Impact of MIDI on Electroacoustic Art Music

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Abstract
The revolution in the tools for music composition in the mid-1980's caused a major change in electroacoustic music composition itself. Inherent features of the MIDI protocol and design of MIDI devices have had numerous implications for compositional practice. This paper highlights the reception, adaptation, and application of MIDI tools on a sampled researched group of electroacoustic art music composers and analyzes the impact MIDI has had on composition with electroacoustic media. The full text of the dissertation is available from CCRMA.

1 Introduction
MIDI was not the first technological revolution to affect art. However, few such revolutions brought change to the degree that MIDI did. Never before, nor ever since the introduction of MIDI, have we witnessed a change in the tools employed by the artists for the creation of art as quick, universal and profound as in the case of the standardization of digital musical instruments and computers in the mid-1980s. MIDI-based music technology provided an entirely new and comprehensive array of composition tools. The flood of MIDI-based hardware and software appearing within two years after the introduction of the standard transformed the concepts of the contemporary electronic music studio, the digital instrument, and the role the computer plays in musical composition.

Transformed but nonetheless present in electroacoustic music, are brought to the fore of the current research. Besides inducing the emergence of a new style in electroacoustic music, the MIDI phenomenon has also highlighted an array of thorny aesthetic and technological issues. Since the technology was not directly designed for the demands of non-commercial art, conflicts arose in the interaction between these two spheres. Thus, the anticipation of MIDI, the initial reaction to it, and the evolution of the reception of MIDI in the art music community are addressed in the study.

The results of this survey accurately reflect the attitudes and experiences of a sampled group of composers. However, the author is convinced that these results can also demonstrate the trends existing in the entire electroacoustic community.

2 Research Design
The study concentrates on the impact that MIDI has had on art music composition, focusing on composers who were active in electroacoustic art music before and after the introduction of MIDI. Due to insufficient bibliographic sources, the author chose to interview these composers as the method to obtain research data. Forty-five composers from thirteen countries including composers from both West and East Coasts of the United States were interviewed in 1996 using the same questionnaire. The collected interviews laid down the foundation of the study.

3 Introduction to MIDI
The majority of respondents -- nearly two-thirds -- did not experience problems arising from incompatibility of pre-MIDI hardware. General lack of communication and control between the pre-MIDI devices was habitually solved by custom-built or same-brand compatibility or, more often, by avoiding the use of mutually unacceptable hardware. Few composers (17%) attempted to forcefully connect incompatible elements of pre-MIDI setup.

Despite the persisting myth of anticipation of MIDI, 79% of those who answered the question “Did you expect the appearance of a control standard like MIDI in the mid-1980s?” responded negatively. The ‘it-was-a-surprise’ pattern dominated the answers.

MIDI and its foremost carrier, the Yamaha DX7, were introduced nearly simultaneously in different parts of the world. Even though manufacturers of Yamaha and other early MIDI synthesizers were pre-
dominantly based in Japan with some technology originating in California, the survey shows no correlation between the locality of the respondent and the time of introduction.

The absolute majority of the composers working in the field became aware of MIDI and MIDI devices within the first 2 years of its existence: 82% of the surveyed composers were introduced to MIDI in 1983-84. In 1985, the percentage grows to 91%.

The rate of applying MIDI to composition was much slower: compared to 82% who were introduced to MIDI, only 19% of the composers wrote pieces involving MIDI equipment in 1983-84. Only in the beginning of 1990s does application of MIDI tools finally catch up with their introduction.

There is a deep connection between introduction of both MIDI and Yamaha DX synthesizers in the communal memory. 19 out of 45 composers mentioned Yamaha DX7 answering the question of the time and place of their introduction to MIDI. Surprisingly, they mentioned this connection without being prompted to recall any such link.

4 Reception of MIDI

The speed at which the composer adapted to new tools depended on how quickly the coming MIDI gear answered his/her compositional needs. The initial impression of MIDI was often laid against the background of the long-term experience of working with pre-MIDI electroacoustic music, in particular, its achievements. What MIDI equipment could not do, but the analog or pre-MIDI digital could, was often the main source of hesitation for using it. Initial reaction to MIDI and MIDI equipment among the art composers can be divided into 2 roughly equal groups: 21 interviewees responded positively, showing interest and approval of the new technology; for remaining 24, the downsides of this technology prevailed in their initial opinion.

Surprisingly, half of the sampled population (51%) have changed their opinion about MIDI over the time MIDI tools have been in use. Overall, the breakdown of favorable/unfavorable opinion percentage evolved from 54:46 at the time of introduction to 80:20 currently. This is a remarkable evolution of attitude to MIDI technology in the surveyed group from roughly evenly divided in the beginning to the absolute majority favoring in the end.

The majority of the surveyed composers (68%) agreed that “MIDI tools were easy to learn, install, implement into the composition environment.” 28 (76%) of 37 composers who answered the question attempted to transfer their pre-MIDI compositional methodology into their MIDI pieces. The transfer was successful with 20 out of 28 of these composers. The failure to transfer was present in the answers of the remaining 3 composers. The numbers above show that the majority of composers successfully transferred their pre-MIDI techniques into their MIDI pieces.

Of 45 electroacoustic composers interviewed, 30 (two-thirds of the entire sample) have used MIDI for their pieces on a regular basis. 11 cited use of MIDI on a minimal basis, peripheral to their pieces and/or, their use in only one piece. A good example of the latter use is a composer who used MIDI in only one piece, being quite prolific before and after.

The decision to use MIDI equipment has been determined by the balance between the assessment of its advantages to express compositional ideas and tolerance of its limitations. The use of MIDI instruments also depended on the aesthetic criteria of the composer and the availability of instruments. When asked if they continued to use exclusively non-MIDI environments after introduction to MIDI equipment, 63% (27 out of 43 composers) responded positively. Only 16 (roughly one third) showed complete transfer to MIDI tools.

5 Social Benefits of MIDI Equipment

Nearly 4 out of every 5 composers (79%) found the social access to the tools much better with MIDI than with pre-MIDI equipment. Financial accessibility is commonly cited as the main social benefit of the MIDI generation of music-making tools. Democratization of electroacoustic music (obviously only compared to pre-MIDI conditions) was another important social benefit of MIDI: the community has expanded as the access to the tools has been given to the musicians not associated with an institution including the musicians coming from underprivileged backgrounds and from non-Western musical traditions.

Commonality of MIDI devices due to their wide distribution was to the advantage of touring performers, particularly in troubleshooting equipment problems. Use of a MIDI device as a substitution for an acoustic instrument could also save the extra costs and rehearsal time when organizing a concert. Portability was another benefit for organizing concerts. Extended performability of MIDI-based pieces, due to equipment interchangeability, was another benefit to concert practice.
6 Timbre and MIDI

The ready-made timbres available in MIDI instruments, usually referred to as MIDI presets, opened a universe of new sounds and compositional solutions. For the first time, libraries of malleable, MIDI-controllable timbres became a major timbral source for composition. The very concept of offering a bank of believable sounds imitating acoustic instruments as well as some entirely original patches, caught on quickly with popular music, but did not fare as well in art music. Only about half of the interviewed composers ever used MIDI presets in composition. Three out of every four composers used software synthesis, but only two out of four would use MIDI timbres.

Only 31% of composers whose answers are available hold positive opinions about MIDI presets. The negative opinions were shared by twice as many respondents. However, among the actual MIDI users, presets were rated much better with 52% viewing them positively vs. 38% negatively.

The MIDI generation of electroacoustic equipment featured a new type of instrument—a controllable module with ready-made synthesized sounds. This signaled a major turn in the concept of synthesizer: from a unit responsible exclusively for synthesis of sounds to a bank of sounds with limited synthetic facilities.

The voice-bank synthesizers had come into existence in the beginning of the 1980s. However, the idea of the ready-made sound itself contradicted with the contemporary approach which emphasized unlimited possibilities for experimentation. As a result, presets enjoyed little popularity before or with MIDI. Easy access to the libraries of ready-to-use sounds paradoxically created a new constraint—the limited number of those timbres leading to a lack of freshness or novelty in sounds. For composers who were used to the extreme range of available timbres that electroacoustic music provides, this constraint ruled out the use of MIDI tools. A number of interviewed composers did not use MIDI synthesizers because they were not interested in using a MIDI patch instead of an acoustic instrument.

The absolute majority of the presets in MIDI instruments simulate acoustic instruments. The general opinion about the quality of simulation in MIDI preset timbres is overwhelmingly (86%) negative. In the responses, several composers distinguish the degree of simulation success with different orchestra groups: percussive and plucked sounds fare better than others; simulated strings and trumpets did not receive many compliments. Software synthesis has continued to be the predominant source of sounds; only about a half of composers used MIDI presets but three-quarters used software synthesis after introduction to MIDI. In fact, the use of software synthesis in the sampled group has modestly grown from two-thirds of the respondents in pre-MIDI years, to three-fourths, during MIDI years. In only two cases has the use of MIDI timbres phased out the software synthesis.

7 Live Interactive Electroacoustic Music

There is a clear connection between the turn to writing live interactive pieces and the introduction of MIDI tools: with the coming of MIDI the percentage of composers writing music for live interactive performance grows from 41% in the pre-MIDI days to two-thirds. Of those who composed live music after their introduction to MIDI, 60% agreed to the statement that the availability of MIDI influenced their choice for writing live interactive music. Meanwhile the number of composers who wrote tape pieces slightly decreased (to 84%) as some switched entirely to live interactive music.

Half of the respondents in the survey reported using improvisation in their compositional practice. All composers who answered the question consider MIDI facilities for improvisation better than the ones available before MIDI equipment.

8 MIDI and Use of Notation

Despite the existence of many practices contradicting traditional conventions of Western art music, the absolute majority of interviewed electroacoustic composers (76%) acknowledge use of notation as part of their compositional method. More strikingly, 63% have used traditional notation for the composition of electroacoustic music. The MIDI note-oriented approach fit perfectly into note-oriented compositional practice: the input of notes was greatly simplified, and the response time for trying out the sketch minimal and user-friendly approach of contemporary digital equipment was helpful. In that regard the contribution of MIDI technology to the notation practices has been revolutionary. Forty-four percent of surveyed composers have used MIDI notation software. Answers show a balance of demands met and unfulfilled by MIDI notation packages.
9 Change of Compositional Interest

Only 8 composers (22%) have changed their focus of compositional interest in electroacoustic music from one property to another in transition from pre-MIDI to MIDI environments. Despite the profound change in the tools, the core of the compositional activity remains the same. The tenacity with which the composer's style persists is indirectly supported by the overwhelming number of composers who decided to transfer pre-MIDI practices into their MIDI works.

The eight composers who did switch demonstrated the shift of interest to those aspects of composition that were greatly expanded by MIDI tools: interactivity, improvisation, and control.

10 Conclusions

The introduction of all-digital MIDI-based technology was not a mere change in the continuum of development in electroacoustic music technology, but much more a revolution in the tools used for composition. The extinction of analog devices came as one of the major effects of this revolution. The birth of new paradigms of instrument design, compositional environment and performance solutions were also significant.

The interaction between composers and MIDI tools is always a compromise between demands of the individual style and advantages and limitations of the MIDI equipment. Advantages and limitations of the protocol, further complicated by the implementation of MIDI and other technologies in the MIDI equipment, have had multiple effects facilitating or constraining the compositional process. In some cases the limitations of MIDI equipment and satisfaction of working with non-MIDI environments has led to the total exclusion of MIDI from the compositional setup.

The tenacity of tradition went against the drastic change of tools. The results show how the pre-MIDI genres and the timbral sources have continued to dominate in this period as well. The majority of art music composers have attempted to transfer their pre-MIDI compositional methodology and practices into their MIDI works. Most of them succeeded in this transfer. The switch to the new set of tools caused a change in compositional interest from one property of electroacoustic composition to another in less than a one-fourth of the surveyed composers; however, stylistic changes are numerous and vary from composer to composer. We see manifestations of that in all steps and elements of compositional process from organization of this process to changes in the structure of MIDI-based pieces. Distinct changes in the produced musical output appear as a result of such influence.

These results lead us to conclude that the adoption of new technology has not affected the core of the compositional style of the majority of composers, but caused abundant examples of changes to the details of methodology.

References