Assignment 6: Survey

Noteworks: Becky Chu, Andy Hickner, Avalon Hu
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Executive Summary

This report outlines the methods, findings, and recommendations of a survey analysis conducted for the music creation application called Noteworks. Noteworks is a program that uses a neuron network approach to model and create music compositions.

Methods: Our team designed a survey for gathering information from potential Noteworks users in order to fuel analysis of the music composing software market and what features maximize user experience. For instance, we asked users about their general musical background, proficiency level and past experiences with music composing software, their preferred features, how they share their work, and we asked about their music teaching experience and habits.

Findings & Recommendations: Based on our survey results, we synthesized six key findings and recommendations:

1. Music collaboration is common amongst composers and features that enhance the ability to collaborate are most valued. Further study is required to determine whether this should come in the form of desk-top or web-based software as our results on the subject were mixed.
2. When sharing their music, users either disseminate audio files or perform their compositions rather than sharing their work in visual notation form. Consequently, file exports of Noteworks compositions should be enabled, specifically, for popular audio formats such as MP3, WMA, RealPlayer, etc.
3. Electronic music composers share their compositions and arrangements primarily through social media personal websites. In this case, Noteworks should facilitate the file sharing, uploading, and publishing of Noteworks compositions on popular social media networks.
4. The linear representation of time and the visualization of frequencies and sound waves were reported as the most important visual tools for music composition. Currently, neither of these visualizations is used in Noteworks; the Noteworks team should consider the incorporation of these aids into their program interface.
5. Music educators are receptive to using computer aids as teaching tools. We recommend that the Noteworks team foster an online forum or community for discussing the educational uses of the application.
6. Of the musicians who classified themselves as visual artists, music was often used in conjunction with visuals. Noteworks should consider adding video edit functions and color customization options into their program in order to aid the visual artistry of their software application.

Discussion: Our survey had several limitations. First and most significantly, the ordering of our options was fixed and may have biased our respondents' answers. Additionally, some of our findings were ambiguous and further study should be conducted before implementing our recommendations, including whether Noteworks should target music educators, which social media platforms are appropriate for sharing Noteworks compositions, and how Noteworks can enhance its visual capabilities.

Introduction

Noteworks is a Java-based computer application that produces music through the use of temporal networks (Noteworks, 2010). The temporal networks are represented by arrows linking MIDI notes (Musical Instrument Digital Interface) to one another; the arrows denote sequence and relationships between the different notes. The end result: Noteworks is a music composition program that enables users to craft both visual and auditory works of art, eschewing traditional music notation for a more modern approach to sound.

Noteworks is a system that originated out of a GROCS (Granted Opportunities [Collaborative Spaces]) project proposal submitted in 2008. Since 2008, the brainchild of Rob Alexander, Patrick Turley, and John Umbaugh has developed into a full-fledged computer application that is targeted for an early February 2010 beta-release. The original idea came out of a neuroscience class that one of the creators was taking, and after learning about how different sections of the brain could be connected via pathways to create thoughts, retrieve memories, and produce emotions, the question became, "what else could be modeled after the neuron paradigm?"

During its two years of development, Noteworks has shifted from a word-based poetry visualization program to a music composition application that is attracting considerable interest amongst electronic music enthusiasts and music educators.

At this stage of our evaluation of Noteworks, we developed a survey in order to gather data from potential users. Surveys are important research tools for gathering data from target populations, via the use of population sampling, and can be disseminated in a quickly and timely manner when conducted over the Internet, as in our case.

The focus of our survey was to address these areas of interest:

- What previous experience do potential Noteworks users have with other music composing software and what features help them when composing their work?
- What kinds of visualizations are helpful to users when creating music?
- How do electronic composers share their work and what are their expectations for music composing software?
- What does the market for music educators look like and does it overlap with the market for composers of electronic and digital music?
- Do music teachers currently use computer aids?
- What other potential uses of music composing software exist?

After clarifying our focus of this survey, we started designing questions around the issues listed above. The collected data will help us identify potential users'

expectations and how they use their current tools. Additionally, we hope to gather information regarding whether Noteworks should be web-based or computer-based software, if it is feasible to target the music education market, and how to optimize Noteworks' visual components. Moreover, the data obtained will help us finalize the next phase of our research, the heuristic evaluation, where we will further aggregate the results of our studies to generate detailed problem and solution guides for Noteworks' development team.

Methods

The method we employed for this phase of our evaluation was a survey, which was posted on SurveyGizmo. The target population of our survey consisted of potential Noteworks users (not current users) who had previously used computer software for composing or arranging music.

We began this process by formulating research questions. These questions served as guidelines for our survey and what we hoped to learn from our respondents:

- What do music teachers look for in educational music software?
- Do users want to share their music compositions with others, and if so, how?
- How do people compare web-based versus desktop-based software? (Do they have separate purposes, functionalities, drawbacks, etc.?)
- What shortcomings do users find in current music software programs?
- What elements/features/functions/visualizations are helpful to users in editing or composing their music?
- Could Noteworks be useful for visual artists?

After formulating these questions, we drafted the first version of our survey, the pilot, which was comprised of 25 questions, including questions on how to improve the survey and how long it took to complete the survey.

(See Appendix A for our original survey.)

For the pilot, we contacted six people. Four of the people we contacted had been considered as possible interviewees for our persona and scenario report but were not actually used. We supplemented these four by asking another two whom we had interviewed and who possessed characteristics that would help diversify our pilot group. Four of the six completed the pilot, and we used their feedback (Figure 1) to revise and refine the survey. We were, however, unable to implement conditional logic into our survey such that respondents could skip ahead to questions that did not apply to them.

Appendix 6:
Please describe any suggestions you have for how we could improve this survey, including any questions you found ambiguous, poorly worded, or just plain dumb.

DATA	
CODE	**VALUE**
66014991	Open source software is a very important thing in the world of computer music, and the tangibility of music hardware is an important thing to explore, especially with all the links between digital music and dance music. There is also no mention of performance as a mode of sharing compositions. Maybe these are outside the scope of this survey. Thanks1
66055530	It was fine. Only thing is you have Microsoft Office as a web-based and ask about internet connection. Doesn't make sense to me when referring to a desktop software.
66150042	#6 Example of a web-based software: Microsoft Office Should read: Example of a desktop-based software: Microsoft Office #3,5,6,8 Use of "Other" option didn't really work for me. It should be an optional write-in, not a forced choice response. For skip-ahead questions (e.g., "If no, skip ahead to question 18)") this should be done using the survey gizmo interface rather than making someone do the skipping manually. #3 I didn't understand the option "Soundboard interface"

Figure 1: *Selected feedback from pilot users.*

(See Appendix B for the final version of our survey.)

Recruitment for our survey required several steps. We first contacted the Noteworks team in order to obtain their list of people who had registered on the product's beta download page and people who had signed up for email notices at various conferences and events. We emailed these lists and invited potential users to take part in our survey. We sent a follow-up email approximately one week later to remind them to participate if they had yet to do so.

We also disseminated the survey through several other methods:

- Posting the survey on the wall of the Noteworks fan page, on Andy's Twitter account, and on the Cycling74 user forum;
- Sending it to various friends, who we felt might know others who would be potential Noteworks users; and
- Asking the chairs of the music education and music composition departments to share it with their colleagues and students.

We decided to entice potential users with a chance to win a $10 iTunes gift certificate, with the drawing to occur after the survey was closed. In order to ensure a blinded study, we created a separate survey to capture respondents' email addresses, which was linked at the bottom of the main survey. Only 17 of our 32 respondents, however, chose to enter the drawing, suggesting that our incentive was either inadequate or unnecessary.

Overall, our survey had 32 respondents. The average age of our users was 30.88 years and the mode of their ages was 34. Of the survey subjects, 46.88% reported themselves as "advanced amateurs," 43.75% considered themselves professional musicians, 43.75% were self-reported as music educators, but only 25% called themselves visual artists. We wanted to keep our survey as brief as possible in order to minimize the number of incomplete surveys; to that end, we chose not to gather any other demographic data.

Figures 2 and **3** summarize the demographic data of survey respondents. As we will describe in the "Discussion" section of this report, our demographic data points to a potential source of bias in our study.
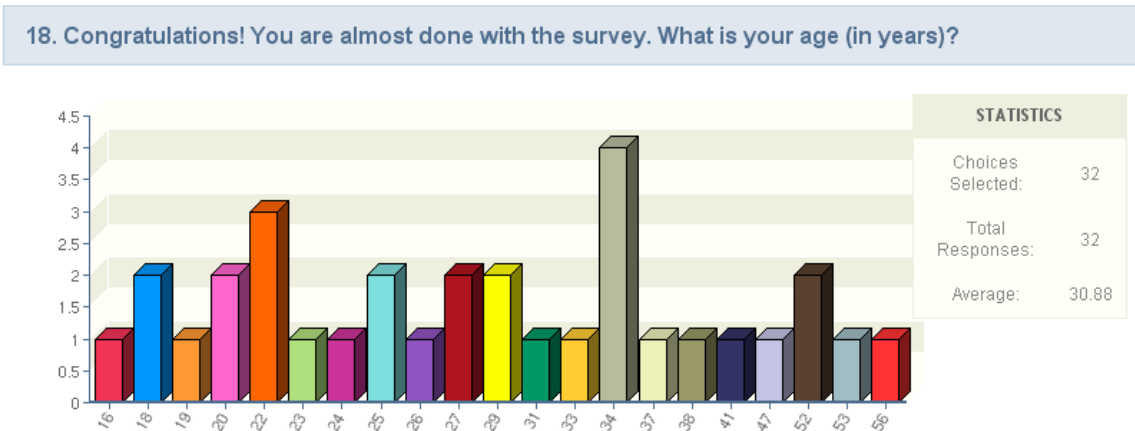
Figure 2: Demographic Characteristics: Age
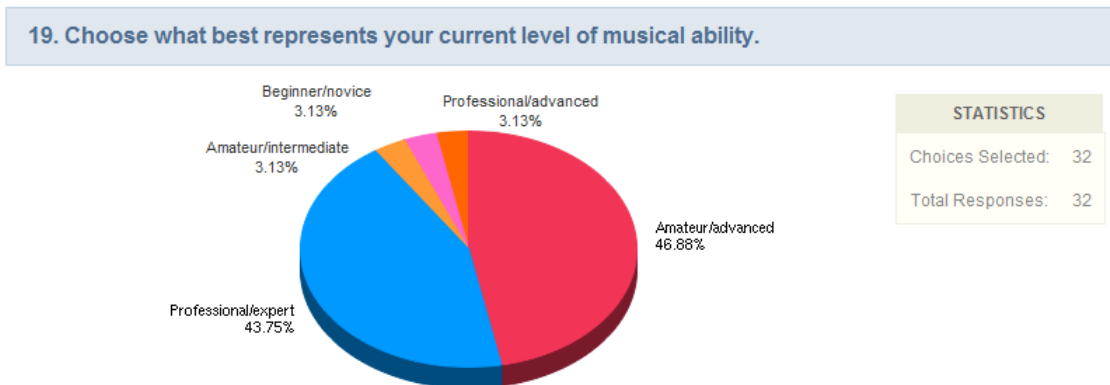
Figure 3: Demographic Characteristics: Musical Ability

For the final stage of our survey process, we used SurveyGizmo's Summary Report function to compile our survey data and for generating tables and graphs of our responses. We then discussed the results of our survey in order to identify what we felt to be the key findings and limitations of our data. We subsequently formulated our recommendations for the Noteworks team based on these findings and limitations.

(See Appendix C for the SurveyGizmo Summary Report.)

Findings and Recommendations

Summary of Results

We came to several findings concerning Noteworks and its potential users. First, sharing music compositions through audio files and live performance is important to users, as is collaboration. Second, whether or not a program is web-based or desktop-based is less important than having features and functions that facilitate collaboration efforts. Third, as hypothesized, music educators form a strong potential market for Noteworks while visual artists form a smaller but still viable potential market. Fourth, while we came closer to answering each of the core questions we described in the Methods section of this report, identifying conclusive answers to some of them remains elusive, and other questions emerged in the process.

Key Findings

Finding: *Most electronic composers collaborate with others and value features that enhance their ability to collaborate but do not need the software to be web-based.*

Evidence: 60% of respondents reported that they collaborate with others when creating music digitally. They also reported using web-based software primarily because it fosters the sharing and collaboration of their work. However, when asked what factors were most important towards collaboration, they cited version control and ease of sharing files and content as more important than whether a program was web-based. In fact, whether or not a program was web-based was the least important factor to users when it came to collaboration.

Assessment of significance: High.

Recommendation: When we were designing the survey, we operated under the assumption that web-based software was best at fostering collaboration between users. Through the survey results, we discovered that users do not agree with this assumption, as version control and ease of sharing files, were considered most important by users. Therefore, while it will be crucial for Noteworks to facilitate collaborative music composing through version control and ease of sharing files between users, this does not necessarily mean the software needs to be web-based.

The construction of the question and confusion over meaning are possible reasons for the surprising results; for instance, web-based software often makes file sharing easier than other methods, like CDs, USB keys, or DVDs, but further study is needed to determine whether Noteworks should be web-based, desktop-based, or available in either form.
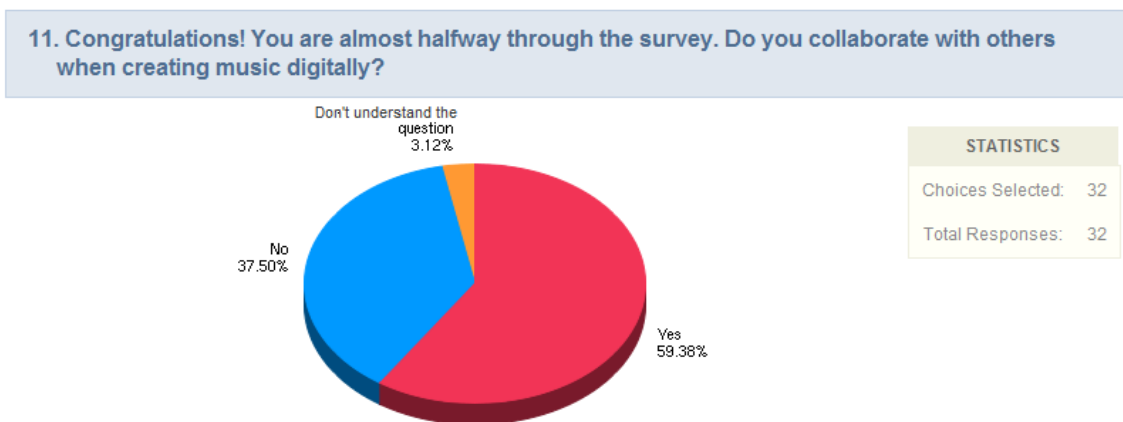
Figure 4: Digital music collaboration

5. What factors most influence your decision to use web-based software?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

Example of a web-based software: Google Apps ()

ITEM	1	2	3	4	5	Avg	Total
Ability to share with others	43.8% 14	25.0% 8	–	9.4% 3	21.9% 7	2.4	32
Ability to edit/create collaboratively	46.9% 15	9.4% 3	12.5% 4	3.1% 1	28.1% 9	2.6	32
Convenience	31.3% 10	18.8% 6	12.5% 4	12.5% 4	25.0% 8	2.8	32
Not having to download software	28.1% 9	9.4% 3	21.9% 7	18.8% 6	21.9% 7	3.0	32
Open source	25.0% 8	15.6% 5	9.4% 3	21.9% 7	28.1% 9	3.1	32
Other/not listed	21.9% 7	–	50.0% 16	3.1% 1	25.0% 8	3.1	32
Average %:	32.8%	13.0%	17.7%	11.5%	25.0%	2.8	192

Figure 5: *Factors that influence use of web-based software*

12. Rate the following factors by how helpful you find them when collaborating with others.
(1 - very helpful, 2 - somewhat helpful, 3 - neither helpful nor unhelpful, 4 - less helpful, 5 - unhelpful) ()

ITEM	1	2	3	4	5	Avg	Total
Version control	39.1% 9	17.4% 4	34.8% 8	4.3% 1	4.3% 1	2.2	23
Web based	17.4% 4	4.3% 1	52.2% 12	8.7% 2	17.4% 4	3.0	23
Easy to identify who made what changes	34.8% 8	26.1% 6	17.4% 4	8.7% 2	13.0% 3	2.4	23
Simultaneous editing	26.1% 6	13.0% 3	17.4% 4	17.4% 4	26.1% 6	3.0	23
Ease of sharing files/content	60.9% 14	4.3% 1	21.7% 5	–	13.0% 3	2.0	23
Average %:	35.7%	13.0%	28.7%	7.8%	14.8%	2.5	115

Figure 6: *Factors that influence collaboration*

Finding: *Users generally share their work through audio files or live performance, rather than through visual notation.*

Evidence: Of the 28 responses we received for this question, 28 reported sharing their work in audio format, 17 shared their work through performance, and 11 shared their work in visual notation format.

Assessment of significance: High.

Recommendation: Noteworks should enable users to export audio-only versions of their compositions in multiple formats (MP3, WMA, RealPlayer, etc). If our respondents are indicative of the electronic composer population, then the ability to share music through audio files is critical to the success of the music composing software and the ease of this function should be a top priority for the design team.

The significance of the relatively low response for sharing visual notation, and how that should be reflected as a recommendation, however, is difficult to ascertain. Since Noteworks' chief advantage lays in its visual form and its unique approach to music in general, we suspect that sharing Noteworks compositions in their original format is what Noteworks' design team would prefer. Sharing compositions through audio format means that the application will compete more directly with pure audio composers. Determining how to interpret the visual notation result, consequently, depends on what the development team intends as Noteworks' core compentency – as a music composer or as a hybrid music and visual tool.
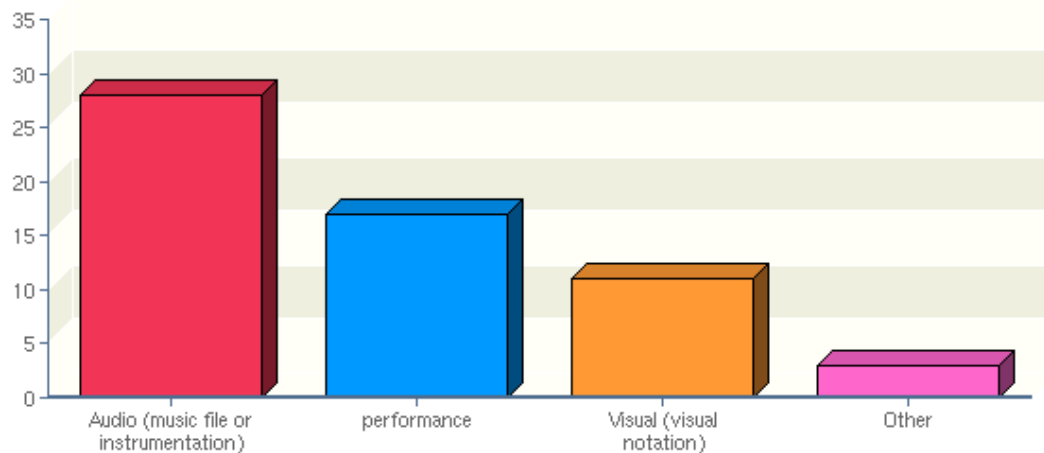

Figure 7: How music compositions are shared

Finding: *Almost all respondents share their compositions and/or arrangements with others and do so primarily through social media and personal websites.*

Evidence: 87.5% of respondents share their compositions with others. Of those who share, 23 of 28 reported doing so by posting to their personal websites, while 15 post to social media websites or applications.

Assessment of significance: High.

Recommendations: Noteworks should make it easy for users to share their work with others who may not have the software installed. Noteworks should facilitate the uploading of files to the web, including posting them to popular social media platforms. One example among analogous competitors of how to share files over the web comes from TechSmith. TechSmith provides easy and user-friendly ways for users of its screencasting software, Camtasia and Jing, to upload their videos to websites like screencast.com and YouTube (TechSmith, 2010).
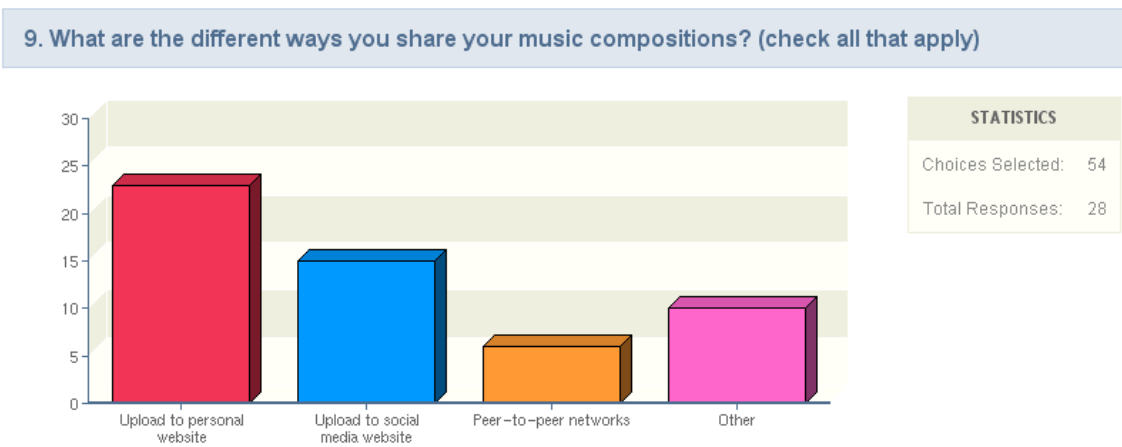
Figure 8: Methods of sharing music compositions

Finding: *Linear representations of time and visualizations of frequencies and sound waves are the most important visual tools for music composition.*

Evidence: The average ratings for the two visual aids were 2.2, or 0.5 higher than the third highest ranked component.

Assessment of significance: High.

Recommendations: Neither of these visual modalities is currently present in Noteworks. The development team should consider whether it is in their interest to incorporate these features into the Noteworks interface, or if doing so would detract from the temporal network visualization that currently exists in the program. We suggest that in Noteworks' case, the linear visualization of time is more important than frequency visualization, and if possible, to give the user the option of turning such a display on and off. However, if incorporating these features is too difficult, further research into whether these are essential to the user experience is merited.

The following is a list of common visual components used in music creation programs. Rate how useful you find each component.
(1 - very important, 2 - somewhat important, 3 - neither important nor unimportant/unsure, 4 - less important, 5 - least important)

ITEM	1	2	3	4	5	Avg	Total
Linear representation of time	59.4% 19	9.4% 3	6.3% 2	3.1% 1	21.9% 7	2.2	32
Visualization of frequency or wave	46.9% 15	21.9% 7	3.1% 1	18.8% 6	9.4% 3	2.2	32
Instrument icons	15.6% 5	6.3% 2	31.3% 10	12.5% 4	34.4% 11	3.4	32
Soundboard interface	21.9% 7	28.1% 9	15.6% 5	18.8% 6	15.6% 5	2.8	32
Mind-mapping	37.5% 12	6.3% 2	18.8% 6	21.9% 7	15.6% 5	2.7	32
Abstract representation	12.5% 4	21.9% 7	34.4% 11	15.6% 5	15.6% 5	3.0	32
Other/not listed	18.8% 6	3.1% 1	53.1% 17	–	25.0% 8	3.1	32
Average %:	**30.4%**	**13.8%**	**23.2%**	**12.9%**	**19.6%**	**2.8**	**224**

Figure 9: Usefulness of visual aids in music creation programs

Finding: *A high number of respondents were music educators, and of those who teach, the majority cited computer aids as one of their teaching tools.*
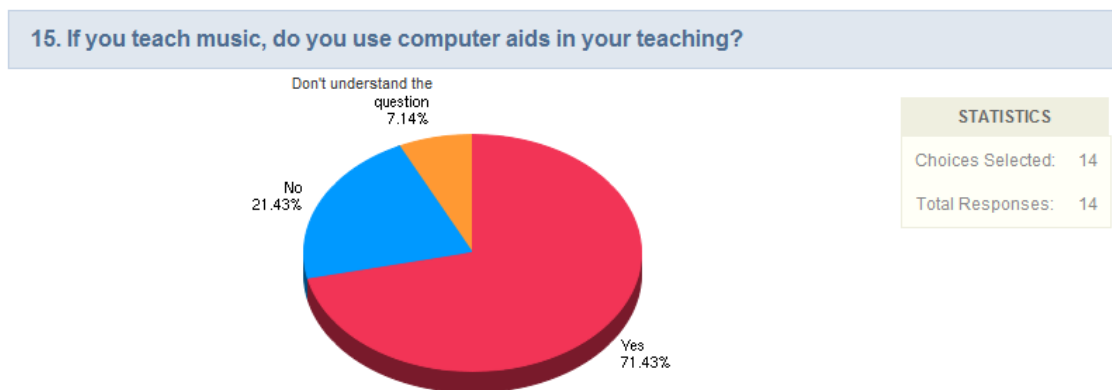
Evidence: Over 40% of respondents were music educators, of whom, over 70% reported using computer aids in their teaching.

Assessment of significance: Moderate.

A surprisingly high number of respondents were music educators; however, we assess the significance of this finding as moderate. Just because they use computer aids in education activities does not necessarily imply teachers (or students) will find Noteworks a useful teaching tool.

Recommendation: If the Noteworks team is dedicated to making the system a music educational tool, we recommend the formation of an online forum or community discussion group to help music educators brainstorm and support one another on possible educational activities for the software. Since the majority of music educators we surveyed reported using computer aids, we do know that teachers are receptive to the use of computers as teaching tools and we will consider this option when developing our usability tests.

Additional considerations involving the educational aspect of Noteworks and how these results can be interpreted are outlined in the "Discussion" section of this report.

15. If you teach music, do you use computer aids in your teaching?

Don't understand the question
7.14%

No
21.43%

Yes
71.43%

STATISTICS

Choices Selected: 14

Total Responses: 14

Figure 10: *Use of computer aids when teaching music*

Finding: *Musicians who are also visual artists often incorporate music into their visual art.*

Evidence: Of the respondents that were visual artists, 64% said they combined their art with music.

Assessment of significance: Moderate.

Self-reported artists constituted a relatively small percentage of people who took the survey.

Recommendation: An area of consideration for the Noteworks team is the software's potential use as visual art. Noteworks could facilitate visual art by including options such as customizable color, size, and styling for its music network structures and other visual elements of the program. Noteworks could also facilitate its use as visual art by making it easy to create and share video captions of Noteworks files; this function would also help users share files over social media sites like YouTube and Facebook.

Video creation and editing programs such as Camtasia or Flash, or image software such as Paint or Gimp, may offer examples of how to do this; however, this could conceivably become an extremely complex undertaking and distract from Noteworks' core purpose of music-making, especially since visual artists still form a relatively small percentage of users of music creation software. Consequently, in the immediate term it may be best to keep this as a background consideration.

Further research is suggested before determining whether Noteworks needs to extend its visual formatting options. We explore potential directions for further study on this topic in the following "Discussion" section.
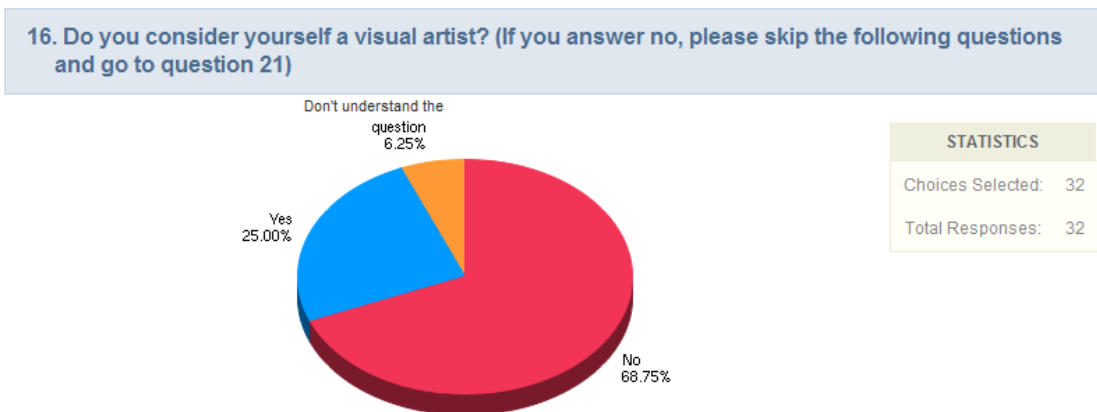
Figure 11: *Visual artists*

17. If you consider yourself a visual artist, have you ever combined music with visual art in your work?

Unsure/don't understand
9.09%

No
27.27%

yes
63.64%
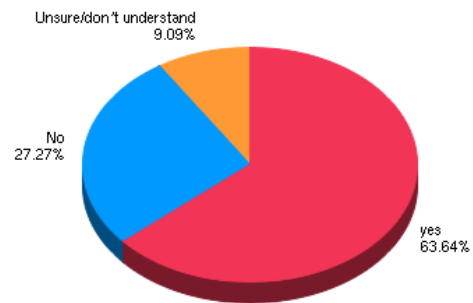
STATISTICS

Choices Selected: 11

Total Responses: 11

Figure 12: *Combining visual art with music*

Discussion

When interpreting our findings and choosing which of our recommendations to implement, the Noteworks team should bear in mind that our survey data has a number of potential limitations. First of all, the ordering of our selection options in the survey may have biased our respondents' answers. We noticed a pattern in our responses, where questions with selection options usually had the top or top two choices consistently being more significant than the succeeding options. The most prominent example of this event occurred when we asked respondents about factors that influence their use of web-based software (see Figure 13).

5. What factors most influence your decision to use web-based software?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

Example of a web-based software: Google Apps ()

ITEM	1	2	3	4	5	Avg	Total
Ability to share with others	43.8% 14	25.0% 8	–	9.4% 3	21.9% 7	2.4	32
Ability to edit/create collaboratively	46.9% 15	9.4% 3	12.5% 4	3.1% 1	28.1% 9	2.6	32
Convenience	31.3% 10	18.8% 6	12.5% 4	12.5% 4	25.0% 8	2.8	32
Not having to download software	28.1% 9	9.4% 3	21.9% 7	18.8% 6	21.9% 7	3.0	32
Open source	25.0% 8	15.6% 5	9.4% 3	21.9% 7	28.1% 9	3.1	32
Other/not listed	21.9% 7	–	50.0% 16	3.1% 1	25.0% 8	3.1	32
Average %:	32.8%	13.0%	17.7%	11.5%	25.0%	2.8	192

Figure 13: In question #5, the reported influence strongly correlated with where it appeared on the list of options.

One way to address this limitation would be to re-run the study using randomized ordering of answers.

Another potential limitation of our study is the selection and self-selection bias of our survey sample. As noted in our findings, most of our respondents were advanced amateur (46.88%) or professional musicians (43.75%); these users are likely to be more passionate and vocal about their opinions when it came to composition software and may not be representative of other potential Noteworks

users. Moreover, by seeking out younger music students, who we hypothesize would enjoy using Noteworks, we may have gotten respondents of more diverse musical ability and, consequently, different results for questions like visualization preferences. Furthermore, we specifically asked survey participants whether they had used Noteworks or not, signifying which composition software we were working for; this information may or may not have biased our respondents' answers.

Finally, in our findings and recommendations section, we noted that further study may be required. Directions for further study include the following:

- Whether Noteworks could be tailored for students and for music education purposes and how that could be implemented. Ideally, we would seek ideas from music teachers, through the use of focus groups, as to possible learning applications of music software.

- Determining which social media platforms are most appropriate for sharing Noteworks compositions. Currently, Noteworks videos are available on YouTube and a fan page was created on Facebook, but what other social networks would help Noteworks reach its audience? And how can Noteworks cater towards each social network in order to maximize the program's impact?

- Rephrasing or issuing a new survey in order to clarify the results for questions 5, 6, and 12. Our survey respondents cited the ability to collaborate and share as being the most important benefits of web-based software, but they do not necessarily believe web-based software is superior to desktop software in facilitating collaboration and sharing. Clarifying this subtle difference in user attitudes would require that we revise questions 5, 6 and 12 to reflect and account for these distinctions. For example, we would need to combine the possible answer sets for 5 and 6 and list them in both of those questions, as well as asking specifically whether web based programs better facilitate sharing and collaboration than do desktop programs. The questions and answers were written in a way that reflected our underlying assumptions about the relative advantages of each type of software.

- Researching possible enhancements to Noteworks' visual capabilities (as noted in the Findings section of this report) would be an additional area for study. For example, how could Noteworks integrate certain visual components (such as linear time or frequency representation) that are currently missing from the software, but that users cited as important? Should Noteworks expand its formatting options with an eye toward serving visual artists? If so, where should it focus its efforts and what formatting options would artists want? Should Noteworks explore ways to integrate the program with image creation and editing software? To what degree are such enhancements a distraction versus a beneficial extension of Noteworks'

capabilities? The answer is unclear due to the persistent ambiguity about who Noteworks' core users are and what the program's core competency is.

Conclusion

The key findings of our survey study are that a high number of respondents were music educators who were receptive to software as a teaching tool. We also found that the vast majority of respondents share their compositions and arrangements through social media and personal websites, while the majority of composers collaborate with others and value features that enhance their ability to collaborate. Additionally, respondents have a high preference for linear representations of time and frequency or sound wave visualizations.

Based on the data we gathered, we recommend that Noteworks add features that facilitate file sharing, uploading, and publishing of compositions on popular social media platforms. Also, we suggest adding audio export capabilities to Noteworks for the most popular audio formats, such as MP3, WAV, and RealPlayer extensions. Additionally, we suggested further studies on how to enhance Noteworks' visualization methods in order to meet user needs and increase Noteworks' ability to adapt to different purposes and applications, like visual arts and education. More specifically, the music education department is an area with considerable potential, with over 70% of music educator respondents indicating using computer aids when they taught.

Despite our best efforts, limitations of our study did occur. The question construction and the ordering of our selection options may have biased the answers we received; the selection and self-selection bias in our survey may have generated results not representative of the population of potential Noteworks users; and there are a number of areas where further study can occur to obtain more specific answers to our questions.

In the next phase of our system evaluation, we will be conducting heuristic evaluations in order to identify any major usability issues Noteworks may have. The heuristic evaluations will be used in conjunction with the usability tests to provide detailed problems and solutions for Noteworks design team.

References

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Appendix A: Survey (Pilot Version)

Music Creation Software Survey - Composers/Arrangers

1. Before starting, please take note of what time you are starting this survey and, if possible, record it somewhere.

Which of the following music programs have you used? *

- ☐ MAX MSP
- ☐ Ableton Live
- ☐ Propellerhead Reason
- ☐ Garage Band
- ☐ ChordGeometries
- ☐ Nodal
- ☐ Finale
- ☐ Sibelius
- ☐ Logic Pro
- ☐ Other [   ]
- ☐ None of the above

2. If you answered none of the above, skip to number 3.
Otherwise, briefly describe what shortcomings you find with any of the above.

3. The following is a list of common visual components used in music creation programs. Rate how useful you find each component.
(1 - very important, 2 - somewhat important, 3 - neither important nor unimportant/unsure, 4 - less important, 5 - least important) *

	1	2	3	4	5
Linear representation of time	○	○	○	○	○
Visualization of frequency or wave	○	○	○	○	○
Instrument icons	○	○	○	○	○
Soundboard interface	○	○	○	○	○
Mind-mapping	○	○	○	○	○
Abstract representation	○	○	○	○	○
Other/not listed	○	○	○	○	○

4. The following are some common features or functions of music creation programs. Rank them in the order you find them most helpful.
(1 - most helpful, 5 - least helpful.) *

1] Formal notation ⬇
2] Analog instrument input ⬇ ⬆
3] File import capability ⬇ ⬆
4] Export ability ⬇ ⬆
5] Other/not listed ⬆

5. What factors most influence your decision to use web-based software?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

Example of a web-based software: Google Apps *

	1	2	3	4	5
Ability to share with others	⊙	⊙	⊙	⊙	⊙
Ability to edit/create collaboratively	⊙	⊙	⊙	⊙	⊙
Convenience	⊙	⊙	⊙	⊙	⊙
Not having to download software	⊙	⊙	⊙	⊙	⊙
Other/not listed	⊙	⊙	⊙	⊙	⊙

6. What factors most influence your decision to use a desktop-based software?
(1- most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

Example of a desktop-based software: Microsoft Office *

	1	2	3	4	5
Range of features	⊙	⊙	⊙	⊙	⊙
Reliability	⊙	⊙	⊙	⊙	⊙
Convenience	⊙	⊙	⊙	⊙	⊙
Interface	⊙	⊙	⊙	⊙	⊙
Speed/quality of Internet connection	⊙	⊙	⊙	⊙	⊙
Other	⊙	⊙	⊙	⊙	⊙

7. Do you share your music compositions with others? *

- ⊙ Yes
- ⊙ No
- ⊙ Unsure/I don't understand question

8. If you answered no to the previous question, skip to question #11.
Otherwise, how much do each of the following reasons influence you to share your work?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

	1	2	3	4	5
Fame	○	○	○	○	○
Recognition	○	○	○	○	○
Peer-review	○	○	○	○	○
Entertainment	○	○	○	○	○
Collaborative works	○	○	○	●	○
Other (reason not listed)	○	○	○	○	○

9. What are the different ways you share your music compositions? (check all that apply)

☐ Upload to personal website
☐ Upload to social media website
☐ Peer-to-peer networks
☐ Other (not listed) [   ]

10. How do you share your music compositions?

○ Audio (music file or performance)

○ Visual (visual notation)

○ Both audio and visual (actual composition file)

○ Other (not listed)/I don't understand this question
[   ]

11. Congratulations! You are almost halfway through the survey. Do you collaborate with others when creating music digitally? *

○ Yes

○ No

○ Unsure/ I don't understand the question

12. If you answered no to the previous question, skip to #14.
Otherwise, briefly describe how you collaborate with others when creating digital music.

13. Rate the following factors by how helpful you find them when collaborating with others.
(1 - very helpful, 2 - somewhat helpful, 3 - neither helpful nor unhelpful, 4 - less helpful, 5 - unhelpful)

	1	2	3	4	5
Version control	○	○	○	○	○
Web based	○	○	○	○	○
Easy to identify who made what changes	○	○	○	○	○
Simultaneous editing	○	○	○	○	○
Ease of sharing files/content	○	○	○	○	○

14. Do you teach music? (If no, skip ahead to question 18) *

- ○ Yes
- ○ No
- ○ Unsure/I don't understand question

15. If you answered yes to question #14, what level of music students do you teach?
(choose all that apply)

- ☐ Beginner (1-2 years musical experience; little or no ability to read music)
- ☐ Intermediate (3-4 years experience; some ability to read music)
- ☐ Advanced (5+ years; proficient in reading music)

16. If you teach music, do you use computer aids in your teaching?

- ○ Yes
- ○ No
- ○ Unsure/don't understand question

17. If you answered yes to the previous question, briefly describe what kinds of aids you use.

[text box]

18. Do you consider yourself a visual artist? (If you answer no, please skip the following questions and go to question 21)

- ○ Yes
- ○ No
- ○ Unsure/I don't understand question

19. If you consider yourself a visual artist, have you ever combined music with visual art in your work?

- ○ Yes
- ○ No
- ○ Unsure/I don't understand

20. If you answered yes to the previous question, please describe how or in what way you have combined music with visual art.

21. Congratulations! You are almost done with the survey. What is your age (in years)?
*

22. Choose what best represents your current level of musical ability. *

- ○ No experience/ability
- ○ Beginner/novice
- ○ Amateur/intermediate
- ○ Amateur/advanced
- ○ Professional/expert
- ○ Other/unsure/I don't understand question

23. Please describe any suggestions you have for how we could improve this survey, including any questions you found ambiguous, poorly worded, or just plain dumb.

24. Approximately how many minutes did it take you to complete this survey? *

[   ]

25. Have you ever used the music composition software Noteworks? (If so, please do not complete this survey.) *

- ⦿ Yes
- ⦿ No
- ⦿ Unsure/don't know

Appendix B: Survey (Final Version)

Music Creation Software Survey

1. Have you ever used the music composition software Noteworks? (If so, please do not complete this survey.) *

- ○ Yes
- ○ No
- ○ Unsure/don't know

2. Which of the following music programs have you used? *

- ☐ MAX MSP
- ☐ Ableton Live
- ☐ Propellerhead Reason
- ☐ Garage Band
- ☐ ChordGeometries
- ☐ Nodal
- ☐ Finale
- ☐ Sibelius
- ☐ Logic Pro
- ☐ Other [_____]
- ☐ None of the above

3. If you answered none of the above, skip to number 4.
Otherwise, briefly describe what shortcomings you find with any of the above.

4. The following is a list of common visual components used in music creation programs. Rate how useful you find each component.
(1 - very important, 2 - somewhat important, 3 - neither important nor unimportant/unsure, 4 - less important, 5 - least important)

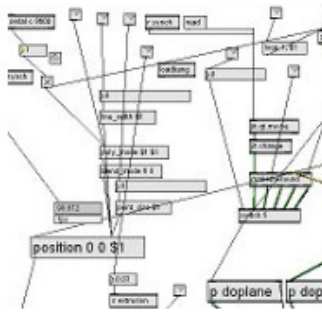## Linear representation of time

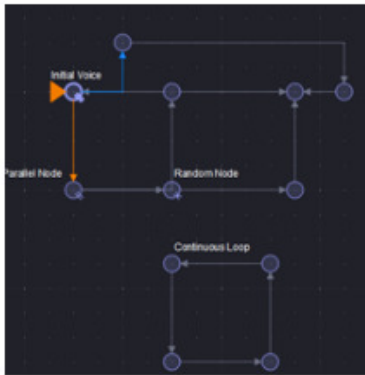## Visualization of frequency or wave

Instrument icons

Soundboard interface

Mind-mapping

Abstract

*

	1	2	3	4	5
Linear representation of time	○	○	○	○	○
Visualization of frequency or wave	○	○	○	○	○
Instrument icons	○	○	○	○	○
Soundboard interface	○	○	○	○	○
Mind-mapping	○	○	○	○	○
Abstract representation	○	○	○	○	○
Other/not listed	○	○	○	○	○

5. The following are some common features or functions of music creation programs. Rank them in the order you find them most helpful.
(1 - most helpful, 5 - least helpful.) *

1] Formal notation ⬇

2] Analog instrument input ⬇ ⬆

3] File import capability ⬇ ⬆

4] Export ability ⬇ ⬆

5] Other/not listed ⬆

6. What factors most influence your decision to use web-based software?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

Example of a web-based software: Google Apps *

	1	2	3	4	5
Ability to share with others	○	○	○	○	○
Ability to edit/create collaboratively	○	○	○	○	○
Convenience	○	○	○	○	○
Not having to download software	○	○	○	○	○
Open source	○	○	○	○	○
Other/not listed	○	○	○	○	○

7. What factors most influence your decision to use a desktop-based software?
(1- most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

Example of a desktop-based software: Microsoft Office *

	1	2	3	4	5
Range of features	○	○	○	○	○
Reliability	○	○	○	○	○
Convenience	○	○	○	○	○
Interface	○	○	○	○	○
Speed/quality of Internet connection	○	○	○	○	○
Open source	○	○	○	○	○
Other	○	○	○	○	○

8. Do you share your music compositions with others? *

○ Yes

○ No

○ Unsure/I don't understand question

9. If you answered no to the previous question, skip to question #12.
Otherwise, how much do each of the following reasons influence you to share your work?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

	1	2	3	4	5
Fame	○	○	○	○	○
Recognition	○	○	○	○	○
Peer-review	○	○	○	○	○
Entertainment	○	○	○	○	○
Collaborative works	○	○	○	○	○
Other (reason not listed)	○	○	○	○	○

10. What are the different ways you share your music compositions? (check all that apply)

- ☐ Upload to personal website
- ☐ Upload to social media website
- ☐ Peer-to-peer networks
- ☐ Other (not listed - please describe) [   ]

11. How do you share your music compositions?

- ☐ Audio (music file or performance)
- ☐ Visual (visual notation)
- ☐ Performance
- ☐ I don't understand this question
- ☐ Other (please describe) [   ]

12. Congratulations! You are almost halfway through the survey. Do you collaborate with others when creating music digitally? *

- ○ Yes
- ○ No
- ○ Unsure/ I don't understand the question

13. If you answered no to the previous question, skip to #15.
Otherwise, briefly describe how you collaborate with others when creating digital music.

[   ]

14. Rate the following factors by how helpful you find them when collaborating with others.
(1 - very helpful, 2 - somewhat helpful, 3 - neither helpful nor unhelpful, 4 - less helpful, 5 - unhelpful)

	1	2	3	4	5
Version control	○	○	○	○	○
Web based	○	○	○	○	○
Easy to identify who made what changes	○	○	○	○	○
Simultaneous editing	○	○	○	○	○
Ease of sharing files/content	○	○	○	○	○

15. Do you teach music? (If no, skip ahead to question 19) *

- ○ Yes
- ○ No
- ○ Unsure/I don't understand question

16. If you answered yes to question #14, what level of music students do you teach? (choose all that apply)

- ☐ Beginner (1-2 years musical experience; little or no ability to read music)
- ☐ Intermediate (3-4 years experience; some ability to read music)
- ☐ Advanced (5+ years; proficient in reading music)

17. If you teach music, do you use computer aids in your teaching?

- ○ Yes
- ○ No
- ○ Unsure/don't understand question

18. If you answered yes to the previous question, briefly describe what kinds of aids you use.

19. Do you consider yourself a visual artist? (If you answer no, please skip the following questions and go to question 21)

- ⦿ Yes
- ⦿ No
- ⦿ Unsure/I don't understand question

20. If you consider yourself a visual artist, have you ever combined music with visual art in your work?

- ⦿ Yes
- ⦿ No
- ⦿ Unsure/I don't understand

21. If you answered yes to the previous question, please describe how or in what way you have combined music with visual art.

22. Congratulations! You are almost done with the survey. What is your age (in years)?
*

23. Choose what best represents your current level of musical ability. *

- ⦿ No experience/ability
- ⦿ Beginner/novice
- ⦿ Amateur/intermediate
- ⦿ Amateur/advanced
- ⦿ Professional/expert
- ⦿ Unsure/I don't understand question
- ⦿ Other (please describe)

Appendix C: SurveyGizmo Summary Report

Report: Response Summary Report

Survey: Music Creation Software Survey

Compiled: 03/09/2010

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1. Have you ever used the music composition software Noteworks? (If so, please do not complete this survey.)
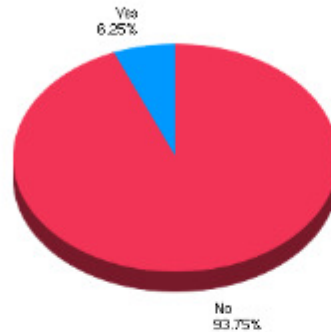
STATISTICS	
Choices Selected:	32
Total Responses:	32

SUMMARY		
VALUE	COUNT	PERCENT %
No	30	93.75%
Yes	2	6.25%

---

2. Which of the following music programs have you used?
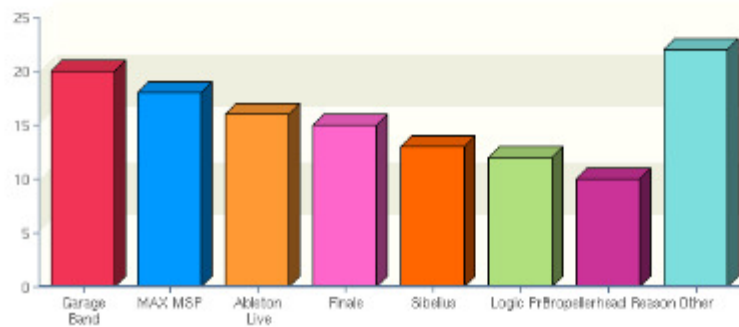
STATISTICS	
Choices Selected:	126
Total Responses:	32

SUMMARY		
VALUE	COUNT	PERCENT %
Garage Band	20	62.50%
MAX MSP	18	56.25%
Ableton Live	16	50.00%
Finale	15	46.88%
Sibelius	13	40.63%
Logic Pro	12	37.50%
Propellerhead Reason	10	31.25%
ProTools	3	9.38%
Fruity Loops	2	6.25%
acid pro	1	3.13%
ChordGeometries	1	3.13%
Csound, Supercollider	1	3.13%
Cubase / Protools	1	3.13%
Cubase SX, Reaktor,	1	3.13%
Digital performer	1	3.13%
Digital Performer, Nuendo, SuperCollider, Audiosculpt, to name only four	1	3.13%
Encore	1	3.13%
Nodal	1	3.13%
None of the above	1	3.13%
OpenMusic, AudioSculpt, PWGL, ProTools	1	3.13%
Pd - ProTools	1	3.13%
ProTools, CuBase	1	3.13%
Reaper	1	3.13%
Renoise, Native Insturments Reaktor	1	3.13%
RTcmix, CSOUND, SC3, ChucK, many other old ones (incl. MUSICIVBF	1	3.13%
Sonar	1	3.13%

3. The following is a list of common visual components used in music creation programs. Rate how useful you find each component.
(1 - very important, 2 - somewhat important, 3 - neither important nor unimportant/unsure, 4 - less important, 5 - least important)

Linear representation of time

Visualization of frequency or wave

Instrument icons

Soundboard interface

Mind-mapping

Abstract

3. The following is a list of common visual components used in music creation programs. Rate how useful you find each component.
   (1 - very important, 2 - somewhat important, 3 - neither important nor unimportant/unsure, 4 - less important, 5 - least important)

ITEM	1	2	3	4	5	Avg	Total
Linear representation of time	59.4% 19	9.4% 3	6.3% 2	3.1% 1	21.9% 7	2.2	32
Visualization of frequency or wave	46.9% 15	21.9% 7	3.1% 1	18.8% 6	9.4% 3	2.2	32
Instrument icons	15.6% 5	6.3% 2	31.3% 10	12.5% 4	34.4% 11	3.4	32
Soundboard interface	21.9% 7	28.1% 9	15.6% 5	18.8% 6	15.6% 5	2.8	32
Mind-mapping	37.5% 12	6.3% 2	18.8% 6	21.9% 7	15.6% 5	2.7	32
Abstract representation	12.5% 4	21.9% 7	34.4% 11	15.6% 5	15.6% 5	3.0	32
Other/not listed	18.8% 6	3.1% 1	53.1% 17	-	25.0% 8	3.1	32
Average %:	**30.4%**	**13.8%**	**23.2%**	**12.9%**	**19.6%**	**2.8**	**224**

Total Responses: 32

4. The following are some common features or functions of music creation programs. Rank them in the order you find them most helpful.
   (1 - most helpful, 5 - least helpful.)

SUMMARY						
VALUE	1	2	3	4	5	AVERAGE RANK
Other	1	2		6	23	4.5
Export ability	1	8	18	5		2.8
File import capability	7	14	9	2		2.2
Analog instrument input	10	3	4	14	1	2.8
Formal notation	13	5	1	5	8	2.7

Total Responses: 32

5. What factors most influence your decision to use web-based software?
  (1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

  Example of a web-based software: Google Apps ()

ITEM	1	2	3	4	5	Avg	Total
Ability to share with others	43.8% 14	25.0% 8	-	9.4% 3	21.9% 7	2.4	32
Ability to edit/create collaboratively	46.9% 15	9.4% 3	12.5% 4	3.1% 1	28.1% 9	2.6	32
Convenience	31.3% 10	18.8% 6	12.5% 4	12.5% 4	25.0% 8	2.8	32
Not having to download software	28.1% 9	9.4% 3	21.9% 7	18.8% 6	21.9% 7	3.0	32
Open source	25.0% 8	15.6% 5	9.4% 3	21.9% 7	28.1% 9	3.1	32
Other/not listed	21.9% 7	-	50.0% 16	3.1% 1	25.0% 8	3.1	32
Average %:	32.8%	13.0%	17.7%	11.5%	25.0%	2.8	192

Total Responses: 32

6. What factors most influence your decision to use a desktop-based software?
  (1- most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important)

  Example of a desktop-based software: Microsoft Office ()

ITEM	1	2	3	4	5	Avg	Total
Range of features	53.1% 17	25.0% 8	6.3% 2	3.1% 1	12.5% 4	2.0	32
Reliability	59.4% 19	15.6% 5	3.1% 1	9.4% 3	12.5% 4	2.0	32
Convenience	46.9% 15	21.9% 7	15.6% 5	3.1% 1	12.5% 4	2.1	32
Interface	59.4% 19	21.9% 7	6.3% 2	3.1% 1	9.4% 3	1.8	32
Speed/quality of Internet connection	31.3% 10	12.5% 4	37.5% 12	6.3% 2	12.5% 4	2.6	32
Open source	18.8% 6	9.4% 3	21.9% 7	12.5% 4	37.5% 12	3.4	32
Other	15.6% 5	-	56.3% 18	3.1% 1	25.0% 8	3.2	32
Average %:	40.6%	15.2%	21.0%	5.8%	17.4%	2.4	224

Total Responses: 32

7. Do you share your music compositions with others?

No
12.50%

Yes
67.50%

SUMMARY

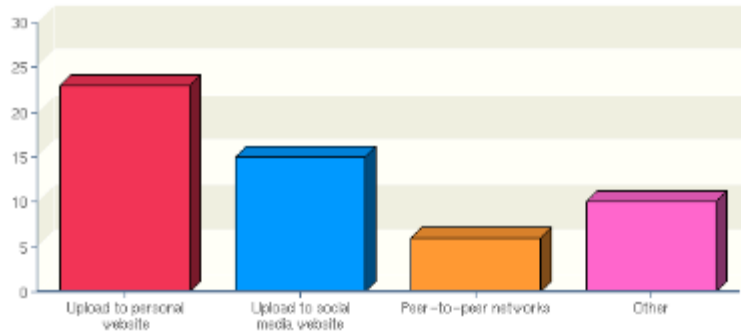| VALUE	COUNT	PERCENT %
Yes	28	87.50%
No	4	12.50%

8. If you answered no to the previous question, skip to question #12.
Otherwise, how much do each of the following reasons influence you to share your work?
(1 - most important, 2 - somewhat important, 3 - neither important nor unimportant, 4 - less important, 5 - least important) ()

ITEM	1	2	3	4	5	Avg	Total
Fame	10.7% 3	7.1% 2	35.7% 10	17.9% 5	28.6% 8	3.5	28
Recognition	17.9% 5	25.0% 7	35.7% 10	10.7% 3	10.7% 3	2.7	28
Peer-review	39.3% 11	14.3% 4	17.9% 5	17.9% 5	10.7% 3	2.5	28
Entertainment	17.9% 5	25.0% 7	21.4% 6	21.4% 6	14.3% 4	2.9	28
Collaborative works	18.5% 5	40.7% 11	18.5% 5	11.1% 3	11.1% 3	2.6	27
Other (reason not listed)	31.8% 7	4.5% 1	50.0% 11	-	13.6% 3	2.6	22
Average %:	22.4%	19.9%	29.2%	13.7%	14.9%	2.8	161

Total Responses: 28

9. What are the different ways you share your music compositions? (check all that apply)

SUMMARY		
VALUE	COUNT	PERCENT %
Upload to personal website	23	82.14%
Upload to social media website	15	53.57%
Peer-to-peer networks	6	21.43%
app distribution	1	3.57%
compact discs or LPs (old school stuff)	1	3.57%
Email Attachment	1	3.57%
file sharing websites or to google docs	1	3.57%
personal disk share	1	3.57%
Physically giving (paper) / performing	1	3.57%
School	1	3.57%
Sites like SoundCloud	1	3.57%
Soundcloud	1	3.57%
website = blog	1	3.57%

10. How do you share your music compositions?
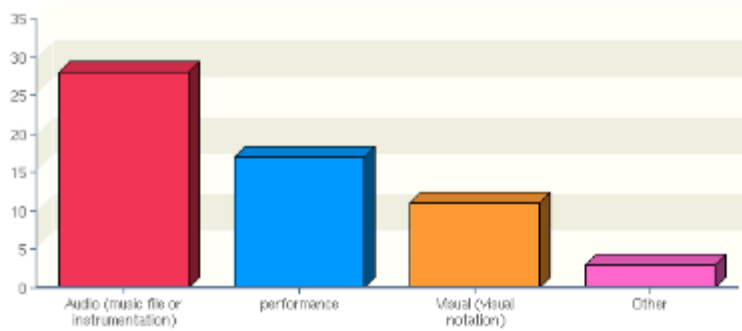
SUMMARY		
VALUE	COUNT	PERCENT %
Audio (music file or instrumentation)	28	100.00%
performance	17	60.71%
Visual (visual notation)	11	39.29%
Max Patch	1	3.57%
standalone generative apps	1	3.57%
Youtube	1	3.57%

11. Congratulations! You are almost halfway through the survey. Do you collaborate with others when creating music digitally?
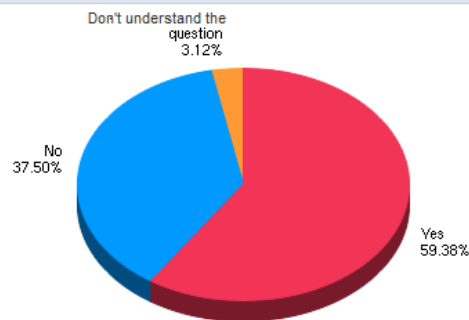
SUMMARY		
VALUE	COUNT	PERCENT %
Yes	19	59.38%
No	12	37.50%
don't understand the question	1	3.13%

12. Rate the following factors by how helpful you find them when collaborating with others. (1 - very helpful, 2 - somewhat helpful, 3 - neither helpful nor unhelpful, 4 - less helpful, 5 - unhelpful) ()

ITEM	1	2	3	4	5	Avg	Total
Version control	39.1% 9	17.4% 4	34.8% 8	4.3% 1	4.3% 1	2.2	23
Web based	17.4% 4	4.3% 1	52.2% 12	8.7% 2	17.4% 4	3.0	23
Easy to identify who made what changes	34.8% 8	26.1% 6	17.4% 4	8.7% 2	13.0% 3	2.4	23
Simultaneous editing	26.1% 6	13.0% 3	17.4% 4	17.4% 4	26.1% 6	3.0	23
Ease of sharing files/content	60.9% 14	4.3% 1	21.7% 5	-	13.0% 3	2.0	23
Average %:	**35.7%**	**13.0%**	**28.7%**	**7.8%**	**14.8%**	**2.5**	**115**

Total Responses: 23

---

13. Do you teach music? (If no, skip ahead to question 19)

Yes
43.75%

No
56.25%

STATISTICS	
Choices Selected:	32
Total Responses:	32

SUMMARY		
VALUE	COUNT	PERCENT %
No	18	56.25%
Yes	14	43.75%

14. If you answered yes to question #14, what level of music students do you teach? (choose all that apply)
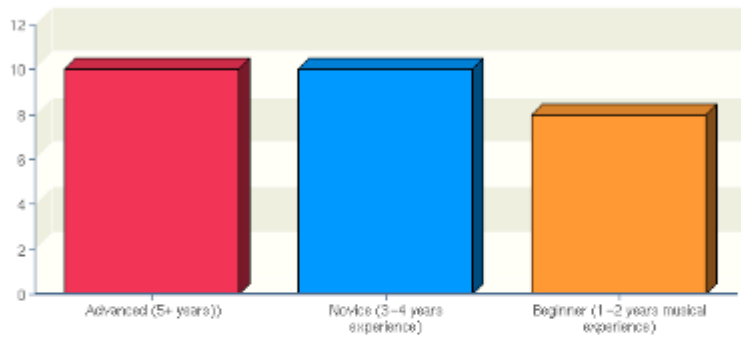
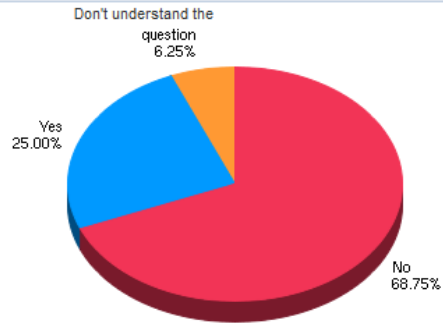| SUMMARY		
VALUE	COUNT	PERCENT %
Advanced (5+ years))	10	71.43%
Novice (3-4 years experience)	10	71.43%
Beginner (1-2 years musical experience)	8	57.14%

15. If you teach music, do you use computer aids in your teaching?
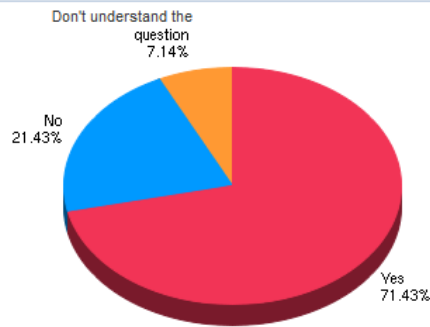
SUMMARY		
VALUE	COUNT	PERCENT %
Yes	10	71.43%
No	3	21.43%
Unsure/don't understand question	1	7.14%

16. Do you consider yourself a visual artist? (If you answer no, please skip the following questions and go to question 21)
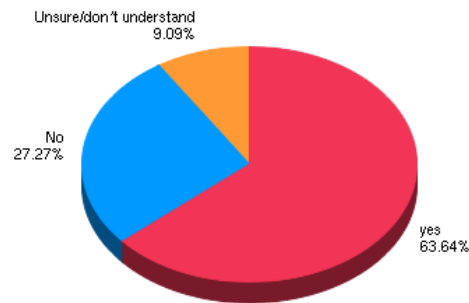
Don't understand the question
6.25%

Yes
25.00%

No
68.75%

SUMMARY		
VALUE	COUNT	PERCENT %
No	22	68.75%
Yes	8	25.00%
Unsure/don't understand question	2	6.25%

17. If you consider yourself a visual artist, have you ever combined music with visual art in your work?
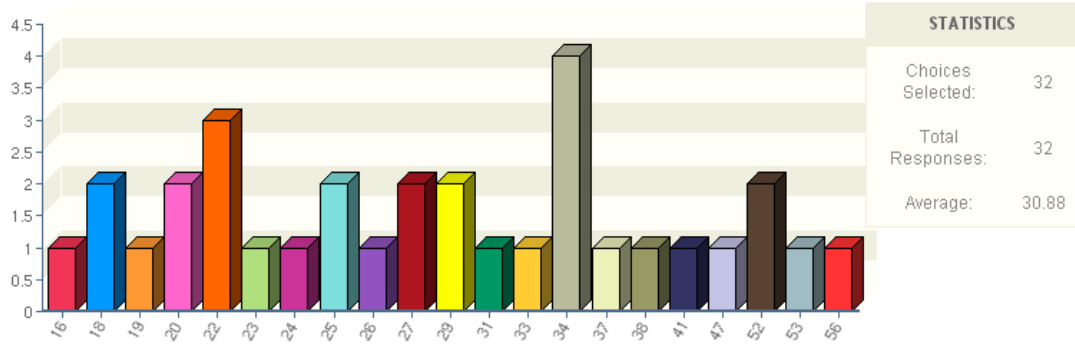
Unsure/don't understand
9.09%

No
27.27%

yes
63.64%

SUMMARY		
VALUE	COUNT	PERCENT %
yes	7	63.64%
No	3	27.27%
Unsure/don't understand	1	9.09%

18. Congratulations! You are almost done with the survey. What is your age (in years)?

STATISTICS	
Choices Selected:	32
Total Responses:	32
Average:	30.88

SUMMARY		
VALUE	COUNT	PERCENT %
34	4	12.50%
22	3	9.38%
18	2	6.25%
20	2	6.25%
25	2	6.25%
27	2	6.25%
29	2	6.25%
52	2	6.25%
16	1	3.13%
19	1	3.13%
23	1	3.13%
24	1	3.13%
26	1	3.13%
31	1	3.13%
33	1	3.13%
37	1	3.13%
38	1	3.13%
41	1	3.13%
47	1	3.13%
53	1	3.13%
56	1	3.13%

19. Choose what best represents your current level of musical ability.

Beginner/novice
3.13%

Professional/advanced
3.13%

Amateur/intermediate
3.13%

Amateur/advanced
46.88%

Professional/expert
43.75%
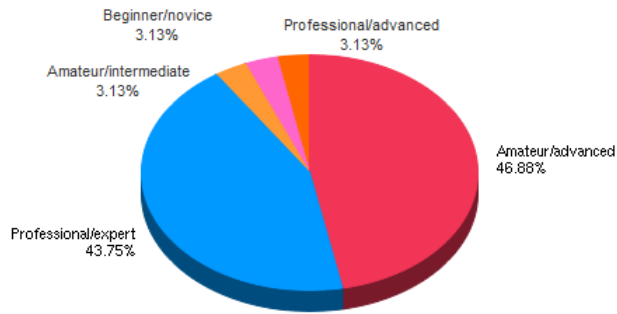
STATISTICS

Choices Selected:	32
Total Responses:	32

SUMMARY		
VALUE	**COUNT**	**PERCENT %**
Amateur/advanced	15	46.88%
Professional/expert	14	43.75%
Amateur/intermediate	1	3.13%
Beginner/novice	1	3.13%
Professional/advanced	1	3.13%