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INTRODUCTION

In this essay I will deep-dive into explaining the process I conducted to create my first software instrument called 'Plushy's Diltar', from a research and development point of view. I will cover and justify my sources of inspiration and the role they played in a social and a commercial context. I will also focus on the experimentation and the recording process. Later I will cover the potential development process and eventually I will demonstrate why 'Plushy's Diltar' is a controversial instrument that instigates user desire.

INSPIRATION AND INITIAL IDEAS

According to www.medium.com 'sex in popular music has had a huge spike since the 90s, while love has declined since the early 90s. Some may suggest that this means that sex really does sell. Occurrences of sexual content on television almost doubled between 1997 and 2001' (Does Sex Sell In Music?, 2022). The evolution of social media has allowed the masses to express themselves sexually and has normalised sexually related topics. But at the same time, sex is still somehow taboo and will always catch the attention of at the consumer. On a personal level, the universal concept that 'sex sells', especially in music, played a very important role in the choices I made and the ideas I developed when building my own virtual instrument and my brand, as an artist and producer. I wanted to develop a musical instrument that was either sourced entirely by a sexually related concept or included some sort of sexual reference or idea. At the same time I wanted to rely on the idea that sex will trigger the interest of the consumer.

The original inspiration came from Arduino which, according to their website, is 'an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online', (What is Arduino?, 2022).

During one of the Arduino focused lectures, we were advised to think about to the most ordinary things surrounding us that incorporate vibrating or moving mechanisms and use them to build music instruments or simply discover objects that could generate electrical power, sound or rhythm. I instantly thought about dildos, beyond their purpose as sex toys and how they are essentially vibration generators.

My plan slowly drifted from building something that was purely technology based to something that incorporated a human element. Taking inspiration from the legendary composer John Cage, and his experimentation with changing the tuning of his piano by placing coins and screws between its strings in Paris, France in 1949, (Magazine, 2022), I aimed to innovate the way an acoustic instrument was played in my own way.

I originally thought, the best way to combine a vibrating sex toy, an acoustic instrument (one that I could play) and human performance, was to use dildos on the strings of a piano

and rely on the effect the vibration of the sex toy would have over the strings. One of the first processes that didn't go as planned, was finding a piano who's owner would be happy for me to experiment with vibrating objects straight onto its strings. This would evidently alter the tuning of the instrument. When I asked all of the potential piano owners I know if they were happy to get involved in the process, all their replies were understandably negative. My plan had to change. The next accessible acoustic instrument, that I had minimal knowledge of, was an acoustic guitar, available to borrow at Tileyard Education.

2. THE DILTAR

'Plushy's Diltar' is a virtual instrument built in Kontakt, the industry-standard sampler from Native Instruments, (Samplers : Kontakt 6 Player : Kontakt 6 Player Vs. Kontakt 6 | Komplete, 2022) that uses sampled recordings of an acoustic 6 string guitar played with a pair of Ann Summers (Ann Summers, 2022), vibrating cock-rings. 'Diltar' is a word that came from combining the first syllable of the word 'dildo' and the second syllable of the word 'guitar'.

3. OTHER SIMILAR APPROACHES

A guitar being played with dildo has been historically experimented with by Sonic Youth guitarist, Thurston Moore (Bio — Thurston Moore, 2022) and (Moderne, 2022). In this instance Mr Moor played an electric guitar, live, on stage and on recordings. However the strings of an electric guitar are of course different than the acoustic - 'Acoustic guitar strings are made of brass and bronze, while electric guitar strings are made of steel and nickel' (Romano, 2020). Therefore the way they resonate is different. At the same time, the audio pickup is different. The sounds I was going to record were essentially only going to be captured by the microphones I was going to use.

4. THE DILDOS

I used two vibrating cock rings from Ann Summers - I initially wanted to go for something that looked more phallic, to really instigate and amplify the sexual element of my instrument, but I decided to go for something more practical and unfortunately less phallic looking. The size of the dildo played a very important part in choosing the sex toys. I wanted to make sure that the sex toy would fit correctly in between the guitar strings and that they would give me the possibility to only play one single string at a time.

The 'Fusion Cock Rings' are waterproof vibrating small dildos with 10 different vibrating speeds (intensities) and rhythms, (Summers, 2022). These came in handy when playing the guitar, because I later discovered that the speed the dildo was used at was highly impacting the way the string resonated and it would heavily change the sound generated at the very first point of contact between the two.

I also choose to go for two different materials for the dildos. The reason I did this was because I anticipated the fabrics would be trivial to the sound generated at the point of contact. I chose to go for a rubber dildo - which I will refer to as **D1** and a plastic coated dildo - which I will refer to as **D2**. The other difference between the dildos was that D1 was rechargeable, whilst D2 was battery fed.

3. EXPERIMENTATION

Taking into consideration I am not a guitar player, the first step in the process was to learn how to play a C major scale with bare hands at first, without using the dildo. It was essential for me to record every correspondent of a white key on the piano (C2 to C3), because my aim was for the instrument to have a humane and realistic sound. In order to achieve that, it was necessary that the pitch spreading in Kontakt was kept to a minimum.

An essential aspect of the experimentation process was to discover a way to dildo play the guitar to achieve a sound that was both interesting and pleasant. The next few steps consisted in trying to figure out the best ways to use the dildos on the metal strings of the guitar. It was important for me to obtain a sound that would be easy to incorporate in both experimental and commercial compositions. A big focus was placed on getting the right angle which in the end resulted to be a 45°degrees whilst only using the top end of the dildo on the strings.

5. MICROPHONES and MIKING THE GUITAR

When it came to miking the guitar there were a few things that I wanted to achieve. Firstly I wanted to achieve a sound that was quite intimate, with no room noise, as if that was captured it would've had to be removed in post production. I also wanted to make sure that there was no fret movement sound, as the instrument was going to be performed in a virtual form.

After a detailed research and talks with Justin Gartry and Ned Roberts (sound engineers at Tileyard Education), I reached the conclusion that the ideal miking technique would be a Stereo XY (Mason, 2022). This came across as the ideal technique for the following reasons 'the mic positioning is similar to that of our own ears, and thus the perceived stereo image tends to sound more natural. Phase issues are less of a concern as well because the capsules are positioned so close. Additionally, sound waves arrive to both mics at roughly the same time, so the resulting tracks are easily mono compatible', (Mason, 2022).

Because I am a beginner guitar player, because I have never used a dildo to play this instrument and because I wanted to innovate, I decided that I would have more control in playing, if the guitar would be standing and playing it would resemble the way a cello or a double bass is played.

The microphones I ended up using were an identical pair of Neumann KM184, which are a cardioid pattern with a very low self noise, (KM 184, 2022). The Overall Range of guitar frequencies lay between 82 Hz ~ 7,000 whilst the Fundamentals ranges between 82 Hz – 1175 Hz (Fox, 2022). The KM184 has a flat response in the range of acoustic guitar frequencies. This will translate into a very clean sound. Considering the slight roll-off in the lower frequency range, this will help to 'naturally remove rumble from the guitar channel without causing the guitar to sound thin. Note also that the 184 is a cardioid directional mic and so the proximity effect (Fox, 2022) will likely bring up some of the low end when the guitar is close-miked', (Fox, 2022).

After it was clear to me that the KM184s were the right choice to mic the guitars, I decided to position the pair at a roughly 12cm distance one above the other, placed longways on the standing guitar. I had them both pointing directly at the guitar, one closer to the resonance hole and the other one closer to the very start of the fret. The sound that I obtained was richer in lower frequencies on the bottom mic and slightly brighter in the the top mic.

7. RECORDING THE SAMPLES

The process of recording the samples was nevertheless the most creative and interesting part. The element of novelty and surprise felt incredible from an emotional point of view, when I first heard what the guitar sounded like played with a dildo. Taking into consideration the fact that I had no expectation or idea of what qualities, texture, personality and tone the sound generated was going to have, I was completely mind-blown by how beautiful the sound was.

After roughly 60 minutes of experimentation and discovering new ways to play the strings, I came to understand that achieving a quality sound depended on a few factors. I eventually reached a few conclusions which I will cover in the next paragraphs.

The point of contact

I noticed the guitar string would only resonate at a corresponding pitch, after it was released from the vibration of the dildo. At the very first contact, the sound generated had a very low harmonic resonance, the main characteristic was of a vibrating piece of metal, this was very heavy in low and mid frequencies.

The intensity of the hit

The intensity of the way the dildo hit the string with dictated not only how loud the sound of the contact was but also how loud the resonating pitch was after the dildo was released from the string.

The angle of the dildo

The angle of the dildo played an extremely important role in the qualities of the sound. In order to obtain an ideal sound, that had an ideal duration, of at least 2 seconds, the angle between the vibrator had to be roughly between 60°degrees and 40°degrees. If the angle was too high , the string would almost not resonate in pitch at all. The sustain of the sound was incredibly short, at around 1.2 seconds. This was definitely not a duration that I would be able to use to record high quality samples. When the angle was too the only way the string would vibrate to a pitch it was if the vibrator was gliding across the string. In this particular case the glide would completely transform the quality of the sound. It would add, an obvious metal on plastic or rubber sounding glide before the string would have a pitch.

The vibration speed

The 10 speeds available of the Ann Summers vibrators dictated the speed at which the string also vibrated at after the contact. I noticed that the lower the speed the clearer the sound and the longer the time the string would vibrate for. A low speed was ideal in the cases where I would hit each string for a shorter time of contact between the dildo and the string and a slightly higher speed when using the dildos to glide on the strings. Speed 1 was used for the hits and speed 5 was used for the glides. All the speed above 10 were too high to generate a quality sound.

The fabric of the dildo

I initially thought that D1 (The rubber dildo), would have a better grip at the contact with the string. However I later discovered that the D2 (the plastic coated dildo) was more adherent to the fabric composition of the strings. When using D1 to glide on the string I found it very hard to achieve a constant dynamic or glide as the rubber would snap off the grid. Eventually I ended up using the plastic coated dildo for 90% of the recording process. Because D2 was used for a much longer time than the other one, eventually the dildo ran out of battery. Luckily I was slowly approaching the end of the recording process and I was able to kind of let it recharge by turning it off and waiting around 15 minutes. This was a very unexpected, as both dildos were new sealed products.

The grip and the tightness used to hold the dildo

When the speed was too high on D1, I could hold it in place and it would slide off the string and compromise the recording. When recording the hit notes, I had to hold the dildo quite tight and apply a higher pressure with my fingers. When gliding D2 on the string the pressure had to be less as the dildo had to vibrate freely alongside the string.

The vibration sound

Using the vibration sound as part of my recording was a very time consuming decision. On one hand the sound of the dildo added to the character of the instrument, but at the same time it was compromising the clarity of the guitar sound. Whilst in the recording process, the vibrating sound got incredibly disturbing. Eventually I had to decide that the vibration sound shouldn't be used at all and tried to minimise it in various ways. Finally I chose to put the dildo behind me when the recording was on going and when it wasn't in contact with the strings and to use my body as a barrier. As was sat between the dildo and the microphones the KM184s would end up not picking up as much vibration sound.

In order to capture the human like element, I figured I needed to record 4 different velocities for each single key. They were done as follows:

1. soft/piano velocity - medium hit of the string right next to the bridge - where the tension of the string is at its highest therefore the resonance is the strongest without too much space and the pitch is the clearest.
2. medium velocity - a harder hit in the same section
3. a placement of the dildo on the string with longer contact time
4. a glide - an upwards movement from the bridge to the bottom edge of the sound hole

9. PROCESSING THE SAMPLES

Processing the samples was probably one of the most time consuming processes. The first step was choosing the best takes. This took over 3 hours. If I would have been a more experienced guitar player, I strongly believe that I would have been able to minimise the time spent on achieving high quality performance in the recording. Since the quality in the performance was far from constant, I had to spend an equally long time in choosing the right samples that had similar qualities and standards. I noticed that the easiest strings to play were the ones closer to the outer sides of the fret.

DENOISING

For the denoising process of my samples I chose Bertom - virtual denoiser. I set the 10.0kHz cut to 30%, 3.2kHz to 40 and everything around 1000Hz to make sure the sound of the vibrator disappeared as much as possible.

A very important part of the processing was to get every sample in pitch as my instrument serves as a melodic virtual instrument. I worked with Graillon 2 virtual pitch correction and set it to only play the notes of a Major C scale. Some of the notes were slightly off pitch which triggered the Graillon harder and the effect was one I was very happy with.

There was no EQ involved in the process as I was happy with the sound achieved by the km184 and I wanted to preserve the organic and real life like element of the sound.

Fading out each sample was essential and this was done collectively. On all 4 velocities of the first 4 notes : C1,D,E,F, the fade out was set to 6000 as the resonance was much higher. On all 4 velocities of notes: G,A,B,C2 the fade out was set to 5000 as the resonance was considerably smaller.

10. PROGRAMMING THE INSTRUMENT

Even though I have never created a Kontakt instrument before, learning this process was probably the most clear and easy to accomplish part of creating my first virtual instrument.

As mentioned earlier, prior to recording the samples and during the experimentation process I consciously made the decision of having 4 different velocities as part of my instrument. Developing the Kontakt instrument was the point where the different velocities had to be implemented, so they were translated sonically depending of the intensity the future user was going to hit the keys with.

Based on Kontakt's references, the four different velocities of the samples were used as follows:

1. Soft - velocities 1 - 33
2. Medium - velocities 33 - 80
3. Hard - velocities 80 - 97
4. Glide - velocities 97 - 127

The middle octave - which is the section I personally use the most (C2 to C3), benefits from 4 different recordings for each separate note (C2,D,E,F,G,A,B,C3), out of which C2,D,F,G, and A were all spread +1 semitone up to cover the 'black notes' on the piano in the interval between C2 and C3. When it comes to the less used intervals of C1 to C2 and C3 to C4, all 4 velocities of C2 were spread 12 semitones down all the way to C1 and all 4 velocities of C3 recording were spread up twelve semitones all the way to C4 to cover the third octave of my instrument.

The next part in the process was the coding. This particular section of the development brought up a lot of serious trauma for me from high school. Inside the script editor, the user can find my modest attempt at coding the size of my instrument display. This particular section was added from Kontakt 6 Manual (KONTAKT 6, 2022). The coding side of the development was kept to a minimal due to lack of drive and the abundance of trauma. However, the opportunities and directions in which these particular aspects can be taken forward are infinite.

The effects were also kept to a minimal because I imagined the instrument to have an organic feel to it, just like a guitar or a dildo would. They are both instruments that need to be used by a human in order to function as originally designed. Relying on this particular statement I wanted to leave the effects choice to the user to experiment with and add whatever they feel appropriate, depending on the context in which the Diltar is used. Future developments include adding effects straight into the interface of the instrument. This was the users also have the option of manipulating the amount of Reverb, Delay, Pitch and ADSR applied to the Diltar.

From a visual point of view, the development was kept to a minimal. My choice of wallpaper played an important part in finessing the branding of my instrument, as the Diltar was designed for commercial purposes and wants to trigger the user on a psychological level and convince that it is a product that instigates controversy and curiosity. I chose a picture I found online, of floating bullet vibrators floating in blank space. (Ocean dildos made from recycled ocean plastic - MaterialDistrict, 2022). This carried on the phallic and sexual theme running throughout my concept and instrument.

11. USE OF THE INSTRUMENT

I wanted to develop an instrument that can be used both as a secondary instrument, for example as an accompaniment behind a lead vocal, but that could also serve as a solo instrument eg. A guitar solo in a song. This is where the different velocities appear to be very useful.

On one hand, in the case where the Diltar would be used as a background sound, it would most likely be performed in the form of intervals or chords. As mentioned earlier in the '**Velocity**' section of this essay, the lowest velocity has a more static and straight forward sound. It does not glide before it reaches the pitch. The low velocity sounds a constant dynamic and texture. Both the lowest and the medium velocity could be used to play and record the Diltar as a background instrument. The quick attack and the absence of a glide effect would have a clear sonic presence and they would not interfere with the vocals in the instance of a pop, minimal production.

On the other hand, in the case where one would like to use the Diltar as a main solo instrument, a more dynamic performance can come in handy, where the performer would experiment with a wide range of velocities of the Diltar. This way they could make efficient use of the gliding element incorporated in the two highest velocities of my instrument.

MISHAPS

During a post development and production analysis of the instrument and the process, I reached the conclusion that some of the approaches could have been different.

I realised that including a fret movement sound on the recording, probably at the end of the each sample and most likely only as part of a certain velocity, would have probably elevated the sound. It would have given it a more organic feel and a more realistic and more human like sound. In future developments this effect would be optional and it would be manipulated by a knob on the interface.

I also realised I could've time planned differently, as part of the last recording session I conducted, I failed to record good quality samples for 1 particular note. This happened because I forgot to comp one of the takes. The solution for this was to pitch stretch one of the notes 2 extra semitones.

A high number of recordings couldn't be used because of the room noise. I realised that if I were to redo the recording process and aim for very high standards in terms of the sound quality, I would have to rerecord the samples in a room that had better sound treatment.

CONCLUSION

The process of making Plushy's Diltar was an eye opening experience. I learned how this represents a great and solid business idea for me. The interest shown by my peers was impressive. 90% of the people that saw my presentation or came in contact with the instrument somehow showed great curiosity in finding out what the Diltar sounds like, experimenting with it and using them in their own production. Regarding the idea and the branding, I feel happy with the outcome. From a development point of view I believe there is a lot of improvement to do and I will surely tackle them with excitement as I strongly believe 'Plushy's Diltar' has a great potential to be a successful commercial Kontakt instrument.

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