

Xbox Streaming Hub App  
(Technical Paper)

Ads Affect Actions  
(STS Paper)

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On my honor as a University Student, I have neither given nor received  
unauthorized aid on this assignment as defined by the Honor Guidelines  
for Thesis-Related Assignments

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## Introduction

Stumbling through streaming services to find the right show is infuriating, so my technical project is an Xbox app that serves as a one-stop shop for TV and movie searching. You enter the title of the content you want to watch and our app returns the platform(s) that the content is on (ex. Netflix, Amazon, Hulu). Furthermore, our app customizes the user experience by utilizing machine learning to recommend shows. The end product will be an Xbox app that streamlines video searching and provides the user with a customized and easier experience. With more people watching TV and more frequently, it is important for everyone to understand the effects that television can have on its viewers. By the nature of this application and many others, user data is collected to improve the user experience. In this case, the user data will be used to recommend shows that the individual is more likely to enjoy. This can improve the user's enjoyment, and also the user is more likely to renew the streaming service if they are enjoying the content more. However, this is not the only way that user data can be used. In the current state of the internet, every user is tracked across various sites that they visit and what they click on. This leads to large ad companies having robust user profiles with a surprising amount of detail. These profiles can then be used to let a company who wants to advertise online target a specific type of user. In a perfect model, you could argue that this is the same as the example of recommending a TV show that the user would be more likely to watch, and in some ways it is, but ads can influence much more than just purchase decisions. Because modern ad targeting techniques are fairly new and ever evolving, this prospectus will analyze the effects that TV ads have had in the past.

## Technical Discussion

With the continued proliferation of streaming services, watching TV has become scattered across many streaming services competing for the viewers' attention. When deciding what to watch viewers may sometimes find themselves wandering through multiple different apps for different streaming platforms and it is not unusual to forget where the content you are looking for lives. In the days of cable TV, there were helpful guides where you could see what was playing on each channel in one place by simply scrolling through. A centralized place to find all TV shows from different streaming services exists on some platforms (Amazon Firestick, Apple TV), but it is lacking on Xbox One. With this project we will connect the streaming services so that Xbox users can have a centralized location to find (and even have suggested to them) what they're looking for. This Xbox One app takes a title and queries each platform to see where the show is hosted and returns the results. As well as connecting these platforms, our app uses machine learning techniques to customize suggested shows for the user. Similar to Netflix, as the user watches more shows or rates movies on this platform, the predictions for shows they will enjoy will become more and more targeted to the user's tastes. From appearances, this Xbox app will look like any streaming service that people are familiar with, but the content will be from multiple services. A user would still have to have an account and be logged in to access any particular service. This app will improve not only the efficiency of searching for shows, but the quality of service provided to the user. By reducing the time for Xbox users to find shows, it provides more time to watch or do whatever they please. The improved convenience is obvious to anyone who uses multiple streaming services on a regular basis, and the benefits are even more dramatic on an Xbox because the typing interface, voice control, or other typing input are

lacking. Typing input is slow because most users will be either using an Xbox controller or a phone app that replicates the inputs of the controller (keyboard support was added by Microsoft in late 2019, but each Xbox app is responsible for adopting support). Typing in a search only one time will save not only the amount of time to close and open multiple apps, but also the non-trivial amount of time it takes to type out a search. This directly impacts the streaming market because this enhanced and easy to use experience will cause current viewers to watch more, while simultaneously attracting additional viewers.

The successful implementation of my project will incorporate many computer science methods and techniques. To contact individual stream providers, I will use an Application Programming Interface (API). This will allow me to query each provider and see if they host the specific content. In order to recommend shows for users I will aggregate a lot of data and develop a good machine learning model. Preliminary data will be sourced from Kaggle, which contains a dataset of 45,000+ movies and TV shows with title, cast, ratings, genre, and keywords. This will suffice for general predictions, but once the customer has used my app, I will apply their specific data to personalize recommendations further. As for the model, I will use a neural network. This decision is based off of Netflix's competition where the winners employed an ensemble model (Chen, 2011). Ensemble models use multiple decisions from smaller models, instead of a single decision from a larger one. Neural networks expound upon this idea and add more layers, which is why I chose to use this method. I'll utilize GitHub in order to collaborate with my partner and we will write our code in Python. Before releasing this software, I will train my model to test its accuracy as well as make sure my API calls are fault resistant. The end product will be an Xbox app that streamlines video searching, providing the user with an easier and customized experience.

## STS Discussion

The general topic of this STS research is TV and the effects it has on viewers, specifically the effects of ads. This is important given that nearly everyone watches TV and the impacts are not always obvious nor beneficial. This will be loosely coupled with my technical report, as my technical project adds structure around how we consume TV. My technical topic also includes some amount of user data collection, which has become pivotal in how ads are delivered in the modern world (mainly internet ads, but with internet TV it is also possible). This topic affects many people, including myself, so being aware of some possible consequences is an interesting exploration.

Watching television is such a universal activity in the United States, that it can be almost guaranteed that someone you meet will have watched at least one of the same shows that you have. In 2017, adults in the US watched an average of 41 hours of television every week (Barwise, 2020). For an activity so widespread, its effects are rarely discussed. The most obvious and perhaps most innocent effects include spending time with friends on a Sunday afternoon watching a football game or talking about the last episode of the Mandalorian. Studies have also shown that watching TV after a long day of work shows brain patterns of “pleasant, wakeful relaxation” (Barwise, 2020). Yet while these can be great bonding experiences, there are billions of dollars spent every year to “build brand awareness and brand image” (Bruce, 2020). Even if some feel that they are above the sway of TV advertisements, the overall statistics cannot be ignored: TV ads spur revenue for companies. For example, Thomas (2019) thoroughly analyzes the effects media could have had, stating, “These analyses provide consistent evidence that television did affect smoking behavior, particularly for 16-to 21-year-olds, an age group that is

already at high risk of smoking initiation.” From the view of the cigarette companies, this is fantastic. But this change of behavior has caused many people to die before they otherwise would have. It should also be noted that some people do genuinely enjoy smoking, but the power of the advertisements stand.

What do ads want us to do? In most cases an ad is for something for the viewer to buy. It could be in the form of a new phone, a new phone carrier, to use a particular insurance, to visit a certain place, apply to a specific university, or countless other things. But the intent is simply that more people would give the advertiser money in some way. That is not necessarily a bad thing, but the behavioral side effects that the ads encourage should not be dismissed. Purchase decisions are not the only type of advertisement. Another is political ads. Political ads can often be a mess of candidates dragging each other through the mud; however, they still have an impact on the voters’ psyche. Analysis of political ads is more complex than analyzing the effects of purchase decisions for several reasons, mainly stemming from a lack of information of precise voter behavior. Benoit (2014) posits that while voting decisions are not entirely logic based, voters do take into account all pieces of information they have on a candidate in some sort of cost benefit analysis. When voters do the cost benefit analysis, the ads that they have seen do play some factor, and can influence the voter’s opinion. More analysis of how ads affect votes is needed, but the fact that they do gain influence for the candidate has sweeping implications for the future.

### **Conclusion**

The concept of advertisements far predates the present day, going back to at least 1780 (Graham, 1780), but the method of delivery has continuously changed and improved. If this has happened in the past, it must be considered how our future is being shaped by today’s television

content and its ads. The effects of ads right now are no less than they were in the past; in fact, they almost certainly impact society more today than they ever have. This is because everyone is exposed to ads at every turn: radio, billboards on the way to work, internet, and on television. There is no escaping them. Ads on the internet even have another trick to make them more effective. Due to advanced tracking and behavior modeling, each person is delivered ads that are tailored to them. It would not be a stretch to say that ads impact shape the future. On the small scale, they influence purchase decisions, but on the large scale, they can be the difference between who is elected to be in charge of the most powerful nation in the world (Benoit, 2014).

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