**Thesis Project Portfolio**


**theCourseForum Blog: Improving Student Outreach and Increasing Course Guidance with a Publication**

(Technical Report)


**Evaluating the Apple App Store: How Apple Leverages Market Power for Anti-Competitive Conduct and How Regulators Can Change It**

(STS Research Paper)


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**Sociotechnical Synthesis**

(Executive Summary)

*An Analysis of Tightly-Controlled Platforms' Power and Influence on Users*

A platform's designers can influence and limit how users interact with each other and the content they generate by using vertical control and market power. This was demonstrated in both my STS research project and, surprisingly, the project behind my technical report as well. In recent years, questions about the responsibilities of "big tech" have emerged on all fronts. Having a prior interest in consumer electronics like smartphones, I decided to research Apple's software strategy surrounding the Apple App Store. My research investigated if the Apple App Store has monopolistic characteristics and if it uses that power for anti-competitive practices, and if so how it could be changed. In my technical report project, I developed a blog feature for theCourseForum, a course review site specifically for University of Virginia students, allowing the marketing team to write articles providing new course insights and advice for students browsing the site. Both projects describe multi-faceted systems in which users are a big part of both the production and generation of content. Sociotechnical frameworks are crucial for looking at these technologies in context.

The technical portion of my thesis covered the production of a blog that will be a part of theCourseForum, a website and student organization I am a part of where students write and read reviews for courses they have taken. When the blog is launched, it will show posts written by theCourseForum's marketing team, which will provide course advice using insights from our review data. We used the Django framework with an engine that converts Markdown, a simple markup language, into HTML that is rendered on the web page. We also provide a no-code admin interface for the team to edit and post articles. This project will increase

theCourseForum's user engagement by bringing students to the site longer and more often. It will also make theCourseForum feel more personal and transparent, especially as many students do not know that theCourseForum is made by other students.

In my STS research, I examined the Apple App Store, evaluating its overwhelming market power and anticompetitive conduct enabled by it. As evidence, I used research papers combined with judicial and legislative material from court cases and investigative reports. These showed that multiple features of the App Store are anti-competitive, including the 30% commission fee Apple takes on all in-app purchases, the anti-steering policy limiting alternative payment options, and Apple's self-preferencing of its own apps. I also analyzed the App Store with actor-network theory (ANT), showing that Apple positioned the App Store as the obligatory point of passage (OPP) between Apple users and developers. As the only way to browse and download iOS apps, Apple maintains broad control over both consumers and developers. In my paper, I recommend changes that regulators could implement including opening up the App Store to other payment methods and allowing competitor stores. These would reduce the power of Apple as an OPP in the network and make the App Store more equitable.

As I analyzed the actor network of the App Store, I realized that theCourseForum is similar in many ways. Like developers making apps, students write reviews. Like consumers browsing and downloading apps, students browse and read reviews. Although the product, reviews, is user-generated, the review data is proprietary. Thus, as the only bridge between users and reviews, theCourseForum is also an OPP, as shown in Figure 1.
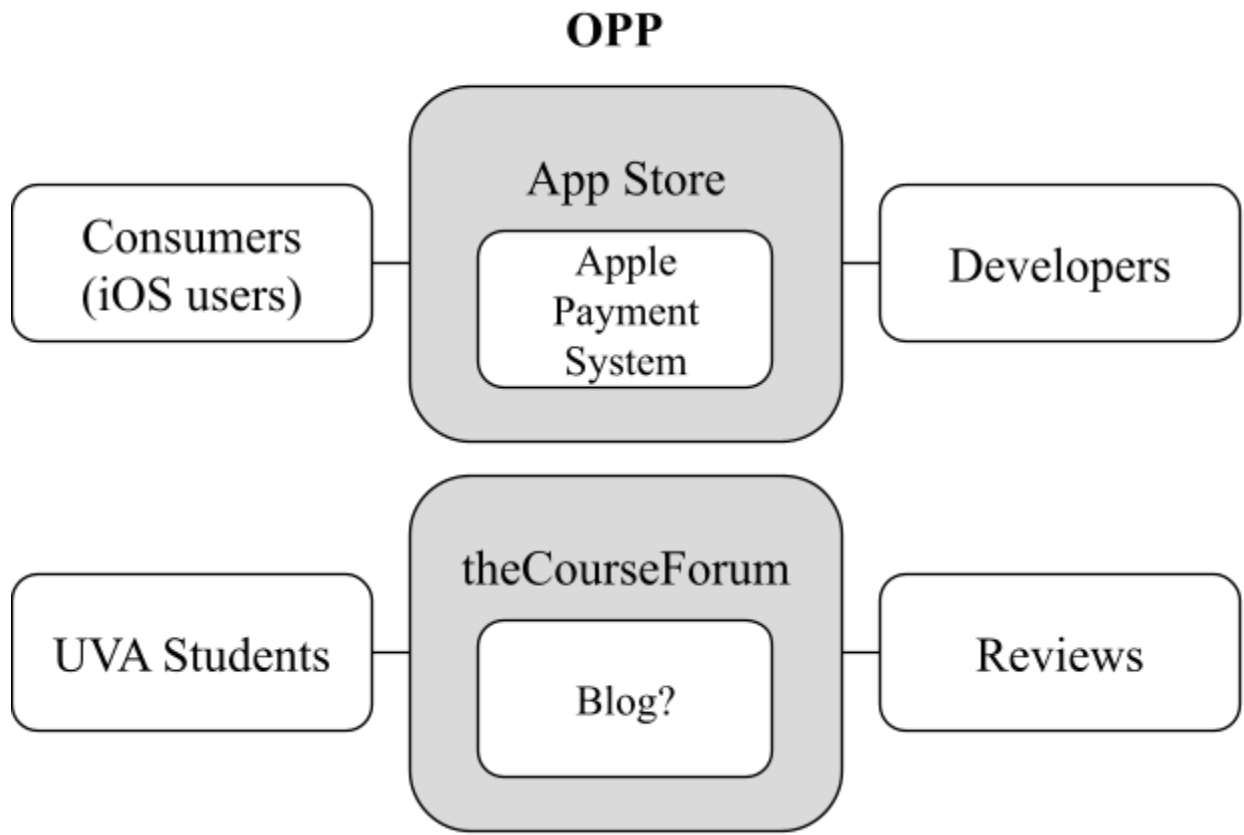
**Figure 1.** Simplified ANT models of the App Store and theCourseForum, compared. Like the App Store, theCourseForum is an OPP in its network with influence over what users can do. In its position, theCourseForum could theoretically force students to use the blog (created by author).

Similar to the App Store restricting payment methods to only its own system, manipulating the access possible in a platform changes users' behavior in powerful ways. For example, suppose we wanted to generate more traffic for the blog I created. In that case, we could make it the OPP by removing any other way to browse course reviews on theCourseForum and forcing students to read the blog to get information about which courses to choose. In the other direction, we could also open up theCourseForum by making reviews publicly accessible for third parties. In this scenario, with direct access to our database, someone could make their own blog using our review data that competes with our blog and, if they provide better insights, draw users away

from our site. We would never do either scenario, of course— limiting our review content to the blog is far too restrictive, but on the other hand, we have no incentive to open up the data to others because we want more users on our site. Analyzing theCourseForum blog as an OPP and evaluating the effects of changing it provides new insight into how theCourseForum works. However, it also shows that Apple's decisions may not stem out of greed or malicious intent, but simple business decisions. After all, we would be hesitant to open up theCourseForum in the same way. Comparing both technologies as sociotechnical systems shows that the decisions that change tightly-controlled platforms are complex and far-reaching for all of the platform's users.