Partner-Based Language Learning Application
(Technical Paper)

Craft Brewing: A Unique Success for the Buy Local Movement
(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
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Introduction

The critical aspects of language learning have shifted dramatically in an age of translation services and text-to-voice software powered by natural language processing. These translation services have greatly reduced the need for rote learning centered around vocabulary, as individuals unfamiliar with items on a menu or how to ask for directions can look up simple phrases in near real time (Rohrbach 2018). Due to the effect of translation software, students are increasingly shifting their learning goals towards developing real time conversational capabilities in order to make their time investment in language learning worthwhile. Despite the fact that the bar for adequate return on investment in language learning has been raised to conversational fluency, most language learning software primarily focuses on reading, learning vocabulary, and occasionally speaking aloud to yourself. Even more advanced applications, such as Duolingo, still only provide human to machine interactions. The technical portion of this portfolio will be developing a platform for language learners to engage in real time practice over video conference software with other language learners at their skill level.

The second proposed project for this portfolio surrounds a resurgence in local manufacturing within the American beer industry. The American beer market was long one of the worst offenders in corporate consolidation: in 2012, Anheuser-Busch InBev and MillerCoors alone controlled 90% of domestic beer production (Thompson 2018). However, by 2016, "the number of brewery establishments expanded by a factor of six, and the number of brewery workers grew by 120 percent" (Thompson, 2018). This sudden reversal in market trends truly begs the seemingly simple question: why are craft breweries doing so well? In theory, they should be offering equivalent products (at least to MillerCoors' and InBev's own craft products) at higher rates, in smaller quantities, with higher shipping costs, and lower brand awareness.

Craft breweries should be struggling to grow in the same way that local farming and custom furniture are, but they are not. The concept for this STS research paper is to identify the technological advances, political climate, and cultural attitudes that have allowed for craft brewing to explode and determine through application of STS theory if craft brewing's success could be replicated by other local businesses.

Technical Topic

Machine-learning driven, real-time language translation services are rapidly minimizing the necessity of vocabulary memorization in secondary languages within the context of travel and business (Rohrbach 2018). Real value in language courses now increasingly comes from providing new language learners the confidence to engage in real conversations in other languages, along with developing their understanding cultural trends and the effect of regional dialects on conversation. Despite this shift in what language learners are prioritizing within the context of their language education, many traditional language programs, such as those taught within the American K-12 educational system, have been slow to adapt their curriculums (Stein-Smith 2019). Even new software products specializing in language education, such as Duolingo and the Busuu Alex bot, only provide conversational components with machine systems, not with other human language learners (Rohrbach 2018). While these automated conversational systems are effective at increasing proficiency, they often fail to maintain long term user attention with many language learners falling off in the first couple days of starting the program, mostly because there is no human component to keep them accountable for learning. The motivation for this capstone project is to address this problem within modern language learning: how could a piece of educational software provide the conversational component that has

become increasingly critical for language learners while also increasing the retention rate of new language learners?

The proposed solution for this problem is to create an Android-based mobile application that integrates video conferencing software to allow for language learners to engage in practice with other people in real time across the globe. After being paired with a buddy, a language learner would receive content within the app for initiating a conversation about a particular topic that they have focused on during their individual studying time. The topic selected to talk about could either be selected a la carte from an existing pool of topics or come from an in-built curriculum designed to maximize learning potential. Language learners potentially would be able to set up a recurring session in order to increase their weekly accountability for continuous language learning. The development of this application will take place over the course of a collegiate semester by a single developer. The app itself will primarily be coded in Java, as that is the recommended language for Android development. Two key APIs will be utilized in development in order to increase the feasibility of a minimal viable product within the confines of a single semester of work. The Jitsi API, an open source piece of software, would provide the bare bones of a video chatting platform, while the second would utilize the Google Translate API through Google Cloud for real time conversational moderation. The initial language supported will be Spanish, as there are established language learning curriculums that could be drawn on for building out the recommended topics for conversation.

STS Topic

Globalization and centralization of manufacturing have driven the modern economy since the industrial revolution and the development of the assembly line. The core value proposition of conglomeration is simple: combining similar businesses into larger entities increases efficiency

in production, relative impact of advertising, and reduces shipping costs, which in turn allows for businesses to offer services to consumers at rock bottom prices (Hefferman 2018). This movement of industry into many brands controlled by a few "mega-corporations" receives strong criticism for its unseen impacts, namely stifling innovation, overly swaying governmental regulations through lobbying, and negatively impacting small businesses and communities. The result has been a cultural backlash in the form of the Buy Local movement (also known more formally as Neolocalism), which encourages consumers to buy goods from smaller entities even if they have to purchase comparable goods at higher prices (Coit 2008). While this movement has received media attention and has found strong roots particularly in more progressive communities, its impact on manufacturing has been mixed at best. In most American goods-producing sectors, market share continues to be dominated by corporate goliaths, with a few notable exceptions, one of which is craft brewing and distilling (Thompson 2018). This anomalous case of revitalization within local manufacturing leads to the central research question of this paper: what sociotechnical, cultural, and economic relationships have been the main contributors to success of the American craft brewing industry? Two subsidiary questions demonstrate the importance of this inquiry: will craft brewing continue to be successful in the long term or is its success more temporal, and if craft brewing's recent success is stable, could the environment critical to craft brewing's success be artificially replicated in other domains to drive innovation and produce success for small businesses?

      As the interplay between relatively independent social and technical forces provides the best explanation for craft brewing's success, the framework selected for analyzing these forces is co-production theory. Within its application of co-production theory, this STS research paper will also frame craft brewing as a political technology, as consumer ideals about purchasing

locally and rebuking corporate consolidation have influenced the growing patronage of craft brewing techniques over traditional manufacturing methods. A criticism that one might make of co-production's applicability to this topic would be to argue that perhaps the success of craft brewing is more the result of technological determinism or momentum, suggesting that some technological innovation or set of innovations have been the driving force in enabling craft brewers to become competitive with larger distributors. This is partially true, as there have been significant innovations in canning technology, in automating control of ingredient churn, and the introduction of new infusion systems that allow for a broader range of flavors especially within American-style India Pale Ales (IPAs) and sours (Didora 2018). However, these innovations only partially explain the success of craft brewing, particularly because these innovations should have almost equal benefit for goliath brewer's craft brands and have not radically changed the economics of beer production, only its flavor (Godard 2018). One could also use a strict social construction-based argument and say that the success is solely due to shifting American cultural attitudes around beer drinking and due to laws from Post-Prohibition-era America that crystallized a difference in standards between mass distributors and local vendors, which have allowed for independent brewers to create additional revenue streams through taprooms and brewpubs (Nurin 2017). While both of these frameworks have their merits, both of these claims fail to adequately explain the dynamic relationship between the technical and social factors contributing to craft brewing's success, as the key factors developed relatively independently of each other. For instance, the key technical innovations were initially developed as improvements for standard American lager production (Didora 2018), and the laws critical for commercial viability existed long before these innovations were reached (Hefferman 2018). The recent

explosion in craft brewing can only be explained as resulting from the complex interplay between independent technology and social forces.

Research Question and Methods

The primary research question being pursued in this STS research paper is the following: what sociotechnical, cultural, and economic relationships have been the main contributors to success of the American craft brewing industry? In addition to this primary question, two sub questions will be addressed in order to increase the relevance of the paper: will craft brewing continue to be successful in the long term, and if craft brewing's recent success is stable, could the environment critical to craft brewing's success be artificially replicated in other domains to drive innovation and produce success for small businesses?

Three primary methods will be employed for garnering the research needed to answer the above questions: documentary analysis, policy analysis, and interviewing. The first method will consist of synthesizing primary sources on the brewing process and the key points from recent technical reports describing major recent technical innovations in brewing. There will be special emphasis placed on determining whether these innovations give craft brewers an additional edge over traditional manufacturers. Some keywords used in locating recent technical reports will be *canning innovation, infusion techniques in brewing, hopping, programmable vats,* and *developments in brewing.* The second method will consist of economic and policy analysis of sources that describe the key social forces at work in craft brewing, prioritizing sources that emphasize geographic differences between breweries and state policies concerning distribution. The final method employed will be interviews with both employees/owners of craft breweries and private citizens that frequent craft breweries in order to gauge cultural attitudes about what makes a successful taproom environment and what design elements aid in product marketing.

While no interviewees have been already confirmed, the researchers will attempt to draw from brewers within the Southeastern United States, namely the greater Charlottesville, Richmond, and Charleston metropolitan areas due to the objective prevalence of diverse brewers within these areas and researcher familiarity with these regions. The interview question base for craft brewers will broadly address typical aspects of brewing success (location, production model, marketing plan, recruiting practices), while the questions for private consumers will focus on how they choose which tap rooms to patronize and how they purchase beer in grocery stores. The diversity in methodologies used for this paper stem from the co-production framework's emphasis on broadly considering a variety of forces as critical in the evolution of a particular paradigm. The combination of technical, economic policy, and interview response analysis should result in a multi-faceted response to the primary and secondary research questions.

Conclusion

The final deliverable for the CS capstone project will be an Android mobile application that allows for users to engage in real time conversational practice with other language learners across the globe. The application will provide prompts for conversation and then monitor the conversation to provide corrections when language learners get off track. The platform will be completed using two main Application Programming Interfaces (APIs) in order to speed up development.

The final deliverable for this STS project provides a nuanced analysis of the key sociotechnical factors in the success of the craft brewing industry, based on both a review of existing literature and lessons learned from interviews with both industry professionals and beer consumers. The primary STS framework utilized in this analysis will be co-production theory, which will be supplemented by a portrayal of the key factors within an actor network. In

addition to identifying these key variables, the paper will also make an argument about whether or not these factors would be replicable within other industries in order to create relevance for the neo-localist movement.

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