digital domain- without real instruments, microphones, amps or recording equipment, but most importantly even without other people– e.g. the ubiquitous 'bedroom studio'. A term that describes the attributes of this group is *Digital Individuals*. This group would possess the level of skill that enables them to record engineer sand mix or produce music within the native environment, but may lack detailed perception and understanding of the processes as undertaken by one or more professionals.

In some musical genres it is possible that music has been created and commercially released that used consumer level music software with drag and drop sample interfaces with FX presets. Though informed knowledge at this level may lack the level of skill to abstract what is happening at the technical level including the musical aesthetic, it is nevertheless an interactive process and may also operate successfully within the boundaries of the 'social culture' of the genre. A term that describes the attributes of this group is '*Digi-Kiddies'*, borrowed from the cut and paste behaviour of the well known 'script kiddie' in computer hacking. Both these groups have the basic knowledge of how things operate but lack the skills perception and understanding to create their own code or user-defined and /or refined presets in an intelligent way.

It must be noted that any interpretation of what is or is not music *per se,* is constructed by social and cultural forces operating in society (though this perspective is a continental

social constructivist and not Anglo Saxon positivist view Garnett (2001:23). However, the main contention here is whether music production of records is moving towards the skill set of the techno-aesthetic intermediary, that uses *all* forms of technology seamlessly, embracing new forms of technology as they appear. Whether this is a 'good thing' for the art of production is another issue.

From stereotypes to reality

Though the above descriptions are in many ways skill caricatures that are partial and incomplete they serve to set general points on a continuum of informed knowledge with likely variations and overlaps that occur between levels that retain the essence of each production *ethos* whilst maximising the utility and characteristics of the others.[4]

A real-life example of the embodied skills of a TAI being used in record production includes latest *Strokes* album, *Room on Fire* recorded in *Logic,* edited with *Melodyne* and mixed in *Nuendo* by Grammy award winner David Kahn, who also uses top of the line audio editor *Sequoia* for post production.[5] This brings into question whether the traditional stereotype of 'big studio, big stack of hardware, one software platform' is slowly transforming into a hybrid set of software tools that includes interacting with a portfolio of high end software recording editing and mixing systems rather than a single platform. Though finding this out will require an extensive survey of industry working practices and may also be a case of 'different strokes (!) for different folks', as individual develops their own particular working practices, in some ways this could also suggest that even professional level industry software does not yet provide the one-stop shop that allows for a generalised set of 'embodied production skills' to be maximised, which means the professional Techno-Aesthetic Intermediary must use a portfolio of software as a solution to the ultimate production.

If the above is correct, this also begs another question: Is there any point in continuing the separation of the processes and specialisms of music production into different skill sets when it is obvious that they may now be part of the same set of embodied skills that can be mediated by single individuals? The main obstacle here is complexity: it may not be that every specialist would want to engage with a new embodied skill set that may take months or years to master. In any event this is probably an incremental process as the non-destructible editing and utility of using a Pro Tools HD TDM system was most likely the first systemic technical change that industry professionals took on board in the early 1990's and is now an industry standard. Though it seems that non-destructibility of a wholly digital arrangement involving FX and instrument plug-ins should make the production process easier, it can also bog it down in a quagmire of choices that are never actually for certain. This is where 'less can mean more' in terms of production workflow, as it is the act or non-act of making a decision during the production/engineering process that creates and also constrains the eventual musical destination. Having too many choices, unlimited undo, and the ability to choose from hundreds of presets may simply remove or indeed replace the 'personality' of producers that can be present in an analogue production. Having said this, one doesn't have to work this way, and TAI's will have a paired down repertoire of

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[4] e.g. using *ProTools* or *Logic* etc to record edit and produce drums, guitars and vocals through an analogue desk or input interface whilst also using virtual pads and sweeteners, or conversely adding mic'd up acoustic guitar track loops and verse/chorus length samples to an arrangement of virtual instruments in *Reason*.

[5] Thanks to London Producer Paul Borg for this information. See also the David Kahn interview at http://www.celemony.com/cms/index.php?id=190

both analogue and digital tools with their own user-defined presets that achieve their production aims without clutter, and will know when enough is enough and bounce tracks to audio rather than keep them as 'virtual possibilities'

Interactivity

Enhancing the application of skills: Mediation at the software level.

With all computer software, the efficiency of the workflow depends on the design methodology, which impacts on the level of interaction required for optimum operation whether this is for the pro user or the consumer. This interaction is mediated by the graphic user interface (GUI) the best of which will have been designed using principles of human computer interaction (HCI), a sub-discipline of software design including software engineering, software human factors, computer graphics and cognitive science.[6] As long as we use computers with screens we will need a GUI to show us the inputs and outputs graphically, though if we end up wearing them this may shift to other forms of display and a new interaction methodology.[7]

Interaction in HCI is defined as:

> *"…a process of communication or information transfer from the user to the computer and from the computer to the user."(Wanderley & Orio 2002)*

This involves the instigation of an interactive process to achieve a task (Dix et al. 1998) that can also be set up using sub routine or macros. Though existing literature in this area largely focuses on interactivity with musical instruments the principles are also valid for music production techniques that include software applications.

Interactive computer music as a subgenre of 'performance oriented computer music' requiring real time HCI communication, though in its wider conception this also includes pre-composition improvisation, random generation, or a mixture of all. (Garnett 2001)

Interactivity and performance

Garnett's (2001) article on interactive computer music discusses interaction as something that can be used to understand how the control of computers or machines changes the musical 'object'.

> *"Interaction…implies the presence of a human being controlling, to at least some degree, the performance of the electronic component of a musical work as it is being performed."(Garnett 2001)*

As the performance of music can now take place in real time in a non-destructive and *native environment* on a computer or music workstation, it is almost an afterthought that one recognises that this can also be recorded at the same time. If Garnett's 'performance of the electronic component…as it is being performed' can be extended to include music

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[6] For an evaluation of HCI for the purposes of input devices for musical expression see Wanderley & Orio (2002)

[7] For a discussion on interactivity in computer music see Garnett (2001). For interactivity and HCI see Wanderley & Orio (2002).

that has not been previously publicly performed, then are not producers of music in real-time (even when there is no public performance) also composing?

According to Garnett (2001) "interaction… becomes more a more significant aspect of the work the more the performer can actually effect changes… [to] any of the usual or unusual musical dimensions."[8] This identifies what distinguishes the process of *choice* over production techniques and processes that traditional composers decide upon during the composition process but are now available if real time on computers which are *operated like instruments*.[9] If this availability is now changing the role of the composition, production and engineering relationship, interesting questions could be asked about how this will impact on the future.[10]

Though until recently interactive performance was the realm of the bespoke system and more serious proponents of electro-acoustic music, this can now and is being done with real-time DAW's that are used as performance instruments. Examples include Reason[11], and Ableton Live as well as standalone virtual instruments such as Reakor used with a variety of input devices sometimes also 'Rewired' into a recording platform. This means that not only is music being created in real-time albeit with a certain amount of set up and configuration of sets of banks, samples and instrument patches etc, but it can also be recorded either directly into the DAW natively and/or sent digitally to another DAW that records the multi-track performance. This is possible not only because of the increased power of computers developments in innovative GUI design and commercial control interfaces for audio performance and production.

If performances were recorded in this way pre-production decisions could form part of the set up routine and the midi input and control information for each track could be recorded virtually whilst simultaneously being recorded as audio. This means that virtual performances can be also edited in post-production giving the option to roll back the rendered audio performance, which with optional the use of ambient microphones may

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[8] The interaction between human and computer performers is the main research interest of Narry Vercoe inventor of C sound (Lefford Computer Music Journal 23:4 , 1999, p9) An interview with Barry Vercoe.

[9] For an interview which discusses this subject with Barry Vercoe see Lefford (1999)

[10] One interesting perspective on the development of optimum software solutions is that they will never be provided by proprietary (commercial) software platforms. Due to a legacy of a 'linear model of innovation' and restrictive intellectual property law they can never quite contain all of the 'killer apps' assembled into one platform (Century 1999). It has been suggested that open source solutions with globally distributed networks of creative digital coders, designers, artists and users will interact to provide the digital solutions of the future providing software that is modular and user extensible (Century 2000a, 2000b). Examples of this kind of interaction already occur to a certain extent in both proprietary and open source modular synthesis software (e.g. Reaktor, MaxMsp or SynthEdit, Pd and jMax respectively). Among the hundreds of currently registered Open Source audio DSP projects, some of them the products of IRCAM, the Institute for Music/Acoustic Research and Coordination at the Centre Georges Pompidou, Paris. Others involve complete DAW systems. Whilst registering its free software on the open source network (i.e http://Sourceforge.net e.g. jMax, OpenMusic) IRCAM has also created a new facility for its own projects to run concurrently at http://freesoftware.ircam.fr/wiki/index.php?pagename=HomePage One well-publicised example is *Audacity,* an open source cross platform audio editor released under the GNU public licence. Audacity runs on MacOS9/OSX, Windows and Linux/Unix platforms. Available on Sourceforge.net the one of the largest opens source software development networks at http://audacity.sourceforge.net/

[11] Third party applications have also been developed to enhance the use of Reason in a performance environment. See 'LiveSet' and 'Hammer' at http://www.petertools.com/

have more or less desirable bleed and or dynamic crowd interaction. Granted that some traditional instruments (guitars/acoustic drums/ percussion/vocals) without digital interface connections would only be recorded as audio this nevertheless provides a wide degree of scope for many genres of music performance including the obvious sample driven dance genres where it is currently being used.

Interactivity and production

If the above is correct, it could be argued to amount to a new production methodology that could impact on the future of music production- where with the raw power of computers the venue actually becomes the recording studio. Though there will always be problems of acoustics for live recording, to some extent these will be mediated by new forms of variable acoustic spaces currently being developed and installed in some venues.[12] Indeed to some extent groups of performers are already beginning to interact together in multilevel simultaneous jam, composition, performance and recording sessions.

Though ideally the complexity of the software interface mirrors its purpose and the complexity of a tool can be measured by counting the number of command and direct manipulations it contains (Lindell 2004), the axiom that GUI's should be designed with the minimum of buttons, menus etc to achieve the multiplicity of desired tasks can be mediated by the degree that the software may have a dual use function such as music production *and* performance. It goes without saying that the best systems for both will have the least number of routines.[13]

Whereas in interactive performance the production emphasis is on configuring the input levels, EQ other parameters to operate within preconfigured (musical) limits, etc the arrangement is defined by the performance itself which is played in real-time perhaps also involving a degree of improvisation. In software production the concept of 'interactive play' can also be useful to understand the interaction between the user(s) and the computer interface. In this sense an accomplished or practiced user will navigate through the software interface in an intuitive manner without workflow problems, be able to perceive options for parameter control, decide upon concrete actions, and receive feedback in the course of the musical process.

The overlap that now occurs in the production process blurs the distinction between recording, engineering and mixing. As a non-linear process it does not require that decisions be made that fix any component or attribute of a project other than accepting a particular audio recording as an acceptable take.

Composition

To the extent that music production, recording, engineering and mixing can now all be done with an (almost) integrated soft toolset is this a composition process? Composition

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[12] Such a system is the SoundLab now installed in the Sage Music Centre Gateshead, UK. See http://www.arup.com/acoustics/soundlab/arup_soundlab.htm

[13] An example is Ableton Live "excluding parameters of filter components, preference panel and explicit file management" which has 77 commands and direct manipulations. (Rindell 2004)

can be viewed as a creative process by which a composer engages with a plurality of representational systems, without which there would be no musical process (Vaggione 2001). Interaction with compositional tools or instruments is a key sub-process which Vaggione argues depends principally on an 'action and feedback loop' which, when taken within a Realist ontological framework, a musical process…

> "…can certainly use formal tools as generative and transformative devices; however, other instances are needed, involving concrete actions and perceptions, in order to qualify results and choices according to a given musical project. Here, formalization is not foundational, but operational, local, and tactical."(Vaggione 2001)

As generative devices provide formal output, this requires mediation involving action, perception and feedback by the composer or user of the compositional tools or the user interface. The composer has control over the generated limits, other musical and sonic parameters that can be varied in real-time to match the compositional expectations in a way that Vaggione describes as:

> "…vectors of posited relationships that may or may not become satisfied, depending on a certain way of interactively matching inputs and outputs. The role of the composer here is not one of setting a mechanism and watching it run, but one of setting the conditions that will allow him or her to perform musical actions."(Vaggione 2001)

This is where the overlap occurs between composition and *native* music production. Where the production resides within a native software environment the levels of perception during audio playback, composition, and engineering exercised as direct or concrete actions to arrange, edit, filter, EQ or any number of other processes within the feedback of work-flow, etc may bring about the balance of matching inputs and outputs as Vaggione describes above to *create, perform or play* a musical action. In this way composers are now using production tools and producers are becoming composers. As Barry Vercoe states "…composers in every day and age have always been the beneficiaries of the technology at the time." (Lefford 1999)

Conclusion

The perspectives addressed in this paper lead to a general conclusion that asks: Why should we look at music production as a socio-technically constrained process, especially when the nature of the art is about creativity, albeit within certain aesthetically chosen constraints. An embrace of new production methodologies is possible because of technological developments, and more interestingly how these are used in unexpected ways. If this does not result in a loss of 'subjective quality' it may mean that no one has the epistemological knowledge or status to criticise it as 'not being proper music production', whether or not this also leaves music production open to a dumbing-down of the drag and drop variety. As Garnett notes:

> "Owing to [the] extreme dependence of music, or any art, on highly variable social and cultural contexts, it becomes impossible to define generally that which is and is not categorized as art."(Garnett 2001)

What is pertinent is that any tool can be used to do 'something'. Whether that something has artistic merit depends on how the tool is used by the artist, composer or producer. Artists have always acted as innovators in product development played a role in the development and social acceptance on new types of musical instruments and more recently creating new tools for real-time audio manipulation or editing (Cook 2001). One such example is *Coldcuts* involvement in the development of audio processing tools with *BrightonArt* software development. [14] Barry Vercoes view is that artists have a function in society to…

> *"show engineers new ways of doing things—creative things. Engineers like to feel they're creative too, but they must realize that artists are creative in a different way. Perhaps only artists know how to push the limits of devices and thereby engender a rethinking of how they can be used." (Lefford 1999)*

If the question then becomes should we restrain or constrain artists in what they create and how they create it, then the answer would probably be a unanimous 'No". Put another away, to quote Vercoe again….

> *"The musically responsible thing is to avoid having the technology tail wagging the artistic dog, but rather to have the technology following and even enabling the musician." (Lefford 1999:16)*

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[14] http://www.brightonart.co.uk

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