

PETER KNEES



FAKULTÄT
FÜR INFORMATIK

Faculty of Informatics

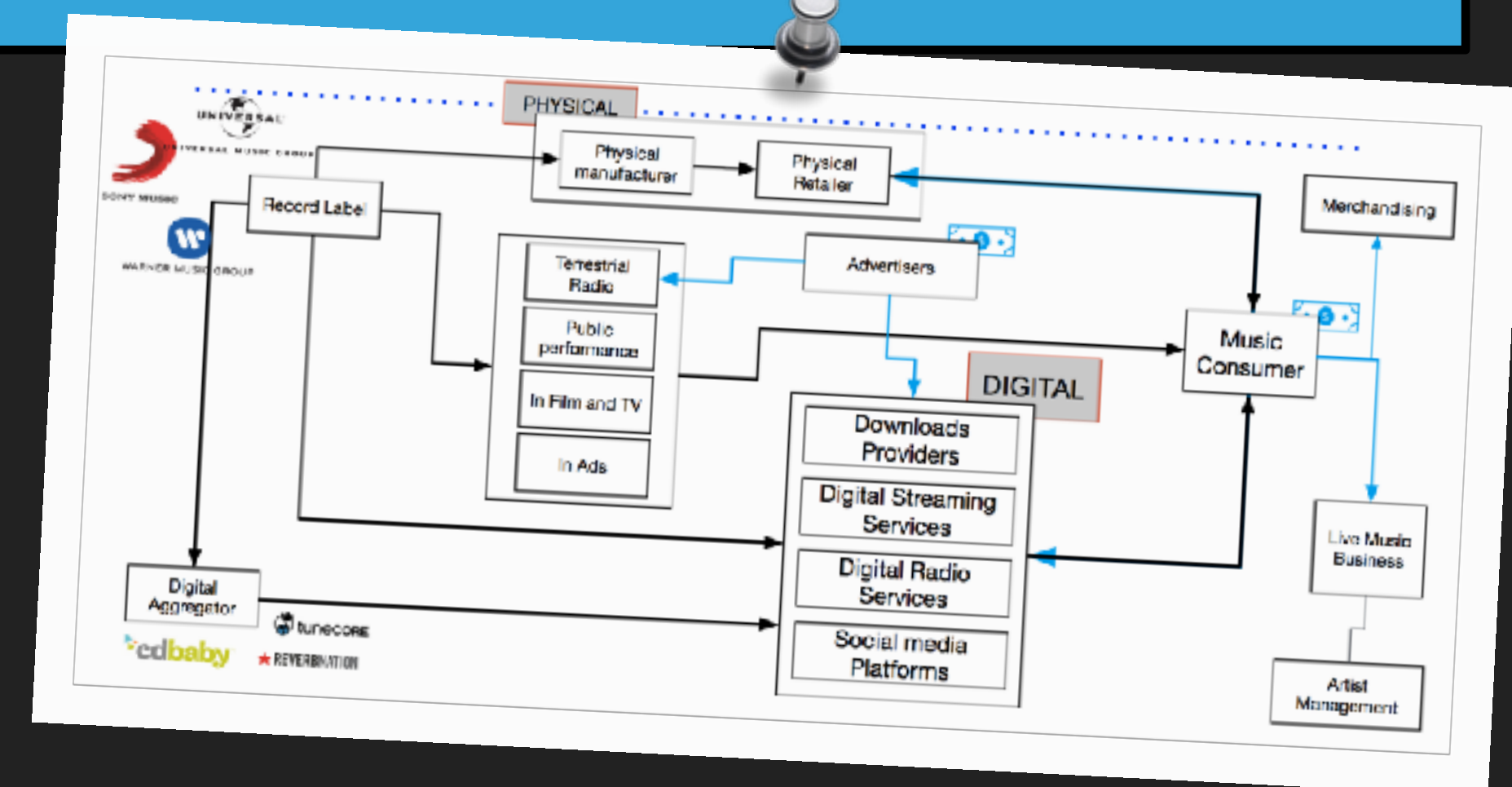
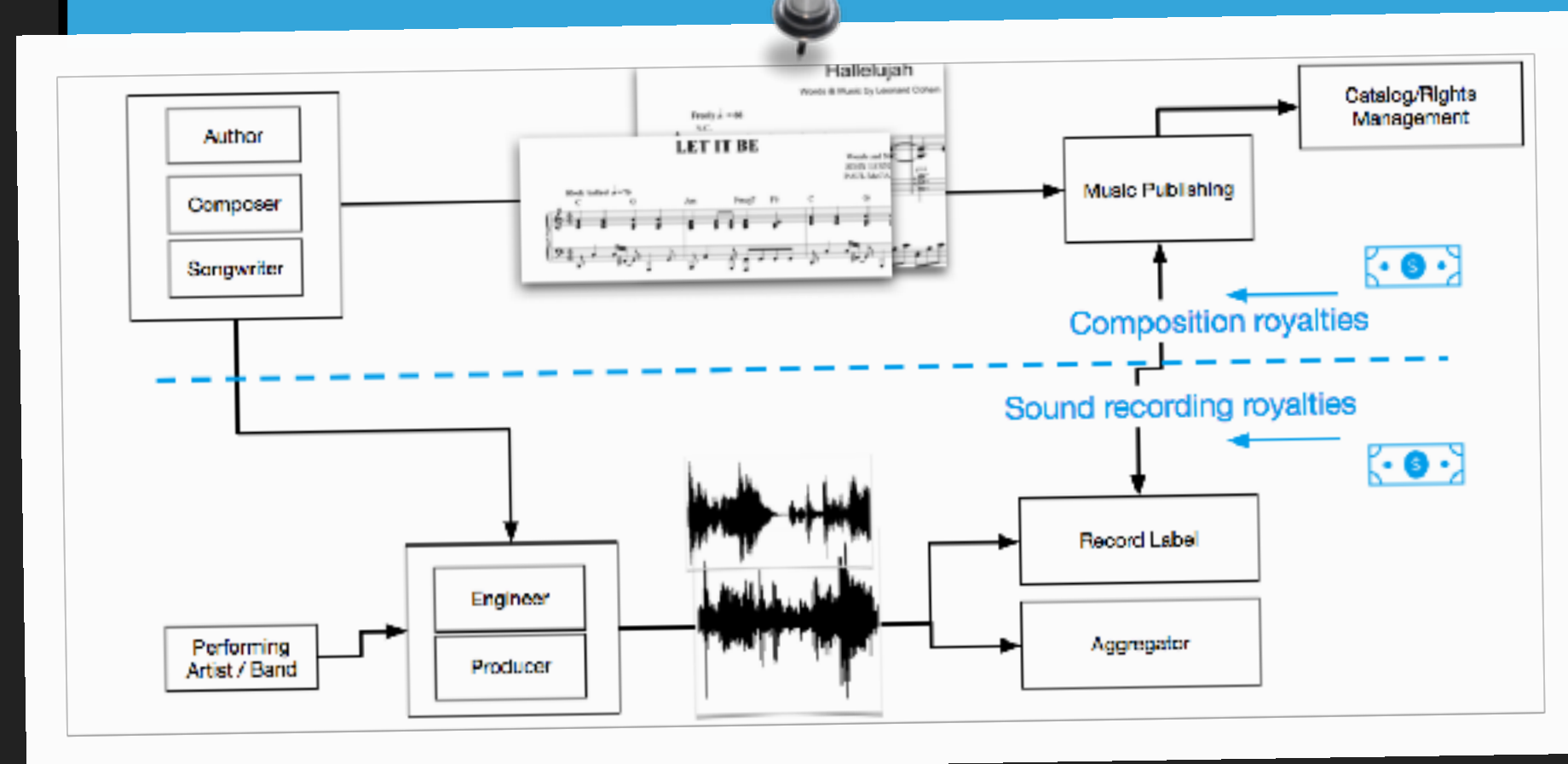
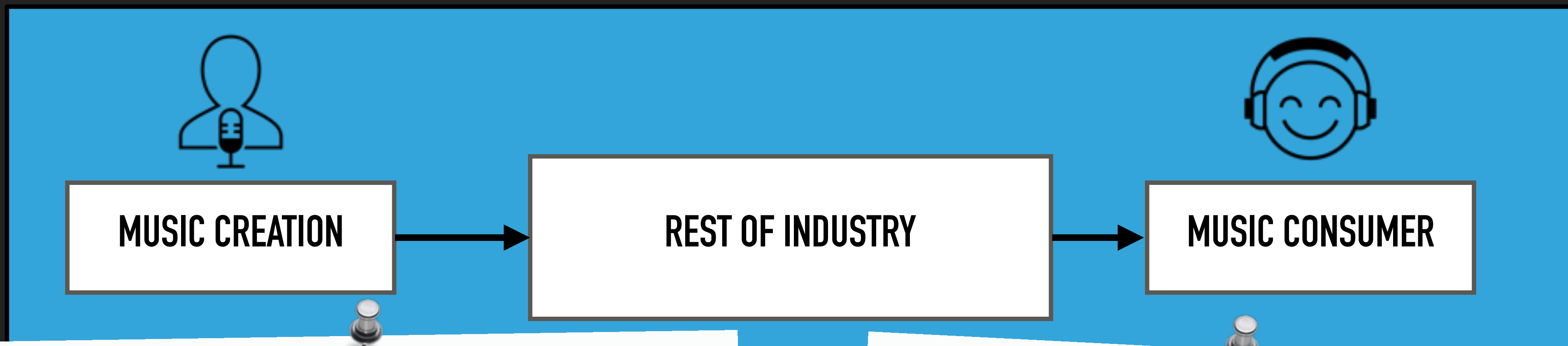
KÜNSTLICHE INTELLIGENZ ALS PERSONALISIERTER KOMPONIST

AUTOMATISCHE MUSIKERZEUGUNG ALS DAS ENDE DER TANTIEMEN?

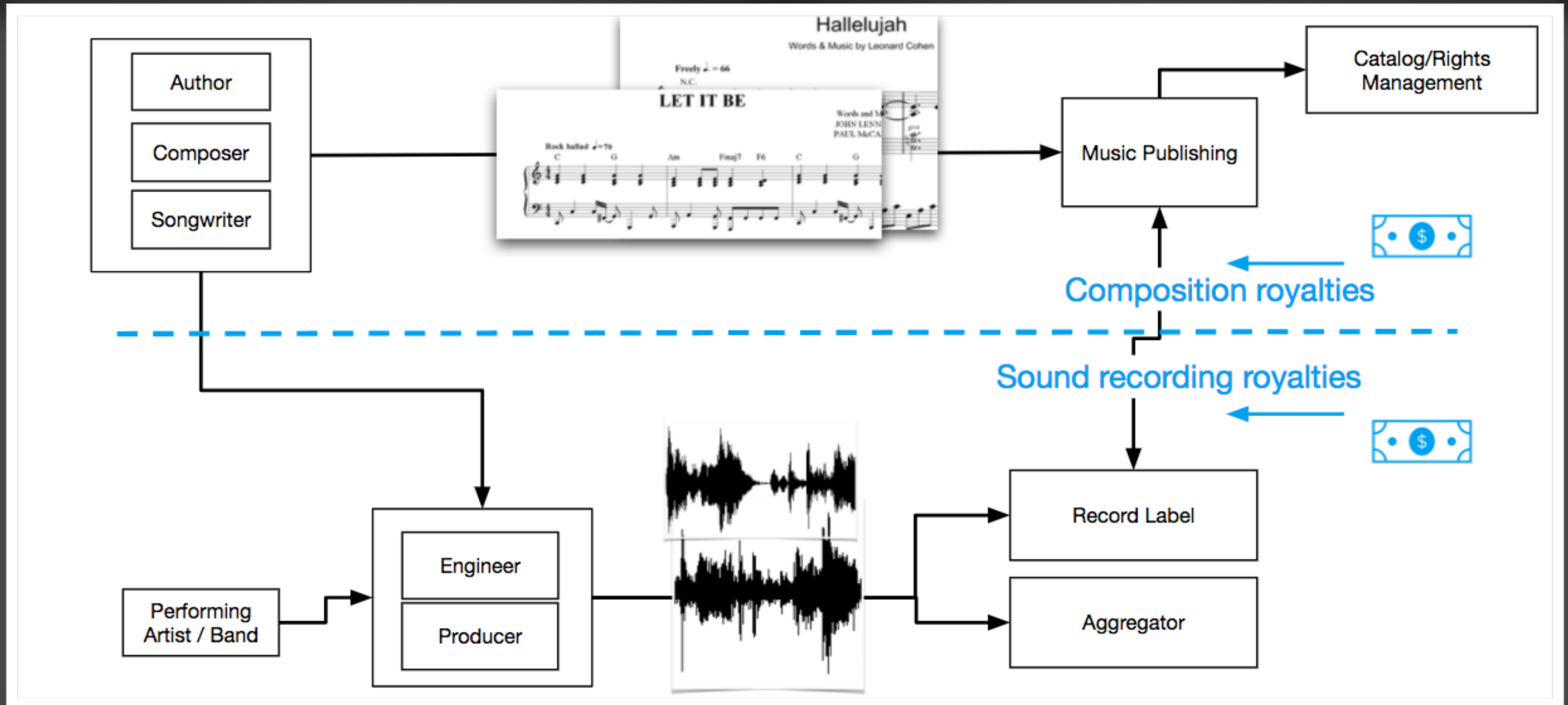
ABOUT ME

- ▶ Music Information Retrieval researcher
 - ▶ Music search engines and interfaces
 - ▶ Music recommender systems
 - ▶ Recently: smarter tools for music creation
- ▶ PhD and PostDoc at JKU Linz, AT (2005-2016)
- ▶ Since 2017: Assistant Professor at TU Wien, AT

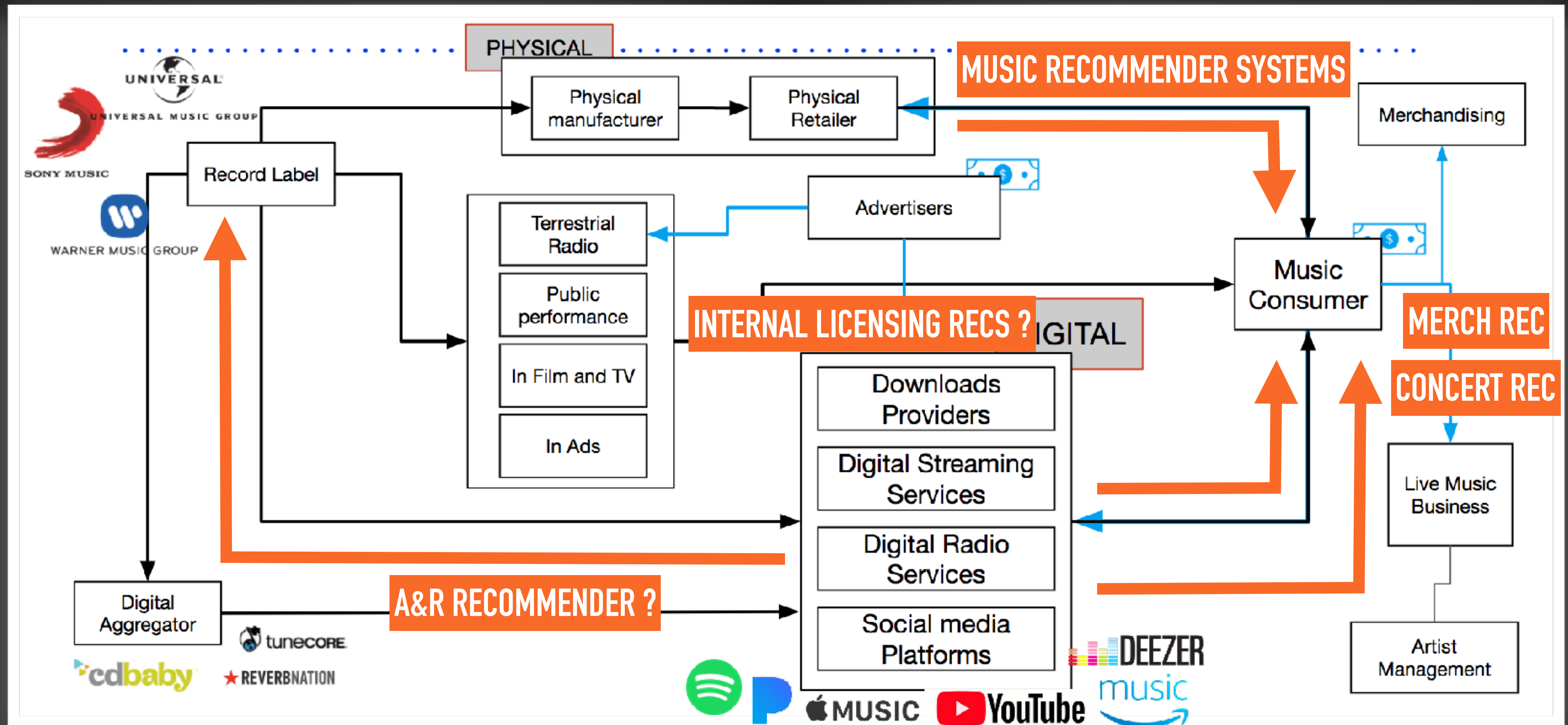
MUSIC INDUSTRY LANDSCAPE



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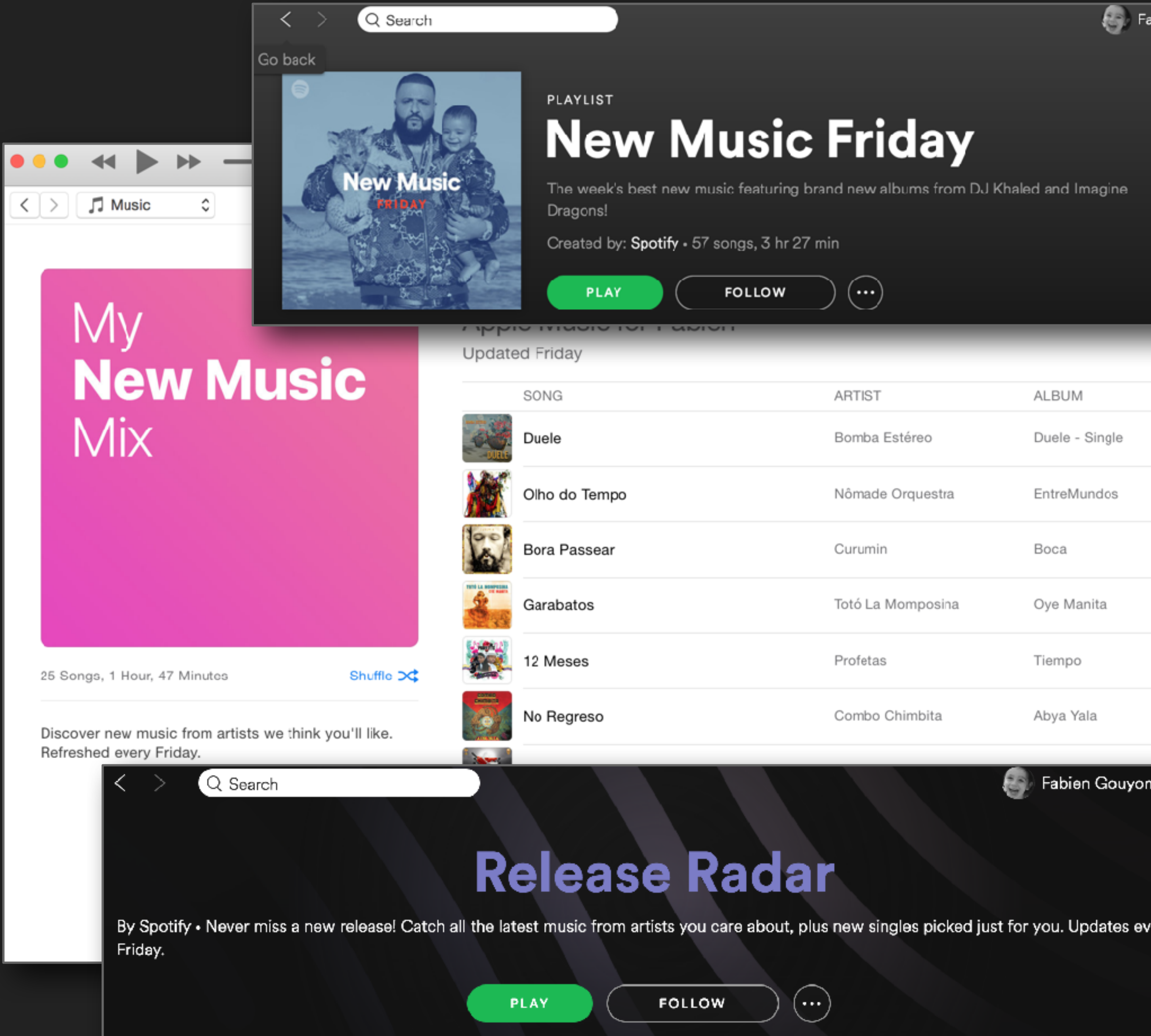
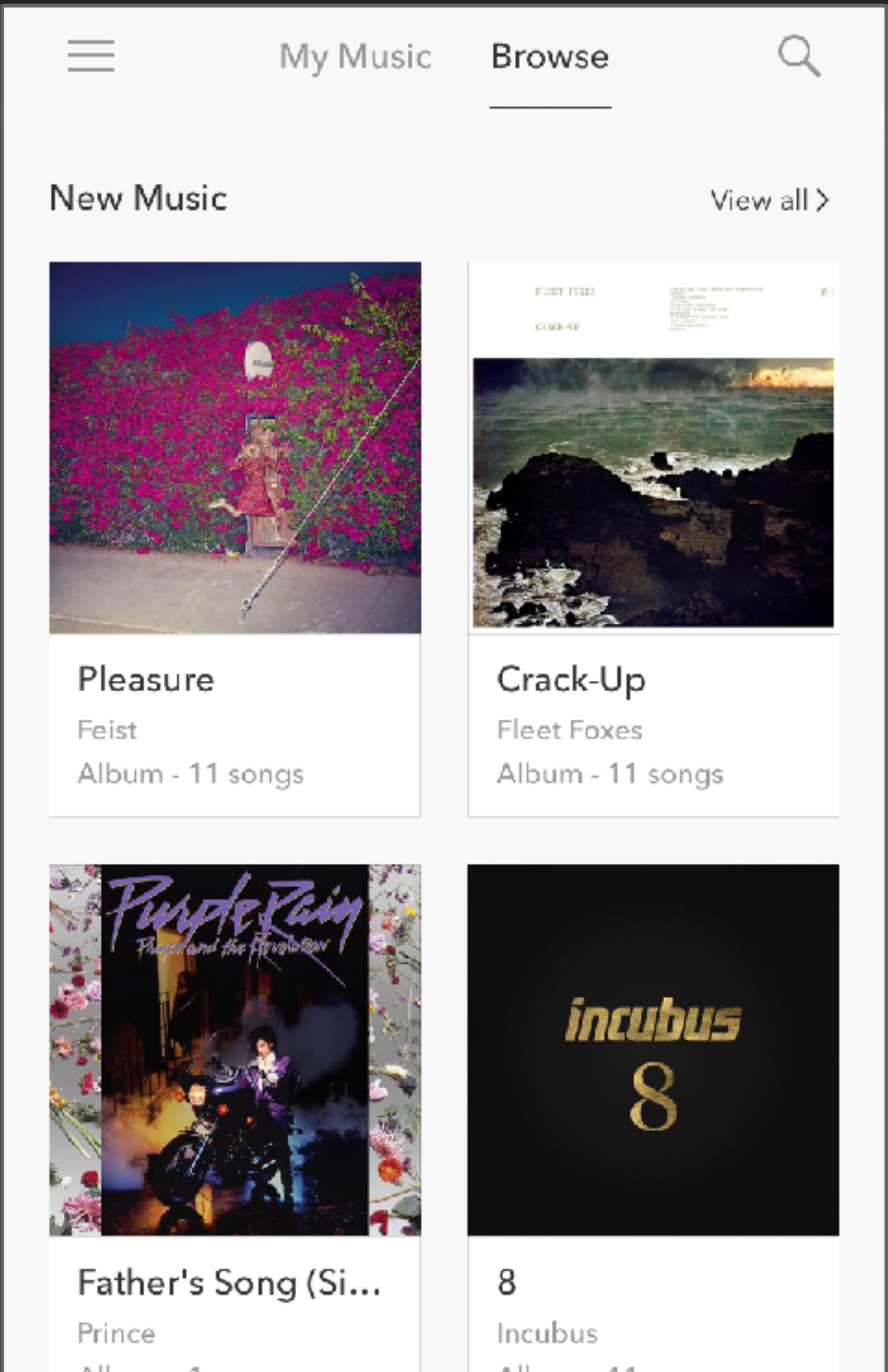
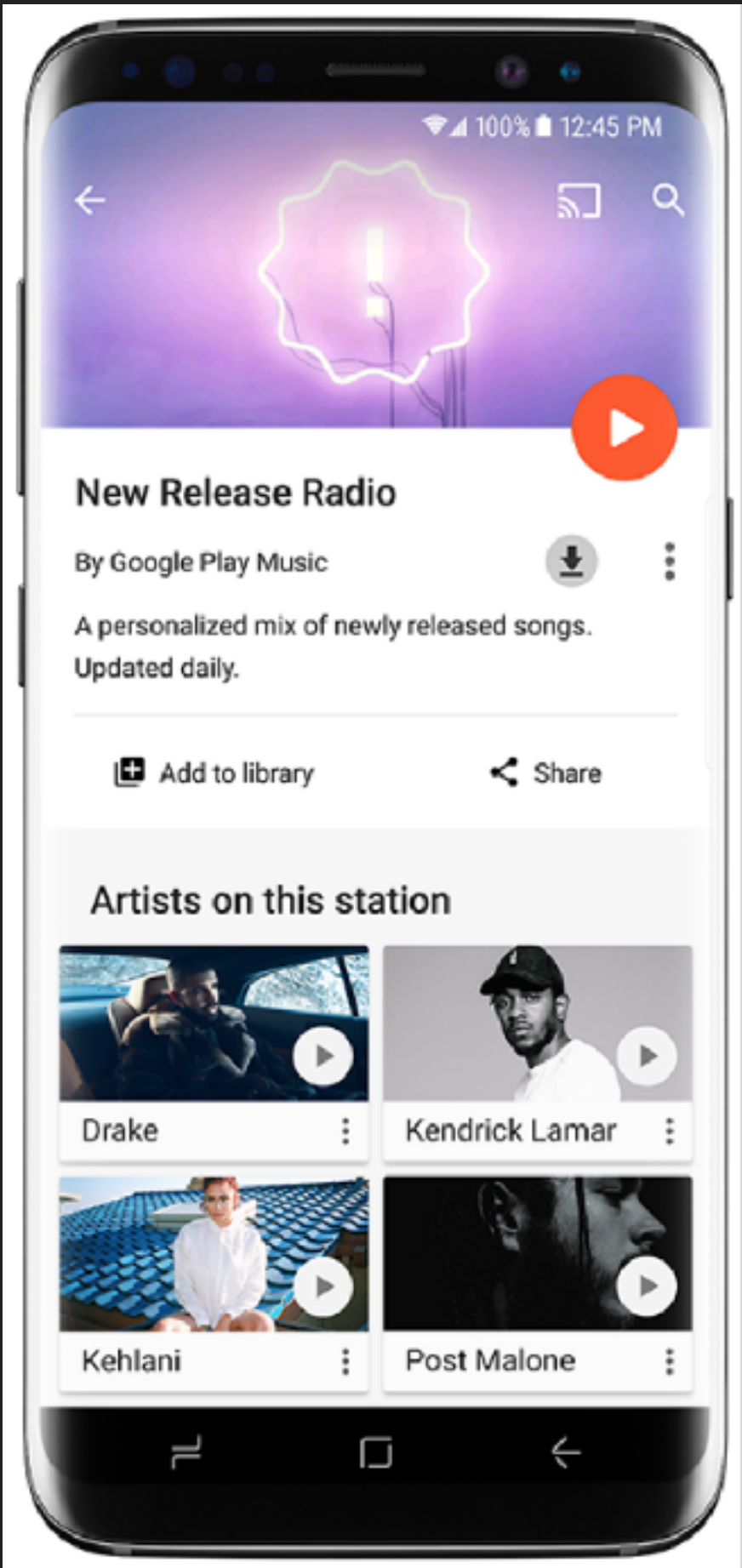


MUSIC INDUSTRY LANDSCAPE

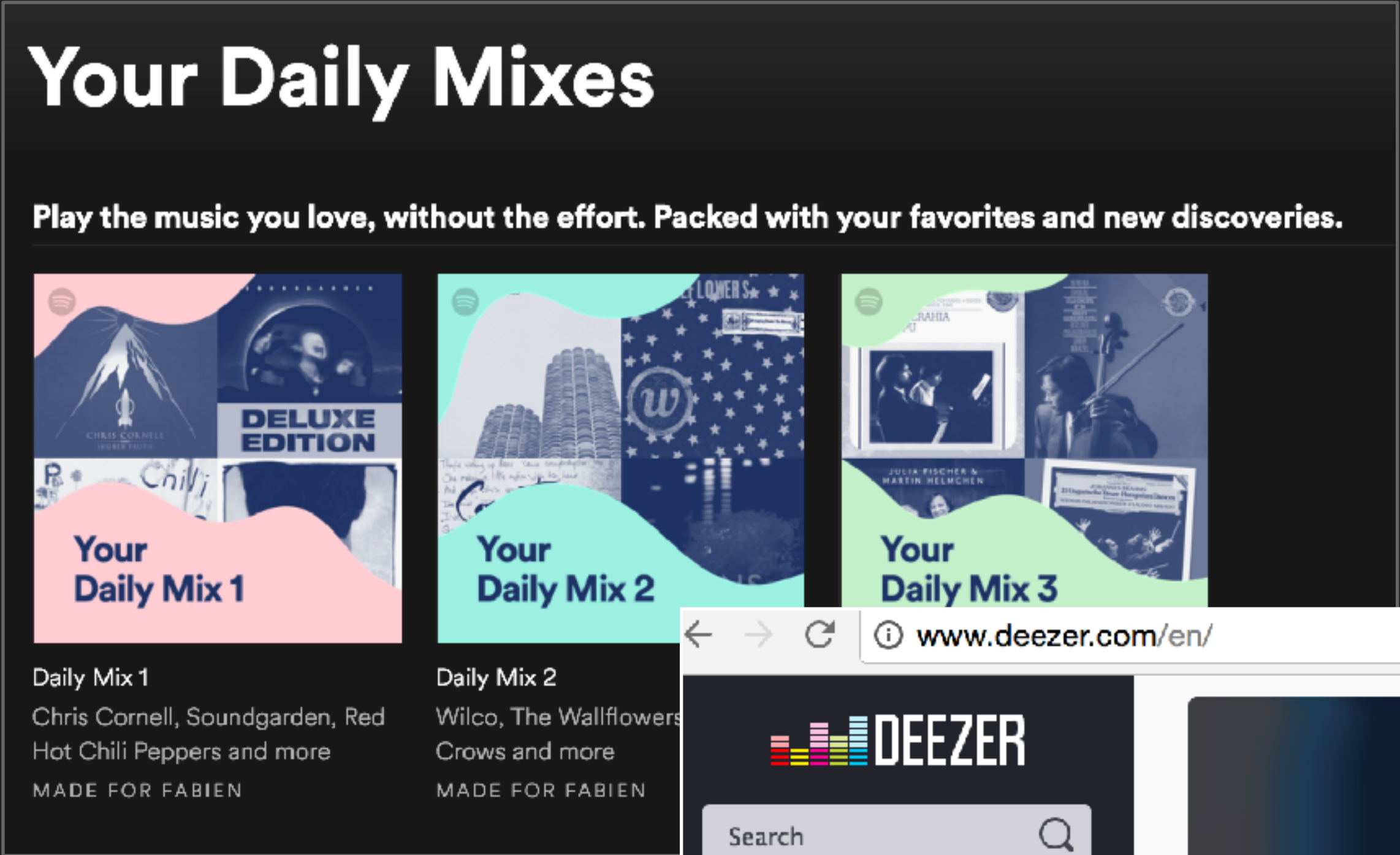
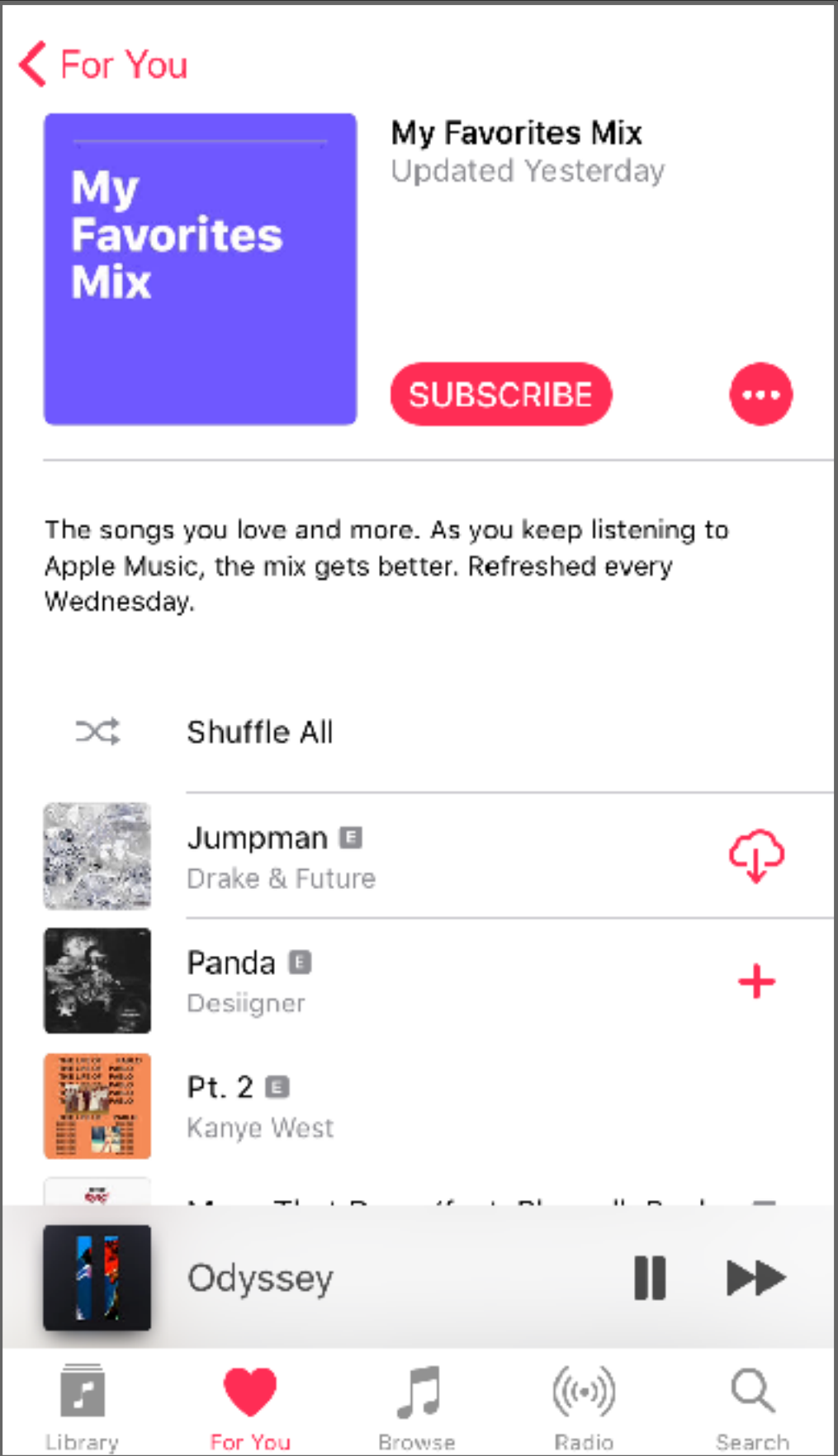


FOCUS ON: NEW MUSIC

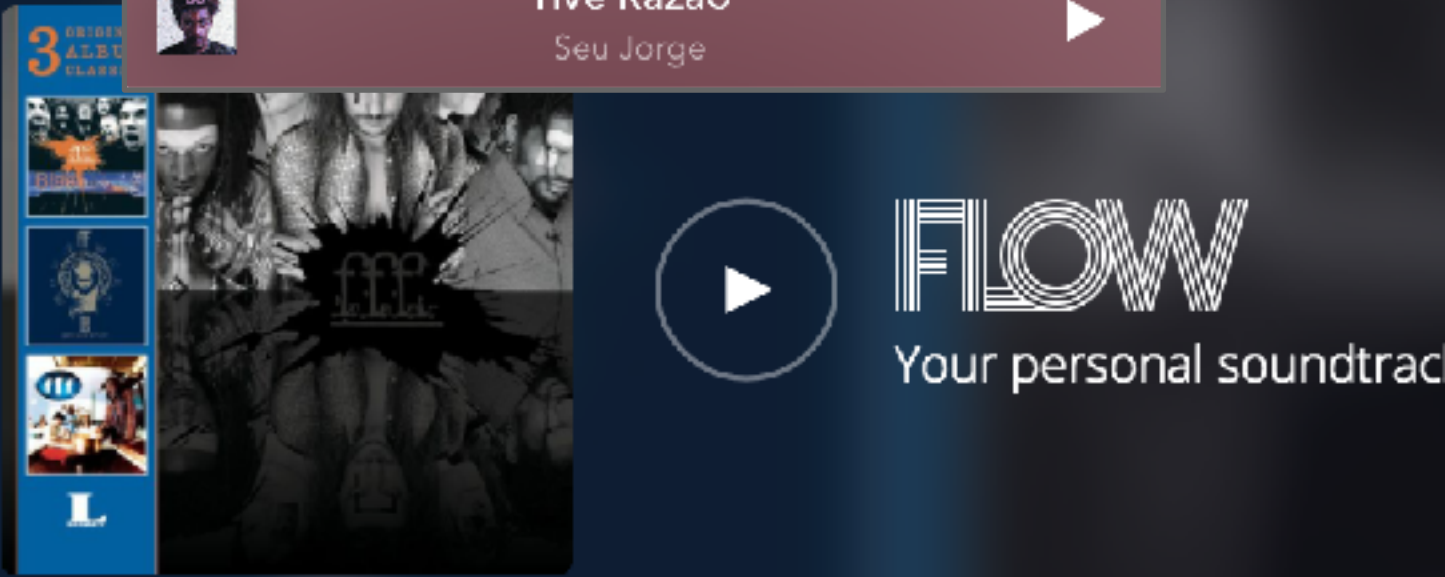
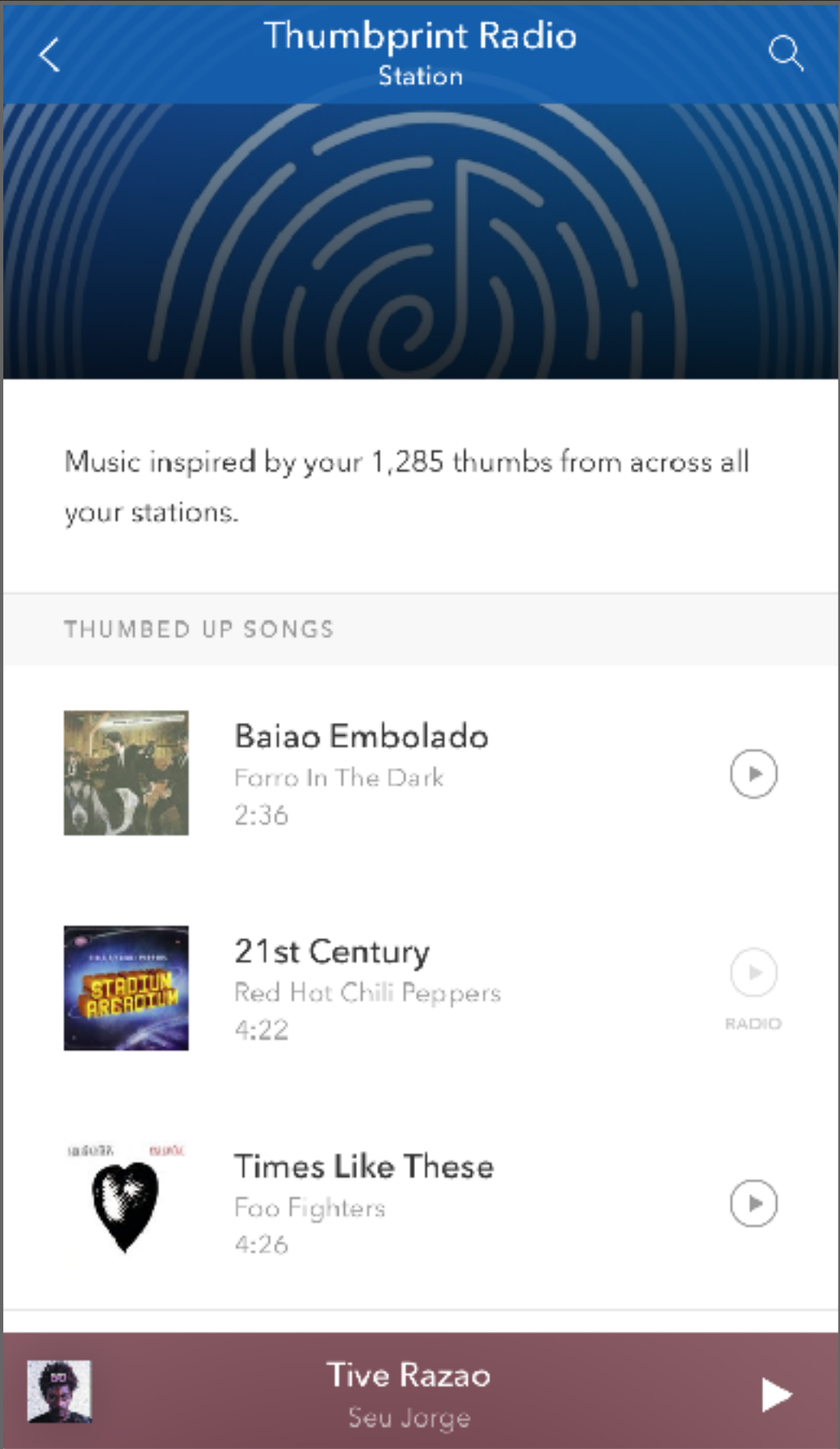
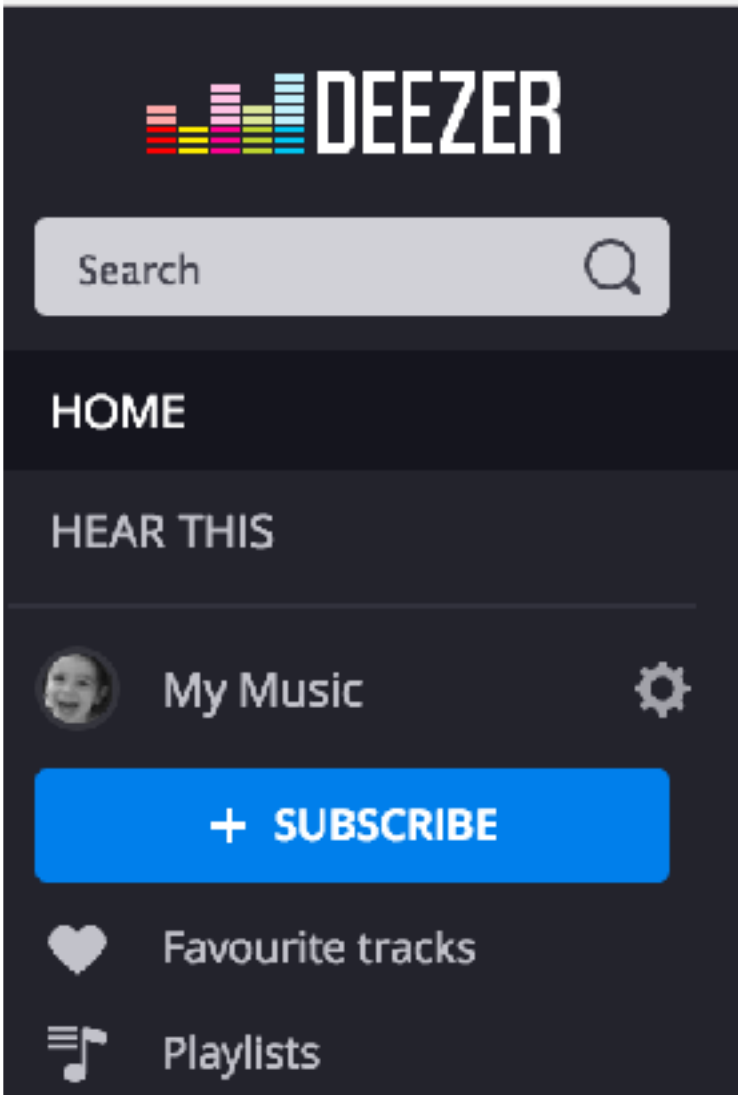
Personalized vs. non-personalized



FOCUS ON: RE-DISCOVERY

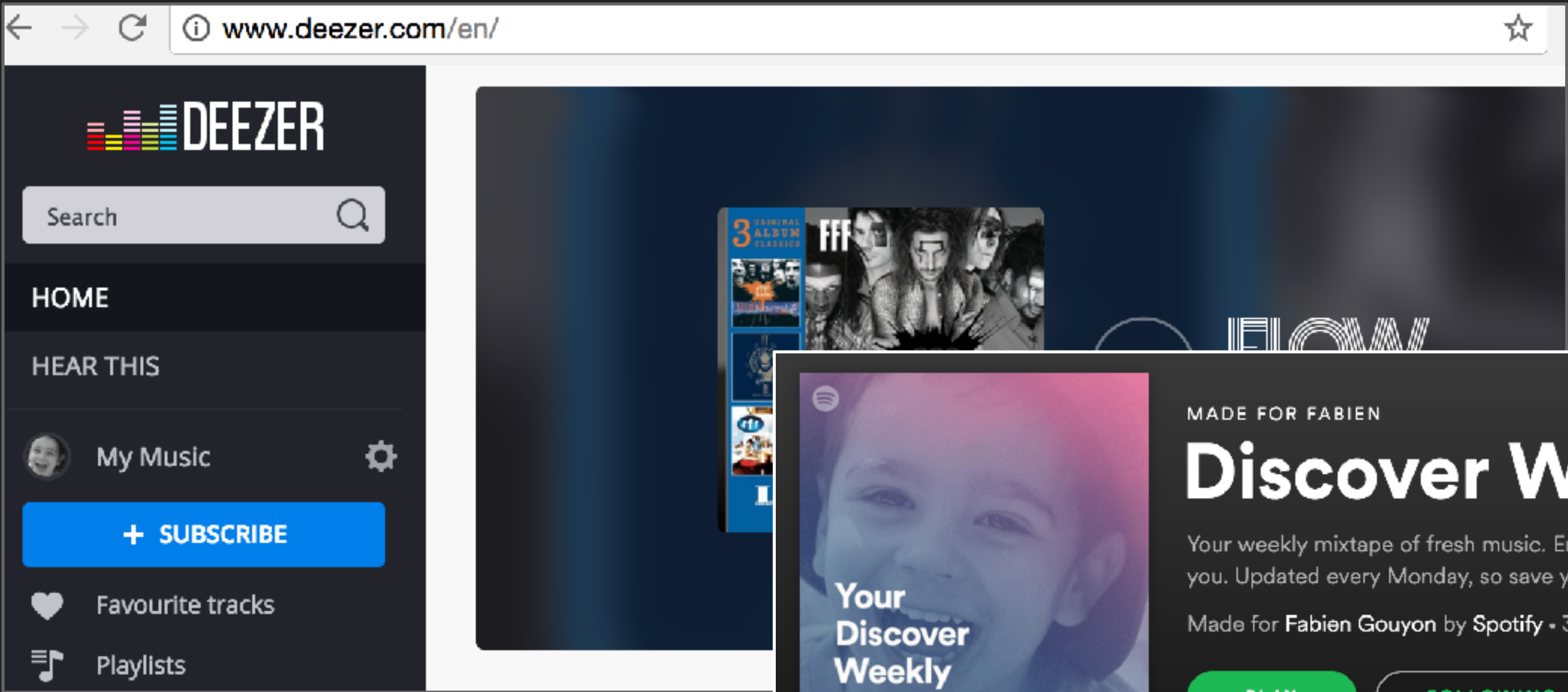
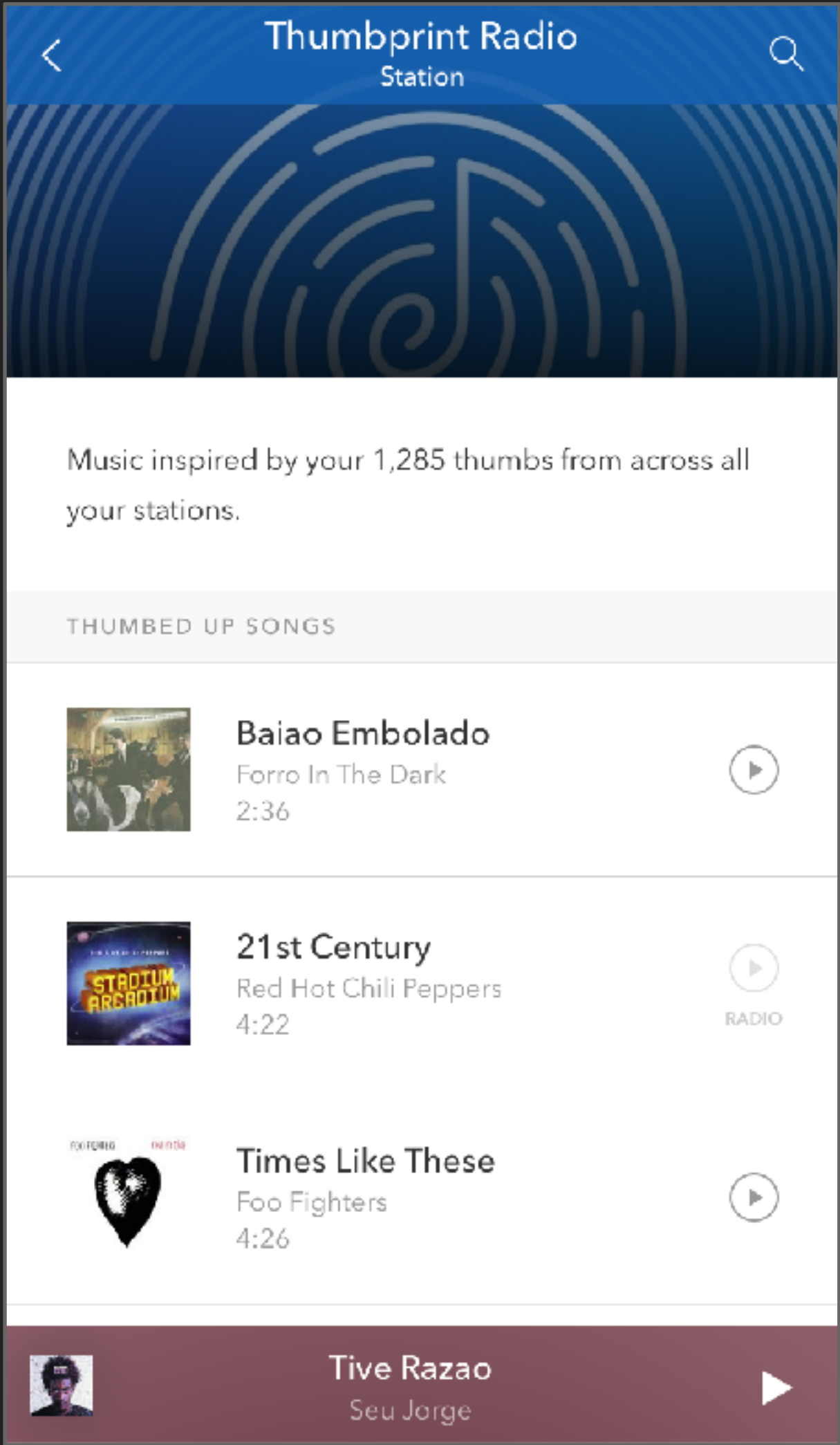


www.deezer.com/en/



Focus on stuff you know you like
Personalized, leaning towards exploit

FOCUS ON: HYPER-PERSONALIZED DISCOVERY



About discovering new stuff.
Intended to feel like it's
curated. Just. For. Me.




Leaning towards explore

MUSIC RECOMMENDERS: CONSEQUENCES





- ▶ Lots of knowledge and power is with streaming providers
- ▶ Personalized services → Loss of public
 - ▶ Only access to own statistics?
 - Record labels need to become shareholders to gain overall insight
 - ▶ Shifting of aggregated knowledge away from old stakeholders
(cf. Kobalt, Mycelia, etc.: decentralization, at same time aggregation in new services)
- ▶ Depending on contracts and associated revenue:
streaming services can **fill playlists with cheaper but still relevant content**
- ▶ Main threat: streaming services bypass rest of industry and sign their own artists


SPOTIFY HIRED FRANÇOIS PACHET


- ▶ Prior: long-term researcher with Sony Paris
- ▶ Expert in AI music making
 - ▶ automatic variation and continuation,
 - ▶ automatic lyrics generation, ...
- ▶ ERC Grant for FlowMachines project
- ▶ Spotify? AI generated music ... no royalties to be paid to copyright owners



WELCOME TO THE FUTURE: SPOTIFY POACHES AI MUSIC EXPERT FROM SONY

3.1K

 JULY 11, 2017 BY TIM INGHAM



On any given day, this is interesting news. In the context of what we've previously reported this week, this is *fascinating* news.

MBW has learned that Spotify has hired François Pachet – one of the world's foremost experts on the application of Artificial Intelligence in the world of popular music.

Or in simpler – perhaps scarier? – terms: music written by computers.

Pachet is currently understood to be waiting out his contract as the Director of the Sony Computer Science Laboratory in Paris, where he leads the music research team. He has worked at Sony for 20 years.

In 2012, Pachet oversaw a project which created the first known pop songs composed with AI, as well as launching the first music label dedicated to the professional use of AI for music production.

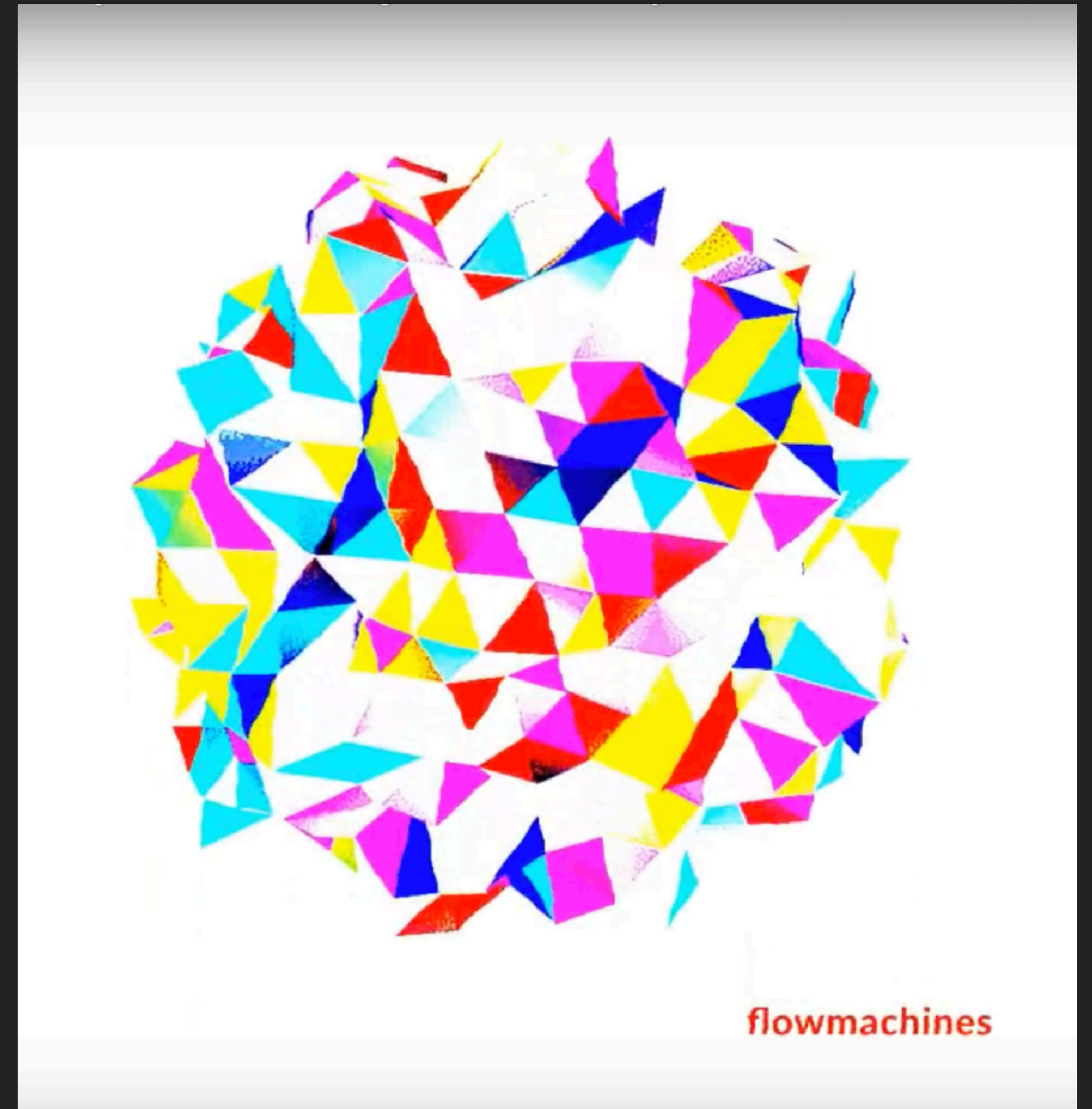
Earlier this year, Pachet's Sony team released two songs generated using AI. Both songs are the style of The Beatles and The Rolling Stones. In the style of American Shakespeare songs.

<https://www.musicbusinessworldwide.com/welcome-future-spotify-poaches-ai-music-expert-sony/>

FLOWMACHINES



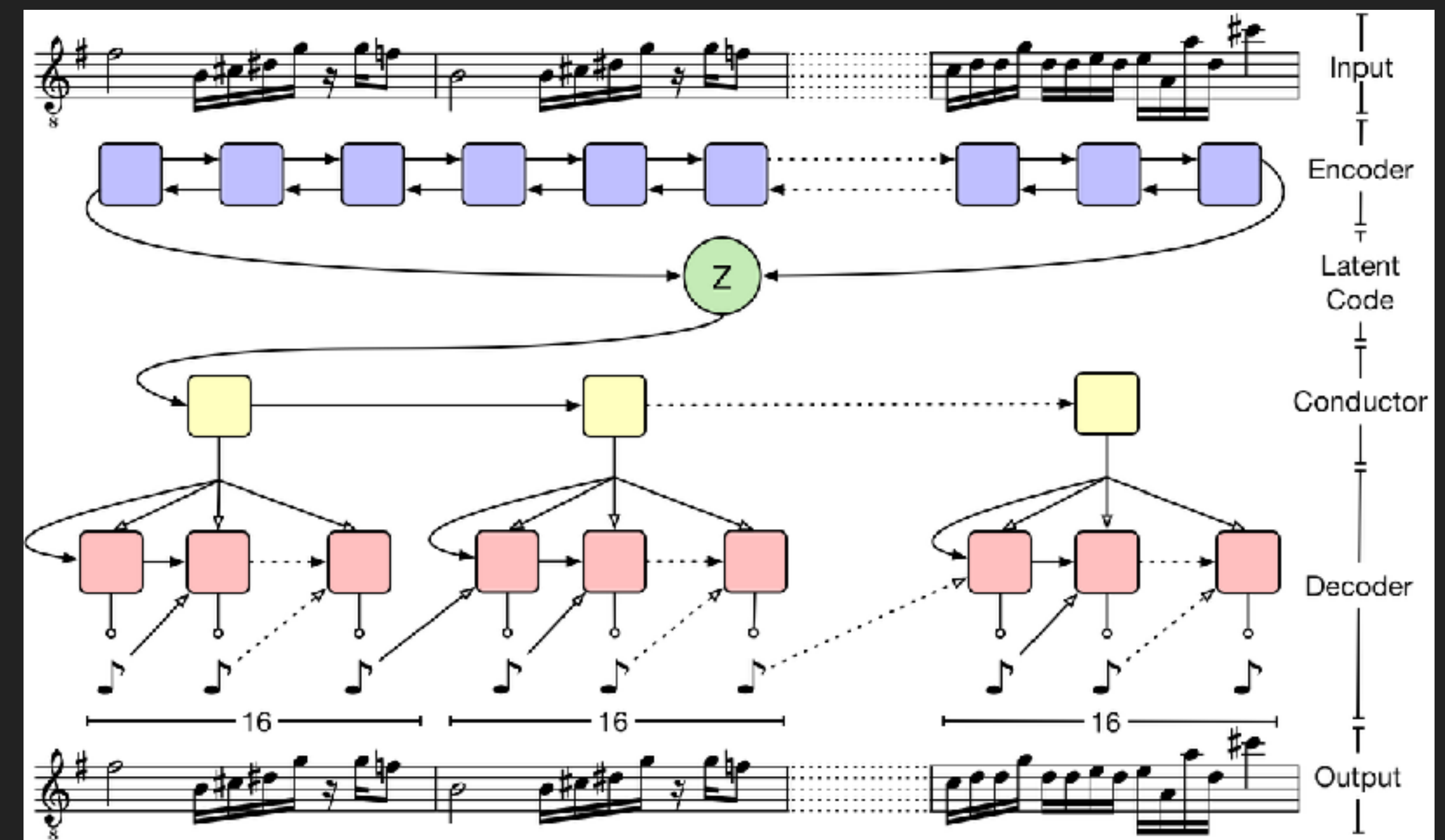
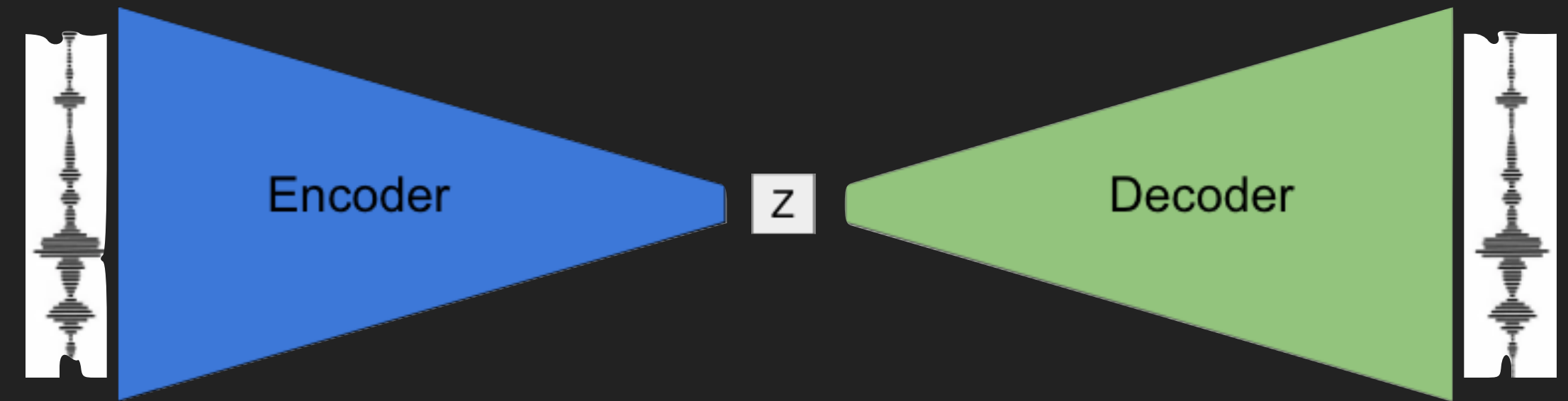
- ▶ Intelligent tools that support users to be more creative
- ▶ e.g., assisted composition, automatic continuation/accompaniment
- ▶ Composition in style of X
- ▶ "Daddy's Car" ... in the style of The Beatles
- ▶ Arrangement, production, lyrics by Benoît Carré
- ▶ <http://www.flow-machines.com>



GOOGLE MAGENTA

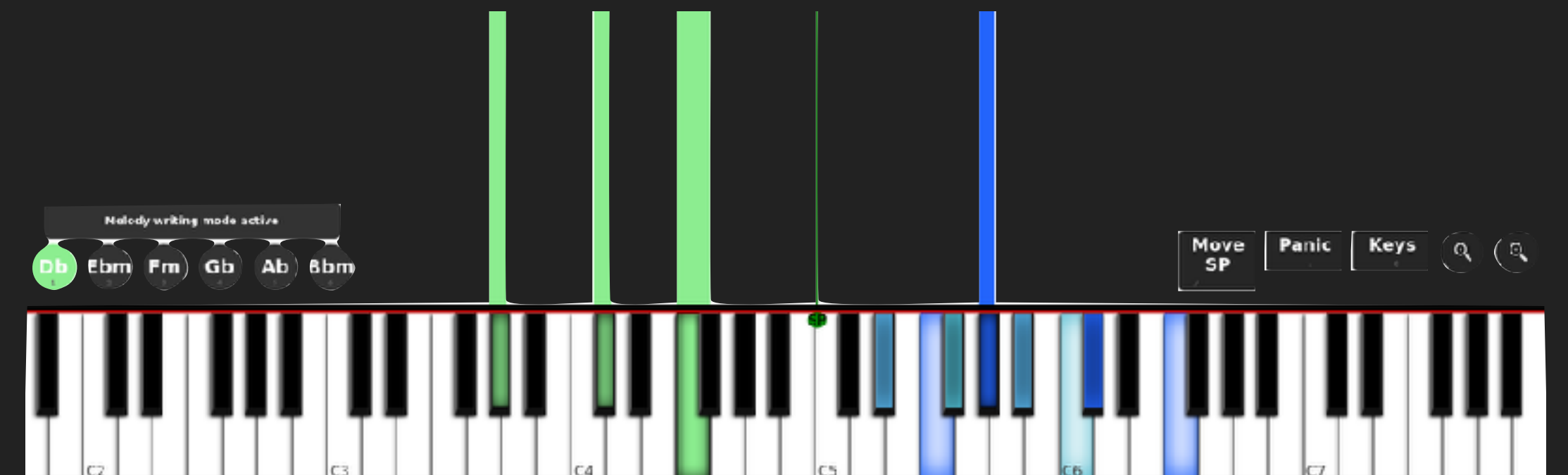


- ▶ Project built on top of TensorFlow
- ▶ Deep neural networks for, e.g., expressive renderings, sound generation, interactive note sequence generation
- ▶ Recently, automatic variation of rhythm, melody, timbre
- ▶ Example: interpolating from bassline to melody
- ▶ <https://magenta.tensorflow.org/>



OTHERS

- ▶ Jukedeck: AI composition, production, sound synthesis
 - ▶ Automatic creation of royalty-free soundtracks, “personalized music”
- ▶ Other big tech companies active as well: IBM Watson (Beat), Baidu
- ▶ Many supportive system prototypes: e.g. Lumanote, Reactable STEPS/SNAP
- ▶ Further sources on generative music:
 - ▶ How Generative Music Works: A Perspective <https://teropa.info/loop/>
 - ▶ Neural Nets for Generating Music ([Medium](#))



ANALYSIS OF EXISTING MUSIC CATALOGUES

- ▶ Music Information Retrieval techniques
- ▶ Detection, extraction, transcription
 - ▶ instruments, voice, melody, meter, structure
 - ▶ automatic genre, mood, tag labelling
- ▶ Learning parameters of music

WHERE IS THIS GOING?

- ▶ Already possible:
supportive systems, simplified control, automatic remixes
- ▶ Parameters of music + usage patterns, context, etc. → train generative model to generate “the right music” for free
- ▶ Does music need to be good to be a success, i.e., listened to?
(in AI terms: will the Turing test be passed?)
- ▶ In any case: music production will get increasingly automatized

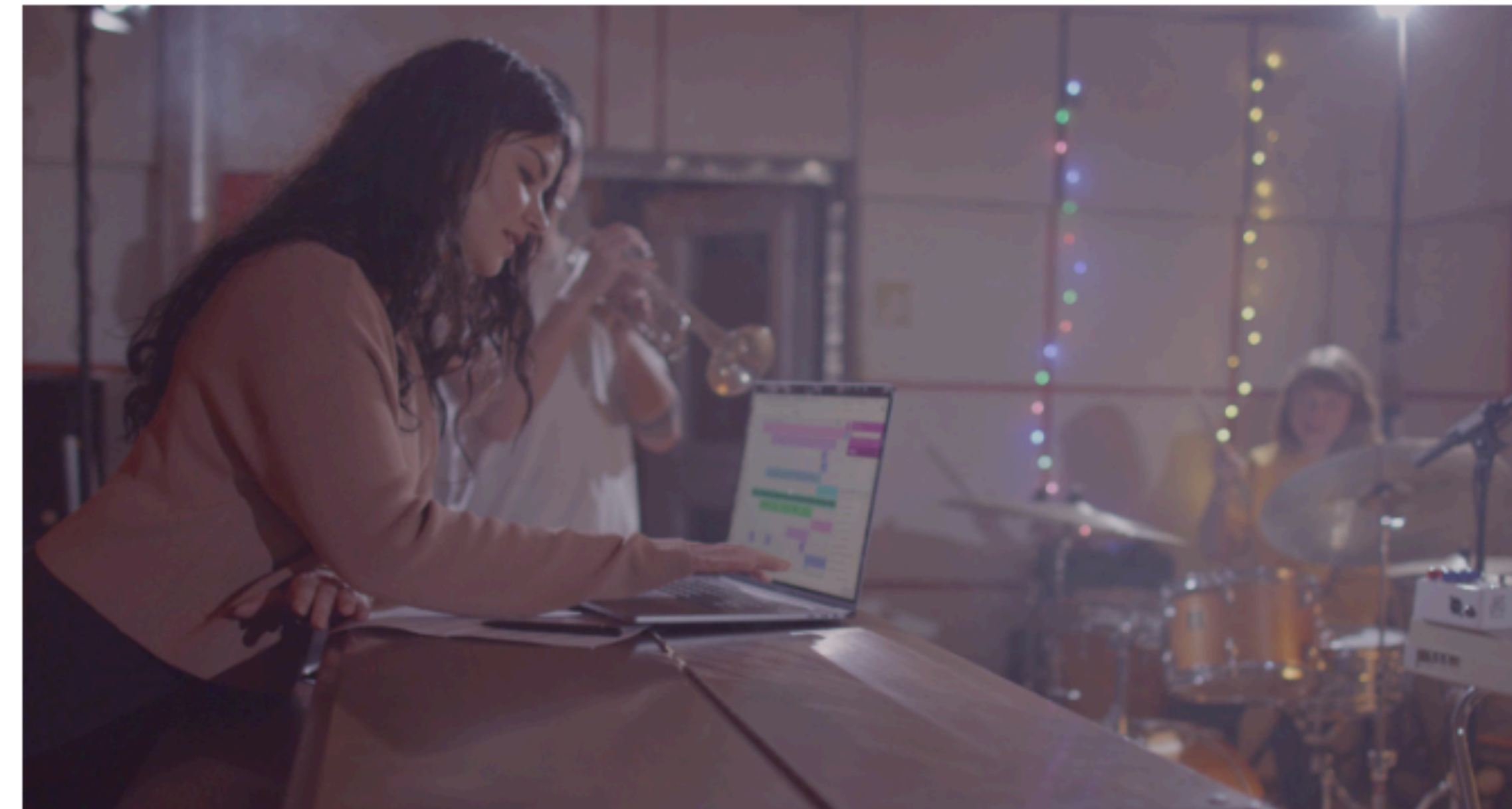
THE NEXT STEPS: CLOSING THE LOOP


- ▶ Spotify acquired Soundtrap (Nov. 2017)
- ▶ Part of strategy to build tools for music creation
- ▶ Music production in the cloud; with tools helping less advanced users to make music (and license it directly...?)
- ▶ Tapping a source of user behavior so far kept offline: music creation/composition/production
- ▶ Learning from this data to mimic human composition strategies and improve intelligent composition algorithms

Spotify acquires online music studio Soundtrap as it goes after creators

Sarah Perez @sarahintampa / Nov 17, 2017

Comment



Spotify  has made another acquisition as it continues to build out the services it offers to artists beyond basic streaming. It has acquired online music studio startup [Soundtrap](#), the company announced via a [blog post](#) this morning.

The three year-old company, based in Stockholm, is the maker of a freemium (paid and free) cloud-based, collaborative music and podcast recording studio that includes its own collection of loops

CONTACT



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