MGS 659: Seminar on Electronic Commerce and E-Commerce Security

Instructor: H. Raghav Rao
Time: Friday, 2:00 PM - 4:40 PM
Venue: 122 JACOBS
Office Hours: Thursdays, 11.00am to 12.00pm and by appointment
E-mail: mgmtraoubcourses@gmail.com
TA: Rajarshi Chakraborty (rajarshic.ub@gmail.com) and Jake Lee (mgmtjake@gmail.com)

Course Objectives:

The main objective of the course is to introduce students to both the theory and practice of doing business over the Internet and World Wide Web. Other learning objectives include:

- Understanding the elements of the infrastructure of Electronic Commerce
- Understanding the technologies and applications in Electronic Commerce
- Creating a managerial understanding of the business of Electronic Commerce and using it for the creation of competitive advantages for the organization
- Invoke critical thinking to strategize and plan technology based solutions to achieve business goals

Course Approach:

This is a case-oriented (real-life) and readings based course. This course will involve significant amount of research work. Learning will be in the form of discussion and sharing of information. Utmost class participation is required. The function of the instructor is primarily that of a catalyst, facilitator and evaluator in a collaborative learning experience. It is therefore essential that everyone participate as fully as possible. The framework for this participation will textbook readings, web site readings, handouts, guest speakers, project work, all designed to help to convey the main body of knowledge and to stimulate the desired critical thinking. There will also be some lab work in order to provide students with some hands on experience with certain E-commerce software and other related technologies.

Required Text:

Electronic Commerce by Gary Schneider, 8th or 9th edition
Publisher: Thomson

Recommended Text:

Information Rules
by Shapiro and Varian, Harvard Business School Press
Interesting Readings:

- Building Cyberstores: Installation, Transaction Processing and Management; Martin Nemzow
- Digital Cash: Commerce on the Net; Peter Wayner
- Digital Money: The New Era of Internet Commerce; Daniel C. Lynch, Leslie Lundquist
- Electronic Commerce: A Manager's Guide; Ravi Kalakota, Andrew Whinston
- Electronic Commerce: On-Line Ordering and Digital Money; Peter Loshin, Pete Loshin
- From EDI to Electronic Commerce: A Business Initiative; Phyllis, K. Sokol
- Frontiers of Electronic Commerce; Ravi Kalakota, Andrew B. Whinston
- Inter-Corporate Business Engineering: Streamlining the Business Cycle from End to End; Gary G. Benesko
- Internet Commerce; Andrew Dahl, et al
- Secure Commerce on the Internet; Vijay Ahuja
- Secure Electronic Commerce: Building the Infrastructure for Digital Signatures and Encryption; Warwick Ford, Michael S. Baum
- Understanding Electronic Commerce (Strategic Technology Series); David R. Kosiur
- Electronic Commerce: On-Line Ordering and Digital Money; Pete Loshin
- Electronic Commerce: The New Business Platform for the Internet; Debra Cameron

Recommended Readings:

Other readings will be provided as classified links on the course web page. There will also be handouts as and when required.

Grading:

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<thead>
<tr>
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<th>Percentage</th>
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<tbody>
<tr>
<td>Assignments/ Labwork</td>
<td>35%</td>
</tr>
<tr>
<td>E-commerce final Exam</td>
<td>25%</td>
</tr>
<tr>
<td>Individual Ideas</td>
<td>5%</td>
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<tr>
<td>Mid-term e-Bus. Project</td>
<td>5%</td>
</tr>
<tr>
<td>(Note: Two points are reserved for contacting the “Helper” from UB. and the “Mentor” from HP / EDS and showing me proof of contact BEFORE March 7th)</td>
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<tr>
<td>End-Term e-Bus. Project</td>
<td>25%</td>
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<tr>
<td>Class Participation</td>
<td>5%</td>
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<tr>
<td>(Includes voluntary presentations, discussion participation, Guest Lecture participation, Presentation participation etc.)</td>
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**Homework**
There will be about 8-9 assignments/labs works. Some will be individual, while some will be group assignments. Some assignments will carry more weight than others. The real-life term projects are group projects and should be done in groups of 4-5 students. Each group will be identified by a group name.

Some of the homeworks will be done in the Information Assurance (Sleiman) lab: The homeworks are to be done as teams (or as individuals), and summary list of homeworks is available on page 8 and beyond. In addition, there might be a couple of other homeworks.

**"Adopters" of the course:**

We take great pleasure in announcing that HP / Electronic Data Systems (HP / EDS) will be the "adopters" of the course. HP / EDS's participation in the course via Guest lectures and the end-term project will help students to understand the complexities involved in developing an e-business strategy in the real world. Rajarshi Chakraborty will be the cognizant TA for the e-Bus project part of the course.

**"Helpers" to the course:**

To be nominated by Nancy Paton; Vice President for University Communications; UB; and Jeff Smith, Asst. VP
Address 521 Capen Hall ; Capen Hall
Phone: (716) 645-4094; 645-6969.

- The Helpers will be associated only with the projects. The Helpers will help streamline thoughts of Students to come up with ideas, which are relevant and achievable. (Tentatively agreed to). They will review plans on a periodic basis. (Dates will be scheduled at the convenience of Helpers. At least one team member to meet the Helpers at fixed intervals)
- **Every team should have the client (Office Of VP University Communications) sign off on the requirements**
<table>
<thead>
<tr>
<th>Date</th>
<th>Class Readings</th>
<th>In Class (Happenings)</th>
<th>After Class (Evaluations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/31/14</td>
<td>Chap. 1, [Introduction to Electronic Commerce]</td>
<td></td>
<td>Group/member Name submission</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Homework 1 and 9 handed out</td>
</tr>
<tr>
<td>02/07/14</td>
<td>Chap. 2 [Technology Infrastructure]</td>
<td>Guest Lectures: Nancy Paton and others from UB</td>
<td>Homework 1 due</td>
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<td>Homework 2 handed out</td>
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<tr>
<td>02/14/14</td>
<td>Chap. 3 [Selling on the Web]</td>
<td>Guest Lecture, Carl Skompinski on e-Commerce by HP / EDS mentors</td>
<td>Homework 1 due</td>
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<td></td>
<td></td>
<td></td>
<td>Homework 2 handed out</td>
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<tr>
<td>02/21/14</td>
<td>Chap. 4 [Marketing on the Web]</td>
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<td>Homework 3 due</td>
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<td></td>
<td>Homework 3 handed out</td>
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<tr>
<td>02/28/14</td>
<td>Chap. 5 [Business-to-Business Strategies]</td>
<td></td>
<td>Homework 3 due</td>
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<td></td>
<td>Homework 4 handed out</td>
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<td>Idea Skeleton due (before class) (Individual deliverable)</td>
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<tr>
<td>03/07/14</td>
<td>Chap. 6 [Online Auctions, Virtual Communities, and Web Portals]</td>
<td>Guest lecture by Prof. Sanjukta D. Smith on online auctions (tentative)</td>
<td>Acceptance of Ideas Announced &quot;Guide Skeleton&quot; for Idea Summarized Plan handed out</td>
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<td>Homework 4 due</td>
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<td>Homework 5 handed out</td>
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<tr>
<td>03/14/14</td>
<td>Chap. 7 [The Environment of Electronic Commerce]</td>
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<td>Part I of Homework 9 due</td>
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<td>Homework 6 handed out</td>
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<tr>
<td>03/21/14</td>
<td>Spring Break</td>
<td>Spring Break</td>
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<tr>
<td>03/28/14</td>
<td>Chap. 8 [Web Server Hardware and Software]</td>
<td>Guest lecture by Dr D. Pravin on Web Languages (tentative)</td>
<td>Homework 5 due</td>
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<tr>
<td>04/04/14</td>
<td>Chap. 9 [Electronic Commerce Software]</td>
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<td>Homework 6 due</td>
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<td>Homework 7 handed out</td>
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<tr>
<td>04/11/14</td>
<td>Chap 10 [Security for Electronic Commerce]</td>
<td></td>
<td>One paragraph submission due ^1 (Individual deliverable)</td>
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<td></td>
<td>Summarized Plan due (before class) (team deliverable)</td>
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<td>Homework 8 handed out</td>
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<tr>
<td>04/18/14</td>
<td>Chap. 11 [Payment Systems for Electronic Commerce]</td>
<td>Guest Lecture by Rohini Srihari CEO, Janya (tentative)</td>
<td>Homework 7 due</td>
</tr>
<tr>
<td>04/25/14</td>
<td>Miscellaneous</td>
<td></td>
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<tr>
<td>05/02/14</td>
<td>Miscellaneous &amp; Chap. 12 [Planning for electronic commerce]</td>
<td>Guest Lecture by Mark Jaquet, who is an e-commerce entrepreneur, past founder and chief scientist of OpenSite</td>
<td>Part II of Homework 9 due</td>
</tr>
</tbody>
</table>

^1 Every member should submit **one paragraph** on what they have done prior to, and what they will be doing subsequent to midterm deliverable.
The above is tentative and subject to changes, depending on the dynamics of the situation. More up-to-date versions will be available on the web periodically.

Note:
- **Attendance at all guest lectures is mandatory**
- **All deliverables should be submitted before the class starts on the due date.**
- **Every member should submit one paragraph on what they have done prior to, and what they will be doing subsequent to midterm deliverable**

### Rules for Idea Generation and Skeleton (Due 2/28):

Each **individual** in a group needs to submit one idea of possible e-commerce ventures for UB. The broad topics are: e-commerce and the topic covered in the guest lecture on Feb 7. The ideas and their submission need to follow the rules below:

1. **A&HP Ideas:**

   "A" means "Achievable" ideas
   - Those which are not abstract
   - Those that can be converted into a concrete business plan

   "HP" means "High Potential" ideas which
   - Provide huge savings in monetary terms
   - Result in major Improvement of services
   - Caters to a new potential market
   - Affects enough number of people to be viewed as a major change
   - Affects a small number of people but can be extrapolated to be viewed as a major change

   The students need not statistically compute the ROI (though they are welcome to do so). The idea should be arrived at after studying an existing process and how drastically the ideas can cause a major improvement and obviously cause high returns. The idea summarized plan is a business plan. It may or may not include the technical design. Emphasize on the improvised functional flow on account of the idea implementation, a comparison to existing procedures and the obvious improvement need to be justified and presented. The plan should also include the detail procedural map to achieve the desired new structure.

2. **Idea Skeleton Submission and selection Rules:**

   Each idea needs to be submitted as a single sheet Word/PDF document by email and cover **ALL** the following 8 points. This is the "idea skeleton": All idea skeletons will be collated and submitted to UB and HP / EDS.
1. The idea in a sentence

2. A very brief paragraph length descriptive on the above idea

3. Probable benefits to UB. (Identify at least 2 benefit points)

4. Prior implementation of this idea (at any organization, university if any)

5. Success / Failure of above implementation. Identify 2 probable reasons for success or failure

6. Any URL's to be referred to better present the idea

7. Group Name & Contact Information (+ Individual name)

8. Idea Number (1 to 4/5/6 – these numbers map to individuals in each team)

Separately, before (or at the time of) submitting the above document, the idea (point 1 & 2 of "idea skeleton") needs to be sent to Rajarshi Chakraborty by email (rajarshic.ub@gmail.com), who will then collate and post the ideas on the Web.

The "Helpers" (and instructor) will weigh and rank each idea with the set benchmarks and will choose 4-5 ideas out of the possible 20 or so ranked ventures. Selection of the ideas will be entirely at the discretion of the "Helpers" and the instructor of the course. The 4-5 ideas will be assigned to the 4-5 groups (one idea each) for the preparation of the business plan.

Archives from UBlearns

3. **a. Mid-Term Project Grading split-up:** (Total -10%)

<table>
<thead>
<tr>
<th>Idea skeleton submission (individual)</th>
<th>5%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summarized plan (team)</td>
<td>5%</td>
</tr>
</tbody>
</table>

**Submit by the week of April 1**

: Please see details of the summarized plan at UBlearns.

**b. Meeting with "Helpers" and “Mentors”:**

The groups are required to meet the "Helpers" AND “Mentors” at regular intervals to review their work. This is very much essential so that all the efforts put in by the students are worthwhile and also in line with what is required. Meeting with the "Helpers" and “Mentors” must be done at their convenience and with prior appointment. **This is worth 2% of the grade.**

**4. End-Term Project:**

The end-term project involves working on an e-business project based on one of the ideas generated above in Point 2 and extending Point 3. Each group will be assigned to a Mentor (HP / EDS personnel or Rajarshi C.) who will help the group to analyze the case. Communication to mentors will be mostly through email and telephone. Personal meetings can be arranged at the convenience of the mentors. It is required that students review their plan on a regular basis with their mentors. More details will be provided in the later half of the semester.
End-Term Project Grading split-up: (total - 20%)

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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</thead>
<tbody>
<tr>
<td>Project Analysis and Report (and regular meetings with mentors and helpers)</td>
<td>10%</td>
</tr>
<tr>
<td>Presentation</td>
<td>10%</td>
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</tbody>
</table>

One half of each team is expected to deliver the final presentation for the project while the other half will handle the Q&A. The presentation should consist of no more than 18 slides and should be submitted in advance to the TA for circulation. Each team in the audience should have at least one question for the presenting team.

Attendance at Helpers’ Lectures and Guest Lectures is mandatory. Prior approval of Instructor is required in case of any unavoidable circumstances. As class participation and discussions will dominate the classes, readings before class are very much essential. Everybody can learn from the new field of E-commerce if there is sufficient sharing of information. Use the Online Companion resources along with the text for the readings.

Academic Integrity:

As clearly stated in the student handbooks (undergraduate, MBA, and Ph.D.), all have an obligation to maintain high personal standards of academic integrity and honesty. (Please refer to your student handbook for details.)

There will be 5-8 assignments/labs works. Some of the assignments will be individual, while the rest will be group assignments. Some assignments will carry more weight than others. The real-life term projects are group projects and should be done in groups of 4-5 students. Each group will be identified by a group name.

Prerequisites:

MGS 607 and MGS 650 or Permission of the instructor
These will be mainly hands-on practice type assignments, most of which will be directly related to the e-commerce security issues being discussed throughout the course. The main purpose of these assignments is to expose students to at least some parts of currently available technologies used in e-commerce, especially e-commerce security. There are 3-4 individual assignments and 4-5 group assignments. Except for the individual assignments, all assignments may be done in Sleiman Lab computing facility.

*These are tentative and may change depending on the circumstances.*

Also, you need to submit the Acknowledgement of Ethics and Responsibility for Use of Information and Information Systems.

**Intro to Assignments:**
(Detailed Directions will be distributed in class according to the assignment schedule.)

1. **Languages on the Web Part I (HTML)** (Individual Project): **2.5 points**

   Today’s prosperity of the web and e-commerce are largely indebted to the simple and easy to learn web language, HTML. HTML can effectively represent various resources (e.g., text, image, sound, or locations on the web) using limited number of tags. While HTML became the foundation of the Web, yet other languages (e.g., XML, OWL, CGI, ASP, Java) can be used or being developed in order to fulfill today’s complex requirements that HTML cannot handle. Therefore, understanding the structure of such languages and the process of web site development are crucial steps to understand how e-commerce works.

   This practice is divided into two sub projects. In the first practice (Part I), you need to create a hypothetical e-commerce website on the UB web server (wings), by MANUALLY coding HTML pages and using uploading them. The elements included in the website will be redirections, frames, blinking texts, and tables. For the second part, refer to the practice # 6.

   Reference chapter:
   - Ch. 2 Technology Infrastructure

2. **Secure E-Mail Communication** (Individual Project): **2.5 points**

   E-Mail has been an integral part of everyday business practice as well as private life. However, e-mail is not a secure communication method, as e-mail messages in transit can be seen by anyone who can tap into the transmission path, a sender can impersonate someone else or deny the fact that he/she sent out the email. These problems inherent to the technical architecture prevent businesses from adopting email as the formal communication method with their customers, vendors, and another employee. One way to solve this problem is using a cryptography system to encrypt the content of an email and attaching a digital signature to the email.

   In this practice, you need to use a cryptography tool to encrypt and digitally sign your emails and communicate with your team mates and the TA.

   Reference chapter:
   - Ch. 3 Selling on the Web
   - Ch. 10 Electronic Commerce Security

3. **Digital Certificates** (Individual Project): **2.5 points**

   Digital Certificates provide a means of proving your identity in electronic transactions, much like a driver license or a passport does in face-to-face interactions. With a Digital Certificate, you can assure friends, business associates, and online services that the electronic information they receive from you are authentic. They are tamper-proof and cannot be forged.

   Digital certificates do two things:
   1. They authenticate that their holders-people, web sites, and even network resources such as routers - are truly who or what they claim to be.
   2. They protect data exchanged online from theft or tampering.

   Digital certificates are used in all implementations of public key infrastructure. A digital certificate is nothing more than an envelope for the public part of an asymmetric key. The envelope has attributes about
the owner such as e-mail address, name and the key. Digital certificates are also considered to be secure because they can be verified for authenticity when distributed by a trusted organization.

In this practice, you will learn to request, import and install the CA certificate through a web interface. The lab will allow you to request general trust certificate between your computer and the root CA.

Reference chapter:
- Ch. 10 Electronic Commerce Security
- Ch. 11 Payment Systems for Electronic Commerce

4. **Web Log Analysis (Group Project): 5 points**

Phenomenal growth in the Web has resulted in millions of websites and ten of millions of web users. This has on one hand opened up new markets for many businesses but on the other hand introduced much more competition in marketplace for on-lien businesses. For a successful business it is essential to understand the needs and activities of a consumer.

In traditional marketing, often businesses construct a profile of target audience in terms of demographics and psychographics. With the Web, however, you don't know much at all about the visitors to your web site - as most visitors are anonymous. They come and go from your site without much of a trace. One way to understand the consumers in on-line environment is through analysis of on-line activity. Today, there are many tools available in market, which allow you to analyze the data about visitors to your site.

In this practice, you will learn different capabilities of these tools.

The web traffic analysis can provide data about visitors, including how many visited and where they came from, and what they do when they get there. As the number of internet users and sites increase, as the number of page requests increases exponentially. Web traffic analysis tools can also give an insight into the peak hours, bandwidth usage and bottleneck creations. Despite the lack of certainty in Web traffic numbers (different tools may give somewhat different numbers for the same log files), analyzing your traffic can be invaluable. For example, do you want to know why your customers abandon their virtual shopping carts before hitting the checkout line? Look at the page-navigation statistics. Can't understand why visitors never make it to the fourth page of your online catalog? See how much time they're forced to spend on the first three pages. Sensing a dramatic shift in the demographics of your visitors? Some analysis tools can also show you which Web sites they visited before coming to you. These are few of the things the web analysis tools can achieve. Broadly speaking, you have three ways to go about measuring and analyzing Web traffic.

Reference chapter:
- Ch. 8. Web Server Hardware and Software
- Ch. 9. Electronic Commerce Software

5. **Analysis of Cloud Vendors’ Policies (Individual project): 5 points**

Cloud computing has gone mainstream with its wide-scale adoption by companies and consumers. Its biggest strength is the ability to scale easily and the low upfront investment in IT infrastructure components. This new paradigm of computation can be useful at several “layers” of IT solutions, ranging from rented software to rented hardware. However, the trade-off faced by most of the clients of cloud computing vendors is the loss of ownership of data and infrastructure. This loss is of varying degree depending on the type of cloud computing service a client adopts. The information assurance available from cloud computing vendors is thus an important element in making business decisions about cloud service adoption.

In this exercise, you will be asked to investigate security and privacy policies of two cloud computing vendors (i.e. companies who provide cloud computing services). In particular, these policies will pertain to the client-related data that are stored in the vendors’ own infrastructure through one or more of their cloud computing services. Your investigation will entail answering a few questions from a questionnaire (to be made available soon) based on information gathered (e.g. policy statements) about these vendors. E.g. you are expected to answer “yes” for vendor X if the question is “Does this vendor inform clients beforehand about data migration in case they are acquired by another company?” and if the security or privacy policy of vendor X suggests exactly the same. You will be assigned the vendors along with appropriate links to search relevant information as we get closer to the assignment date.
6. Online Transaction and Secure Sockets Layer (SSL) (Group Project): 5 points
Online transactions often involve sending and receiving sensitive information such as a credit card number and passwords for online banking sites over the Internet. However, the popular application layer protocols like HTTP that use plain text to exchange such sensitive messages, are not adequate for online transaction. The most popular technique that provides both acceptable security and convenience of the web is using SSL. SSL protocol runs between application layer (e.g., HTTP) and transport layer (TCP) and establish an encrypted connection between SSL-enabled server and client to. SSL utilizes standard techniques of public-key cryptography to check that both client’s and server's certificates and public IDs are valid and have been issued by a certificate authority (CA) listed in the client's list of trusted CAs.
In this practice, you need to monitor SSL connection with a web site (HTTPS) using Ethereal, explain the handshaking procedure between the SSL-enabled server and client, and compare it with an insecure HTTP connection.
Reference chapter:
   Ch. 10 Electronic Commerce Security
   Ch. 11 Payment Systems for Electronic Commerce

7. Languages on the Web Part II (XML) (Individual Project): 2.5 points
XML was developed to offset HTML’s shortcomings and is now widely utilized by many e-commerce applications. As a meta-language, XML allows users to define tags of their own, and thus to define data structure within the document. This capability makes XML an ideal web language for data exchange once done with proprietary EDI data formats. Furthermore, XML has become a critical part of the concept of Semantic Web, becoming a foundational language for layers of other technologies (e.g., RDF, RDFS, OWL). In this project, you will MANUALLY create a XML document suite that can be exchanged and easily utilized among multiple organizations.
Reference chapter:
   Ch. 2 Technology Infrastructure

8. Languages on the Web Part III: Ajax (Voluntary individual Project): 2.5 points
Ajax (Asynchronous JavaScript and XML) is a set of web programming standards, including HTML, XML, CSS, Javascript and Document objective, to enable developers to create faster, user-friendly and interactive web application. Through the asynchronous data transfer Ajax provides, web application can request only the content which need to be updated instead of reloading the whole pages, which therefore significantly reduced bandwidth usage and respond time. Because of these advantages, Ajax has become popular since 2005 and gets increasing supports from mainstream software vendors like Google. More and more complicated web applications are developed using Ajax. Gmail and YouTube are good applications of Ajax. In this lab, you need to analyze the structure of a simple Ajax application and deploy it on a web server.
Reference chapter:
   Ch. 8 Web Server Hardware and Software
   Ch. 9 Electronic Commerce Software

9. E-commerce store homework (Group Project): 10 points
Electronic commerce is changing the way the world shops. Electronic commerce is defined here as browser based sites created for the purpose of selling goods and services over the Internet, regardless of whether the actual sale takes place on the Internet or via fax, phone, or another means provided by the website. The electronic commerce market is exploding at a remarkable rate. In order to leverage this new marketing strategy, companies must understand how to create usable e-commerce sites based on their target markets. Electronic shopping has some key differences from physical shopping. First, it is easy to go from one site to another for purposes of price comparison, product selection, and ease of finding the product. There is minimal overhead for changing sites, unlike getting back in the car and driving a distance to a similar store, so sites that offer a range of products that are easy to find on the site and priced competitively will do well. A successful site attracts additional customers and reduces the workload of the sales force by providing much or all of the information that they would have had to provide.
In this homework, students will develop justifications for the E-commerce website and create with a tool provided by Ecart.com as a victim on their own website.

- **Part I: E-commerce store creation strategy reports**
- **Part II: Building an e-commerce website**

Reference chapter:
- Ch. 3 Selling on the Web
- Ch. 4 Marketing on the Web
- Ch. 12 Planning for electronic commerce

**Some web sites for reference:**
- [http://en.wikipedia.org/wiki/Web_2.0](http://en.wikipedia.org/wiki/Web_2.0)
- [www.smallpieces.com](http://www.smallpieces.com)
- [http://ses.symantec.com/content.cfm?articleid=1539](http://ses.symantec.com/content.cfm?articleid=1539)
- [http://www.samspade.org/](http://www.samspade.org/)
- [http://www.iaac.org.uk/](http://www.iaac.org.uk/)
- [http://www.gnupg.org/](http://www.gnupg.org/)
- [http://www.us-cert.gov/index.html](http://www.us-cert.gov/index.html)