

CREATING AN ONLINE STUDENT RESOURCE:
CollegeEconomics.com

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CollegeEconomics.com

HONORS THESIS

Presented to the Honors Committee of
Texas State University-San Marcos

In Partial Fulfillment of
the Requirements

For Graduation in the University Honors Program

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May 2009

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Introduction

The idea behind CollegeEconomics.com started somewhat innocuously. When I chose to become an economics major, I tried to learn more about the subject using the internet. I found a few informational sites and glossaries, but few were easy to use and most felt claustrophobic in some way or another, be it the difficult to read colors that lacked contrast, or the cramped organization of information. Recognizing the need for a novice friendly site, I later decided to register a domain name, CollegeEconomics.com, to eventually use to develop a site for economics students that would be uncluttered and easy to use. However, I was not familiar enough with web development at the time to actually execute any kind of vision, so the actual creation and implementation of the site would have to wait. Fast forward to the beginning of my final semester, Spring 2009, the semester in which I must also complete a thesis project to graduate with my Honors minor. I decided it was time to marry desire with necessity by making the creation and implementation of CollegeEconomics.com my Honors thesis project.

The Website

CollegeEconomics.com

The goal of CollegeEconomics.com is to provide a fun, fast, easy place for learning more about economics while on the internet. In order to do this, CollegeEconomics.com will take advantage of Web 2.0 technologies. At its core, Web 2.0 is a concept about how users should experience the internet. The principles of Web 2.0 dictate that a user should be able

to interact with a website and dynamically craft the site's content to be most relevant and usable for each unique participant. On top of that, Web 2.0 has evolved into more than just a concept of how a website should function, but also how it should look. In fact, while the functional capabilities for Web 2.0 have been around for over a decade, the concept did not gain popularity until just a few years ago. That was when web designers became armed with technology to make buttons and icons mobile as well as attractive. Ten years ago, a button on a website was simply a colored shape with two apparent dimensions that was also static and immobile. Now, Web 2.0 utilizes design capabilities that give buttons, icons, and logos a three dimensional appearance, along with the appearance of a variety of textures (glossy, rough, corrugated, etc.) and other properties (shading, glow, reflection, movement, etc.). On top of looking the 21st century part, these buttons are sometimes capable of being reconfigured or even moved on a website. While CollegeEconomics.com may not reach that level of advancement in its implementation of Web 2.0, it will look the 21st century part. But the emphasis is more on acting the part rather than looking the part. For instance, every economics glossary that I have come across on the internet simply provides a single definition for each term or phrase. While this may be sufficient, often times too much information is provided for the casual user or introductory-level student. On the other hand, often times not enough data is available for the upper-level or graduate student looking for a quick refresher on a term or concept. CollegeEconomics.com aims to satisfy the needs for both Basic and Advanced definitions, while providing Intermediate level definitions as well to bridge that occasionally wide gap. The Basic, Intermediate, and Advanced definitions will be selectable by the user for each term or phrase, where applicable. This is the foundation of Web 2.0 implementation on CollegeEconomics.com.

Term Definitions

Not all terms or phrases will have Intermediate or Advanced definitions, but all will have Basic definitions. Basic definitions will provide only enough information to briefly describe what the term means. In other words, it will define the term in a succinct enough way so that it could be Twittered if necessary (Twitter.com is a website where people share quick status updates with each other in 140 characters or less). The Basic definition is targeted towards people who might want to know what an economics term in an article might mean, or students taking introductory-level economics courses where they are tasked with learning economics jargon prior to concepts. The constraints of the Basic definition are loosened for the Intermediate definition, where the context and appropriate application of the term are provided, as well as any applicable formulas, up to an algebra math level. Graphs are also provided in this definition level, where applicable. This level of definition is targeted towards college students who may be taking an introductory or intermediate level economics course. Finally, there is the Advanced definition level, where most everything known about the term is provided. This includes the history and etymology of the term, in addition to the term's applications in practical and theoretical research. Formulas are provided, where applicable, and generally at a calculus level. Graphs are again provided at the Advanced level, where applicable, and these graphs could be 3-dimensional if the concept necessitates it. The term definitions and their varying levels of specificity will provide the foundation for CollegeEconomics.com and its dynamic content.

Sourcing Definitions

The definitions for these terms will come from a variety of places. One of the more surprising sources for these definitions will be Wikipedia. Wikipedia, oft lambasted in

academia for its ability to be edited by laymen at a whim, has come a long way since it was first introduced to the world. Though there is still the potential for misinformation on Wikipedia, the user and editor community in Wikipedia is intent on detecting and reversing abuse as soon as possible. In fact, in a 2005 study by the journal Nature, Wikipedia was found to be almost as accurate as Encyclopedia Britannica, with Wikipedia averaging 3.86 mistakes per article to Britannica's 2.92. With this in mind, I decided that I would pull at least the definitions for the Basic tier of my words and phrases from Wikipedia. I would do this legally under the GNU Free Documentation License (www.gnu.org/copyleft/fdl.html). I would of course have to vet all definitions used to ensure integrity, but it would at least save me significant time in typing. Intermediate and Advanced tiers of the definitions would have to be pulled from a broader variety of sources. Wikipedia would still be referenced when its depth and breadth on a particular subject was adequate, but much more of the conceptual information would have to be learned from textbooks and journals then translated into a definition for the site. This original content will not be subject to the GNU Free Documentation License.

Quiz Creation

While the term definitions are the most important part of the website, the Quiz Creation is the second most important part of the site. Learning the definitions is important, but if the educational goal of the user is to be able to retain and apply those definitions for future use then the user should have a way to be tested. That is where the quiz creation comes in. In this section of the site, the user gets to select whichever terms he or she wants to be tested on. Additional criteria for quiz creation includes selecting the desired definition level for each term (Basic, Intermediate, or Advanced) as well as the number of questions per

term (up to a maximum of three questions per term). This way, if the user just wants a quick quiz on basic definition material, the user can select the Basic level for the desired terms on the quiz, and then select '1 question per term'. When the criteria for the quiz are specified, the user can click a button to generate the quiz. At this point, a quiz will be generated, selecting random questions from the pool of available questions that meet the specified criteria. The answers will be multiple choice or true/false. For the multiple choice option, the available answers are displayed in a random order so that a user could be quizzed on the same term multiple times and rely on their grasp of the term to select the right answer, instead of their inadvertent memory of the correct answer position from a previous iteration of the quiz.

The Quiz questions, at their varying levels of Basic, Intermediate, and Advanced, are designed in accordance with cognitive domain of Bloom's Taxonomy, a hierarchy of educational objectives. In the Revised Bloom's Taxonomy (RBT), there is a hierarchy of six educational objectives. They are (from basic to advanced):

- Remembering
- Understanding
- Applying
- Analyzing
- Evaluating
- Creating

On the quiz, the Basic level questions intend to test a user on his or her memory of a term's definition (the Remembering objective of RBT). In most cases, this will simply involve a parroting of the Basic level definition in a quiz format. The Intermediate level questions will target the user's ability to associate a concept with an issue or situation (the Understand and Apply objectives of RBT). For these questions, the user could be given a scenario and, through the multiple choice answer format, the user could then be asked to select the term which best applies to the situation. Finally, for the Advanced level quiz questions there will rarely be a reference to the term the question is associated with. Rather, the user could be given a situational problem then be asked to select the best conceptual solution directly or indirectly related to the term that is being tested (this correlates with the Analyzing and Evaluating objectives of RBT). Unfortunately, none of the questions would cover the sixth and final cognitive domain (Creating) of the Revised Bloom's Taxonomy.

Study Guide

The Study Guide section of the website is much like the Quiz Creation section of the site. Users will be able to select the terms and their associated definition levels that they wish to have on the study guide. Also, while reading a particular term definition, a user will be able to tag that term definition for inclusion in the study guide while on that term definition's page. Once at the study guide, all the selected terms at the specific definition levels will be displayed all on one page. This will allow users to view the definitions they want in a more condensed format. However, should a user need to take that information offline, there will be an easy print option so that the user can print that study guide. This will save users valuable time that would otherwise be spent tediously copying and pasting and then printing information from an entirely separate application.

News & Blog, Podcasts

The News & Blog and Podcasts section of the website will be content aggregators. That is, these portions of the site will take material from a variety of other sources and aggregate that content on a single page using RSS feeds. RSS, which stands for Really Simple Syndication, is a format of content sharing that allows for certain content of a website to be condensed and retransmitted or redisplayed in an organized and succinct fashion. For the News & Blog section of the site, news will be taken from multiple news outlets, whereas certain blog posts will be pulled from popular blog sites on the topic of economics. This will be done through the use of RSS feeds, though even these already condensed feeds may need to be reorganized to provide clear, uncluttered content for CollegeEconomics.com since they will be coming from multiple sources. Likewise, the podcasts, which are news and editorial material presented in audio files (almost always MP3 files), will be pulled from other sources via RSS feeds. They too will likely need to be reorganized to fit the clean, uncluttered theme of the website. It is worth noting that using RSS feeds for podcasts will be very beneficial because the files, which can be very large, will be stored on the site where the RSS feed is pulled from, and not stored on CollegeEconomics.com.

Content Management

All of the afore-mentioned sections (Definitions, Quiz Creation, Study Guide, News & Blog, and Podcasts) are administered through a Content Management section accessible only by logging into this particular section of the web with the website administrator's username and password. This management portion of the site is not linked to from any other portion of the site, so the address of this section must be known to the Administrator. In this Content Management section, the site administrator is given access to the following functions:

- Edit Definitions
- Edit Quiz Questions & Answers
- Edit News & Blog
- Edit Podcast

For the Edit Definitions section, the site administrator can create a new term to be defined or select an existing term whose definitions can be edited or deleted altogether. For both options, three boxes for text input are displayed for population, corresponding to the Basic, Intermediate, and Advanced levels possible for each term. These boxes, like all text boxes, accept HTML code (which allows for formatting of web content) and plain text, and they have no character limitations that would otherwise constrict how expansive the definitions could be.

The Edit Quiz Questions & Answers section provides the site administrator the ability to create a question for a particular term (a question must be associated with a term), select the question type (Multiple Choice or True/False), write the question text, select the number of possible answers that should be displayed for a question (3, 4, or 5), write the text for the available answers, and specify which answer is the correct one. Also, it is worth noting that any number of answers can be provided as options for each question. In other words, when the site administrator is specifying answers, there could be 15 answers specified for one question. Only one would be correct, and only 3, 4, or 5 answers could be displayed at a time (depending on what the site administrator specified for that question), but the Quiz Creation section will randomly select the incorrect answers it will display as options, and it will also randomize the order in which they are displayed under the question.

The Edit News & Blog and Edit Podcast sections function exactly the same way.

Both are just large boxes for text input, only the output for each box displays under its respective section on the websites. Those text boxes support HTML code, therefore a variety of options exist for each section. First and foremost among those options is the incorporation of RSS feeds to supply content for each section. Additional content could be added manually in the same text box though, if so desired.

Forums

CollegeEconomics.com should be a place where users come to learn more about economics. But per previous examples, only five of the six cognitive domains of the Revised Bloom's Taxonomy can be covered by the afore-mentioned features of the website. That is why it is necessary to have a place where users can collaborate amongst themselves, requesting help, giving help, debating topics, and even providing site feedback for the betterment of CollegeEconomics.com. This will be done through the use of forums. The type of forums used in this case will be phpBB forums, which is an open-source version of forums. Since open-source solutions are generally free and highly customizable, this was an ideal forum solution for CollegeEconomics.com. Within the phpBB forum framework, three forums will exist for users: "Help & Homework", "Discussion & Debate", and "Suggestions & Site Ideas". The "Help & Homework" forum will provide an area for users to share questions and solutions to practical or theoretical economics problems that arise during their coursework, or even their employment. The "Discussion & Debate" forum will be a place for users to freely share their thoughts and ideas on economics theories and news. This forum will likely devolve into an 'anything goes' kind of forum with banter on a much wider variety of subjects, but once that happens, an additional "Off Topic" forum can be created to

handle those conversations. However, rather than create forums for every possible evolutionary path of the site, the forum growth strategy we will employ will be more adaptable and dynamic. Finally, there will be a “Suggestions & Site Ideas” forum that will allow users to provide their comments and concerns on the website. If the users notice problems or have ideas for improvements to CollegeEconomics.com, this will be the place to share and discuss them.

The forums are not administered through the Content Management section of the site, but administration options for the forums do nevertheless exist. Behind the scenes of the forum, there is a panel of features available only to the administrator(s) of the forum. This includes the ability to control which forums are visible to the users, as well as the ability to restrict the functional capabilities of individual users or groups of users on the site should problems or concerns develop regarding user harassment, inappropriate language or content, advertising of products/spam, and other misuse and misconduct. But despite the ability to control many aspects of the forums and users’ interactions on them, the general user and topic management approach will allow for a large degree of freedom. The term definitions are the most fundamental and important feature of CollegeEconomics.com, but it is the forums that offer the most potential for spurring traffic to the website. After all, one thousand users can create far more content than just one administrator.

The Process

Beginning

Having only ideas and little else done for the site, I was going to have to figure out how to make it all work, and work right, and then get it done with time to spare. When

developing a software application, getting it finished is difficult enough. However, getting it done right is the most critical element. Getting it done right means you've made it flexible and adaptable to the inevitable but unknown changes of it that will be required in the future. Good software is not just complete upon deployment. Good software lives and evolves with the needs of its users. Websites are no different. For example, Friendster.com was a popular social networking site many years ago, but due to its inability to adapt to the user load and add features as its user base requested them, it failed. It could have taken advantage of the craze for social networking first, but it did not because it failed to evolve. MySpace.com instead became the first social networking site to take off and to actually respond to the wishes of its users. For this, the creators were rewarded with \$580 million when NewsCorp bought MySpace.com. So again, it's not just enough to get it done, it is imperative to get it done right.

Personal Experience

Thankfully, I have spent a good amount of time managing the logistics of a variety of software development projects as an IT Development Manager for two years in a former occupation. Without this experience in my past, I would have surely been less aware of the requirements of a decent sized development project. Having done basic application and web development in the past, I knew first-hand all the work that even simple development entailed. At this point, my educational goal for the project had to be defined. Did I wish for this to be an exercise in learning 'web development', or did I wish for this to be an exercise in 'project management'? The question then evolved into "which way would best help me accomplish my goals within reasonable constraints?" The reasonable constraints I speak of deal primarily with time and money, neither of which I had much. I had never been an adept

developer, and knowing the skills an adept developer must possess, I knew I would not become one in mere months. This meant that I had to turn over the development aspect of my project to someone else.

Project Team

For the web development role, I chose a former co-worker, Matt Tyler, who was now doing freelance development in addition to his day job. I am familiar with some of his work, including HourVille.com, work that I had deemed to be very good. Additionally, being a freelance developer, he was much more affordable than a development firm that generally charged inflexible hourly rates. However, simply developing the functional aspects of the web site would not be enough, the website had to have an aesthetic appeal to it that would draw in and retain my target audience. I would also have to hire a web designer since I am not adept at web design either. For this, I chose a local company, SparkNet Creative, whose previous work was clutter-free and easy on the eyes, which was exactly what I wanted for CollegeEconomics.com. But before the web designer could begin their work, the web developer had to finish his work, or at least deploy most of it. This would require dexterity in time and resource management.

Project Management

The project management approach taken during this project was a blend of Traditional Project Management and Agile Project Management methodologies. In traditional project management, there is an emphasis on communication through documentation. Also, the project is dealt with as a singular entity in that the deployment is generally tackled in one fell swoop, and the post-mortem evaluation reviewing lessons learned is done only once and upon the completion of the project. In Agile Project

Management methodologies, documentation is still important, but the emphasis is placed on more personal forms of communication, such as face-to-face meetings or phone conversations. Also, the project is handled in bite-size pieces, pieces that are often individually deployable. In this tiered production approach, post-mortem evaluations are done following the complete of each piece. Agile Project Management methodologies are arguably more befitting of software development projects since it is supposed to be more effective when used with the smaller teams that are typical of software development projects, that is when compared to engineering and defense projects for which the traditional methodologies were developed. Agile methodologies were developed in 2001 by developers and project managers from the software development industry. For the CollegeEconomics.com project, face-to-face interaction was often not possible due to conflicting schedules and distance. The developer was in Austin, I was in San Marcos, and the times were most often able to communicate via e-mail, IM, or phone was while one or both of us was at work, or sometime after midnight. So with that in mind, an emphasis was placed on documentation for communication, and then supplemented with e-mail, IM, or phone communication. This is primarily how communication occurred with the designer as well, though there were a couple of face-to-face meetings with SparkNet. However, other aspects of the Traditional Project Management methodologies did not mesh well with this project, especially as it related to the scope and timeline of this project. So, with that in mind, a deployment plan was created to complete and deploy certain pieces of this project individually. As for the post-mortem evaluations, those would be done on an ad hoc basis, but the primary evaluation focus would be on one post-mortem following the completion of the Alpha phase of deployment (discussed in greater detail further down).

Documentation Type

One of the great challenges in project management is creating and managing the detailed documentation of a project. It is not enough to simply have an idea of how you want a piece of software to work, unless of course you are the developer and can develop exactly what you want. As a project manager or other non-developer trying to communicate how you want a piece of software to function, you must be very explicit about what you want. Anything left open to interpretation could be interpreted incorrectly. In those instances the developer must re-develop functionality that was not properly specified initially, which is then what causes delays. I could not afford delays in this project since the timeline was very specific and rigid; therefore I had to be very detailed in my documentation regarding functionality. This meant spending a great deal of time initially creating the Requirements Document, spelling out exactly what I wanted from the site. This cuts down on time-consuming communication with the developer and allows the developer a more streamlined work process since most functional decisions are already made for him so that he can simply create code to match the requested functionality.

Requirements Document

Perhaps the most important document to the entire documentation process is the Requirements Document. In a traditional sense, that is, the way it is most practically used in business environments, this document defines the following:

- Purpose of the project
- Identifies team members and roles
- Specifies requirements, including:
 - Functional requirements (i.e., what the application should do)

- Technical requirements (i.e., the technologies that should be utilized)
- Support requirements (i.e., the long-term maintenance and evolution of the application)
- Testing Plan
- Deployment Plan
- Timelines & Milestones

However, this project is not the typical web development project. The roles of each team member are muddled. In addition to being the project manager, I also had to serve in the client role. The web applications developer and the web designer also must occasionally serve in the same role as each other. For instance, to create a basic layout for the input and output options for the web applications, the developer must create some sort of design for the site, even if it is crude. The web designer on the other hand must make minor changes to the developer's code in order to have it properly display within the constraints of the final design concept. With this lack of role delineation, certain compromises had to be made to the typical structure of a Requirements Document. The functional requirements required no compromise, since it is generally the client and the project managements that do the bulk of the collaboration on this aspect of the document. With me being in both roles, that was easy to do. The technical requirements are more challenging though, since two different team members serve in overlapping technological roles. However, given that the developer had to complete his tasks before development could begin, it was the developer with whom I primarily collaborated on the technical requirements. Crafting the support requirements was a team effort, as it required a feasibility assessment to determine if my long-term support

goals were possible within the rest of the project's framework. The testing for the website would be done by everyone. The deployment plan was something I as the client and project manager had to specify, though this evolved as the site grew in its infancy. Finally, the timeline and milestones had to be spelled out in the Requirements Document so that the other stakeholders were aware of when I had to have work finished.

Design Document

Due to the nature of this project and its scale, as well as the subsequent lack of proper delineation of roles, the Requirements Document was rather general compared to what a Requirements Document would be on a larger project with a larger team. This meant that there would need to be Design Documentation. That is, there would need to be documents that describe the in-depth functionality of particular features. The most complex features on the website would be the Quiz Creation and Study Guide sections of the website, including the content management aspects of both. The Design Documentation describes step-by-step how each feature should function and how it should look, but from a developer's perspective. This document is typically written by the lead software designer or software development manager for use by the software development team. However, being as that there is only one developer, the Design Documentation took on a less technical air because it was written by myself, serving as the project manager. It would be up to the developer to interpret what direction to take the software development in based on the specified functional and design requirements.

Supplements to Documentation

It would be unreasonable to expect the Requirements and Design Documents to cover all aspects of the site requirements for the developer given the loose and agile nature of this

project. Therefore, supplemental materials are necessary. These are informal, and include e-mails, instant messages, phone conversations, and face-to-face meetings. These informal discussions are perhaps the most important aspect of the communication on the project. This is where questions are asked, answers are given, ideas are discussed, and improvements are made. In addition to the communication, another type of supplemental material was often used and relied upon to convey ideas, and that is site mock-ups. Site mock-ups are images that were created in Adobe Photoshop or Microsoft Paint to convey to the developer and the designer how the website or a particular feature should look. It is worth noting though that while the mock-ups are meant to convey an idea of intended feel or functionality, the mock-ups are not intended to be strictly adhered to when developing or designing. This is especially true for the web designer, who I wanted to have as much creative freedom as possible when coming up with a design solution. Nevertheless, mock-ups are found in every document created for this project.

Deployment Plan

Stepping back from the Requirements and Design Documents, which spell out what the site should do and how its features should work, one of the other important aspects of the project was determining when each feature should be built and deployed. While the project, could be rolled out all at once, it could not have been accomplished completely within the timeframe we were targeting. There also had to be a deployment plan which prioritized the development of features and planned their tiered release. In the deployment plan for CollegeEconomics.com, there would be three deployment phases, or tiers. This plan, in accordance with the Agile Project Management methodologies, would exhibit the caution necessary in this project so that if one aspect of the deployment failed, it would not stop the

entire project, so again this meant a tiered deployment of features. Now, from the development side of things, this meant focusing on the three main sections of the site: the Term Definitions, the Quiz Creation, and the Study Guide. With that in mind, that is how the initial development was planned. Other features such as the news feeds and videos and podcasts are still on the table, but they would not be the focus of the initial deployment. What will be difficult from the aesthetic web design side is whether or not all of the web design can be completed within the time allotted following development. It is possible that I may have to create crude images for implementation of the web design aspect of the site in order to deploy the first version. With all this in mind, early on in this process I created a tiered deployment plan setting forth my goals for a full deployment of the site over three separate mini-deployments. These mini-deployments, and the features to be rolled out in them, are as follows:



- Alpha usually refers to the earliest deployable version.
 - All links on the website will be text at this point
 - Feedback should be available via Forum
 - Some definitions (focus on Basic, add Intermediate as possible)
 - Study Guide & Quiz Creation sections are functional, though the design elements associated with each will not be completed.
 - All available terms have a quiz question for the Basic level

- News & Blog section, along with Podcast section, utilize a single RSS feed to populate their respective sections
- A large variety of features scheduled for final release during Beta and Gold deployments may or may not be at this time, but if they are available, it is for temporary testing purposes.
- Basic CSS Skin covers the website



- Beta usually refers to a version still in the testing phase yet is closer to completion. Still, a few bugs must be worked out prior to a final release.
 - News & Blog section, along with Podcast section, becomes more dynamic in its aggregation of content by pulling content from multiple sources. RSS feeds may still be used.
 - Text links become Web 2.0 buttons
 - More definitions (more Basic, introduce Intermediate if not already available)
 - All available terms have two quiz questions for the Basic level, one or more questions for the Intermediate level, and perhaps one at the Advanced level
 - Design at this stage has advanced so that some text headings and prompts begin taking on a Web 2.0 look



- Gold is the final release. The term “gold” comes from the gold CD that software manufacturers would use for the mass duplication of a product.
 - All three forums should be available
 - News & Blog section, along with Podcast section, have been designed and are utilizing web applications to pull data from multiple sources beyond just RSS feeds
 - Full complement of definitions (Basic, Intermediate, and Advanced for all applicable terms)
 - All terms have at least three questions for each complexity level
 - The Web 2.0 look to the site has been completed

There will always be terms added to the site well after the Gold deployment, but these are the planned deployments that are accomplishable within the next six months. However, the only deployment I am aiming to have completed for this thesis project is the Alpha deployment.

The Unexpected

For all this planning and all this work, something unexpected is bound to happen. A variety of challenges arose from the onset of the project related to the developer’s need for certain hosting technologies. The hosting plan I had purchased from GoDaddy.com did not allow for the usage of the PHP 5.x code that the developer was using, and it also did not allow the developer to view error logs which he would need to see in order to test his code

once deployed onto the server. The hosting plan therefore required a more costly upgrade and a migration from a Windows platform to a Linux platform, which would in the end allow the developer to develop the web applications in accordance with his design plan.

Thankfully, this hiccup occurred early in the project's life and was relatively easy to remedy.

The project progressed smoothly, though at a slower pace than originally intended. This primarily stemmed from the fact that the developer had a pretty busy schedule outside of this project already. Even looking at the project in hindsight though, I would not change the developer in order to speed up the process, for two reasons. First, the developer, Matt Tyler, really is a talented developer. While I wasn't asking him to create worlds in this project, his tasks were not simple tasks either. However, very few bugs made it into the deployed product, and those few bugs were quickly corrected. He was also a great person to collaborate with on the project in terms of discussing features and making improvements. The second reason why I'd stick with him again is cost. Given that we have personal ties (I work with his brother), I received a great deal on the cost of development. It was not cheap, but the value was unbeatable. Phrasing it in the language of economics, I maximized my utility given my scarce monetary resources.

However, the lag in development was not without its consequences. The web designers could not do much until some of the development was deployed. The development did not have to be completely done for the designers to do their work, but it had to be functional and live. However, in the time that the development was delayed, the web designer I was originally working with at SparkNet ended up leaving that company. The timing was especially bad for the CollegeEconomics.com project because he left the

company within days of when the already-delayed design was supposed to begin. I had already received site mock-ups from that designer which showed me what he had in mind with the website, and I had already collaborated with him in person, over the phone, and via e-mail about my thoughts and comments related to his design concept. However, once he left, I was forced to start over with a new designer. Unfortunately, with SparkNet being a small company that meant the new designer I began working with had to continue servicing his own work load on top of the additional work he would receive as a result of the other designer's departure. This led to delays in the design while the new designer caught up to where I was at with the previous designer, meaning the new designer had to review all of the documents and mock-ups I had sent over, as well as e-mail communication I had with the previous designer. With the already-delayed design being now further delayed, certain compromises had to be made when it came to the look of the website. The hope and plan was for the website to have a Web 2.0 look and feel at the time of the Alpha deployment. This did not happen, but this wasn't a big setback either, just a disappointment. The situation is analogous to the creation of a car. The developer had done his part to get the car running and functional with four wheels on it. There would be improvements made as the project goes along to make it drive faster and smoother, maybe add a few bells and whistles, but it was drivable right now. The designer simply had to come along and add body panels, aerodynamics, and paint. Well, to this end, the developers got the body panels on. The CSS skin, which adds color and a bit of formatting to the site layout, was completed on time. But, like it was said before, the Web 2.0 aspects of the design, including buttons, icons, and other features, were not completed. However, like it was said before, this wasn't a big setback. It



gave the site a minimalist look, which remained in line with the uncluttered goal of the design. Thankfully, this was the final setback in the project.

Conclusion

CollegeEconomics.com will be a website dedicated to economics education on the web. Unfortunately, it is likely that no user will get as much of a benefit from the site as I will. While users will be able to attain varying degrees of cognitive learning per the Revised Bloom's Taxonomy, they will primarily achieve learning on only five of those six levels (Remembering, Understanding, Applying, Analyzing, and Evaluating). The sixth level of cognitive learning, that is Creating, will be attainable for users on the forum, but forums users generally absorb far more content than they create. However, Creating will be the cognitive realm in which I primarily work and learn. In creating CollegeEconomics.com, my goal, and hopefully the end result, will be a level of understanding regarding economics that far surpasses what most could hope for simply by receiving an undergraduate degree in the subject. However, with the Gold deployment still many months away, I am not close to the end result. But then again, with any good piece of software, there is a constant evolution and adaptation of the software to meet the continuing needs of its user base. CollegeEconomics.com will be no different. With that in mind, maybe it is not the end result I should look forward to, perhaps it is the journey that I need to enjoy.

Appendices

Appendix 1 – Requirements Document

Requirements Document

for

www.CollegeEconomics.com

Goal

User Perspective

To create a website that provides Economics definitions at different levels of complexity in order to serve most every student's needs.

Owner Perspective

Eventually, I hope this site will fund itself through advertising such as Google's AdSense or some other unobtrusive advertising on the page.

Requirements

3-Tier Complexity for each definition

- For each definition, there should be a basic explanation of the word or phrase.

However, for each word or phrase, there should also be the option for more expansive explanations. The tiers of explanations are:
 - Basic: text only; target audience: high school students and introductory undergrad students

- Intermediate: text and some pictures/formulas where applicable; target audience: upper level undergrad students
- Advanced: text and all applicable pictures/formulas; target audience: grad students

Quiz Creation

- Create a multiple-choice, a true/false, or a matching quiz based on word selections made by the user
 - **Word Selection**
 - The word selections could come from the definition list via checkboxes beside each word when viewing the definition list.
 - Alternatively, a list of words (without their definition provided) could be brought up by clicking a Create-A-Quiz link on the link bar to allow for more rapid word selection that way.
 - Only one question will be generated per word selected.
 - The word level (Basic, Intermediate, or Advanced) would have to be selected in order to know what level to test on. The initial version of the site may only offer testing at the Basic level, though.
 - **Quiz Type**
 - Multiple-choice refers to a quiz where a question is posed then 3-5 possible answers are given. The answer selection would be made by radio button.

- True/False refers to a quiz where a statement is made then the option of True and the option of False is given. The answer selection would be made by radio button.
- Matching refers to a quiz where two columns are shown. In one column (Column A), there are key words or phrases, and in the other column (Column B) are definitions for those key words or phrases. The answer selection would be made by entering the letter or number for the definition in Column B into the blank box beside a particular key word or phrase in Column A.
- *Submission and Grading of Quiz*
 - There should be only one button at the bottom of the quiz: Submit. Submit will submit the quiz for grading
 - Regardless of whether the quiz is completed, the user will have an option to Submit the quiz for grading. Once the Submit button is clicked, the Quiz will be graded. The Quiz Score Summary page should provide a percentage indicating how many the user answered right, as well as a relisting of the quiz they just took with the correct answers highlighted in green. If the user answered correctly, only one answer should be highlighted. If the user answered incorrectly, the correct answer should be highlight green and the incorrect answer that they made should be highlighted red.

Study Guide Creation

- Allows for the creation of a printable Study Guide that includes the words/terms selected by the user and their selected definitions.
 - Word Selection
 - The word selections could come from the definition list via checkboxes beside each word when viewing the definition list.
 - Alternatively, a list of words (without their definition provided) could be brought up by clicking a Create-A-Quiz link on the link bar to allow for more rapid word selection that way.
 - The word level (Basic, Intermediate, Advanced) would have to be selected in order to know what information to put on the Study Guide.
 - The Study Guide should provide three options for how much information to include for printing
 - Text-Only
 - Text & Formulas (where applicable)
 - Text, Formulas, and Pictures/Graphs (where applicable)

Forums

- UBB Code
- Initial Forums
 - Help & Homework
 - Discussion & Debate
 - Suggestions & Site Ideas

Meta News & Blogs

- A section where multiple listings of economic related news and articles are compiled, pulling from news sites and blogs via RSS and/or any other feeds, as well as manual posting of links/news/articles.
- Something similar to news.google.com but for economics-related items

Feedback

- Private Form
 - Fields: Name, E-Mail Address, Feedback Text Box

Security

- IP Ban capabilities for Forums & Feedback form

Meta Podcasts


- A section where multiple listings of economic related podcasts is compiled, pulling from sites via feeds if possible or manually linking to the podcasts.

Content Management system

- This would be the system from which I would post definitions or make updates to existing definitions. I'm not sure if this should be a separate entity or not because if I'm comfortable enough and familiar enough with the language and code used, then ideally I would be able to make definition additions and updates in the database used. I put this here as a separate entity in case I don't reach that comfort level.

Preliminary Site Mock-Up

(very rudimentary and open to significant change)



FEEDBACK!

TERM SEARCH

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

News & Blogs

Create - A - Quiz

My Study Guide

Podcasts

Forums

Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

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Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

Econ Term - A basic defintion would be written here.

ALPHA

Appendix 2 – Design Document: Quiz Taking

Quiz: Taking Quiz, Selecting Answers

College Economics **FEEDBACK!**

TERM SEARCH # A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

QUIZ 6 Terms 13 Questions

INTERMEDIATE

1) Which of the following is NOT a determinant of the **Supply** curve:

- ☐ Change in input prices
- ☐ Change in taxes & subsidies
- ☐ Change in producer expectations
- ☐ Change in consumer expectations

INTERMEDIATE

2) Which of the following is NOT a determinant of the **Demand** curve:

- ☐ Change in the prices of complement goods
- ☐ Change in the number of buyers
- ☐ Change in technology
- ☐ Change in consumer incomes

BASIC

3) In a standard Supply and Demand graph, Price is on the y-axis (vertical) and Output (aka Quantity Produced) is on the x-axis (horizontal):

- ☐ True
- ☐ False

Submit **ALPHA**

Here is a basic mock-up of the Quiz page. The main things to note with this mock-up are:

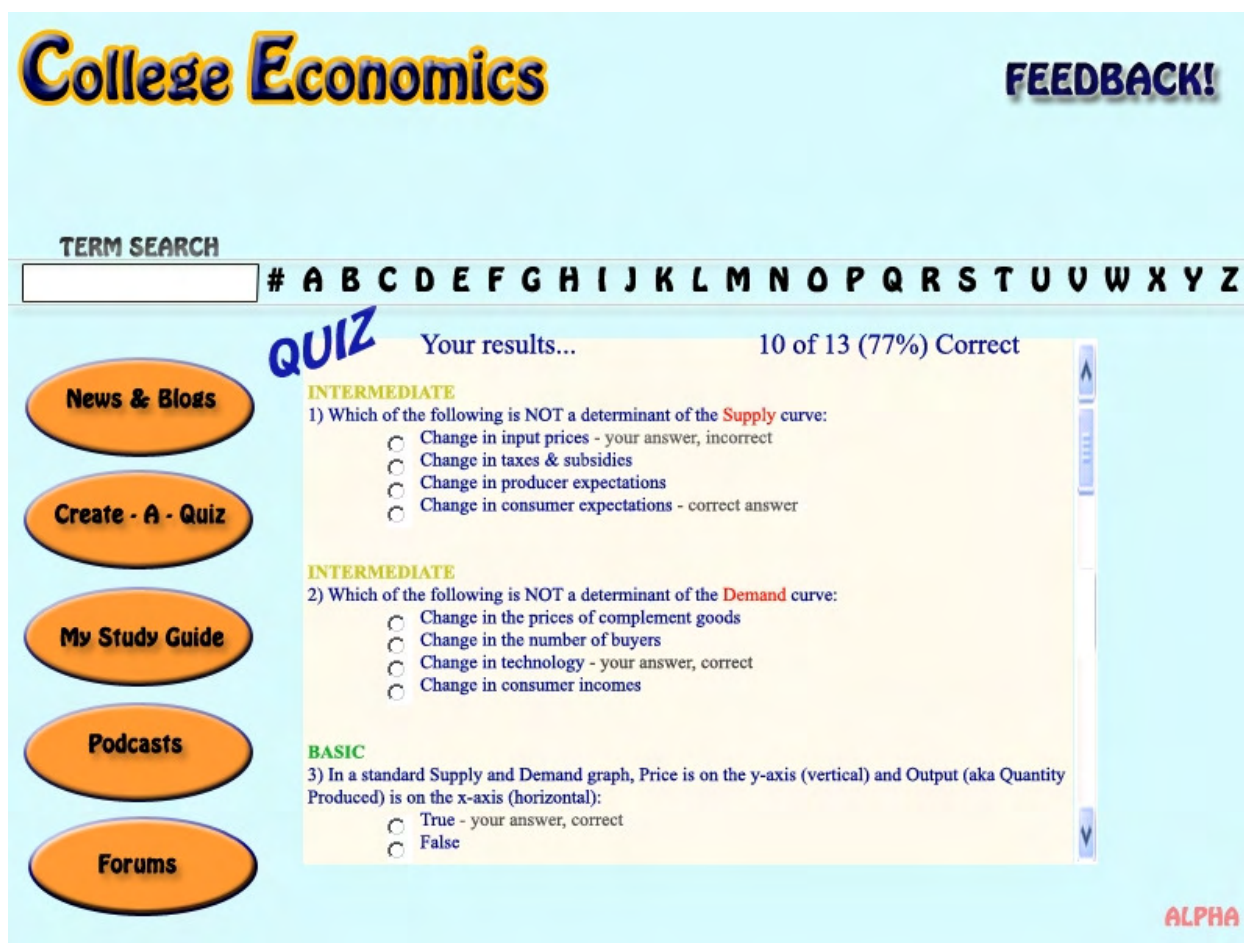
- Question Difficulty: Basic, Intermediate, or Advanced (not listed)
- Question types
 - multiple choice (with up to 5 answers each, only 4 answers pictured though)
 - true/false
- Links to the Terms in each question. Supply and Demand are highlighted red above.

The link should open to a new window that displays the highlighted definition.

- The number of terms on the test, listed as '6 Terms' above
- The number of questions on the test.
 - It is important to note that there can be up to 3 questions on each test per term, regardless of term difficulty.
- Something that can't be seen but should be noted is that if a radio button is populated, it should be unpopulated if it is clicked on a second time. Additionally, if a radio button on a question is populated, but a different radio button is selected, then the first button should be unpopulated and the new one should instead be populated.
- The quiz does not have to be completed in order to be submitted.

Appendix 3 – Design Document: Quiz Grading

Quiz: Reviewing Results



Here is a basic mock-up of the Quiz Results page. Once graded, the quiz should be redisplayed, but of course with a few differences from the pre-submittal version of the quiz.

The main things to note with this mock-up are:

- Now, instead of displaying the number of Terms and the number of Questions, “Your results....” are displayed, followed by the actual results, which should be the number of questions correct divided by the number of questions total (in this case, 10/13), along with the corresponding percentage in parentheses rounded to no decimal points (in this case, 76.9% becomes 77%).
- The correct answer should always be highlighted in some way, a font size larger and displayed in a different color (green preferred, but this should be alterable). This does not change regardless of whether the user’s answer was or was not the correct answer. I had problems illustrating what I’m talking about in Photoshop, so above I simply noted whether the answer was “correct”, “your answer”, and “incorrect”.
- It’s also important to note that the user’s answer should be noted as incorrect or correct. This is in addition to the formatting changes. Incorrect answers should have the same font size but be highlighted red (this color should also be alterable in the future).

Appendix 4 – Design Document: Study Guide

Study Guide: Selecting Words

When clicking the “Study Guide” button, the user should be taken to a page that lists all terms by themselves (without definitions) in multiple columns (enough to fill the page, but not so many as to require horizontal scrolling; vertical scrolling is acceptable if necessary). This should look like the “Create-A-Quiz” list of words. Like that list, beside each term should be a check box indicating if the user wants that term on the study guide. However, rather than there being one box per term, there should be three in order to indicate Basic, Intermediate, or Advanced. Rather than spelling out each, though, it should be listed as B, I, or A. I’ve pictured this below. Functionally speaking, checking “I” for Intermediate should populate “B” for Basic as well (checking A would auto-check B and I too). Once “I” is checked, “B” cannot be unchecked; only “I” can be unchecked.

<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	actuary
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	adjustable peg
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	administered price
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	ad valorem tax
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	adverse selection
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	agency
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	aggregate demand
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	aid
<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	amortization



At the top of the Study Guide page, there should be a counter indicating how many terms are requested thus far by how many boxes are checked. There should be a limit of 20 terms (an arbitrary number, can be increased if no significant server load is created, or decreased if server load is a concern). Also, there should be an option at the bottom of the term selection page that allows the user to specify:

“Definition Preference: ☐ Text Only (no pictures or graphs) ☐ With Pictures and Graphs”

Note: The “☐” represents a checkbox. Only one option can be checked.

Finally, there should be a “Create Study Guide” button at the bottom that will take the user to a page that lists out the terms and their level of complexity on one page (this page may require significant vertical scrolling, this is acceptable). Unlike the standard definition pages, the user should not be allowed to select different complexity levels. This would be a nice capability if it is easy to include, but it is not necessary. The main goal of this page is to be simple and easy to print. Accordingly, there should be a print button at the top of this Study Guide that allows for a copy of the guide to be printed.

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