Undergraduate Thesis Prospectus

**Horse Show Results Tracking and Reporting**

(technical research project in Computer Science)

**The Social Construction of Libra**

(STS research project)

by

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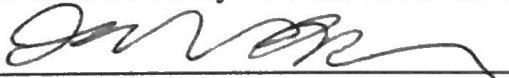November 18, 2019

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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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# Horse Show Results Tracking and Reporting

*How can horse shows better track and report results?*

The technical advisor of this capstone research project is Ahmed Ibrahim of the Computer Science Department.  This project includes improving and adding functionality to an existing Django application developed to manage horse shows. We are working with a customer to define the requirements of the technical side of the project, and we will be producing documentation so that future students can replicate our team's development strategies and processes. While the software created from this project is reusable in the future, the main purpose of the project is to work specifically on improvements requested by a single client and write documentation for future students to follow.

In horse shows, a system must exist for tracking riders, horses, and combos of a horse and a rider. Additionally, for each combo the system must have a way to record scores for each event, also known as classes, in the show. Previously, our customer used a large poster for tracking all results where everything would be handwritten (fig. 1).
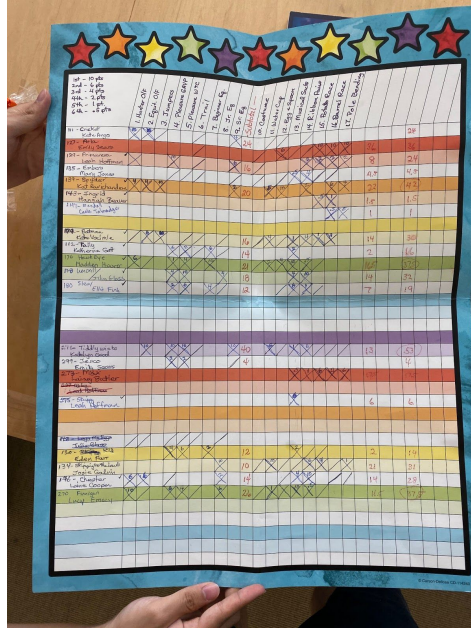
Figure 1. Previous system for recording results for Hoof n Woof horse show.

This system is not optimal as all results were only stored in one location. All calculations of final

scores had to be done manually, and fixing mistakes on the scorecard would be very messy.

Tracking new riders and horses is time consuming, and this old system makes it especially

difficult to track them between new shows. The team that developed the original software

created a solution to fix these problems, but not without its own issues. We worked with our

client to improve the software further, removing the bugs and making the process more

streamlined.

For this project, we used Jira to keep track of all the tasks that we had to complete and

Git for version control. On the technical side, we worked on bug fixes, user interface, and new

features that the client requested. A few improvements include a detailed search, increasing the

valid combo number range, and the ability to include hyphens in the accession number. The user

interface upgrades involved being able to sort riders and horses by categories and viewing a

horse-rider combo's name and owner on the rankings page instead of just its combo number. A lot of the main feature changes involved the form to add a new horse-rider combo: the ability to add the combo to classes, searching for existing riders/horses, and creating new riders/horses without losing the combo form data entered already. Other features that were added include viewing the rankings of all of a show's classes on the same page, adding a notification system for adding, editing, or removing entries, and implementing a more secure method for website registration and data modification. After installing our updates onto the client's computer, they have since been able to organize new horse shows quicker and easier than before.

The other half of this project involved writing documentation for server installation, Jira installation, team workflow, and code coverage. The server installation documentation includes instructions on installing required dependencies and configuring settings to launch the application for both Linux and Windows. The Jira installation documentation includes instructions for installing and configuring Jira onto a Linux server. The team workflow documentation outlines how we use Jira and Git for our project, and the code coverage documentation describes how to use Coverage to view the code being tested. With these documents, future students can follow our example to quickly and efficiently create software for local clients.

# The Social Construction of Libra

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# Contents

# 1   Introduction

The primary purpose of the proposed thesis is to use the Libra cryptocurrency and its generated controversy to better understand how technological artifacts are socially constructed and adopted. To this end, I draw from the theory of Social Construction of Technology (SCOT) and aim to develop the theory farther. The technology itself, Libra, is a cryptocurrency developed by Facebook with huge implications for the unbanked, the developing world, and many other relevant social groups. Libra could stand to threaten sovereign currency, existing banking systems, and government control over fiscal policy. Compounding this disruptive potential is the fact that an estimated 2.1 billion people use one of Facebook's apps each day (Facebook, 2019). As a result, the launch of Libra would deliver massive and nearly-instant impact. When comparing this potential user base to existing the number of 50 million total blockchain wallet users, Libra could easily envelop this market (Statista, 2019). As a result, understanding why Libra did or did not make it to launch is an issue of importance. In order to reach this understanding, I cover some background on what Libra is and existing goals for the project, I introduce the framework I will use for the analysis of Libra's construction, and I state our intended research questions that I aim to answer going forward.

# 2   Background

Libra's goal is best described by its white paper stating: "This is the goal for Libra: A stable currency built on a secure and stable open-source blockchain, backed by a reserve of real assets, and governed by an independent association." (Libra Association et al., 2019). In its white paper Libra claims that those with less money pay more for financial services in the form of high loan rates, overdraft fees, wire costs, and other costs. By offering a more efficient, decentralized, and global system that removes the requirement of trust in centralized authority which is found in existing financial systems, Libra could significantly reduce these inequalities. Without the overhead of maintaining trust in the financial system, Libra could significantly reduce

transaction costs. As a result this technology has the opportunity to make the global economy more global and more inclusive. In short, the white paper states: "The association defines success as enabling any person or business globally to have fair, affordable, and instant access to their money."

In studying the development of Libra, it is important to distinguish Libra from Facebook. Facebook aims to be just one of many companies forming the non-profit called the Libra Association where Facebook will only have one vote. However, Facebook will oversee the development of Libra as an open-source technology to help make the system viable. The part of Libra that will be wholly owned by Facebook is the Calibra digital wallet which will facilitate Libra transactions. In the spirit of competition, other companies like Apple and Google are encouraged to develop their own wallets to process Libra transactions. Facebook claims that the features brought by this wallet's integration into their host of applications is part of what makes developing Libra worthwhile. Additionally, Facebook CEO Mark Zuckerberg explains that "when we eliminate friction for customer buying something from a business they and the value of advertising goes up" (Zuckerberg, 2019). Thus, the motive for Facebook's construction of Libra is rather indirect and has been the cause of some public distrust.

Another important point is the difference between Libra and other cryptocurrencies. Libra aims to protect the value of its users, and as such has focused on producing a stable cryptocurrency. To accomplish this, Libra will be fully backed by assets kept on-hand by the Libra Association. This means that if at any time, all of Libra's users decide to cash in their Libra for fiat cash, they can. This minimizes, but does not eliminate, the volatility of Libra and stands in stark contrast to Bitcoin which is backed by nothing and exhibits remarkable volatility. A second key difference is that Libra runs on a permissioned network where only some members (the members of the Libra Association) of the network will be responsible for validating transactions. This is bad in that the network requires some trust in the Libra Association, but good in that it allows the system to be potentially more secure and scalable. Libra has mentioned that they aim to move to a permissioned network in the future (Libra Association et al., 2019).

# 3  Approach

In analyzing the factors contributing towards the success or failure of Libra's adoption, I elect to use the Social Construction of Technology (SCOT) as a guiding theory for our analysis. There are several key concepts that SCOT advocates for which will be useful in our analysis. These include the principle of symmetry, the idea of a relevant social group, the concept of interpretive flexibility, and the concept of closure mechanics as noted by Pinch and Bijker's seminal paper: The Social Construction of Facts and Artefacts (1984). Pinch and Bijker suggest that in order to avoid an overly simplistic and linear analysis of technological development, successes and failures should be treated symmetrically in analysis. With this in mind it seems appropriate to use SCOT in the analysis of technology like Libra that is 'in construction' as I are unaware of the technology's success or failure.

In the same paper, Pinch and Bijker note that SCOT's predecessor, Empirical Programme of Relativism (EPOR), had particular success in analyzing controversial scientific claims and note the concept of a 'Core-Set' or 'controversy group'. The idea of a Core-Set is that in scientific controversy, a set of experts arise whose opinions can be monitored to determine when consensus is reached. However, when it comes to technology, Pinch and Bijker conjecture that no such Core-Set may exist stating: "it does seem to be the case that the social construction of scientific knowledge can be followed through by monitoring the activities of one dominant social group — the Core-Set. In technology it seems that there is no equivalent group, and that a number of social groups must be studied." (1984). However, I hope that in the case of Libra, a Core-Set may emerge. Since Libra's construction is highly publicized, highly controversial, and debated at a governmental level, I may see that a group of prominent public figures emerge that can be looked to as a metric of consensus.

Additionally, Libra is especially conducive to the concepts of relevant social groups and interpretive flexibility. Relevant social groups could include the underbanked and unbanked who Libra is supposedly targeted at, the members of the Libra Association who would regulate Libra, advertisers who may see the value of their ads increase, the public at large that is

concerned that Libra is just another Facebook data-grab. These social groups and others can help us motivate and understand the non-linear development of other financial systems such as federal currency, federal banks, and traditional cryptocurrencies. These social groups also have differing interpretations of Libra as a technology, the unbanked may see Libra as a way to secure their money and participate in the global economy, while regulators may see Libra as a threat to their nation's power to control monetary policy. This breadth of interpretation allows a 'multi-directional' model of financial technology to develop in accordance with SCOT.

A final point strengthening the evidence for SCOT as useful framework for the analysis of Libra is the idea of variation and selection. In Pinch and Bijkers original paper they note that "the developmental process of a technological artefact is described as an alternation of variation and selection". It is easy to see by the thousands of cryptocurrencies that exist that there are many variations of this technology. It is also easy to see that the Bitcoin was selected as a closure in the construction of cryptocurrency as it holds a sixty-eight percent market cap (Taskinsoy, 2019). This prevalence of variation and selection in the construction of cryptocurrencies indicates that there is a multi-directional model of development and that SCOT is an appropriate framework.

## 4   Moving Forward

Now that I have introduced the topic of Libra and the theory of SCOT, I introduce a few questions I aim to answer moving forward. If possible, I would like to identify a Core-Set of people who the public at large looks to for consensus on Libra's acceptance or rejection. If found, this Core-Set should be studied carefully to determine how each individual became part of the Core-Set and what relevant social groups look to each individual for guidance. This research would hopefully yield information on how a technological artifact's construction can include a Core-Set and under what conditions. If a Core-Set does not develop, I aim to better understand why such sets do not appear in even controversial technology. Any result in this direction would

be helpful to SCOT as a theory.

Additionally, I will identify the relevant social groups in reference to recent developments in financial technology. These social groups will inform our analysis of variation and stabilization in the development of financial technology. I hope to explain the historic move to federal currencies from state currencies in the United States in the language of SCOT and draw parallels to the idea of a global currency. I would also like to explore how financial technology is particularly subject to social construction. To this end I will examine how the 2008 financial crisis may have contributed to Bitcoin's success and how similar scenario may help or hurt the development of Libra.

# 5   Conclusion

In summary, Libra is an impactful and unique technology that is being given an outsized portion of public attention due to its controversial creation. This scenario provides a unique opportunity to better understand how controversial technology becomes adopted. I believe that the tools provided by the Social Construction of Technology are perfect match for this topic. In particular, there is potential that a 'Core-Set' of prominent figures in the development of Libra will emerge, enabling detailed study of Libra's adoption or rejection by society. Regardless, the principles of symmetry and relevant social groups will prove useful in providing context around the multi-directional construction of financial technology. With these advantages, the technology of Libra and the science of SCOT could further the understanding of one another in a fruitful thesis.

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