**Master's Thesis for Jeppe Hjersing Knudsen & Martin Geertsen**
Engineering Psychology $10^{th}$ semester

# Development Of The TonePrint Community: A case study in user involvment

April 23, 2019

# Contents

# Chapter 1

# Introduction

The purpose of user involvement in the design process of any given product is to develop a product that's easy to interact with for the regular user. A common problem with having engineers design these products is that they are experts in technology but are limited in their understanding of people. As a result the final product may be designed logically according to their understanding but may not match the understanding of the users (Norman 2013, p. 6). User experience designers intend to counter this issue as full members of the design process by applying knowledge of the users, providing more relevant and meaningful experiences for them (Interaction Design Foundation 2019). However, there still seems to be some misconception to this among classical engineers, both from a simple web search of the vast amount of forums covering UX and from personal experience. This chapter will therefore start with an interpretation of user involvement in the design process with regards to the terms *user experience design (UX)* and *usability* before moving on to how it can be applied in this project.

## 1.1 The benefits of user centered design

The term *user experience* was originally coined by Don Norman in 1993 while working at apple. He defined it as everything that touches upon the user's experience with the product from first acquiring it to actually interacting with it and later evaluating this experience (Norman 2019). Numerous interpretations have since been formulated with *allaboutux.org* containing a vast amount of these. Despite the differences in phrasing, what seems to be a common trait for these is that UX should be considered a broader term also covering other terms such as usability (All About UX 2019). By further investigating the ISO standard on human-centered design, it describes UX as *All aspects of the user's experience when interacting with the product, including all aspects of usability and desirability of a product from the user's perspective.* (ISO 9241-210 KILDE). The ISO standard for usability furthermore states: *The extend to which a product can be used by specified goals with effectiveness, efficiency and satisfaction in a specified context.* (ISO9241-11 KILDE). These standards support the previous stated definition that UX is the broader term to other related terms such as usability.

Designing with a user-centered approach holds multiple benefits. Reka (2017) describes these with regards to both the benefits for the users but also for the design process in general and the members. For example, by having UX designers in the design team they can first of all apply the necessary understanding of users that classical engineers don't possess, as previously mentioned. By understanding the users, the UX designers will then be able to understand the problems they may face by observing the way they interact with the system in question. Secondly, sales increase when products satisfies users. Designers develop products from their own mental model of how they think the product should look, and how it should behave. The designers expect the users to have an identical model to them, but since the user typically can't speak with the designer, the burden of communicating this model lies solely on the product itself including documentations and manuals (Norman 2013, p. 31). If it isn't clear to the users how they interact with the product, they won't have a satisfying experience with it. However, if the appropriate information is available to make the product understandable and usable, especially in situations when things go wrong and needs to be corrected, then the user is more likely to have a pleasent experience (Norman 2013, p. 32). Finally the design team itself can also benefit from the involvement of a UX designer. The better understanding of the users' needs the design team have, the better their basis is for estimating the required amount of time and money for both development and subsequent maintenance of the product (Reka 2017).

Despite the outlined benefits of a user-centered approach to the design process, it is not yet fully integrated in the industry, and the reason for this lies in the difference of how the academic world develops methods for UX and usability testing, and how the industry utilizes these. Dennis Wixon stated in 2003 that *"The literature evaluating usability methods is fundamentally flawed by its lack of relevance to applied usability work"* (Wixon 2003), this supports the concept of a gap between academia and industry. Several studies have since been made on this with Øvad and Larsen (2015) being of interest. The purpose of this study was to investigate how 8 different companies changed how they worked within the fields of UX and usability over a period of 2 years. Interviews were held in 2013 and 2015 to uncover a positive development in the companies' understanding of UX and usability during these two years. Almost all of the companies had developed or were developing ways of implementing UX in their design process with examples such as low-fi prototyping, usability testing, workshops, personas, expert evaluations, etc. (Øvad and Larsen 2015, p. 48). in correlation with this it is important to emphasize that for almost all of these companies, their design process follows the agile *Scrum* framework, which means that development is carried out as an iterative process in the form of sprints with the option of going back and making changes to the product in between these.

## 1.2 Introduction to the case in focus

# Chapter 2

# TonePrint

The purpose of this chapter is to give the reader a understanding of what the TonePrint concept is and how it works. In this cahpter there will be a description of what a TonePrint is and how it is created with TC Electronics software. The information in this chapter could be essential to understand the later thoughts and considerations, regarding the development of a TonePrint community.

## 2.1 What is TonePrint?

Effect pedals is a normal piece of equipment used by guitarists and bassists, in many different music genres. An effect pedal works by changing the input signal from the instrument, accordingly to the effect type. This gives the musician the ability to change the sound of his or hers instrument, with a simple push on a button. By using normal effect pedals, you're normally limited in the sense of only being able to adjust a small number of parameters on physical knobs on the pedal. A simple guitar pedal is shown on Figure 2.1. On this example there is three separately adjustable parameters on the pedal (Dwell, Mix and Tone), which each have its own knob. This limits the range of different sounds, which a pedal enables the user to create. In 2011 TC Electronics wanted to get rid of this limitation so they created the TonePrint concept.
A Pedal containing the TonePrint technology enables the users to change the sound of the pedal, beyond the parameters presented by the physical knobs. Using the TonePrint application the users can transfer a range of different premade variations of the effect, directly to the pedal. These premade variations is called TonePrints. In collaboration with multiple famous guitarists and bas players have TC Electronics create TonePrints for a number of pedals used by the artists them selves (Andersen 2012). The TonePrints are created by tweaking all the parameters which are able for the given pedal, which isn't just the ones that are represented by the physical knobs. When the creators of the TonePrint is satisfied with the result is the TonePrint uploaded to the TonePrint library, enabling every one with a pedal of the same type the TonePrint was designed fore, to download the TonePrint and use the effect to sound just like the artist whom created it. The TonePrints created together with famous musicians will from now on be referred to

as "**Artist TonePrints**".
Due to requests from the TonePrint users did TC Electronic in ?? launch what we will refer to as "**User TonePrints**". The main difference between Artist- and User TonePrints is the creator of the TonePrint. A User TonePrint is a TonePrint which is created by a user, using the either the TonePrint smartphone application or the computer software "TonePrint Editor"(Editor manual som kilde). With User TonePrints does the user of a TonePrint pedal have he opportunity to alter all the different parameters for the effect, making the sound just as he or she desires.(Det skal måske rettes så det ikke ser ud til at Appen og editoren er noget forskelligt, for det tror jeg ikke det er.)


**Figure 2.1:** This figure shows a Drip spring reverb effect pedal by TC Electronics `https://www.tcelectronic.com/Categories/Tcelectronic/Guitar/Stompboxes/DRIP-SPRING-REVERB/p/P0CQ2#googtrans(en|en)`.

## 2.2 TonePrint software

As mentioned in section 2.1 is a key item for the TonePrint concept, the software in either the smartphone app or the computer software. It is from these softwares the users are able to brows the different Artist TonePrints and create their own User TonePrints. When wanting to use a Artist TonePrint, the user have different options. Either the user can chose to brows the library by the artist whom have co-created the TonePrint, or by brows by the different TonePrint pedals, as shown on Figure 2.2. Both ways the users is still given the information of which artist and pedal type. When a user has found the desired Artist TonePrint there is two ways of transferring it to the pedal. This can be done by either using a cable connection between the computer or smartphone and the pedal. The other way is to send a sound signal from the TonePrint app through the pickups on the instrument to the pedal, this is called "beaming".

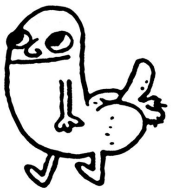

**Figure 2.2:** Here its illustrated how a user can select a Artist TonePrint by browsing the TonePrint Pedals.

when wanting to create a User TonePrint the user can either use the smartpone app or the computer software, which doesn't differ in capability, only the interface. Firstly the user have to connect the computer or phone with the pedal with a cable, whereafter the editor features will appear. The users than has the option to change the parameters with the help of sliders and buttons on the interface. The user can also assign other parameters to the buttons on the pedal, than the ones that is the default.

- What is TonePrint
  - How do regular pedals work?
  - What is special about TonePrint?
  - What is Artist TonePrint?
  - What is User TonePrint and what does it mean.
- The TonePrint editor
  - How does the Editor work (Just the basic principles)?
  - The use of the App (Beaming, editing)
- Shall we mention the lack of platform?

# Chapter 3

# Exploring the TonePrint application

The following chapter....

- Vi vil gerne have en bedre forståelse af TonePrint appen, hvorfor det?
  - Generelt skal det bruges til at forberede os på interviewet.
  - Vi leder efter faldgrupper i appen, som vi kan snakke om i interviewet.
  - Vi ved altså allerede på det her tidspunkt, at vi har tænkt os at lave interviews.
- Vi leder efter forskellige metoder til dette formål
  - Er det usability, UX eller noget tredje, vi leder efter?
  - For usability/UX kan man lave brugerinddragelse
  - Dette er dog tidskrævende
  - I stedet kan man lave en heuristisk evaluering
  - Alternative metoder til heuristisk evaluering?
- Vi går med at lave en heuristisk evaluering
  - Formålet - Vi skal udpege faldgrupperne
  - Udover, at det hjælper os, fungerer det også som et studie af appen for dem.
  - Derfor skal vi overveje, hvordan vi beskriver problemerne, så det er gavnligt.
  - Hvad er formålet med de forskellige platforme?
- Resultat og analyse
  - De cirkulære slidere - Bruger vi den rigtige analogi?
  - Rop synes, vi også bør udpege de ting, der fungerer godt.
- Konklusion - Hvordan hjælper dette os i forhold til interviewet?

- Vandt nogle forskelle på tværs af platforme.
- Tyder på en løs tilgang til det og måske en mangel på kommunikation internt

## 3.1 Heuristic Evaluation Results

The results of the heuristic evaluation are presented in categories of what usability heuristic they may violate....

**Visibility of system status**

- When browsing through the available TonePrints for artists, some of them may have created the same TonePrint settings for multiple pedals. Clicking between these doesn't provide any clear feedback to which is selected however, as the description of the TonePrint is the same whichever pedal it is set for.

- There is a lack of indication to which instrument is selected, as this selection happens in settings and not in the list itself. If either *guitar* or *bass* is selected under the instrument filter, and not *all*, the message in the list *"all TonePrints by..."* is misleading, as the user is only going to find TonePrints for one instruments.

- When pressing *user* on the computer application there are no indications of what to do next. The user is just presented a blank column with nothing in it.

- When selecting the **Helix Phaser** with the *guitar* filter active on the computer app, nothing happens. When trying this on the Iphone app, it opens one TonePrint, and when opening it on an android unit, the app crashes.

- When pressing the video icon on the android and computer app, it isn't clear that the unit will open youtube in a web browser compared to the Iphone app.

**Match between systems and the real world**

- The sliders for the various parameters are all presented as circular sliders, but interaction with them are done by pressing the center of it and swiping up or down. As such there is a risk of grabbing the entire canvas and not the parameter in question.

- It appears to still be possible to select bass TonePrints with the *guitar* filter active.

**User control and freedom**

- Nothing here...

**Consistency and standards**

- Some artists have published the same TonePrint for multiple pedals and when switching between these, the text description is the same. However, in some cases there is a noticeable difference when doing these switch, as some of the descriptions has minor spelling or typeset errors, even though they should be identical.

- When opening a video description of a TonePrint with its creator on the smartphone app, it is presented in a new window. When opening one in the computer app, it passes you on to the given video on youtube.

- When browsing TonePrints, there are different buttons in the top right corner of the description page, depending on on the TonePrint.

- When watching a video description of a TonePrint on the Iphone app and the user at some point wants to return to the list of TonePrints or artists, it demands two different interactions. First, the user must swipe down in order to return to the TonePrint description, before either swiping right or pressing *back* to get back to the list view.

- When choosing the **SpectraComp Bass Compressor** with the *guitar* filter on, the user dosen't get the same menu as when choosing other pedals. This is probably due to it being a bass effect.

- When creating a favourites list, the TonePrints are sorted by pedal name, even if the user selects *sort by artist*.

- When opening the app on an android unit, the user gets informed that he needs a midi connection. This message doesn't appear on the desktop version, even though the same goes for that.

- The user has a search functionality available on the android system but not on either the desktop or Iphone version.

**Error prevention**

- The typical confirmation dialogue of either ✓ or × is presented to the users with these icons inside the button on the Iphone app. As such it isn't clear whether the user selects an action when it is visible, or if this visibility means that it is already selected.

- When the user is beaming a TonePrint to the pedal, he is given the instruction: *If your pedal flashed like this beaming was a succes.* In order to follow this instruction the user would have to focus on the pedal, and by doing this he wouldn't have seen

this instruction in the first place. As such, the user has to focus on two things at once.

- The user can assign different parameters to the same physical button on the pedal, allowing for live editing of the TonePrint. However, the pedal comes with a print above the knob on the pedal itself, which can't change. As such, the user can potentially edit a parameter, even though the knob says something different.

**Recognition rather than recall**

- When switching between *browse by product* and *browse by artist*, this has to be done under settings, and the same goes for switching between type of instrument. Instead of having this filtering action visible with the list, the user must remember to check this in the settings menu.

**Flexibility and efficiency of use**

- In general there are limited ways of customising the canvas, for example the favourite list.

- The search functionality on the android app only allows for searching in the open menu, making it almost redundant. The user still needs to to go to the right menu before searching for specifics, making scrolling a faster way of finding the right TonePrint.

**Aesthetic and minimalist design**

- It's limited to what extend the size of the canvas can be expanded on the computer app. If it is made full-screen it will no long match the size of the window and take all the space. Instead, the far right of the window will just be a blank column of nothing.

- When opening the computer application, until something is chosen, the screen will primarily be just blank.

**Help users recognise, diagnose, and recover from errors**

- Nothing here...

**Help and documentation**

- When choosing *Editor Help*, the user is sent to the main TonePrint webpage.

# Chapter 4

# The Design process of TC Electronic

## 4.1 Interview with TC

### Introduction

Formålet med dette interview er, at vi gerne vil have et indblik i jeres udviklingsproces af TonePrint appen, da fokusset for vores projekt er at kigge på, hvordan et fremtidigt TonePrint community kan udvikles. Interviewet kommer til at foregå under et semistruktureret format. Det vil sige, at vi har forberedt nogle spørgsmål, men hvis du har nogle pludselige indskydelser eller ekstra informationer, du tænker vil være relevante, så skal du endelig ikke holde dig tilbage med disse.

For at vi kan holde styr på de mange informationer, vi må få ud af interviewet, kunne vi godt tænke os at lydoptage det. I den forbindelse, vil vi selvfølgelig gerne høre, om det er ok med dig? Optagelserne har til formål at hjælpe os videre i processen med vores projekt, og dit navn vil på ingen måde fremgå af vores dokumentation.

- Da i udviklede konceptet for TonePrint appen, hvordan besluttede i hvilke funktioner der skulle være med og hvordan de skulle designes?

- Hvordan har jeres viden angående jeres brugere påvirket udviklingen af TonePrint appen, og hvor har i den viden fra?

- Gjorde i noget for at målrette TonePrint appen mod bestemte brugergrupper, og hvordan gjorde i det i såfald?

- Selvom TonePrint appen er et ret unikt produkt har i så draget inspiration fra andre interne eller eksterne produkter, og i så fald hvordan?

- Hvordan besluttede i jer for informationsstrukturen i TonePrint appen, både set i forhold til menustrukturen og de forskellige måder de kan kategoriseres på?

- I har en meget stor database af både TonePrints, pedaler, kunstnere og videoer. Hvordan besluttede i jer for, hvordan i håndterer og præsenterer de forskellige data?

- Hvilken data vil du mene er nødvendig for at kunne gøre et TonePrint community med User TonePrints effektiv, og hvordan vil du mene denne data skal struktureres og kategoriseres.

- Hvad ligger til grunde for forskellen på appen fra platform til platform? Eksempelvis informationen om ikke tilsluttet pedal, søge funktionen, video visning og TonePrint information samt beaming?

- Hvad er formålet med tekstbeskrivelserne tilhørende de forskellige TonePrints, og hvordan beslutter i jer for, hvad der skal stå?

- Hvilken type feedback får i vedrørende TonePrint editoren, og hvordan bruger i denne feedback?

- Til hvilken grad bruger i informationer, i får gennem TonePrint-junkies-facebook-siden, youtube eller music tribe community?

- Meget har ændret sig op til den nuværende app. Hvorfor ændrede i både den grafiske identitet og flere features?

- Hvilke positive og negative effekter har jeres SCRUM arbejdsmetode haft på udviklingen af TonePrint appen?

- Hvilke teknologiske begrænsninger har i haft under udviklingen af TonePrint editoren, og hvordan har i kompenseret for disse?

- Hvordan opstillede i kravene for TonePrint appen, både konceptuelt og design mæssigt?

- Hvordan opstillede i målsætninger for TonePrint appen? og hvordan sikrede i jer, at disse blev nået?

- Hvis du skulle nævne fem vigtige aspekter som vi bør tage med videre i udviklingen af et TonePrint Community, hvad skulle det så være?

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