

Comparison of Music Composing Software: Cubase 13, Ableton Live and Logic Pro X

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Abstract: As a matter of fact, with the universal usage of computers and modern technologies development in the field of computer science in recent years, using digital audio workstations (DAWs) to compose music is a common thing to do. Over time, many DAWs occur on the internet. Some of them are of high quality, but some are not as good as users concerned. With this in mind, this study talks about the definition of DAW, the origin and development of computer music. To be specific, 3 common softwares are selected to compare, i.e., Cubase 13, Ableton Live and Logic Pro X in order to make a comparison between different DAWs. According to the analysis, the basic functions, principle as well as features for the software are demonstrated. At the same time, the current limitations for the state-of-art software are analysed and discussed. In the meantime, the future prospects are proposed accordingly.

1 INTRODUCTION

Music can give human mental support and it plays vital role in the development of human personality (Madaminovich, 2023). With the development of the technology, the way for us to make music changes over time, from acoustic instruments to electronic instruments. Nowadays, music can even be made on the computer by touching the keyboard. In the 1960s, after the world's first computer is built, people try to use computers to generate music and to make music producing simpler. To achieve this, people developed audio synthesizers and music programming language, such as ALGOL and FORTRAN to generate sounds and music pieces. During this period, people was still exploring this new area. In the 1970s, people developed more software for sound creating, such as MAX. This software is unlike programming languages, they make the programming progress visible and easier to understand by using modules. Also, the invention of midi sets a stage for the way for people to create music patterns as it enables the connection between computers and electronic equipment. Later in the 1980s, with the wide use of individual computers, some music producing software like Cubase (released in 1989) and Pro Tools (released in 1990) started to provide more complete digital audio workstation (DAW) and make the

production addressable. As time goes by, DAWs have become a must have tool for modern music production, which is able to edit, record, mix and add plug-ins to the audio pieces and help composers to create music works of different styles and effects (Yang, 2024). Based on DAW, more and more software are developed. That software not only improve efficiency to make music, but also broadens the edge of music production as they add new technologies or tools to create some strange sounds or sound effects. The following part, this study will introduce different software, Cubase, Ableton Live and Logic Pro and this research will comment on their drawbacks, advantages, perspectives and limitations.

2 DESCRIPTION OF MUSIC COMPOSING AND DAW

So, how to produce music on computers by using software not instruments, although instruments have been used to create music for centuries. In the prehistory time, fundfundamental percussion and wind instruments is popular among human (Nadirova & Aliyeva, 2024). These basic instruments are made from natural resources like animals' bones. Date back to the days when tribes were formed, primitive man, who lived in the tribe, started to use things like bones

and pelts of the animals, woods and stones to make some very simple musical instruments. Research shows that Indigenous southeastern communities produced flutes and whistles between AD 1000–1500 (Sanger et al, 2023). Recently, fast technological progress brought in a new age of historic invention, from electric musical instruments to digital musical instruments and synthetic sounds (Clester & Freeman, 2023). Currently, there are a large variety of DAWs for consumers to choose, for example Logic Pro, Cubase and Ableton Live.

DAWs plays an outstanding part in the creative arts (Walzer, 2020), and is relatively expensive for decades since it is a groundbreaking product in music composing. Fortunately, contemporary DAWs are cheaper (Fagnoni & Morales, 2019) and most of them is fit with different systems. Basically, DAWs are used to produce and record music works, but they can also help to process recorded audio with a high quality (Nahmani, 2020). In DAWs, notes are visualization, which help to do some changes like aligning to the bars, shifting note pitches or deleting the wrong notes. In order to make the final music sounds real, plug-ins are essential. What's more, automation is as crucial as using plug-ins. Automating sounds' volume, frequency or plug-ins used, sounds are textured.

3 SOFTWARE

3.1 Cubase 13

Cubase is a well-known DAW developed by Steinberg. It is widely used in music composing,

audio recording and sounds mixing. The only downside is that it is a bit costly and difficult to learn, but if one learns it, he or she would find it is practical (Vivian et al, 2023). Cubase has three basic functions. First, it allows audio recording and editing. For audio recording, Cubase has a high quality of audio recording, which allows recording several audio samples on a track. For audio editing, it provides functions like cutting and time-stretching the audio samples. Second, it allows MIDI recording. Cubase provides a comprehensive MIDI editing tool like automating the volume or something else to the MIDI recordings. Users can use virtual instruments, synthesizer and sampler to compose their workings. Third, tons of plug-ins make the sounds more real. Cubase are mainly used in music making, audio recording, movies' soundtracking, video games soundtracking. Also, Cubase can be used in live shows to help to control audio samples and instruments' sounds. Cubase can be seen as a good alternative for process audio samples efficiently. Also, by using vast plug-ins and some unique sound designing measures, a musical work with a high-quality can be determined.

Cubase allows online collaboration platform, which allows users share and synchronize their project with other music composers easily. This function is so vital that it make collaboration across geographic boundaries come true. The interface is presented in Fig. 1 (Moyo & Muranda, 2021).

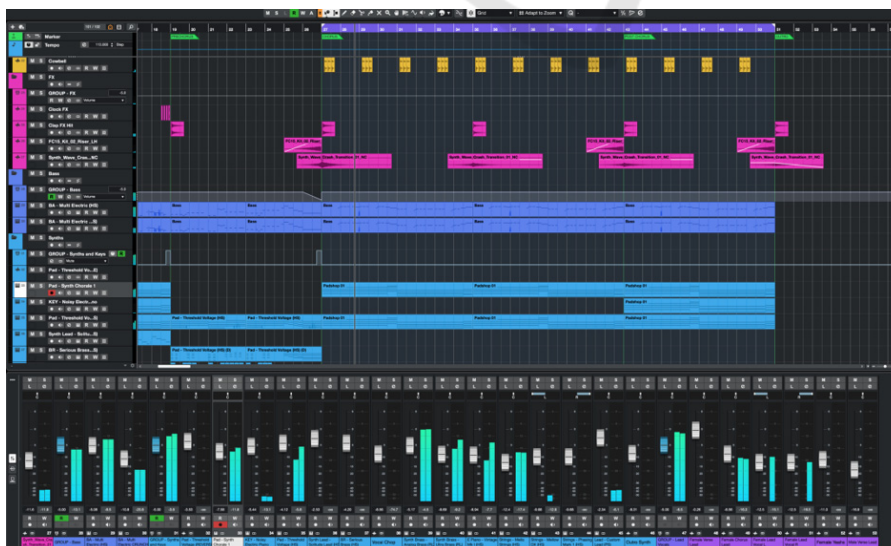


Figure 1: User interface of Cubase 13 (Moyo & Muranda, 2021).

3.2 Ableton Live

Ableton Live is famous for its flexibility and ease of using. One of its strength is that it cost-free to download and compatible with Windows and Mac (Smith, 2023). It is widely used for electronic music composition. The basic functions include audio and MIDI recording, real-time playback. In this case, users can record any audio source and MIDI equipment. For audio recording, Ableton Live provides non-destructive editing functions like adjusting volume and pitches. Also, the Warping function makes time and rhythm easier. The same as other DAWs, Ableton Live has many built-in virtual instruments and effects plug-ins, also it allows external plug-ins like VST and the AU plug-ins. Its audio processing functions contains reverb, decay, compressor and equalizer, which satisfy all audio processing requirements. What's more, Ableton Live has two different working modes, that are session view and arrangement view, and they are the core part of Ableton Live. Session review is mainly used for improvisation and live shows while arrangement review is widely used for composing a complete music work.

For more details, the session view allows users use non-linear ways to arrange and trig audio and MIDI pieces. Users can create different audio and MIDI tracks and arrange them in the session view to play immediately. In this case, it is mainly used for improvisation and live shows as it provides flexible ways to experiment and adjust musical elements. The

arrangement view provides traditional linear timeline and therefore, it is used for composing a complete music work. In the arrangement view, users can move audio and MIDI pieces from the session view to the timeline to rearrange and restructure them in detail. It allows precise control to every part of the music, including distribution and details editing. In general, these two views complement each other, by allowing switching between music composing and making, the efficiency and creativity is fully showed. The user interface is shown in Fig. 2 (Yang, 2024).

3.3 Logic Pro X

Logic Pro X is a DAW developed by Apple and is popular among most Apple users. Logic Pro X costs \$199 on Apple's App Store and it is a derivative version of GarageBand, which is a standard equipment for Apple computers. Compared with Cubase and Ableton Live, Logic Pro X has shown unique advantages in many aspects, making it stand out among many DAWs. First of all, Logic Pro X provides a unique library of virtual instruments and effect plug-ins, with built-in powerful tools such as EXS24 sampler,Alchemy synthesizer and Ultrabeat analog drum, which gives a platform for users to create music from electronic to classical. These virtual instruments and effect plug-ins are not only numerous, but also comprehensive in function, supporting users to carry out high-level sound design and sound effect processing during the creative



Figure 2: User interface of Ableton Live (Yang, 2024).

process, reducing dependence on third-party plug-ins. Secondly, Logic Pro X's MIDI editing function is also particularly famous among the DAWs. Its MIDI editor provides powerful editing tools, including automative quantization, Midi velocity transformation and MIDI pitch transformation, to help users create precise and complex MIDI data. In addition, Logic Pro X's Session Player function is a unique innovation, which is launched in the newly version. It offers a virtual drummer function that includes an interactive drum set for graphically incorporating drums for some fun playing and a natural sound kit (Nahmani, 2020). Besides, this feature can replicate the performance of a real drummer, bassist, and keyboardist, offering users the ability to customize drum grooves, bass lines, and keyboard patterns. This not only accelerates the creative process but also enhances the authenticity of the music.

Logic Pro X also excels in audio recording and editing. Its automated editing tools provide users with precise control over various audio elements, such as volume, panning, and effect settings. This level of precision renders the audio production process more adaptable, allowing for detailed audio effects and energetic modifications. Using the touch tool for volume randomization produces more authentic effects compared to mere randomization found in other DAWs. What's more, Logic Pro X's flex tool allows for smooth time stretching and pitch

adjustments, greatly helping in the correcting and rearranging of recorded sound samples.

Compared with Cubase and Ableton Live, Logic Pro X also has a significant advantage in its deep integration with the Apple ecosystem. As Mac-only software, Logic Pro X can take full advantage of the performance advantages of the macOS system and seamlessly connect with other Apple applications such as Final Cut Pro. This integration not only improves overall operational efficiency, but also ensures system stability and compatibility. The user interface is shown in Fig. 3 (Yang, 2024).

4 LIMITATIONS AND PROSPECTS

Although DAWs provide powerful features, there are some limitations. First of all, the systematic requirements of DAWs would be surprisingly high. This is because complex projects and high-quality plug-ins will rise the frequency of using CPU and occupy more storage, which would further influence systematic performance. Secondly, compatibility is another drawback. When changing project between DAWs, as different DAWs support different forms of plug-ins like VST, AU, AAX, problems may occur since some plug-ins cannot be used in some particular



Figure 3: User interface of Logic Pro X (Yang, 2024).

DAWs. Also, Logic Pro X can only be used on macOS, if your patterner uses Windows, it may be difficult to share your project to the patterner. Thirdly, complex functions and user interface would confuse the green hand. They might spend tons of time and vigour to learn what the functions do they possess. Fourthly, the size of a full big project could be extremely big, for example, scoring for the film will generate massive audio files and resources. It is a challenge to manage and store these files. Fifthly, stability seems to be better improved. When composing a huge project, DAWs cannot cope with it, and therefore it would cause data loss. Besides, third party plug-ins or sound resource may conflict with the DAWs' and further lead to system crash. The last point is about cost. DAWs and high-quality plug-ins and sound resources are expensive. It can be a burden for those who's budget is limited.

The prospect of DAWs in the field of music composing and audio recording is very bright. With the development of technology and change in demand of the market, DAWs have a lot to do. Here are some prospects. Firstly, developers can combine their software with artificial intelligence (AI). It can help composers mix their sounds, analyse and fix corrupt audio. Meanwhile, AI can give some inspiration to composers when they stuck to continue finishing their work. Secondly, DAWs should improve their compatibility. They should allow project transferring between different system. Thirdly, the algorithm needs to be improved. If a better algorithm is released, files of a huge project can be compressed, and help to release storage. Also, DAWs can cope with huge projects properly, therefore, it is not that easy to face the break-down problem. Fourthly, the development of DAW will be more integrated with other fields and mediums, such as combining virtual reality and augmented reality technology to provide a more immersive and innovative environment for music production and performance, combining social networks and gaming platforms to provide a more interactive and fun way to learn and entertain music (Hallas, 2022).

5 CONCLUSIONS

To sum up, this study discusses about the development of computer music, functions of the current mainstream software and tells the importance of DAWs in the modern music composing. By analyzing Cubase 13, Ableton Live and Logic Pro X, this passage mentions the uniqueness of each software and their basic functions. Although DAWs

have made a great progress in their functions and users' experience, problems still exist. There is still a long way to go. With the development of AI technology and machine learning, the intelligence and flexibility of DAWs can be better developed.

REFERENCES

- Clester, I. J., Freeman, J, 2023. *Composing with Generative Systems in the Digital Audio Workstation*. Joint Proceedings of the ACM IUI Workshops.
- Fagnoni, F., Morales, J, 2019. *Digital Audio Workstations: The Infrastructure of Music Production*. Springer.
- Hallas, T, 2022. *Mixing it up*. Music Teacher, 101(2), 42-43.
- Madaminovich, F. Q, 2023. *History Of The Science Of Music Theory And Modern Innovative Technologies In The Teaching Of Science*. Journal of Positive School Psychology, 1042-1050.
- Moyo, K. F., Muranda, R. A 2021 *Comparative Exploration of Cubase 13 and Wavelab 12 as Mastering Suites*. Research Gate.
- Nadirova, M., Aliyeva, H, 2024. *Evolution of musical instruments: from ancient times to modern innovations*. Agricultural Sciences, 135, 12.
- Nahmani D 2020 *Logic Pro X 10.5-Apple Pro Training Series: Professional Music Production*. Peachpit Press London.
- Sanger, M. C., Cajigas, R., Blair, E. H., Semon, A, 2023. *Air and sound: Indigenous wind instruments made of bone in the Southeast United States*. Southeastern Archaeology, 42(4), 311-321.
- Smith, B, 2023. *Break beats, not budgets—affordable music technology*. Music Teacher, 102(9), 62-63.
- Vivian, Y. I., Arifin, M. B., Wahyuni, I., Aprazaq, F. Y, 2023. *Pengajaran Digital Audio Workstation (DAW) Cubase kepada Sanggar Tari Runtiq Bulau*. Pelita: Jurnal Pengabdian Kepada Masyarakat, 3(1), 5-12.
- Walzer, D, 2020. *Blurred lines: Practical and theoretical implications of a DAW-based pedagogy*. Journal of Music Technology & Education, 13(1), 79-94.
- Yang, Y, 2024. *Analysis Of Different Types of Digital Audio Workstations*. Highlights in Science, Engineering and Technology, 85, 563-569.