Thesis Project Portfolio

Automated Dog Ball Launcher: For Post-Covid Dogs

(Technical Report)

Changes in the Music Industry Monetary Flow with Streaming Services

(STS Research Paper)

An Undergraduate Thesis

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Table of Contents

Sociotechnical Synthesis

Two distinct projects are involved in this undergraduate thesis portfolio exploring the dimensions of society and technologies' interactions: an automated dog ball launcher for post-Covid times and the economic changes in the music industry with the widespread usage of streaming services. The technical aspect of the launcher addresses a response to a societal change, whereas the research paper addresses a deeper understanding of societal change and its corresponding music technologies. Both topics have relevance to members of society for those who are pet owners or music consumers. Coming out of a season of working from home, the first thoughts of the team went toward their dogs staying at home alone. To tackle this issue of keeping dogs entertained, the launcher was designed for an owner to use when having to leave their dog at home. Using a Bluetooth connection between a web application and the launcher itself, the user can launch the ball at different directions, distances, and time intervals. The launcher is designed in response to a new societal change which has resulted in dogs being left home during the post-pandemic phase. For the research portion of the portfolio, daily technologies used in everyday life was the initial starting point, as most young adults at college are music consumers. Most often, young consumers do not see the effects of their technology choices affecting the greater music industry, creating a reason to research this topic. Technological momentum dives into how society and technology both affect one another along with how paradigm shift occurs in the different widely used music technologies.

Coming out of the Covid-19 pandemic, life is slowing shifting back to working in the office. The mass dog adoption which happened over quarantine leaves dogs at home alone without their owners now that people are transitioning back into in-person work. With the automated dog ball launcher, dog owners and dog sitters can keep a dog busy and active. The system is designed to

have various features for user input of launch distance and direction, with the goal of the dog being able to play on its own. Any device connecting to the internet can access the application controlling the launcher. Personal devices can connect to an application via Bluetooth with the launcher with fields for entering distance, direction, and run time. A distinction of the automated ball launcher designed is its ability for the user to set a range of direction with the rotation being at the base. Having a range of direction gives the dog a sense of predictability but will keep the dog engaged as the ball will not be thrown in the same exact spot each time. The launcher will allow dogs to exercise and provide a temporary relief from being home alone.

Music streaming services, such as Spotify and Apple Music, have become household names for music consumption. Most forms of music consumption are through streaming services, contributing to being the largest player in digital platform sales. With the mainstream acceptance and usage of these services, there are changes in the monetary flow within the music industry. Analysis of the history of music distribution, music technology, and key music industry players before and after streaming services will be researched to answer what economic changes have occurred and why. The STS research paper aims to show economic changes in the music industry, which have come about from music streaming services, and why these changes resulted. Journal articles and published papers are used to gain insight about the states of the music industry and its interactions with the producers and consumers. Change in the monetary flow and the reasons for user acceptance of streaming services will be analyzed through two theories: paradigm shift and technological momentum. Working together, paradigm shift and technological momentum will explain the relationship between accepted music technologies and society's reasoning for choosing the technology, and how economic changes have resulted from music consumers' choices. Conclusions drawn from the research paper aims to have music

consumers to understand the consequences of the choices to accept streaming services and how these choices have affected industry.

Working on both projects simultaneously helped to better understand and make room for the unforeseen outcomes of technology's effects on society. Designing the technology for the automated ball launcher focused on responding on society and its needs, without taking note about all the possible ways the technology could affect the users or dogs involved. Conducting the research about music technology and its effects on the music industry filled in the gap of making room to understand technology could have greater effects than predicted. Consumers also take part in selecting the technologies performing best in a given era, showing the consumers of technology should be aware of their choices and how society can change based on their demands and needs.