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Hardware DAWs and Synths vs Software DAWs and Synths

And Hardware vs Software in general

There are many advantages and disadvantages to using hardware and software, a huge advantage of the software is that computers and PCs are very common among households, most people own some sort of device and plenty of people own a device capable of running a good DAW (Digital Audio Workstation)

A little history on Synthesizers



(Figure 1: The Minimoog)

The Theremin is widely accepted as the first electronic sound production system that automates modules and oscillators. This machine controlled the height, intensity and timbre of the sound for a protocol and printed by the composer on a roll of perforated paper. The sound was generated by twelve sinusoidal oscillators and the waveform could be modulated and processed through the filters. The **Mark II** was far from being an easy-to-use tool and occupied an entire room with its size: its monstrous size owes its nickname, Victor (from Frankenstein).

Robert Moog is referred to as the father of the modern synthesizer, who built theremins part-time in the early 1960s when he became friends with the musician Herbert Deutsch. Then He went on to release the first commercially available synthesizer the Moog's 900 series modulator system. This contraption quite resembled a huge series of giant patch bays which looked incomprehensible. these device sequence songs or play them in real-time.

This invention was not so popular with the masses being rather controversial initially, but then the Grammy award-winning album "Switched-On Bach" by Wendy Carlos showed the world the endless possibilities that synthesize produce. Other groups such as the Parliament-Funkadelic,

the Mahavishnu Orchestra and Emerson, Lake, and Palmer would begin to use these synthesizers in their music, following this the MiniMoog was invented. This device was much smaller and much less expensive, containing 13000 synthesizers and bringing it out into the world of music. Even after the advent of digital synthesizers, musicians continue to honour Moog and his creation at Moogfest which is an annual event in Ashfield New York City.

The new era of digital synthesizers began in the 1980s with the advent and release of the Yamaha DX7. digital synthesizers became an irreplaceable tool in the hands of musicians creating hip hop pop rock or electronic music and was used by filmmakers for the scores, whether it was just for the template or for the actual score.



(Figure 2: Yamaha DX7)

Fast forward and MIDI (musical instrument digital interface), a protocol introduced in 1983, links synthesizers with sequencers, samplers, digital audio workstations like Avid's Pro Tools and Apple's Logic, drum machines, and all order of electronic music devices and software. This is what's used by students learning music technology today (among other tools).

Synthesizers have become a universal way for anyone to make music if they so desire, thereby reducing the barriers of entry into the industry.

Pros and cons

Space



(Figure 3: An empty studio)

Hardware devices require a place to keep them and will require physical maintaining. But with them being analogue this means you can interact with them physically, which is a lot more satisfying than just pressing buttons on a keyboard. You are also required to have a space to keep all the synthesizers and apparatus.

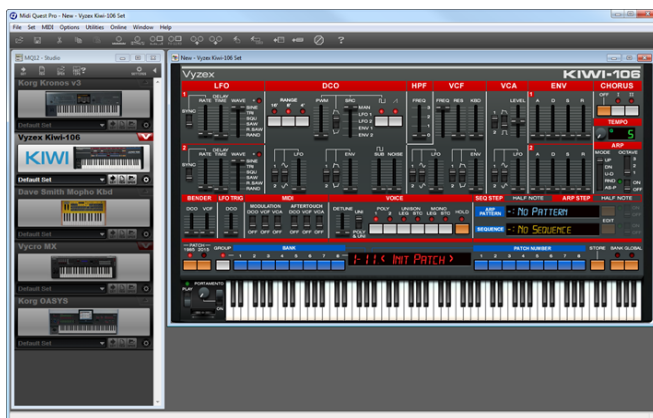
Software, on the other hand, will keep for as long as your device keeps and does not require any maintaining or external powering. All that's needed is a set of working speakers and the usual computer apparatus and you're on your way. One huge advantage of software has on hardware where is that 1 or 100 synthesizers take up the same space (physically).

Control interface



(Figure 4: Example control interface A)

Hardware synths are made up of sliders and knobs, physical things that you can interact with. This enables you to tweak the parameters and the sound simultaneously and intuitively. What was created with the user in mind and so that everything is playing the see with an easy layout often with an industry-standard agreed upon setting up. With a hardware setup you can be playing sounds through a midi keyboard or simultaneously adjusting the settings allowing for wider control of emotion and clarity within the same time frame, allowing you to make music on the fly with a bit more control.



(Figure 5: Example control interface B)

Software Synthesizers do have beautiful interfaces with lots to look at, your time interacting with them can be quite unsatisfying and a lot more fiddly due to only being limited to the mouse for input and perhaps the keys on your keyboard which are not designed for the sole purpose of Music Production. You also lose the feeling of playing a musical instrument while using a software instrument.

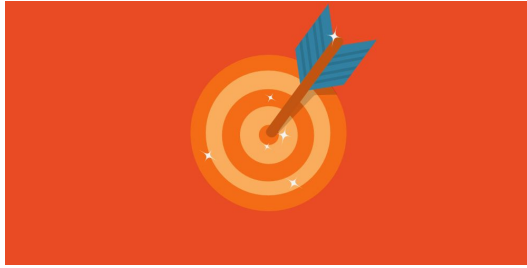
Immediacy



(Figure 6: Picture representing Immediacy)

with a hardware synthesizer you boot up and it's ready to go, this is usually not the case with a software synthesizer, however, thereby limiting you with your spontaneity.

Ease of Mastery



(Figure 7: A picture depicting mastery)

When it comes to learning how to use a setup, and then become proficient with it, and feel comfortable maintaining that level of skill a hardware DAW is your best bet as the learning curve with a software DAW is ever-growing. there are always going to be new components and features that you'll have to I just two and master. With a hardware setup It's all in front of you at all times but a software setup it can be difficult to even get a fraction of the output for the amount of effort.

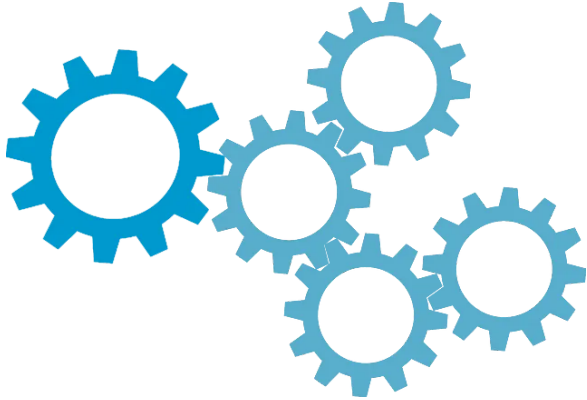
Sound and versatility



(Figure 8: Motif XD7)

A workstation Style synth like this one has thousands of Sounds built-in in all areas of music Within one neat and convenient package. You would be hard-pressed to find any software synthesizer that does all of this in one. Software synths are usually built around one job, One specific component, Such as piano synthesis or perhaps drums. You may need dozens or even hundreds of synthesizers to replicate the number of sounds and variety you can gain out of just this one workstation alone. However, synths specialising in one category or generally do it much better than one of these workstations despite their versatility. Lots of producers and sound engineers will claim that hardware is superior, and always will be based on sound. And that once you find the perfect sound it is very difficult to recreate with software synthesis.

Components

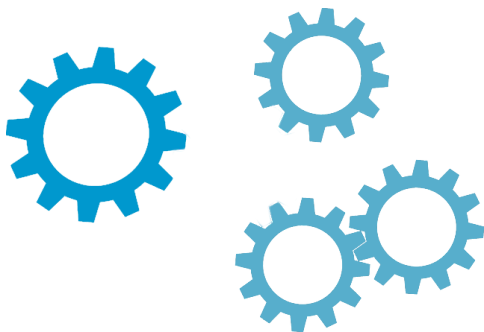


(Figure 9A: Component cogs)

In terms of components software DAWs are limited by how much money you have to spend.

software DAWs also suffer from a considerable amount of feature byte (paying for a bunch of extra features you don't need, to use the thing you want). hardware DAWs also get the job done for basic mixing and Mastering.

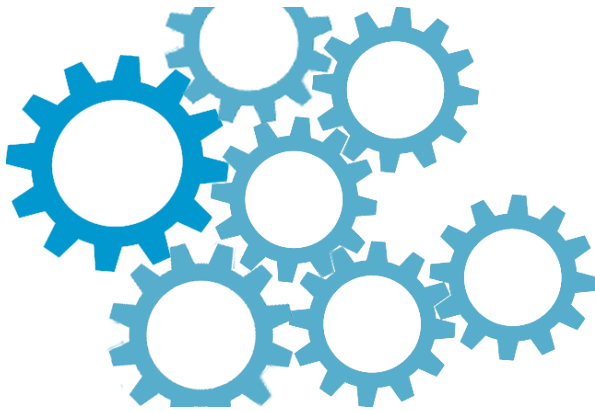
Missing components



(Figure 9B: Component cogs -Edited by me)

software is again budget dependent, whereas machines will often lack playback or Reddit capabilities for the next down and adding drum tracks can be a painful experience without an actual drummer. trying to make small adjustments to single tracks can be incredibly tedious and sometimes impossible.

Additional components



(Figure 9C: Component cogs -Edited by me)

If using a software DAW you're going to need high-quality preamps as well as a monitor and headphones, but with a hardware DAW you don't require any additional hardware.

Pricing



(Figure 10: Price tag)

software is usually a fraction of the cost of hardware having just a few gadgets of hardware will probably put you have to be out of pocket whereas, with software, you can even get excellent performance and sound from completely free components. The products within a modest price range only provide two inputs and outputs so if you require more you might as well part of something like the Zoom R16

Portability



(Figure 11: Picture representing portability)

In regards to hardware, there are lots of very useful and very workable devices that can be on the road in a range of spaces. But you are somewhat limited on how much of your studio you can take a video based on your mode of travel and the size of your device. A software-based studio is a lot more practical for this, all you need to do is take your personal computer and you're good to go.

Software DAW portability heavily relies on you having a dedicated laptop for the specific purpose of recording.

Convenience



(Figure 12: Picture representing Convenience)

Recording convenience for software is superior, if you make any mistakes you can just edit the MIDI data, things can be automated, tweets and patches and such are all stored with the song. Acquiring a piece of hardware is also limited to the time of day and availability, software, on the other hand, can be acquired Around the Clock.

Some other things to keep in mind

Latency

Latency is the bane of the producer. Hardware devices have a small amount of latency while generating the sound but software instruments have much higher latency as all the information is being generated by the CPU, which can easily add up to a lot more latency.

Audio quality

If you want to go and put some hardware since then you will need to connect to your analogue outputs with your recording system, over time this can cause warping and degradation and due

to the conversion of the signal from analogue to digital, there can be a loss in quality. using a digital device however there is no conversion and us all quality is maintained

Identity

An ever-increasing number of reducers have switched to a purely analogue, really hardware system. a lot of them do this to cement themselves and their brand with the kind of Sounds You get using hardware synths. Naturally, these people have already accrued a significant amount of funds to pursue this line of work and our efforts are paying off. their popularity speaks for itself.

If you're looking for that analogue feel there is a way with software setup, and easy way to emulate the feel of a classic synth is to use a USB MIDI controller.

Why limit yourself

So after all these points have been laid out in front of you, which is better

The answer is neither or they are not mutually exclusive the hands-on approach and instant inspiration you get with physical hardware and the convenience and portability of software are not mutually exclusive and can be combined at your whim. lots of actors coming to get generation on how you plan to build your studio with a big one being cost you decide what factors are most important to you and build your studio around that :))

Using hardware and software synths and DAWs together is likely your best option right now, as it is a cost-effective method with an infinite amount of directions. Most producers nowadays are doing some sort of combination of both. No matter what most producers have at least one 12 computer with some sort of digital DAW. And incorporation of both can be seamless with the right prep and mindset. good luck on building your own router setup and find your own identity in the music world!

Bibliography

(Figure 1; The Minimoog)

Silva, J., 2020. *Moog Minimoog Model D Review*. [online] MusicRadar. Available at: <<https://www.musicradar.com/reviews/tech/moog-minimoog-model-d-643414>> [Accessed 21 May 2020].

(Figure 2: Yamaha DX7)

En.wikipedia.org. 2020. *Yamaha DX7*. [online] Available at: <https://en.wikipedia.org/wiki/Yamaha_DX7> [Accessed 21 May 2020].

(Figure 3: An empty studio)

Thejoint.org.uk. 2020. *Sound Stage Studio At The Joint - Central London Music Studios*. [online] Available at: <<https://www.thejoint.org.uk/studios/sound-stage-studio>> [Accessed 21 May 2020].

(Figure 4: Example control interface A)

(Figure 8: Motif XD7)

Soundonsound.com. 2020. *Yamaha Motif XF7*. [online] Available at:
<<https://www.soundonsound.com/reviews/yamaha-motif-xf7>> [Accessed 21 May 2020].

(Figure 5: Example control interface B)

Sound Quest. 2020. *Midi Quest 12 Multi-Instrument Editor/Librarian For Macintosh And Windows*. [online] Available at: <<https://squest.com/Products/MidiQuest12/>> [Accessed 21 May 2020].

(Figure 6: Picture representing Immediacy)

Harvard Business Review. 2020. *Fast Thinkers Are More Charismatic*. [online] Available at:
<<https://hbr.org/2016/03/fast-thinkers-are-more-charismatic>> [Accessed 21 May 2020].

(Figure 7: A picture depicting mastery)

Dickson, G., 2020. *3 Ways To Increase Engagement Through Skill Mastery*. [online] Blog.bonus.ly. Available at:
<<https://blog.bonus.ly/3-ways-to-increase-engagement-through-skill-mastery/>> [Accessed 21 May 2020].

(Figure 9ABC: Component cogs)

The Core Components Of A Rainwater Harvesting System That You Should Be Aware Of

2020. [online] Available at:

<<https://www.rainharvesting.co.uk/core-components-rainwater-harvesting-system-aware/>>

[Accessed 21 May 2020].

(Figure 10: Price tag)

Marketing-Insider. 2020. *What Is A Price? - Definition Of Price - Marketing-Insider*. [online]

Available at:

<<https://marketing-insider.eu/marketing-explained/part-iii-designing-a-customer-driven-marketing-strategy-and-mix/pricing-strategies-and-considerations/what-is-a-price-definition-of-price/>>

[Accessed 21 May 2020].

(Figure 11: Picture representing portability)

Reen, L., 2020. '*Leto: GDPR*' By Laura Reen. [online] Iconfinder. Available at:

<https://www.iconfinder.com/icons/3129149/personal_data_portability_transfer_icon>

[Accessed 21 May 2020].

(Figure 12: Picture representing Convenience)

Medium. 2020. *The Burden Of Convenience*. [online] Available at:

<<https://medium.com/swlh/the-burden-of-convenience-27ce4be5f2ad>> [Accessed 21 May 2020].

Woody Piano Shack. 2020. *The Great HARDWARE Vs SOFTWARE SYNTH Debate*. [online]

Available at: <https://www.youtube.com/watch?v=yU6y_So4Wlw> [Accessed 01 May 2020].

Garden, H., HowStuffWorks, Tech, Electronics and Gadgets, 2020. *How Synthesizers Work*.

[online] HowStuffWorks. Available at:

<<https://electronics.howstuffworks.com/gadgets/audio-music/synthesizer3.htm>> [Accessed 21 May 2020].

Nytimes.com. 2020. *Honouring The Moment When Music Met Moog*. [online] Available at:

<https://www.nytimes.com/2010/11/02/arts/music/02moog.html?_r=1&pagewanted=all>

[Accessed 21 May 2020].

i1.wp.com. 2020. *Rainharvesting.Co.Uk*. [online] Available at:

<<https://i1.wp.com/www.rainharvesting.co.uk/wp-content/uploads/2017/03/The-Core-Components-Of-A-Rainwater-Harvesting-System-That-You-Should-Be-Aware-Of.png?w=640&ssl=1>>

[Accessed 21 May 2020].

Corfield, C., 2020. *Differences Between Hardware And Software* | *Dawsons Music*. [online]

Studio D: Artist Interviews, Gear Reviews, Product News | Dawsons Music. Available at:

<<https://www.dawsons.co.uk/blog/differences-hardware-and-software>> [Accessed 18 May 2020].

Australia, Q., 2020. *Digital Audio Workstation (DAW) - Hardware Vs Software Recording*

Solutions. [online] Musicstudio.bigredroo.com.au. Available at:

<http://musicstudio.bigredroo.com.au/Recording_Gear_DAW_Options_01.html> [Accessed 18 May 2020].

Amazon.co.uk. 2020. [online] Available at:

<https://www.amazon.co.uk/Zoom-R16-Recorder-Interface-Controller/dp/B002HQWM2Y/ref=asc_df_B002HQWM2Y/?tag=googshopuk-21&linkCode=df0&hvadid=310853157999&hvpos=&hvnetw=g&hvrnd=15524735519315923667&hvpone=&hvptwo=&hvqmt=&hvdev=c&hvdvcmdl=&hvlocint=&hvlocphy=1007460&hvtargid=pla-444368694692&psc=1> [Accessed 18 May 2020].