

F&F Wholesale E-Commerce Web site

By

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Submitted to
the Faculty of the Information Engineering Technology Program
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Abstract

The F&F Wholesale E-Commerce Web site was created for Mr. Michael Fellingner, a Hunting Equipment Sales Distribution manager from Dallas, Texas, who plans to start a small online retail trade by selling imported Germany and Switzerland hunting equipment. Mr. Fellingner found that most US dealers, who are major buyers, do not import. Instead, US dealers typically buy from exclusive importers due to customs hassles.

The F&F Wholesale Web site targets dealers and retail end-users and entails multimedia, programming, and database. There is a customer front-end of the site, as well as a backend administrative console with a secure login. ColdFusion was used as the main programming tool, and SQL Server 2000 was used for the database. The Web site focuses on design and usability because studies have shown that usability is a prerequisite for E-Commerce success.

F&F Wholesale E-Commerce Web site

1. Statement of the Problem

There are several hunting manufacturing companies in Germany and Switzerland that want to expand sales into the United States (5). They are looking for a company based in the United States to warehouse and sell their products because they have found that most US dealers, who are major buyers, do not import. Instead, US dealers typically buy from exclusive importers due to customs hassles (5).

1.1 Definition of the Need

F&F Wholesale, a Hunting Equipment Sales Distribution company based in Dallas, Texas expressed interest to the manufacturers and agreed to sell their products. F&F Wholesale plans to sell the imported products primarily through an E-Commerce Web site and with catalogs. The main purpose of the Web site is to start a small retail trade by providing information for dealers so they will order on a wholesale level, although retail end users will also be considered. The companies that will be represented on the Web site are small German and Swiss companies, such as Linder Knives Inc., that make quality products at a low cost.

1.2 Review of the Literature

Despite all of the dot-com failures, many people believe that “the future of business is E-Business”. E-Commerce is still young, and the future looks bright for companies to conduct business online (3, p. 4). While there are many benefits and rewards with E-Commerce today, building and maintaining an online business is not easy. Developing an E-Commerce site is very involved; it takes a lot of time, effort and creativity (13, p. 2). To create a successful E-Commerce site, it is essential to understand

how technology affects the business. It is important to consider both the technological side as well as the business side when developing an online business (3, p. 12).

1.3 Description of the Solution

The Hunting Supplies E-Commerce site that we developed is a Web site intended to sell imported hunting supplies to dealers and retail end-users over the Internet. There is no physical store where the consumers can go to purchase the items. The functionality of the site allows F&F Wholesale to completely automate inventory and purchasing business procedures.

We focused the Web site on design and usability because studies have shown that “usability is a prerequisite for E-Commerce success” (10, p. 1). We created an inviting atmosphere that clearly explains and illustrates exactly what the user needs to do in order to pick out a product and buy it on the site. If the user does not know how to use the Web site, they won’t purchase anything (10, p. 1).

2. User Profile

The intended users of the Web site are consumers: dealers and retail end-users. We developed the site in an easy to use format and also incorporated a help feature to assist those in an online purchasing procedure. To use the E-Commerce site, customers must have a general knowledge of the Internet. They should know how to connect to the Internet and navigate through pages. It is not necessary that they had ever purchased anything online before; our help feature will guide them through the entire process.

3. Design Protocols

For the design protocols, we developed flowcharts and inspected the interface design, navigation, icons, graphic symbols, color scheme, and help feature.

3.1 Flowcharts

To display how our site works, we developed two flowcharts. We developed an administration console back-end flowchart and a consumer front-end flowchart. These two flowcharts are independent of each other. The charts are displayed in Appendix A and B, pages 13 and 14.

3.2 Interface Design/Navigation

For the interface design and navigation aspects of the site, we decided to keep things as simple and user-friendly as possible. We looked into Web site usability guides to ensure that our site follows usability standards. One book that we gained valuable information was from *Designing Web Usability: The Practice of Simplicity* written by Jakob Nielsen.

Jakob Nielsen is known for his Web site usability techniques and examines both the technical and psychological factors. Three technical factors that Mr. Nielsen believes are essential include “compatibility with the greatest range of browsers and browser versions, optimized pages and images for quick downloads, and coding pages which look good on both large and small monitors” (9, p.3).

In addition to looking into usability studies, we also examined successful E-Commerce sites such as Target.com, JCrew.com, and Amazon.com. During the development of the site, we strived to create a professional look that would intrigue

customers into purchasing products and add credibility to the products and services that are offered. Figures 1 and 2 are screen shots of the front-end of the site.

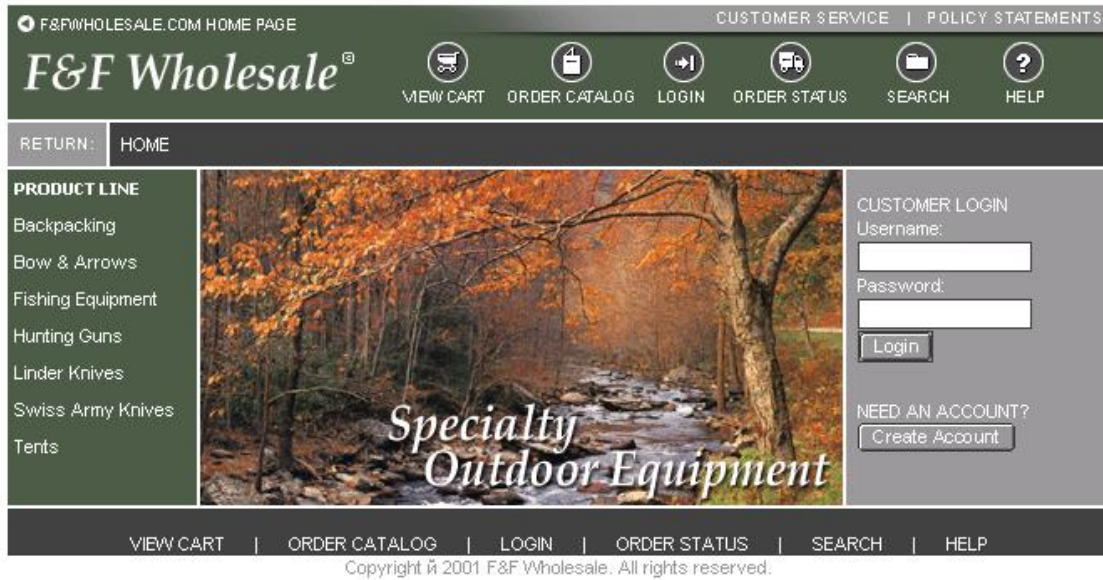


Figure 1. Front-end: Opening Page

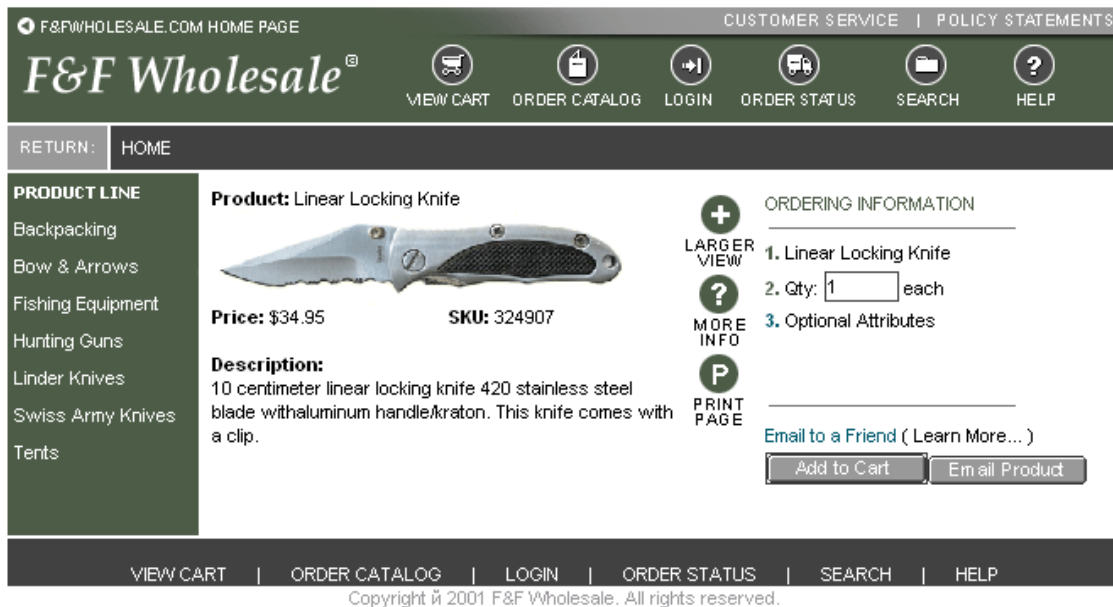


Figure 2. Front-end: Product Details

When a consumer visits our site, all of the navigation is found at the top and left sides of the page, and it doesn't change. We did this is to ensure that the user doesn't get lost in the site. We also created a site map for the user so they can learn the site architecture.

The interface design of the administrative console to the site is very similar to the front-end of the site. We gave the back-end and front-end of the site the same look-and-feel. The administrative console is secured by a username and password. Figures 3 and 4 are screen shots of the administrative console.

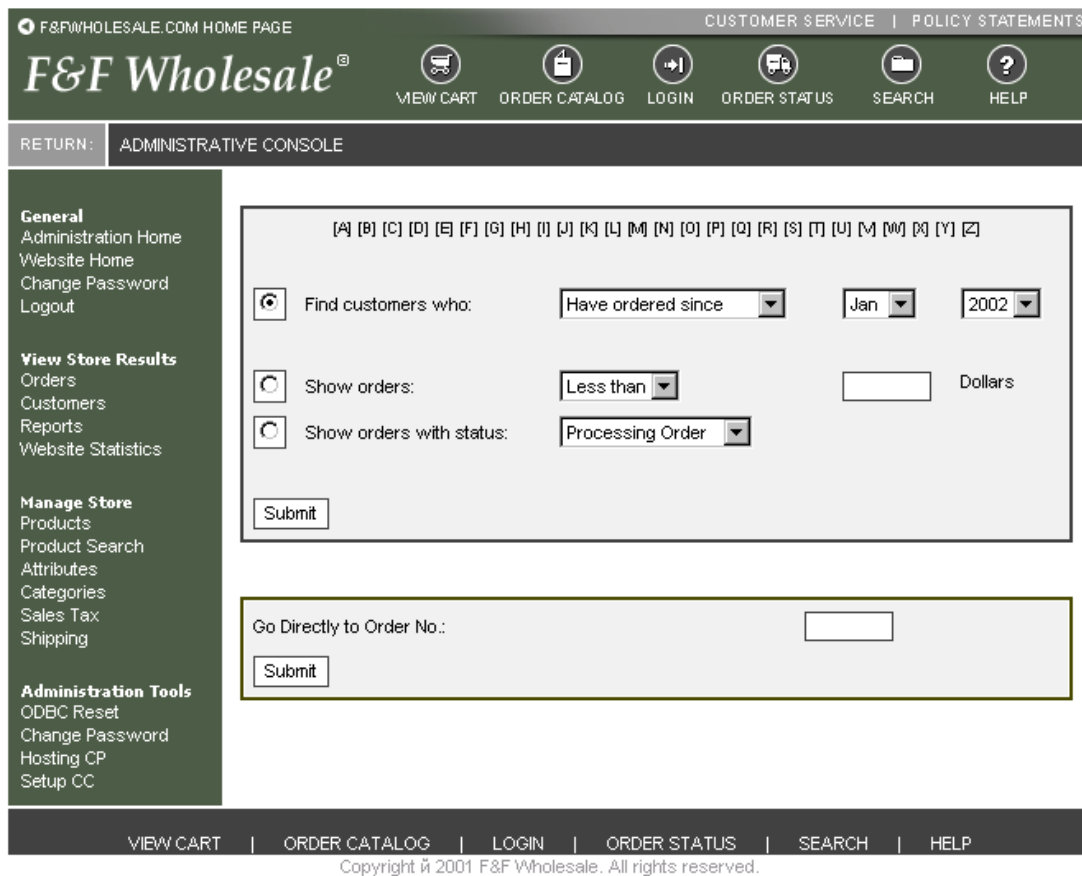


Figure 3. Back-end: View Store Results - Customers

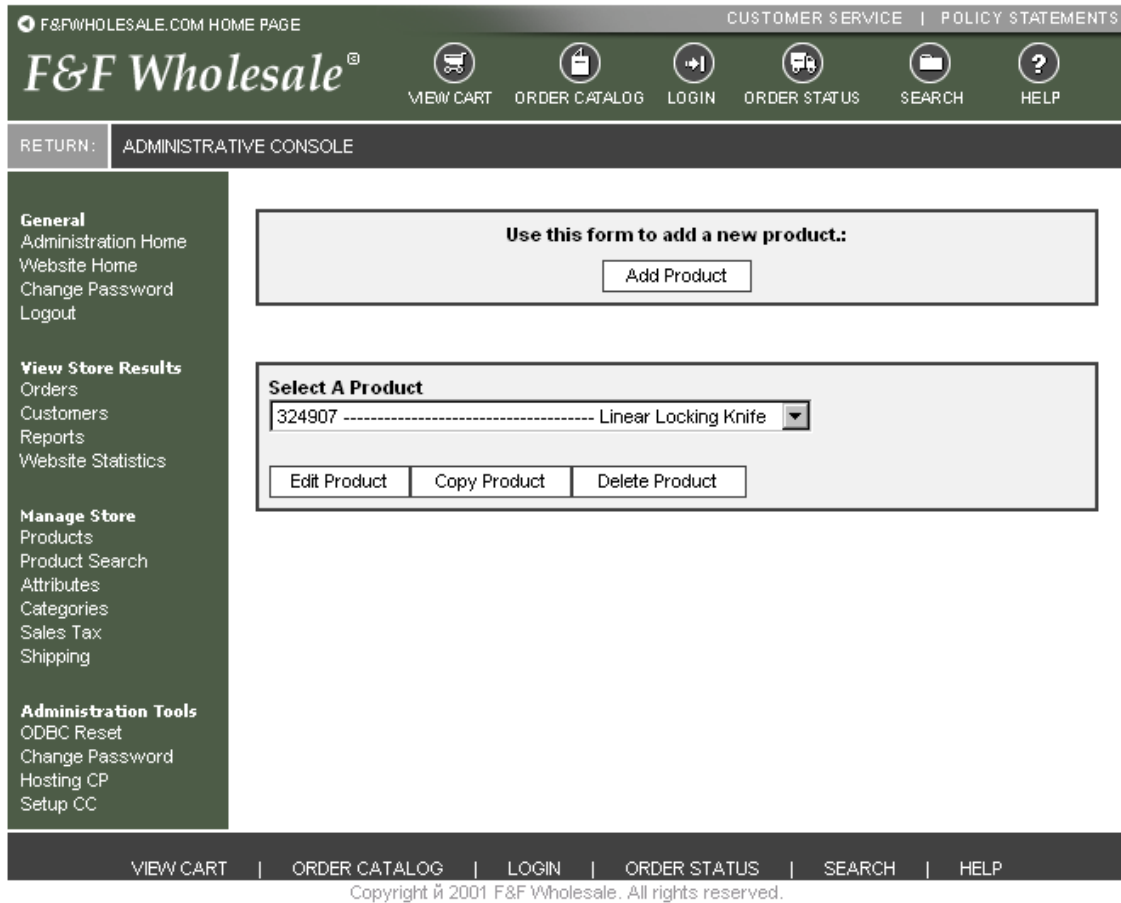


Figure 4. Back-end: Manage Store - Products

3.1 Icons/Graphic Symbols

Various graphics and icons were designed for the Web site. On the opening page, there is a graphic displaying the Web site logo. Icons are used for navigational purposes and are located on the top navigational bar. On the inside pages, there are images displaying the products as thumbnails, as well as the option to view the product in an enlarged view.

3.2 Color Scheme

We decided to use hunter green, orange, tan, and white colors for our site because they are earth tone colors. We found that people associate these colors with the outdoors and camping. For instance, if you go into a store to look for camping gear, many of the camping items are brown or green. Since our site offers hunting and camping products, we felt that these colors were appropriate and might play on their emotions to buy products.

3.3 Help Feature

We developed a help option on our site that is always available to the consumer and is found on the top navigational bar. The help option describes an online purchase procedure by stepping through the purchasing process. The customer service link also contains help by providing contact information to inquiry about products or services.

4. Deliverables

We devised two sets of deliverables as shown in sections 4.1 and 4.2. The deliverables listed in 4.1 are items that we were sure we could produce by the end of Senior Design III. The deliverables listed in 4.2 are items that were dependant on F&F Wholesale, so we could guarantee that we were able to produce these. F&F Wholesale informed us that they are more cautious due to the economy and have not decided to go live with the site yet.

4.1 Definite Deliverables

- a. An administrative backend with secure login:
 - i. To allow administrators to modify aspects of the shopping cart and products and print reports of total product
- b. Customer Relationship Management
 - i. Query database of customers
 - ii. Look up customer by date of last order, order amount or order number
- c. Customer Self Service
 - i. Customer can check status of orders
 - ii. Customers can update their information
- d. Shopping cart built with ColdFusion
- e. Search feature to enable customers to search for specific products
- f. Help option to provide information about the online purchase process
- g. SQL Server 2000 database
- h. Multimedia elements:
 - i. Interface development
 - ii. Logo design
 - iii. Pictures of products
 - iv. Icons

4.2 Potential Deliverables

- a. Domain Name
- b. Hosting
- c. Credit Card Authorization
- d. Secure Socket Layer

5. Design and Development

The design and development section describes the budget and project timeline. In the final budget, we considered all expenses, including hardware, software, and miscellaneous E-Commerce fees. In the timeline, we outlined the entire project from Senior Design I-III.

5.1 Budget

F&F Wholesale offered to fund the E-Commerce aspects of the project, while we covered the hardware and software costs. Figures 5, 6, and 7 display the cost of each individual hardware, software, and miscellaneous item, as well as where the information was obtained. Figure 8 displays the final budget as a total of all hardware, software, and E-Commerce and miscellaneous costs.

<i>Hardware</i>	<i>Price</i>	<i>Source</i>
Desktop Dell Computer running Windows XP (<i>with IIS</i>): 900 MHz Intel Celeron processor 256 MB SDRAM 20GB Hard Drive 19" Monitor	\$799	www.dell.com
HP ScanJet 4400Cse Scanner	\$149	www.dell.com
Lexmark X83 Color Jetprinter	\$179	www.dell.com

Figure 5. Hardware Expenses

<i>Software</i>	<i>Price</i>	<i>Source</i>
Microsoft Office 2000 Professional	\$599	www.microsoft.com
SQL Server 2000	\$1,489	www.microsoft.com
ColdFusion Server 5.0	\$1,295	www.allaire.com
ColdFusion Studio 4.5	\$495	www.allaire.com
Dreamweaver 4.0	\$299	www.macromedia.com
Adobe Photoshop 6.0	\$609	www.adobe.com
Flash 5.0	\$399	www.adobe.com

Figure 6. Software Expenses

<i>E-Commerce & Miscellaneous</i>	<i>Price</i>	<i>Source</i>
Credit Card Verification (per year)	\$300	www.paymentech.com
Secure Socket Layer (<i>Free with hosting</i>)	\$0	www.crystaltech.com
Website Hosting (per year)	\$600	www.crystaltech.com
Domain Name (per year)	\$35	www.inww.com

Figure 7. E-Commerce & Miscellaneous Expenses

Total Budget:	
Hardware	\$1,127.00
Software	\$5,185.00
E-Commerce & Miscellaneous	\$ 935.00
<hr/>	
<i>* Total</i>	<i>\$7,247.00</i>

Figure 8. Total Budget

5.2 Project Timeline

The project timeline is shown in Appendix C, page 15 and displays the start date, end date, and the person responsible for each specific task. The project started in April of 2001 and finished on March 7, 2002.

6. Proof of Design

To determine if the F&F Wholesale Web site was successful, our client, potential customers, and the IET staff all had to be satisfied with the final product. In addition, we had to ensure that the F&F Wholesale Web site was error-free, so we thoroughly tested the site during Senior Design III. We tested on various operating systems including MAC and Windows, as well as different versions of the Netscape and Internet Explorer browsers. No major errors were detected.

F&F Wholesale was very happy with the final Web site and plans to go live with it in the upcoming months. They were especially pleased with the secure administrative console that will enable them to manage both the products and customers efficiently.

“Unfortunately, we are not ready to go live with the E-Commerce Web site quite yet; the economic conditions and time frame are not convenient at this time,” stated Mr. Fellingner, owner and operator of F&F Wholesale. “I will be totally confident to use this site when we are ready.”

To determine if the potential customers were satisfied with the site, studies were conducted. A sample of ten people including IET students, friends, and co-workers filled out the questionnaire and gave their input in Appendix D, page 16. The interface, navigation, and design features were all evaluated. Overall, everyone was pleased with

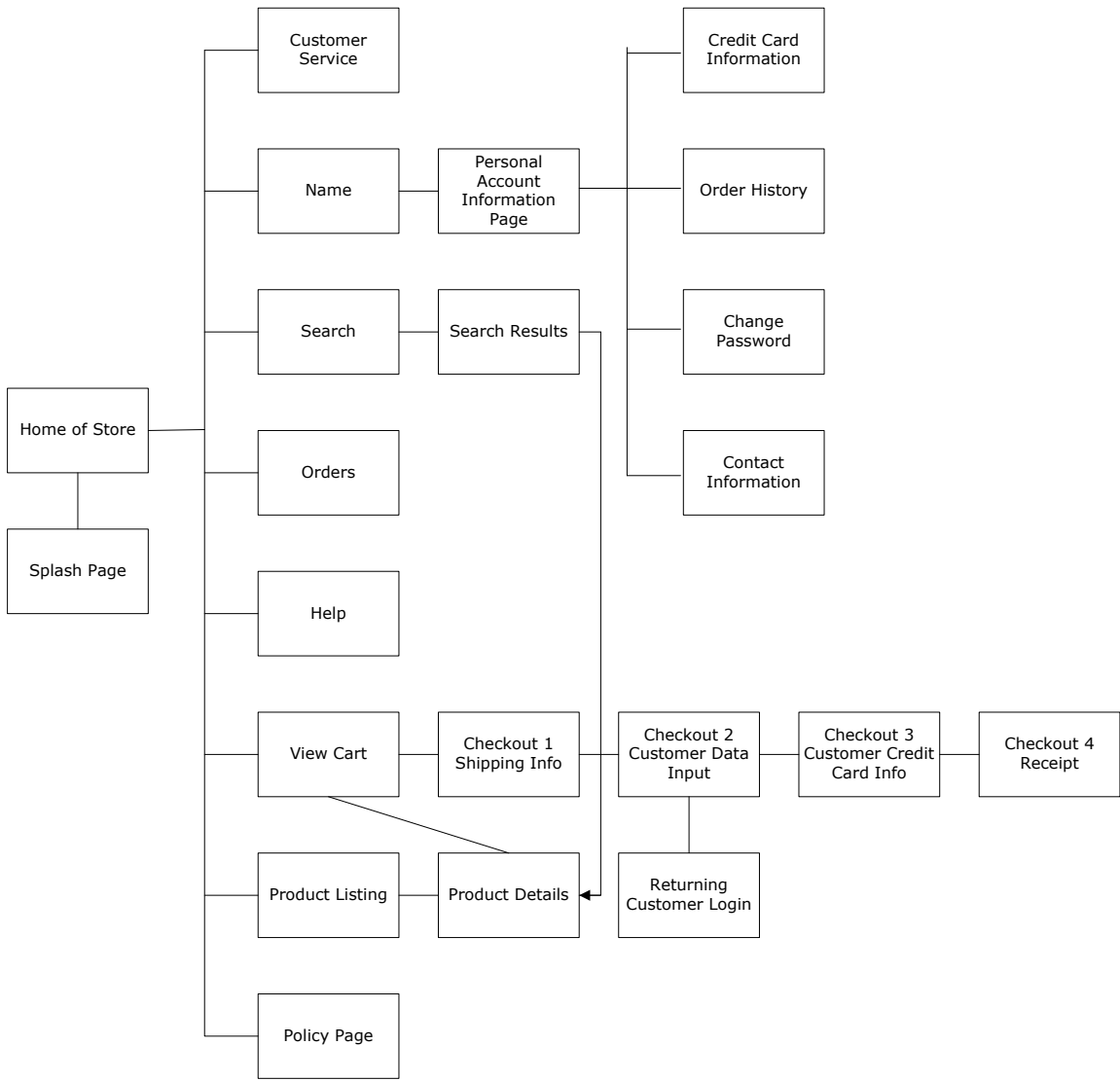
the site. 8 out of the 10 people circled “Excellent” ratings for all of the questions, and the other two people circled a combination of “Excellent” and “Good” ratings.

To determine if the IET staff was satisfied with the site, the deliverables needed to be examined. Before we started this project, we were aware that there was a chance that Mr. Fellingner may not be ready to go live with this site by March 2002; therefore, two sets of deliverables were developed: a definite deliverable list and a potential deliverable list. All of the definite deliverables were met and thoroughly tested for completeness. Due to F&F Wholesale’s request to wait on going live, the potential deliverables were not implemented.

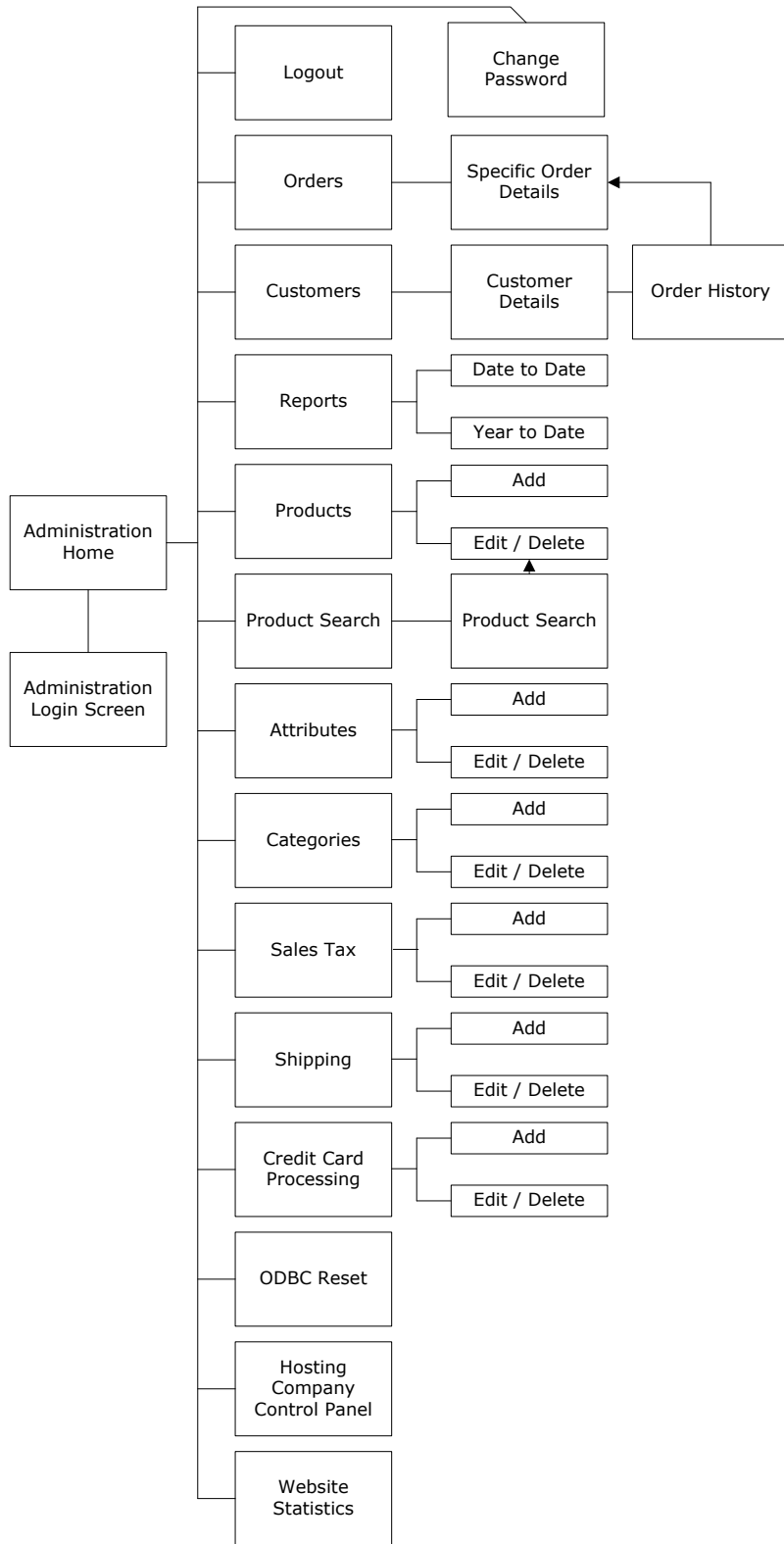
7. Conclusions and Recommendations

Overall, the development of the F&F Wholesale E-Commerce Web site was a challenging and rewarding experience. We received many positive comments, and our client was very happy with the results.

Appendix A. Front-end Flowchart



Appendix B. Back-end Flowchart



Appendix C. Project Timeline

<u>Responsible</u>	<u>Task Name</u>	<u>Start Date</u>	<u>End Date</u>	<u>Completed</u>
Spring Quarter - Senior Design I				
Julie / Joe	Determine Subject	3/28/2001	4/2/2001	Yes
Julie / Joe	Develop Problem / Area of Inquiry	4/2/2001	4/18/2001	Yes
Julie / Joe	Write Proposal	4/18/2001	5/22/2001	Yes
Julie / Joe	Presentation of Proposal	5/12/2001	5/22/2001	Yes
Summer Quarter - (Break)				
Joe	Define a Rough Web site Layout	6/12/2001	6/19/2001	Yes
Julie	Develop Access Database	5/22/2001	11/2/2001	Yes
	Populate Database with Mock			
Joe	Products	5/29/2001	5/31/2001	Yes
Joe	Develop Backend Administration	6/1/2001	10/6/2001	Yes
Joe	Develop Shopping Cart	7/10/2001	11/14/2001	Yes
	Create Administrative Login			
Julie	Feature	10/25/2001	12/30/2001	Yes
	Create Web site Product Search			
Julie	Feature	11/9/2001	11/16/2001	Yes
Julie	Develop Lost Password Feature	12/30/2001	2/11/2002	Yes
	Develop and Format Product			
Julie	Pictures	11/20/2001	1/31/2002	Yes
Julie / Joe	Develop Product Materials	11/20/2001	2/15/2002	Yes
	Populate Database with Actual			
Julie	Products	11/20/2001	2/5/2002	Yes
Senior Design II				
Joe	Develop Company Logo	10/8/2001	10/15/2001	Yes
Julie / Joe	Create Web site Interface Design	9/25/2001	10/3/2001	Yes
Julie / Joe	Write Design Freeze Paper Draft	9/28/2001	11/6/2001	Yes
Julie / Joe	Finalize Design Freeze Paper	11/25/2001	11/28/2001	Yes
	Prepare Web site for Prototype			
Julie / Joe	Presentation	11/25/2001	11/26/2001	Yes
Julie / Joe	Prepare Material for Presentation	11/25/2001	11/28/2001	Yes
Julie / Joe	Presentation of Prototype	11/28/2001	11/28/2001	Yes
Senior Design III				
Joe	Register Domain Name	1/3/2002	1/4/2002	N/A
Joe	Setup Hosting	1/3/2002	1/3/2002	N/A
Julie	Setup Credit Card Authorization	1/3/2002	1/3/2002	N/A
	Convert Access 2000 to SQL			
Julie	Server 2000	1/5/2002	1/8/2002	Yes
	Develop Connectivity to Secure			
Joe	Socket Layer	1/5/2002	1/5/2002	N/A

Senior Design III (continued)

Joe	Register for Merchant Card Verification Service	1/12/2002	1/12/2002	N/A
Julie / Joe	Write Final Report and Final Documentation	1/5/2002	3/8/2002	Yes
Julie / Joe	Beta Testing	2/14/2002	3/8/2002	Yes
Julie / Joe	Prepare Material for Presentation	2/28/2002	3/7/2002	Yes
Julie / Joe	Presentation of Final Project	3/8/2002	3/8/2002	Yes

Appendix D. Evaluation Form

User computer literacy: Low (0), Medium (2), High (8)

Have you ever made an online purchase? Yes (8), No (2)

** Rate each question 1 – 5 (1 being poor and 5 being excellent)*

Interface Design / Navigation:

- 1 2 3 4 5 How is the Web site interface design? (8 surveys circled 5)
- 1 2 3 4 5 Is it easy to navigate throughout the site? (8 surveys circled 5)
- 1 2 3 4 5 Are the icons clear? (8 surveys circled 5)
- 1 2 3 4 5 Is it easy to create a new login account and update your information?
(8 surveys circled 5)
- 1 2 3 4 5 How do you like the search feature? (8 surveys circled 5)
- 1 2 3 4 5 How do you like the help feature? (8 surveys circled 5)
- 1 2 3 4 5 Are the directions to make an online purchase clear?
(8 surveys circled 5)
- 1 2 3 4 5 Would you know how to check the status of an order?
(8 surveys circled 5)

Design Features:

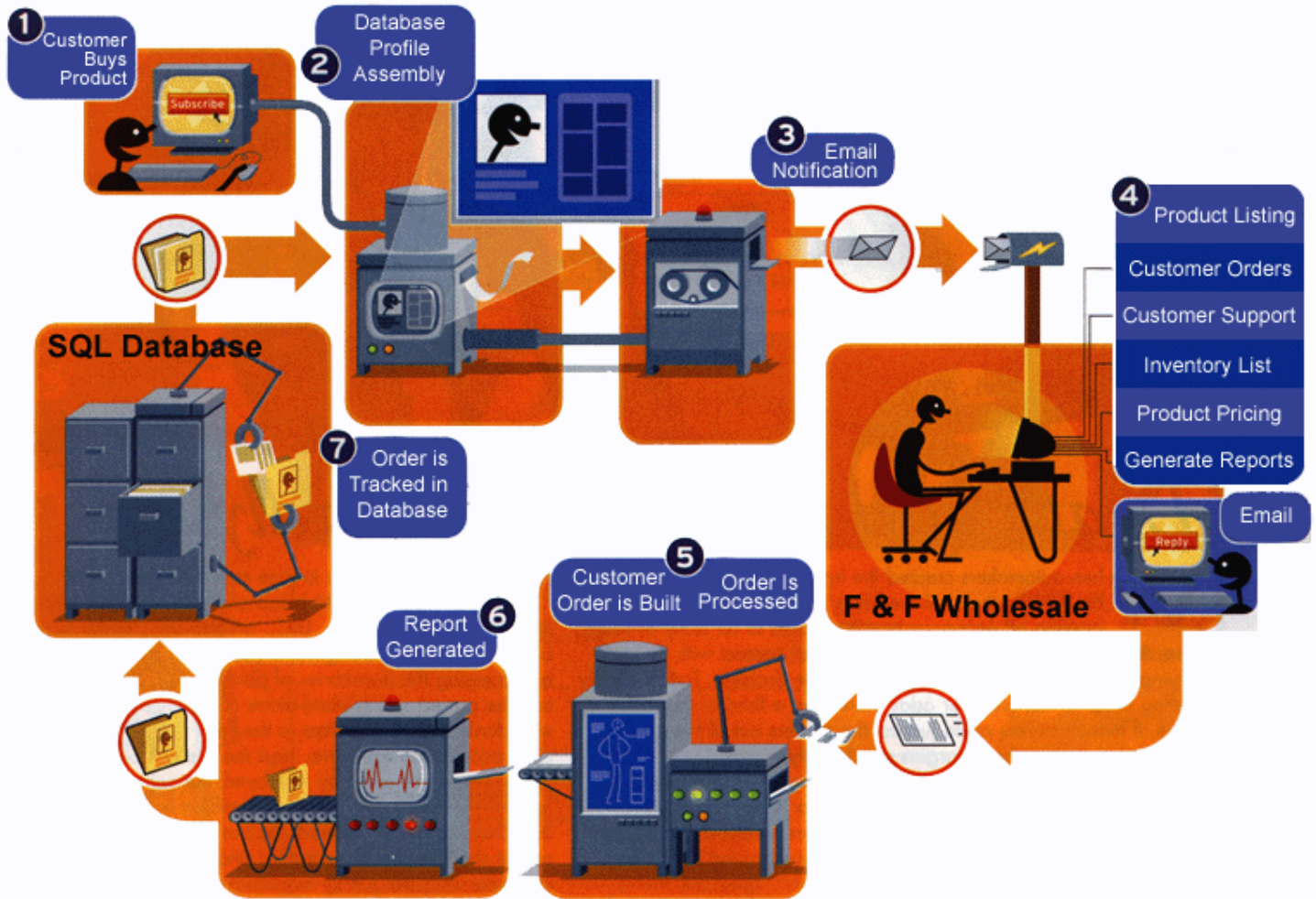
- 1 2 3 4 5 View on the opening page. (8 surveys circled 5)
- 1 2 3 4 5 Color scheme. (8 surveys circled 5)
- 1 2 3 4 5 Icons & graphics. (8 surveys circled 5)

Overall Rating:

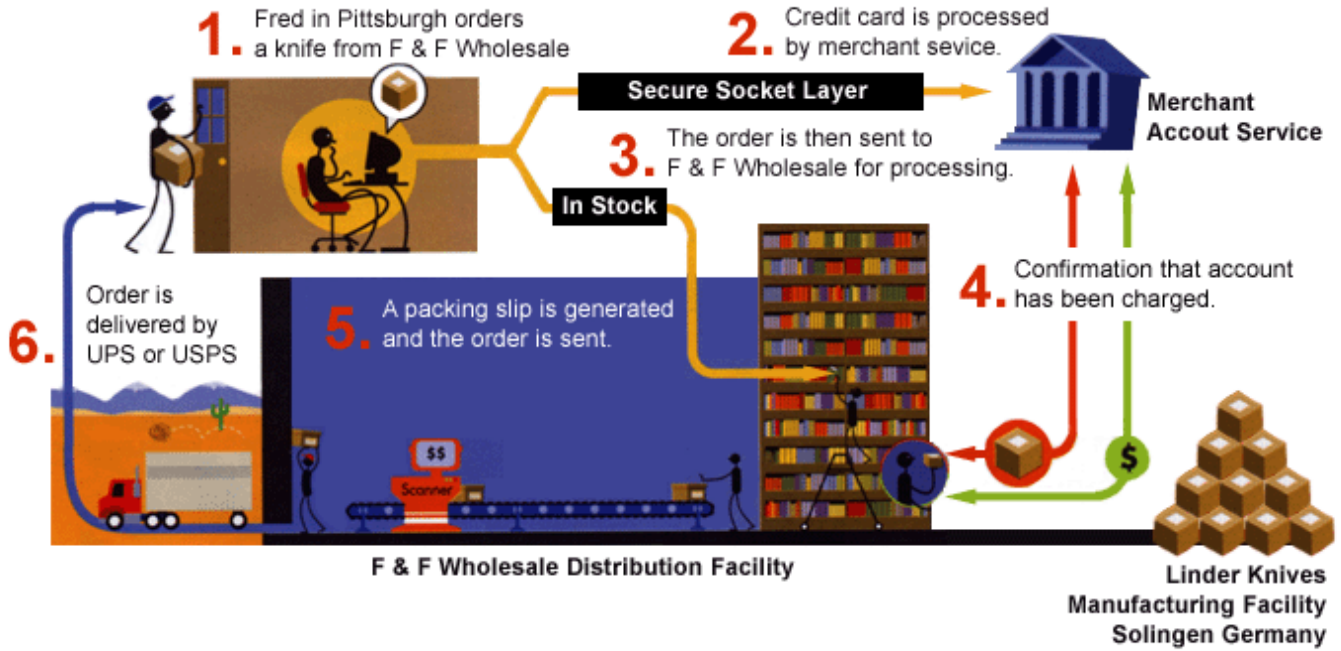
- 1 2 3 4 5 Overall opinion of the Web site. (8 surveys circled 5)

- Comments/Suggestions:**
- Very impressive.
 - It has a clean and stylish look.
 - Easy to navigate.
 - Nice use of colors.

Appendix E. Transaction Process



Appendix F. Business Process



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