CAPiTAL Passages and Remind

Business Proposal

George Washington University Senior Design Fall 2015

Writing Assignment 3

**Overview**

Since 1992, the percentage of U.S. adults who are functionally illiterate has hovered around 14% without much deviation. That is, an average of 30.8 million adults in the United States have been unable to read or write in any practical capacity for the past 20 years! Minority populations are disproportionately represented, as well; this figure includes 24% of the adult black population, 41% of the adult Hispanic population, and a staggering 70% of the adult prison population. Students fare no better, with up to 64% of eighth graders reading below their expected reading level in 2013 and 19% of high school graduated unable to read. The implication of all these statistics is that we face a very real problem with adult illiteracy in the United States today—a problem that has persisted stagnantly for two decades. We, the Comprehension and Pronunciation Instructional Tools for Adult Learners (CAPITAL) team, would like to propose a solution: an educational system called reMind and a reading-comprehension module called CAPITAL Passages.

CAPITAL will create a system that instructors and students can use in a classroom setting to deliver and practice educational materials, respectively. Its two principal components will be a website for instructors and a mobile application for students. This system, reMind, will be a convenient platform for instructors to amass educational materials and for students to complete their materials on the go—the mobile application will be developed so that students can access it through a browser or as an application on any mobile platform (Android, iOS, Windows Phone, etc.). For students, the mobile application will incorporate some aspects of social media and gamification, such as leaderboards, to encourage practice by making the act of completing materials fun. Meanwhile, for instructors, CAPITAL aims to create a practical system that lessens instructor workload by generating material automatically using add-ons like CAPITAL Passages, particularly in the area of reading comprehension. Both instructors and students will collaborate to amass banks of quality questions over many academic areas, and instructors will be able to use materials that other instructors have made public as material for their own students. Overall, CAPITAL hopes these tools will lead to an improvement in adult literacy in the United States, as well as a more collaborative, convenient, and enjoyable educational system.

Institutions such as schools will register to use reMind, and their instructors will log onto a website which allows them to manage many aspects of their courses and students, including course materials, course organization, student enrollment, and so on. In addition to giving students materials to practice, instructors will be able to administer surveys to gain feedback about whatever aspects of their courses they wish, as well as examinations which they can use to gauge students’ understanding of the material. All of these materials, including questions, course organization, user information, and student performance, will be recorded in a database hosted by CAPITAL, and CAPITAL will be responsible for maintaining this database and ensuring its security. The students of these instructors will log into a mobile application from any browser or mobile device and practice materials at their own pace, receiving immediate feedback indicating which answers are correct for every practice question they complete. Using the mobile application, students will complete materials for practice, examination, or survey at their own convenience, and they will view their own progress and the progress of their peers to motivate them to practice.

Passages will be the algorithmically distinctive portion of the system: it will accept a passage of English text and use it to generate coherent reading-comprehension questions from the sentence to entire-passage semantic levels. While current question-generation algorithms are largely factual and handle single sentences, CAPITAL is in the process of developing new, more sophisticated natural language processing algorithms that incorporate information from multiple sentences into one question while retaining the correct answer (so that questions can be evaluated automatically, as above). These questions will be generated in a back-end module for reMind and fed into the front-end interface for instructors to choose and customize—just one of many potential modules that can improve and expand the functionality of reMind.

**Business Plan**

CAPITAL believes this is a project with striking potential for success. Our primary market is, of course, low-literacy adults and their educational institutions, which may not seem like a particularly lucrative market at first glance. However, CAPITAL has a plan to ensure this project is profitable. First, we will make sure to cover as much of this market as possible, with a multi-platform mobile application that will run on every mobile platform. A full 68% of U.S. adults own smartphones, including more than 40% of those without a high school diploma, and low-literacy adults are in fact likely to own Androids. Better yet, our software does not rely on any particular hardware features of a mobile device, so with our development tools it can also be made available as a browser application. Clearly, we are able to reach a significant portion of our target market with our software. CAPITAL already has some literacy partners who can be targeted directly, and we can raise awareness of adult illiteracy by investing in marketing (after all, our target audience cannot read, so it is valuable to invest in an innovative marketing department).

The percentage of low-literacy adults in the United States may not be growing—in fact, our goal is to make certain that it shrinks. However, CAPITAL has the potential to expand into other markets. First, although there are significant differences between native English speakers and non-native English speakers, it would be possible to repurpose our applications for those learning English. With a few months of effort and some linguistic assistance, the algorithms in our system can be translated into other languages, allowing CAPITAL to sell abroad to the approximately 14% of the global population that is illiterate. Finally, the content of the reMind system is absolutely not limited to materials on adult literacy, and we can target academic institutions of all types, from literacy centers to universities.

CAPITAL already has one working system, CAPITAL Words, that our partners are currently using with their students. This means we have some exposure and recognition already. The institutions that are likely to use our system are also likely to have government funding; CAPITAL can require fees for the use of our system, and we may be able to charge the students a low fee for the mobile application, typical of many mobile app stores. The CAPITAL team is technically competent, and we intend to invest in two things to give our project all the strong financial and administrative foundation it needs to succeed: good marketing and good management.Finally, we can also license our algorithms for use by others in research or profitable applications—this is also a good way to contain our competition.

The biggest distinction CAPITAL has to offer is uniqueness: no one on the market right now is doing what we’re doing. Our algorithms are unique and innovative, and our only current competition is desktop software. CAPITAL clearly exceeds the capabilities of these competitors, most notably with the freedom of our mobile application. Students, especially adult students, will prefer to use reMind and CAPITAL Passages because they will be able to complete exercises and learn materials anywhere their devices can connect to the Internet instead of needing to sit down at a desktop computer and commit to a long study session. However, beginning this December, a nonprofit organization called XPRIZE is announcing its $7 million adult literacy competition. Competitors are likely to appear soon and in force. Unlike these competitors, CAPITAL already has several years of work completed and is poised to flourish with the development and release of our new systems: now is the optimum time for CAPITAL to gather support and truly soar.

There are naturally several risks associated with CAPITAL’s plan. It is possible that our target market will not take an interest in our systems; this is why we believe it is imperative to invest in marketing. It is possible that our market may not believe adult literacy is a serious problem in need of a solution, either; listeners are often quite shocked to hear statistics about the extent and severity of adult illiteracy in the United States. CAPITAL believes that a significant focus on raising awareness with this marketing will draw attention to this serious issue, encouraging potential clients to purchase our system and philanthropists to donate to us and our clients. One final risk is that students may not be motivated to use our systems, promoting the view that CAPITAL is not a successful system. However, prior research suggests this is not the case: students find our systems engaging and are motivated to learn and practice. Furthermore, in the reMind and CAPITAL Passages system, we will implement gamification features (including social aspects) that make students want to use our applications. Overall, CAPITAL is built on sturdy groundwork that leaves us well prepared and highly driven to succeed and overcome any challenges in the near future.

**Social Impacts**

CAPITAL has a clear social goal: we intend to improve education and adult literacy in the United States (and beyond). Low literacy today poses a number of serious problems, leading to lower economic status, less independence, lower self-esteem, and far grimmer health outcomes. Adults who cannot read struggle with education, employment, finances, healthcare, transportation, and countless other areas of day-to-day life. With the help of our convenient system, adult learners will be able to build their literacy skills, and subsequently build other life skills related to literacy. They will be able to educate themselves on any topic they can find in books or online—home repair, cooking, investing, any number of vocational skills, and so on. Literacy is the great barrier to all important life skills; students who improve their literacy will be able to improve their economic and financial standing and obtain an education. They will be able to participate more fully in all areas of education and industry—this is 14% of American society that has been neglected and not given the fair chance to learn and grow and express their ideas. Giving these individuals the chance to increase their literacy will increase both their quality of life and the excellence of our society overall.

CAPITAL also hopes that the reMind system will improve education in the United States. ReMind is flexible enough to reach a much larger audience: it can be used in universities, literacy centers, middle schools, vocational schools, and any other educational institutions that can use short questions (multiple choice, fill in the blank, etc.) for learning. Students, especially those in middle school and high school, often find school boring, stressful, and unpleasant. Meanwhile, teachers at these schools are often burdened with a large amount of work and do not have time to address students’ individual problems. CAPITAL believes that the reMind system will give students an enjoyable way to learn materials through mobile freedom and game aspects and give instructors more free time through automatic question generation and question bank collaboration. In the event that we expand this system to address the needs of non-native English speakers or low-literacy adults in other countries, CAPITAL will also improve the quality of life of a great many other individuals by giving them the tools to be able to function more effectively and advance in the country in which they live.

Best of all, this system cannot cause any personal or environmental harm. The system consists only of a mobile application and website which retain little to no uniquely identifying information (only names, email addresses, passwords, and academic performance), and all of this information will be stored by CAPITAL on secure servers. ReMind and CAPITAL Passages do not present any new problems in education; we rely on the integrity of instructors to treat their students fairly just as current educational systems do. We trust the administrative staff and instructors of our partners to encourage ethical teaching practices, and we will ask our future partners to agree to codes of conduct regarding the use of our system and the fair treatment of students. Even through the social aspects of reMind, students will not be able to view each other’s progress or scores without permission, and the system will not use the gamification aspects to cause any student emotional distress over failure, rather framing progress in a positive light. There is little to no potential for misuse of this system, and the CAPITAL team will maintain the databases and software and enter a dialogue with any institution that believes it has been treated unfairly.

Imagine a world where every member of the population was fully literate, with a livable salary and a stimulating education. Imagine a world where students were always excited to learn and teachers always had enough time to pay attention to their individual needs. With your help, CAPITAL can take the first step on the road to this new world.