

Capstone Project

Requirements Specification

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1. The Purpose of the Project

1a. The User Business or Background of the Project Effort

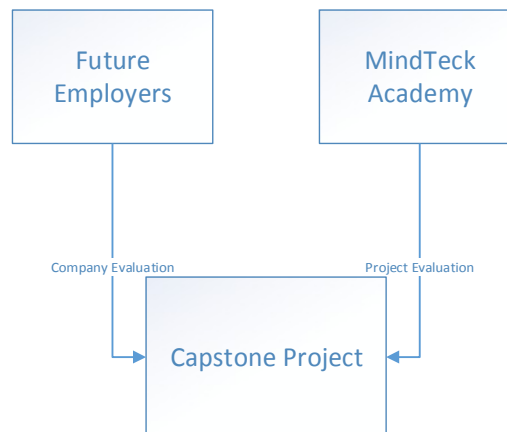
The purpose of this project is the development of a web application, utilizing the technologies that are learnt from the Academy (LearningLine **Mindteck .NET Developer Class (July 28-Sept 8, 2014)**). This project will follow the steps utilized in a real world application (SDLC artifacts).

1b. Goals of the Project

The Goal is to create a minimal e-commerce site that offers products for sale (think a miniature amazon.com). The project will be used to demonstrate personal capabilities and work conduct.

2. The Stakeholders

2a. The Client



MindTeck Academy

- Evaluate the high level concept documentation
- Provide the base requirements for the Capstone Project
- Evaluate the quality of the final code
- Provide guidance to completing the project

Future Employers

- Assess the final product implementation
- Assess the final product documentation

2b. The Customer

The user is transient in the project since it will not actually ever reach them, but they remain the bar by which the project is measured.

- The website provides the standard functionality that other websites like it are also providing
 - Amazon
 - NewEgg
- Products are easily managed (Administrative and user stand points)

2c. Other Stakeholders

- Potential future employers
- Stores/ Sellers wanting to sell their own items on the site

2d. The Hands-On Users of the Product

Anonymous Users

- Relative experience in using the internet
- New to the site (Needing some direction)
- Desires finding items for purchasing with ease
- Desires purchasing items without creating an account

Registered Users

- Somewhat experienced with the site itself
- Desires a history of items bought to be viewable
- Desires basic information be stored in the application for repeat purchases

Administrators

- Are responsible for:
 - Adding
 - Deleting
 - Editing products for sale
- Understands the principals of e-commerce websites

2e. Personas

1. Jack Gillamo

- A young hard working man starting a family. There isn't much time in the day after Jack has returned home from work. This lifestyle absorbs all of Jack's time therefore he must use what he has wisely. Using the internet to purchase products is a great way for jack to save time and provide for his family. This type of user may not even have time to create an account.

2. Cdr. Shepard

- No stranger to the internet, e-commerce, or space exploration, this man is constantly purchasing items on websites like Amazon. This type of user is intrigued to seeing his past purchases so he can resupply himself.

3. Bill Gates

- An experienced application creator who is completely prepared to create, add and edit items on the site. He has certain expectations when it comes to the administrative properties of a website in which we must provide.

2f. Priorities Assigned to Users

Due to the fact that this is a project for a course that may lead to employment, the key users are the ones assessing the final product. With this said however, the one assessing and providers of the course/project aim to teach us to develop skills in application/ web development.

- Assessor – Key User
- Future Employers – Key User
- Anonymous User – Secondary User
- Registered User – Secondary User
- Administrator – Secondary User

2g. User Participation

- Assessor
 - Assignment Expectations
 - Scope of project
 - Evaluate final result
- Potential Employers
 - Evaluate final result

2h. Maintenance Users and Service Technicians

Not applicable. There will be no maintenance users beyond possibly myself should I desire a later date.

3. Mandated Constraints

3a. Solution Constraints

- Description: The e-commerce site must be made using the technologies that are learnt from the academy.

Rationale: I should be able to showcase what was provided to me over the passed month.

Fit Criterion: Using visual studio MVC project as a starting point and any add-ons for databasing. Any topic covered over the duration of the course is “fair game”.

- Description: Follow the typical steps utilized in a real-world application project, producing the relevant SDLC artifacts.

Rationale: To attract potential employers, it is important to show real world application. It is also important to finish the course and this is mandatory.

Fit Criterion: This design document is one of the steps that will lead to the final product by covering all of the important topics mentioned in the slide show provided (Slide labelled “Objective”). The following are SDLC artifacts:

- Design Document
 - Design Document
 - Test Case Document
- Description: Time to create a mini e-commerce site might be low.
- Rationale: Its been said to complete as much as possible but it is understandable that not everything will be working. However having code set-up to accomplish a functionality is expected.

Fit Criterion: Having all the html files along with classes complete is absolutely necessary. Completing all the website's functionality would be gratifying and accomplishing to share.

3b. Implementation Environment of the Current System

The web application is guaranteed to work on Windows 7 using Google Chrome as a web browser.

3c. Partner or Collaborative Applications

The product is encapsulated within the compiling of visual studio. Any add-ons or external software is added there. However a live database will be used to accompany the functionality of the web application.

3d. Off-the-Shelf Software

- Using Visual Studio and included libraries for C#
- Libraries provided by NuGet package manager

3e. Anticipated Workplace Environment

The pc may be used in any number of environments, audible notifications may not work in some of them. We are to assume that keyboard, mouse and monitor are functional.

3f. Schedule Constraints

- Sunday September 28
 - Due Date for final code and documentation

3g. Budget Constraints

- No money is to be spent on this product

3h. Enterprise Constraints

- N/A

Not applicable since this product is not funded by anyone

4. Naming Conventions and Terminology

4a. Definitions of All Terms, Including Acronyms, Used by Stakeholders Involved in the Project

- Web Application: An application that is created to function with users over networks (aka internet)
- E-commerce site: Refer to above but focused for selling/buying products
- User types: (Refer to 2.f)
- DB: Database

5. Relevant Facts and Assumptions

5a. Relevant Facts

MongoDB might be incorporated into the project as it handles dbs.

5b. Business Rules

Mindteck Academy reserves the right to change the properties of the project if they desire. Currently we are allowed to use external resources and websites.

5c. Assumptions

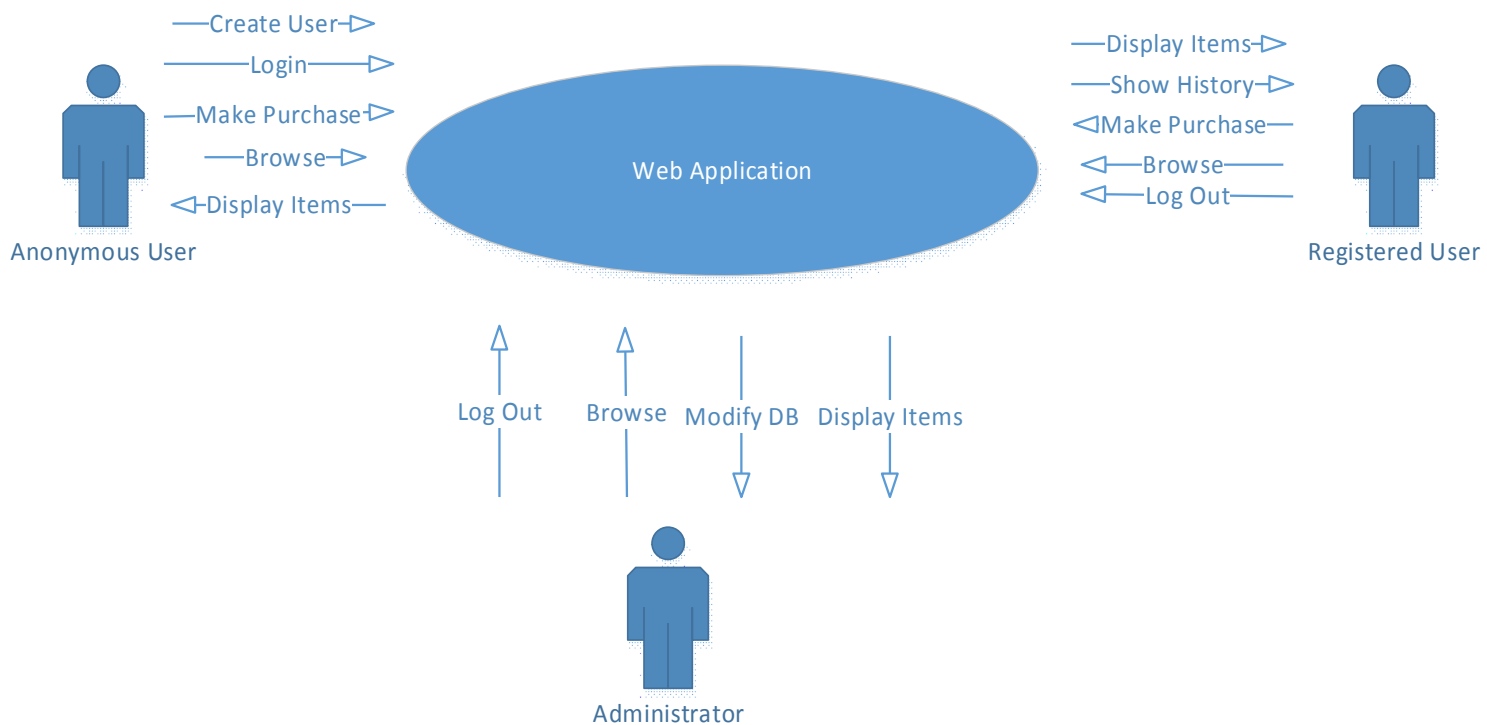
- The project is to be used on a browser that supports it.
- The project will have no issues connecting to its db
- No server disconnects will occur

6. The Scope of the Work

6a. The Current Situation

Not very applicable, I am not building off of previous projects. The starting point for this will be the generated code for a new project in visual studio for MVC. The design of the html pages will be taken from created open domain work (creative commons).

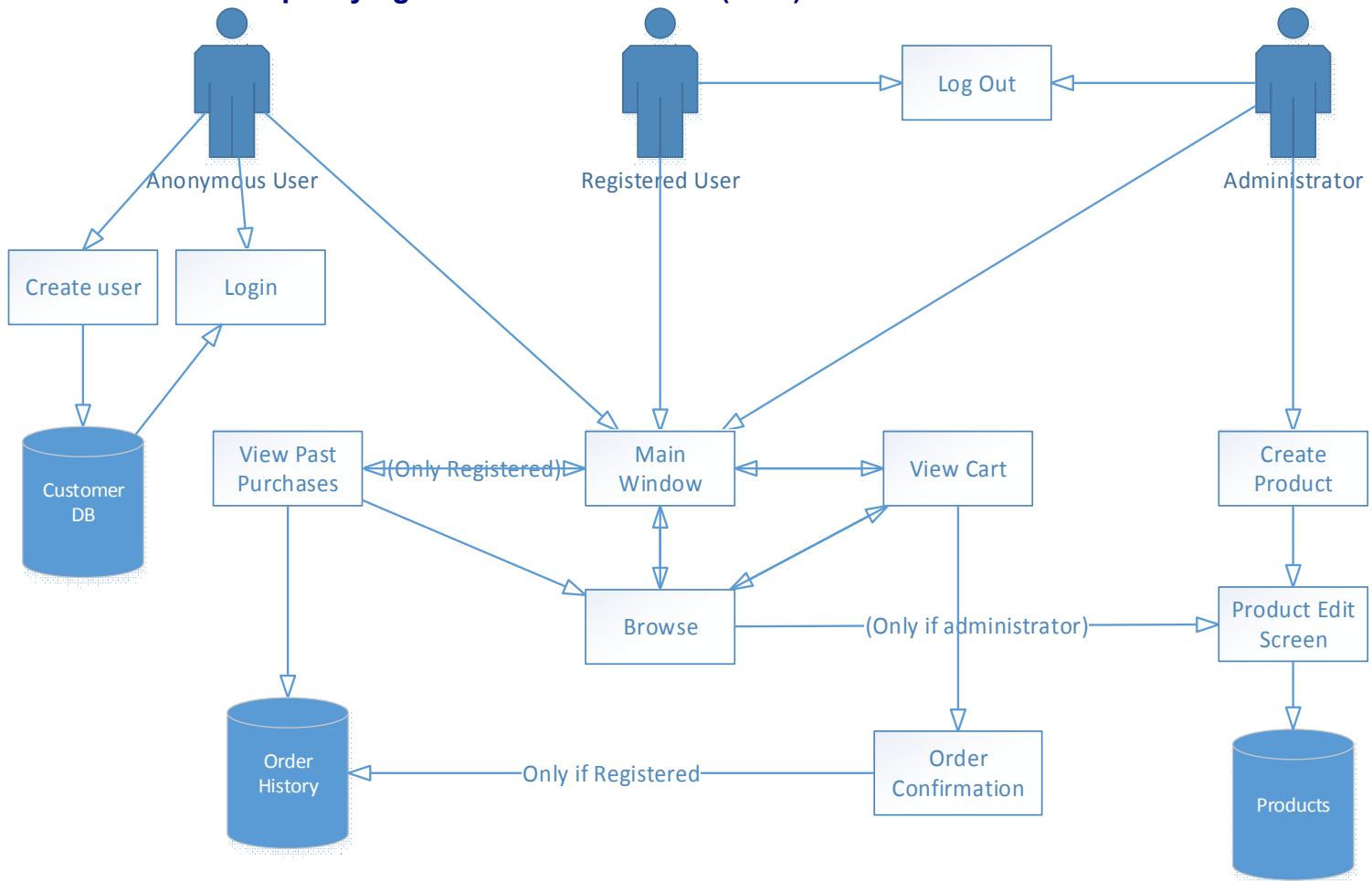
6b. The Context of the Work



6c. Work Partitioning

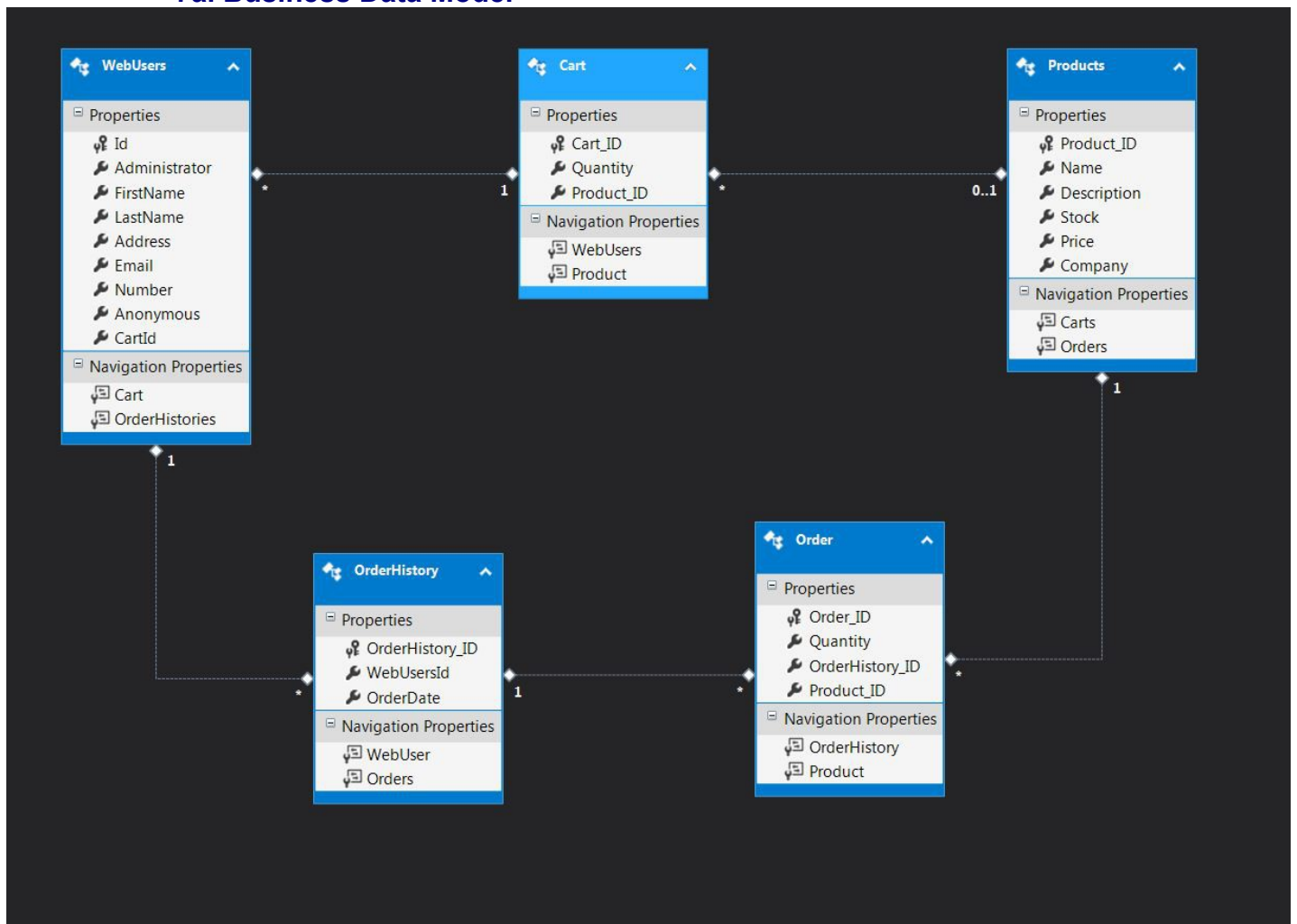
Event Name	Input and Output	Summary of BUC
1. Registered/Anonymous/Administrator Browsing	Selections on the site being made (in)	The website returns pages of information to the user. This also covers adding items to the cart.
2. Registered or Anonymous purchasing	Purchase clicked (in)	The items that have been selected and put in the cart are now ready to be purchased by the user. They now request to purchase these items.
3. Show History	Show History clicked (in)	Past purchase information is shown to the user.
4. Modify DB	Edit item/Add item/Delete Item clicked (in)	An administrator is adding/editing/deleting an item.
5. Display Items	The website is showing the results that the user requests (out)	Html is sent to the user's browser allowing him/her to interact with the website and what they require to see visually.
6. Log in	User name and password + log in button pressed (in)	User name and password are passed into the web application and checked. Personal preferences are then loaded
7. Log out	Log out clicked (in)	The user wishes to log out. Website is then viewed in anonymous mode.
8. Create user	Create account is clicked(in)	The user is shown the create account page where they may enter personal information.

6d. Specifying a Business Use Case (BUC)



7. Business Data Model and Data Dictionary

7a. Business Data Model



7b. Data Dictionary

Name	Content	Type
WebUser	All information related to the user. (See above)	DB Entity
Products	Information related to products. (See above)	DB Entity
Cart	Products being purchased. (See above)	DB Entity
Order	A list of products that are ordered. (See above)	DB Entity
OrderHistory	A list of orders that a user can have. (See above)	DB Entity

8. The Scope of the Product

8a. Product Boundary

Creating another diagram here but would be very much a duplicate version of the diagram in 6.D. Please refer to 6D for this section and all related below.

8b. Product Use Case Table

Input/Outputs are usually shown here on the following table. In this case our whole system's interaction is based off of HTML buttons/clicks/dialog boxes via a web browser. For this reason I do not show them on the following table.

PUC No	PUC Name	Actor/s
1	Login	Anonymous User
2	Logout	Administrator/ Registered
3	Browse	All users
4	Create User	Anonymous User
5	Make Purchase	Registered/ Anonymous users
6	Display Items	Web Application
7	Show Order History	Registered Users
8	Modify DB	Administrator

8c. Individual Product Use Cases

PUC #1: Login

- The user is viewing a page and would like to login. Their account information is input and they proceed to click login
- The system verifies the credentials

PUC #2: Logout

- The user no longer wishes to be logged into the website
- User clicks on the logout button

PUC #3: Browse

- The user may browse many products on the website
- Viewing information about the products as they browse through them
 - They can view things such as price, stock, and other potentially important information
- The web application delivers this through HTML using the MVC model

PUC #4: Create User

- An anonymous user wishes to create an account on the web applications
- The web application will verify credentials and add the correct information to the database

PUC #5: Make Purchase

- This is done in a couple of steps:
 - Add items to the cart
 - Verify these items are what the user wants
 - If the user is registered add this order information to their history

- for future viewing
 - Checkout is completed by the user verifying the purchase
- PUC #6: Display Items
 - This is to show that the web application may give the user's web browser html to display on the screen. This could be anything from a login screen, to an error screen
- PUC #7: Show order history
 - To a registered user this will show past purchase/orders on the site
 - Include the date products were purchased
 - What products were purchased
- PUC #8: Modify DB
 - An administrator would like to add/delete/edit an item that other users may purchase/view
 - When the administrator is browsing they may edit an item
 - These options are available on the main administrator page of the web application

9. Functional Requirements

9a. Functional Requirements

- 9a. Users Types
 - 1. Administrator
 - Users responsible for
 - Adding products for sale
 - Deleting products for sale
 - Editing products for sale
 - 2. Registered
 - Have their basic information stored in the application
 - Ability to view past purchases
 - 3. Anonymous
 - Browse products and purchase items without creating an account
- 9b. Web Pages
 - 1. Are to be browsed by the different types of users (refer to 9.a)
 - 2. Are to display items and each have a unique purpose
 - Information of the user
 - Information about logging in
 - Information about creating a new account
 - Information about products
 - Information for creating/adding/deleting products
 - Information about past purchase history
 - Information for logging out
 - Information on the cart and its items

9c. Database

1. An underlying system storing all the information that is to appear on the web pages mentioned in 9b
2. Refer to 7a for details on the model
3. Able to be managed through web pages(9b) by an administrative user(9a.1)
4. Must store the following information
 - Purchase history
 - Products for sale
 - User information/credentials
 - Cart information

Non-functional Requirements

The following sections 10-17 describe the non-functional requirements. The form of these requirements is the same as for the functional requirements as described above.

10. Look and Feel Requirements

10a. Appearance Requirements

The web application will follow standards brought by other various web application in which sell items to users.

- Rationale
 - The users should feel familiar with this web application when compared to others such as Amazon
- Fit Criterion
 - Have an accessible login/logout button
 - Have easy navigable pages
 - Able to purchase items to the standard of other websites on the internet
 - Having a cart
 - Confirming the items in the cart
 - Have a history

Lists of products easily seen by users.

- Rationale
 - This is the norm of websites selling items
- Fit Criterion
 - Html pages will correctly displays lists

Images of products easily seen by users.

- Rationale
 - This is the norm of websites selling items
- Fit Criterion
 - Html pages will correctly displays images of products

10b. Style Requirements

The contents of the web application must present themselves to be trustworthy and safe. Users are to trust the web applications by the following criterion:

- No distracting amounts of advertising
- Advertising that does not influence the safety of purchasing products on the web application
- Follow the standardized steps in buying products that other websites have presented (such as Amazon)

The interface will remain simple and intuitive

- We do not want to “Scare off” potential customers
- Base our outlook on Amazon

11. Usability and Humanity Requirements

This section is concerned with requirements that make the product usable and ergonomically acceptable to its hands-on users.

11a. Ease of Use Requirements

The web application will be easy to learn and straight forward, no training required.

- Rationale
 - We want users to feel comfortable as they use the web application
- Fit Criterion
 - The web application resemble Amazon and other e-commerce sites very closely
 - Using real world objects such as the “Cart” will make things convenient and intuitive
 - Registered users are expected to have some knowledge of the web applications usages, they are given more tools such as order history

The web application will be ready for administrators to use

- Rationale
 - Those with administrative permissions will be doing advanced modification to the site in a secure way and must have some prior knowledge to using the web application
- Fit Criterion

- Admins must have prior training before editing the database

The web application must react within a reasonable time.

- Rationale
 - Users mustn't feel as though the web application is unresponsive
- Fit Criterion
 - The commands to the web application should react within 1-3 seconds otherwise impose some type of loading screen to the user

The web application is not safety-critical

11b. Personalization and Internationalization Requirements

The web application users defined in 9a User Types all have their levels of expertise and expectations.

- Rationale
 - Based off of our requirements (9a User Types) different users will have access to different functionality therefore different available buttons/web pages
- Fit Criterion
 - Administrators can access database related Web pages along with buttons.
 - Can access all features
 - Registered users can access web pages and functionality allowing them to verify/see/check passed orders.
 - Can access almost all features, minus administrative options
 - Anonymous users will have the “bare bones” functionality available to them
 - Purchase items
 - Create a user

Currently there is no international usage planned for the web application and we will assume that we achieve our goals and objectives with an American user base.

11c. Learning Requirements

We are accommodating users who are updated with current internet trends done by websites such as Amazon for purchasing products

- Rationale
 - Our web application must accommodate the different types of users (9a User Types)
- Fit Criterion
 - In general the user will learn from experience by using the web application
 - Administrators are assumed to have some knowledge of the underlying database

11d. Understandability and Politeness Requirements

Shopping on the web application will follow the metaphor provided by similar web sites (Amazon.com)

- Rationale
 - We are developing an e-commerce web application, therefore we follow the industry standards
- Fit Criterion
 - The industry standard terms:
 - Cart
 - Purchase
 - Order
 - History
 - Create Account
 - Products
 - Quantity

11e. Accessibility Requirements

- N/A

We will not be catering to those who have other types of needs. We are assuming that there are no input changes necessary from the normal keyboard, mouse, pointer and that web browsers will take care of the rest.

12. Performance Requirements

12a. Speed and Latency Requirements

The web application will respond within 1-3 seconds of a user input otherwise a loading page will be presented to the user to signify that something is occurring on the back-end.

12b. Safety-Critical Requirements

- N/A

Not applicable, we need not worry about the safety of our users, security is however an entirely different problem that could occur with payment information. However that isn't the focus of this project. There are some security factors accounted for in terms of user creation.

12c. Precision or Accuracy Requirements

- All monetary amounts shall be accurate to two decimal places
- All database ids shall have enough bits to not limit the amount of users or products

12d. Reliability and Availability Requirements

- Due to the nature of this project running on a single machine, the web application should be available 24 hours per day, 365 days per year.

12e. Robustness or Fault-Tolerance Requirements

User disconnects from the site

- If registered
 - Cart is saved in the database, user may return
- Otherwise the cart is lost, thus encouraging web application registration

Errors or bad information recorded in the database

- Creator of the web application can directly modify the database if it needs to be repaired

12f. Capacity Requirements

We are catering to one person using the web application at a time through the Google Chrome web browser. We need not worry about multiple database modification due to multiple administrators or multiple carts/ orders being placed.

12g. Scalability or Extensibility Requirements

Future growth of the web application is possible through the standards that are being used initially. Web pages are being written in HTML and the database is scalable/ replaceable. Most of the libraries being used are up-datable such as those included by Microsoft's C# and entity framework.

12h. Longevity Requirements

The web application is expected to function for the time required to analyse it by the evaluators of the project. This could be any time between 5 minutes to an hour. It isn't possible to estimate how long the Google Chrome browser will remain relevant/ keep using the standard of html being used in the project.

13. Operational and Environmental Requirements

13a. Expected Physical Environment

The expected environment for the web application is Google Chrome on a Windows 7 operating system running on a computer with the necessary hardware.

13b. Requirements for Interfacing with Adjacent Systems

We are focusing on a single internet browser (Google Chrome) along with whatever version of Databasing technology we see fit.

13c. Productization Requirements

The product will be distributed via Microsoft's Visual Studio Solution files. This will include everything in a single compressed ZIP. The ZIP will contain this document along with all the necessary files to run and compile the web application.

13d. Release Requirements

Currently the release of the product will not be public, it is for demonstrative purposes only. If anything we are releasing this as a prototype, or a skeleton of what could be an excellent website.

14. Maintainability and Support Requirements

14a. Maintenance Requirements

- Database
 - Administrative users will be able to maintain the database by adding, editing, removing values for products in a matter of

minutes. For everything else, a developer would have to modify the database for user credentials and order history. This might take a bit longer but no more than a couple of minutes.

- Web Pages
 - Depending on the quality and graphics, the range of creating or maintaining a web page could vary

14b. Supportability Requirements

- N/A

Not applicable, we do not have the resources for such a service. The potential of adding a feature as such could occur in the future as the project will be set-up for upgradability.

14c. Adaptability Requirements

Other browsers and operating systems should be able to display the web pages without issues, minor testing on Firefox will be done but for the most part will be done on Google Chrome (Windows 7).

15. Security Requirements

15a. Access Requirements

This web application will be open to modification and if the user wants to modify variable data, it is possible. Security is not the focus of the project.

15b. Integrity Requirements

This web application will be open to modification and if the user wants to modify variable data, it is possible. Security is not the focus of the project.

15c. Privacy Requirements

The back end of the web application will correctly show users information that is their own. Private information will not be shown or made public. Any occurrence of this otherwise is in error and some type or form of bug.

15d. Audit Requirements

- N/A

Not applicable, we will not have legal audit implications.

15e. Immunity Requirements

The security provided by a default MVC project in C# is the only immunity provided. This isn't the current focus of the project.

16. Cultural Requirements

16a. Cultural Requirements

The web application shall not insult anyone's culture and shall remain neutral. We may have real world items that are listed in our products but we have no affiliation to the companies in which they belong and are simply for example/experimentation.

17. Legal Requirements

17a. Compliance Requirements

Code must be referenced if taken from somewhere and sources will be cited. Any type of media shown will be following the laws of creative commons.

17b. Standards Requirements

The web application will follow MVC standards depicted by Microsoft. The web application will also follow the current trends found on other e-commerce websites.

Project Issues

18. Open Issues

1. During the duration of the course, the latest MVC was not used (Visual studio 13). We are unaware if this will change very much in the implementation but there are a couple features that may be new to the MVC process that might be included.
2. Entity framework may also be a different version leading to a couple of different instructions.
3. A default MVC project has a login system implemented, weather replacing it or creating another database with the same entries as to not touch the already complete implementation hasn't been decided.

19. Off-the-Shelf Solutions

19a. Ready-Made Products

1. MongoDB
 - A possible change instead of entity framework
2. Any creative commons HTML available to change the overall look of the website
3. Other possible solutions to problems / e-commerce like websites

19b. Reusable Components

Content

Description of the candidate components, either bought from outside or built by your company, which could be used by this project. List libraries that could be a source of components.

Motivation

Reuse rather than reinvention.

- The default MVC startup project done in visual studio
- Some of the samples/examples available on the sideshow provided to us
- Several examples in the learningline website may be brought over

19c. Products That Can Be Copied

Perhaps other source material found online. If used, sources will be cited.

20. New Problems

20a. Effects on the Current Environment

- N/A

The web application has no direct effects on the environment.

20b. Effects on the Installed Systems

- N/A

This doesn't apply to a web application of our type.

20c. Potential User Problems

- We may have security issues and some users might try to take advantage of the system
- Errors may occur that would hinder the user experience due to the time constraints
- Database problems could also occur

20d. Limitations in the Anticipated Implementation Environment That May Inhibit the New Product

- Potential issues of visual studio requesting to be purchased might be an issue
- Potential issues with any google chrome updates might occur
- Perhaps changes that would occur to the os due to windows update

20e. Follow-Up Problems

- Some anti virus software might not like the implementation of the HTML pages
- Sometimes ports are deemed as unsafe, and in visual studio we have a static port set for the project

21. Tasks

21a. Project Planning

- Functional Specification (includes use-cases, screen mock-up, functionality and navigation)
- Design Document (Technical Architecture, Class Diagrams, Database Tables Design)
- Test Case Document (A minimal set of test cases to ensure that the site works fine)
- Code (Final Deliverable of source code, ready for deployment)
- Setup the website for a demo

21b. Planning of the Development Phases

Windows and Google Chrome are the environments in which we will be installing on and should already exist, we will have nothing to do in regards of this.

22. Migration to the New Product

22a. Requirements for Migration to the New Product

- N/A

Not applicable, there are no previous products

22b. Data That Has to Be Modified or Translated for the New System

There will be no transfer of data into a new system. Our database is being created from scratch, and does not take any data from external systems.

23. Risks

The biggest risk would be the time constraint that has been given to us. We may not be able to do everything listed above and have it work perfectly.

Even if well equipped with the knowledge from the course, remembering of topic and review will be necessary. Added knowledge not yet attained from the course could also be a risk.

24. Costs

No cost for our project.

25. User Documentation and Training

25a. User Documentation Requirements

There will be no training or instructions on how to use the web application. The only reliable source of information given to the user is the fact that the web application will follow recent trends in e-commerce websites such as Amazon.

For the administrative user, we are assuming that they have prior knowledge. Other than what has been mentioned, everything else is out of the scope of the project.

25b. Training Requirements

Very little training is needed to understand how to browse the web pages of the web application. Unless of course the user hasn't used a web browser before or hasn't been on the internet previously.

Also as stated previously administrative users are assumed to have some type of knowledge in the field and have been trained already.

26. Waiting Room

- Sleek pages for the products instead of a simple list that would include:
 - Images of the product
 - User reviews
 - Product ratings
 - Chat system to those wishing to speak to representatives of the different companies selling products on the web application
- Reorder a passed purchase
- Storing credit card information
- Being able to use paypal
- Setting a picture for the portrait of the user who is signed in
- Credit card authentication

- User being able to sell unofficially on the site, sort of like an ebay part of the site

27. Ideas for Solutions

- Using MongoDB for the database system
- Using a creative commons system already in place for logging in
- Using a creative commons system already in place for the entire e-commerce part of the site
- Using any external sources not listed already