

Master's Thesis for Jeppe Hjersing Knudsen & Martin Geertsen
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Development Of The TonePrint Community: A case study in user involvement

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Contents

1	Introduction	5
2	TonePrint	7
2.1	What is TonePrint?	7
2.2	TonePrint software	8
3	Exploring the TonePrint application	11
3.1	Heuristic Evaluation Results	12
4	The Design process of TC Electronic	15
4.1	Interview with TC	15
5	Thematic Analysis	17
5.1	Method	17
5.2	Themes	17

Chapter 1

Introduction

The following master's thesis takes its starting point in the use of user involvement product development in a company. Whether this means conducting extensive user studies or simply applying feedback from the users in the design process, it has multiple benefits...

The significance of involving users in the design process of any product is considered beneficial from the viewpoint of people working in the field of user experience design. It is also a growing trend amongst developers not usually applying user involvement (sovs? - Øvad).

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 (**PDF:TonePrintAnalyse**). 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/POCQ2#googtrans\(en|en\)](https://www.tcelectronic.com/Categories/Tcelectronic/Guitar/Stompboxes/DRIP-SPRING-REVERB/p/POCQ2#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 smart-phone 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 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 fokuset 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?

Chapter 5

Thematic Analysis

5.1 Method

5.2 Themes

As described in (Braun and Clark (lav kilde)) does the thematic analysis create a understanding of the interview data by thoroughly coding the transcribed interview data, whereafter the codes are used to create themes, that can be used to interpret the interview.

The four interviews were given a total of 272 codes, from which several codes did cover more than one interesting aspect and is hence present in more than one theme. As result of an iterative process of dividing the codes into themes, a total of 35 themes were created. Some of the themes are strongly connected by addressing some of the same areas, but are divided to create more specific themes rater than to general. The themes are in danish and is shown in Table 5.1. This is followed by a description of the theme.

Beaming App	Ikke inspireret af andre	Udviklingsværktøj	Parameterdesign	Rollefordeling / Hieraki
Prioritering af features	Beslutning på baggrund af test	Erfaring fra tidligere produkter	Målrettet mod brugergrupper	Beslutning på baggrund af antagelser
Beslutning på baggrund af bekvemmelighed	Kommunikation i udvikling af app	Forretningsmodel	marketing TonePrint beskrivelse	TonePrint koncept
Parametre UI	Ingen brugerinddragelse	Beslutning på baggrund af personlige holdninger	Inspiration af eksterne Produkter	Rod
UI design	Brugerinddragelse	Eksterne udviklere	Brugerfeedback	Brugerinddragelse
Community efterspørgelse	Community tags	Tilbageholdt deling	Community beslutning	Feedback om langsom app
Fokus på brugere og brugervenlighed	Prioritering af TonePrint appen	Samarbejde med kunstnere	Tekniske begrænsninger	Ingen målsætninger i forhold til TonePrint appen

Table 5.1: Themes overview

Beaming App

This theme describes that TC Electronic earlier had a TonePrint app which did not include a TonePrint editor part, that allowed the creation of User TonePrints. The app consisted of a library with Artist TonePrints that could be filtered for guitar or bass, and with it the options to beam the TonePrint through the instruments pickups to the pedal.

No inspiration from others (Ikke inspireret af andre)

This is a small theme containing comments that TC Electronic hasn't taken inspiration from other products, neither external nor internal, for the development of the TonePrint app. However is on commenting that one of the sister companies has a product with some similarity, but he don't think that it has worked as inspiration.

Development tool (Udviklingsværktøj)

The TonePrint concept and the editor is a evolution of system that have been a part of TC Electronics for a long time. The system Virtuel Front was a system that TC Electronic used to create new pedals, by determine the values of different parameters of the product and determine which parameters the users could alter with the physical knobs. This system was not anything that TC offered to their costumers. This system

was very complicated, and was mostly used by the audio engineers at TC Electronic. In the beginning of the development the TonePrint concept, Virtuel Front was used to set the parameters of the TonePrints and has since been developed to become the current editor.

Parameter Design (Parameterdesign)

Given the way that TC Electronics products work, is the different parameters of the audio settings set by models, described as Meta Models. This models is what is altered to define the sound of the products. A problem at TC Electronic has been to make the models readable for the users e.g. how gain is controlled, with labels, intervals etc. These models is what the editor is altering and that have given a problem, because TC Electronics still have to hide some of the models, to avoid showing all of their concept and risk being copied.

Roll allocation / hierarchic (Rollefordeling / Hieraki)

At some point in the development process, desisions has to be made, and it's commented that the product manager has the final saying. This has lead to scenarios where the programmer doesn't even know how to describe a feature because he think it's very complicated and didn't make sense to him, however has it been implemented because the decision was taken bu others. In another scenario however, did the designer insist that a feature had to be done a certain even though he was told it would be to difficult. But through dialog and stubbornness, was the feature created as the designer wanted.

Prioritizing of Features (Prioritering af features)

When TC Electronics are developing new products they of cause have to plan out which features to include. Every employee can come with suggestions, and some often doe. Here they also try to listen to their uses, because when they get features recuests from their users on e.g. Facebook, is the idea stored together with the ideas from the employees. When it comes to implementing the features the decision is made upon how easy and quickly an feature is to implement, and how important the feature is. Hence are some features implemented even though it isn't very important, because it's easy and quick to implement. This does however also work the other way around whereas the community has been a feature request, almost since the beginning of the TonePrint concept. The problem has been that it was deemed to difficult and time consuming to create at the beginning, so the idea was putted away, so other easier features and task could be done.

Decisions based on test (Beslutninger på baggrund af test)

TC Electronic has conducted few user studies which have led to decisions in the development process. One time they wanted to make a certain type of pedal, on a market they weren't currently in. There fore they made a user test on a competitors product, which indicated that the interface and controls of the pedal were to complicated. This

knowledge was used to design their own pedal, which became a success. The concept of making the editor available for users, instead of just using it as a development tool, also came from a user study. Here a group of bass players were given access to the Virtual Front section 5.2, with the task of creating a new sound for a bass amp, which resulted in a new setting for the TC products. This opened the eyes for TC Electronic for giving the users this opportunity, which became the TonePrint editor. Finally there has been conducted a user workshop for developing ideas for the TonePrint Community (Jespers rapport). This workshop has led to several ideas for which features that should be included in the community. One of the decisions is that the users shouldn't be constrained by categories created by TC Electronic, which has led to the idea of 'tags', which has its own theme.

Experience from former products(Erfaringer fra tidligere produkter)

This theme highlights that TC Electronic uses their prior experience which they have obtained through other products. This includes a pedal that was too complicated to use and too expensive, which resulted in a failed product. Another experience is the pedal mentioned in section 5.2, where a user test of a competitor's product led to the success of their own. They have also drawn on experience when creating the TonePrint concept, because they earlier have experience that when creating complex systems, they have to make it more simple to ease the use of the product.

Focused on target group(Målrettet mod brugergrupper)

There are several target user groups for both the TonePrint concept in general, and the TonePrint Community. With the TonePrint concept there are users whom just want a regular pedal, with which you can control the settings with the physical knobs. Then there are the users whom have an idol they want to sound like, or just love to discover new sounds made by professionals, which is accommodated by the Artist TonePrints and templates. The third group are the "tweakers" whom like to go in depth with the different parameters and create their own TonePrints. These target groups are not anything that TC has found by doing any investigations, but was more like a gut feeling. For the community there is also a target group which are users whom want to share their TonePrints, so that other people can use it.

Decisions based on assumptions(Beslutning på baggrund af antagelser)

This theme highlights that TC Electronic doesn't have much experience with including user studies or investigating their users. The decisions of which features to include and how to design them is mostly based on assumptions of what the users want and what works best. For example is the interface for the parameter settings design, because it was meant to be the most natural way to design it. In total it is clear that they base their development on assumptions of the users' needs, abilities and wishes.

Decision based on conviviality(Beslutning på baggrund af bekvemlighed)

Here to scenarios are mentioned where conviviality have played a role in how a decision was made. Firstly is the idea of implementing links to to youtube and the likes, when creating a TonePrint for the community. This is something they are almost sure they will include, because they already have the technology to implement it. The second scenario is that when they design new solutions have the orpotunity to test different ideas, if the implementation is easy enough, otherwise wouldn't they test the ideas first.

Communication in the development of an app (Kommunikation i udviklingen af en app)

It seams like there hasn't been a perfect communication between all members of the development team, when creating the TonePrint App. It's found that the differences that are depending on which platform that is used, stems from individual programmers for each platform, whom have used their 'artistic freedom' and are allocated on different teams. However some of the difference is depending on what is commonly used at the specific platform. Another example is that the designer of the parameters interface didn't know how they worked when he designed them, so he designed a interface for something he didn't understand, which he felt was problematic.

Business model (Forretningsmodel)

The TonePrint concept enables TC Electronic to always upgrade their product, by adding new content, in the form of new artists and templates. In this theme it's also highlighted that TC is a business, whom have to separate from their otherwise competitors, which also i way they made a user test of competing product, section 5.2.

Marketing / TonePrint description(Marketing / TonePrintbeskrivelse)

For every TonePrint in the library is there a text description which tells something about the artist and the specific TonePrint. The ideas to what is ridden in thous descriptions normally stems from the crew whom are with the artist under the description of the TonePrint. But in any cases is the marketing team going through it to ensure it fits its purpose. The aim with these descriptions is to engage the users and to make them want to try out the TonePrint. Also does it help give some information about the purpose of the settings in the TonePrint. The description part is also important when looking at the TonePrint Community, because there could easily come alot of TonePrints, where these descriptions can help the users sort out which ones they want to try.

TonePrint Concept

The TonePrint concept have three layers which are, regular pedal adjustment, beaming of Artist TonePrints and templates and finally the creation of User TonePrints. Each of

these layers aspires to different target groups section 5.2.¹.

Parameter UI

When going from the former TonePrint editor to the current alot of the UI has been changed. Earlier every interaction has been controlled with sliders, and there were a problem with mapping the sliders and how they affected the parameter. Another problem with the old design was that the sliders took up alot of space, which would be very messy for a phone size interface. So the focus of the new design was also to make it more user friendly.

Currently a problem that is discussed is the lack of information at for each parameter. There is no information of what a parameter changes, so the only way to figure this out is to try new settings and listen. To accommodate this problem are they discussing groupings and descriptions, which in the end should enable the user to better understand how to interact with the sliders to reach a desired effect.²

No user involvement (Ingen brugerinddragelse)

This is a very small theme which only highlights that TC Electronic hasn't used much user involvement and decisions are made without including the users.

Decisions based on personal opinions (Beslutning på baggrund af personlige holdninger)

Much of TC Electronics development is based on personal opinions in the development teams. This theme shades further light on the fact that there is little communication with the users of the systems. The decisions on how to design the informational structure and how to design the TonePrint app, was all based on gut feeling. Gut feeling seems to be a important part of how decisions are taken at TC Electronic.

Inspiration from external products (Inspiration af eksterne produkter)

In this theme it's become clear that TC Electronic have been looking at other companies for inspiration for the TonePrint Community. They are looking at Yamahas Soundmondo and Fyres Effects, which both have some sort of community. From their search have they discovered that having a 'like' system, can result in many effects not being presented, because they haven't been rated yet. When looking at others solutions, they find both inspiration, and what works and what doesn't.

Mess (Rod)

This theme contain codes which aren't found useful and will not be described further.

¹Tag den her senere

²Anything IMPORTANT missing

UI Design

User involvement (Brugerinddragelse)

External developers (Eksterne udviklere)

User feedback (Brugerfeedback)

Community demand (Community efterspørgsel)

Community tags

Detain sharing (Tilbageholdt deling)

Community decision (Community beslutning)

Slow app feedback (Feedback om langsom app)

Focus on users and user friendliness (Fokus på brugere og brugervenlighed)

Prioritizing of the TonePrint app (Prioritering af TonePrint appen)

Collaboration with artists (Samarbejde med kunstnere)

Technical limitations (Tekniske begrænsninger)

No objectives in relation to the TonePrint app (Ingen målsætninger i forhold til TonePrint appen)