

Developing Web-Enabled Interactive Financial Tools Without HTML and Script Languages

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This article identifies an alternative approach to developing Web-enabled interactive financial tools without requiring HTML or script languages. A comparative product testing model was used with two dimensions (spreadsheet software and Web browser) to form 12 combinations for testing which combination(s) would produce a workable Web-enabled interactive financial trend analysis tool without HTML and script languages. The purposes of this study are fourfold: (a) to reduce the complexity of developing Web-enabled financial calculators; (b) to provide educators with a cost-effective alternative for teaching students to develop such interactive Web applications; (c) to increase the productivity of Web developers; and (d) to stimulate students' creative thinking in generating new ideas and products.

The Internet and Web technologies are fundamentally changing the way business is done, the way software applications and services are being built and delivered, and the way people work, study, and live. While companies and consumers have been experiencing the tremendous benefits of using Web-enabled interactive database applications such as online shopping, trading, banking, inventory, and accounts management, they also demand more Web-enabled, interactive financial applications for boosting user and organizational productivity in data analysis, problem solving, and decision-making (e.g., Charski, 2000; Kulman, 1999; Lim, Dillion, Pethokoukis, & Charski, 2000; Perry, 2000; Wiener, 2000). To meet these growing demands, employers in all areas seek to hire individuals who can develop and support Internet, intranets, and Web applications (Bureau of Labor Statistics, 2000). Corporate recruiters expect the business school graduates they hire to have Web-related skills, and more business schools are offering Internet and e-commerce training (Korry, 1999).

Currently, most Web-based interactive financial tools available on the Web, such as loan payment calculators, retirement planners, and business budgeting tools, are developed with HTML and script languages (e.g., FinanCenter.com, 2001; MoneyAdvisor.com, 2001; SectorUpdates.com, 2001). These financial tools play an important role in corporate business strategies because they help users increase productivity in data analysis,

problem solving, and decision-making and create customer loyalty. However, developing such applications not only require a good knowledge of HTML and script languages but also is time consuming. This application development hurdle indicates a need for identifying a more cost-effective alternative approach to developing Web-enabled interactive financial tools.

Problem Statement

The problem addressed in this study is to identify alternative approaches to developing Web-enabled interactive financial applications without requiring HTML and script languages. As the related literature indicates, while much current spreadsheet software enables users to save spreadsheet files in HTML format for Web publishing, software producers have also exerted efforts to make spreadsheets as integrated with Web technologies as possible. For instance, Microsoft Corporation (1998) created an Office Web component that is a Component Object Model (COM) for working in the Internet Explorer browser to provide basic grid or spreadsheet functionality. Corel's (1999) Quattro Pro 9 includes a new Web query tool that allows users to create Web queries and import data such as currency exchange rates and stock price lists

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from the Web. According to Patterson (2000), with Lotus' Internet tools, creating Web pages from Lotus 1-2-3 worksheets is a straightforward task. Similarly, Sun Microsystems challenges Microsoft Office suite by making its StarOffice suite highly compatible with Microsoft Office. Therefore, users can easily migrate and work with MS Office files on StarOffice. In addition, StarOffice has easy-to-use Web editing and publishing tools (Hamilton, 1999; O'Regan & Bu-Bois, 1999).

Based on this review of the capabilities of the most popular spreadsheet products, this paper examines the ability of Lotus 1-2-3, Microsoft Excel, Quattro Pro, and StarCalc to develop Web-enabled interactive financial calculators. The purpose of this study is fourfold: (a) to reduce the complexity of developing Web-enabled interactive financial calculators, (b) to provide educators with a cost-effective alternative for teaching students to develop Web-enabled interactive calculators; (c) to increase Web developers' productivity; and (d) to stimulate students' creative thinking in generating new ideas and products.

Procedures

A comparative product-testing model was designed with two dimensions, spreadsheet software and Web browser. The spreadsheet dimension included four types of spreadsheet software, Lotus 1-2-3 release 5, Microsoft Excel 97/2000, Corel Quattro Pro 9, and Sun StarCalc 5. The Web browser dimension contained three programs: Internet Explorer 5.6, Netscape Communicator 4.7, and StarOffice 5.1. These two dimensions formed a 4 x 3 design with 12 possible combinations for testing which environments would produce workable Web-enabled interactive financial trend analysis tools without HTML and script languages.

First, the author designed an interactive financial trend analysis tool on a spreadsheet. The layout of the tool includes an interactive input/output table and a related bar chart (see Figure 1). As shown in Figure 2, proper mathematical formulas and both relative and absolute references were used in the

appropriate cells so that entering key data can automatically generate trend analysis results and a bar chart.

Second, the author developed the financial trend analysis tool using the four different spreadsheet programs to create four versions of the tool for the Web. Then, the four versions were saved in varied types of spreadsheet files.

Third, the author posted each file on a local intranet and tested them on each of the three different Web browsers. If a file passed the initial tests, it would be published on the Internet for further testing. The final testing results are reported here.

Figure 1: Spreadsheet Design of Financial Trend Analysis

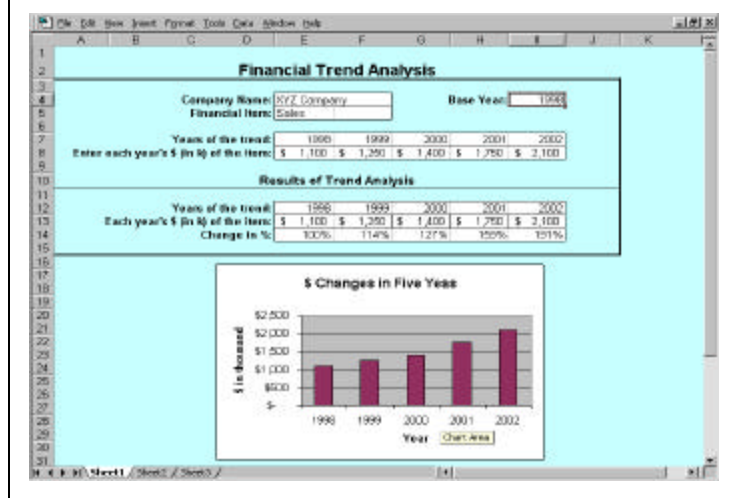
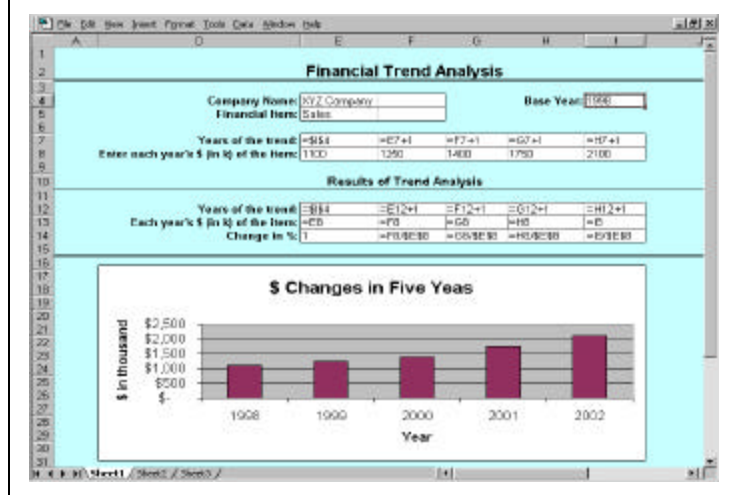


Figure 2: Spreadsheet Formulas of Financial Trend Analysis



Findings

Lotus 1-2-3. The financial trend analysis tool was developed using Lotus 1-2-3 and saved as a Lotus 1-2-3 file with .wk4 as the filename extension. As the testing results indicated, the Lotus file could not be browsed or used interactively with the Internet Explorer, Netscape Communicator, and StarOffice browsers, although the file could be downloaded from a Web site via Internet Explorer (see Figure 3) and automatically opened with Lotus 1-2-3 software when the Lotus software was available on the same computer (see Figure 4).

Microsoft Excel. Microsoft Excel 97 and 2000 were used to develop the financial trend analysis tool. Two files were created and saved as a Microsoft Excel 97 & 5.0/95 Workbook and a Microsoft Excel 97-2000 & 5.0/95 Workbook, respectively, with .xls as the filename extension. During the intranet and Internet testing, the Excel files could be browsed and used interactively with Internet Explorer as long as the Excel software was installed on the same computer (see Figure 5). Netscape Communicator could not use the applications. When using the StarOffice browser to access the files, the applications could be browsed on a read-only mode but could not be used interactively.

Quattro Pro. Quattro Pro 9 was used to develop and save the financial trend analysis tool as a Quattro Pro 9 file with .qpw as the filename extension. During the intranet and Internet testing, the Quattro Pro file could be browsed and used interactively only with Internet Explorer when Quattro Pro software was available on the same computer (see Figure 6). It was not accessible with the other two browsers.

Sun Microsystems StarCalc. StarCalc 5 spreadsheet software was used to develop and save the financial trend analysis tool as a StarCalc 5 file with .sdc as the filename extension. The test results indicated that the StarCalc 5 file could be accessed with Internet Explorer if that browser, in turn,

Figure 3: Downloading Lotus 1-2-3 File from a Web Site

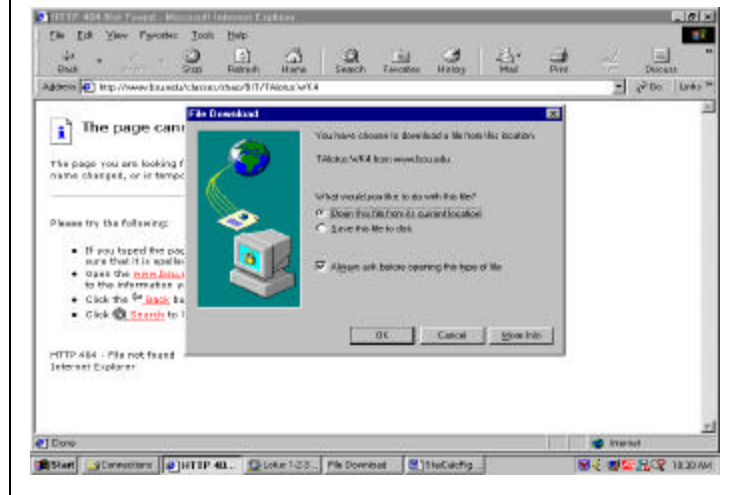


Figure 4: Lotus File of Financial Trend Analysis on Lotus 1-2-3 Spreadsheet

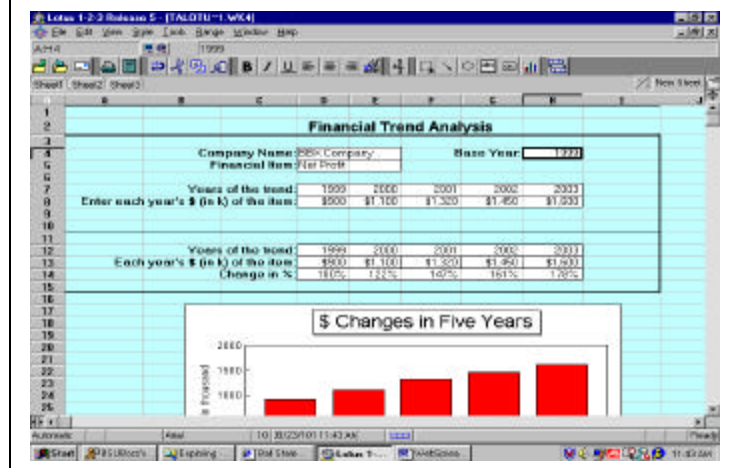
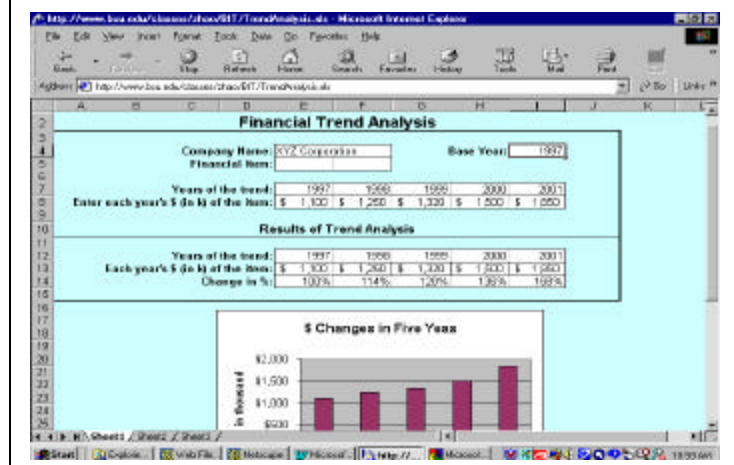


Figure 5: Excel File of Financial Trend Analysis on Internet Explorer



activated the StarOffice browser and transferred the file to StarOffice as a temporary internet file (see Figure 7). If accessed directly from the StarOffice browser, the application could only be browsed as a read-only file. The application could not be browsed or used interactively on Netscape Communicator or Internet Explorer.

Summary and Conclusions

Excel 97/2000, Quattro Pro 9, and StarCalc 5 can be used to develop Web-enabled interactive financial tools and other calculators without HTML and script languages. Excel and Quattro Pro spreadsheet applications can be browsed and used interactively with Internet Explorer only when the appropriate spreadsheet software is available on the user's computer. In contrast, StarCalc spreadsheet applications can only be browsed and used interactively with the StarOffice browser as temporary Internet files.

While browsing and using Excel applications with Internet Explorer is as easy as any other Java-based Web application, browsing a Quattro Pro file with Internet Explorer requires opening the file and moving the cursor with the arrow-down and arrow-up keys on the screen to bring up the application.

Although Lotus 1-2-3 spreadsheet applications cannot be browsed and used interactively on any Web browser, Internet Explorer can automatically transfer them to Lotus 1-2-3 software when it is available on the same computer.

Based on the findings of this study, the following four conclusions can be made:

1. Web-enabled interactive financial calculators and spreadsheet applications can be developed without using HTML and script languages.
2. On the Web, Excel spreadsheet applications are more user-friendly than Quattro Pro and StarCalc spreadsheet applications for users to browse and use interactively.
3. Internet Explorer has more interoperability than the Netscape and StarOffice browsers when hosting Web-enabled spreadsheet applications.

4. Since these Web-enabled spreadsheet applications require compatible spreadsheet software on client computers, they are more appropriate for organizational intranets because the application developers know which spreadsheet software is most widely available on employees' computers.

Business, Pedagogical, and Theoretical Implications

Developing Web-enabled spreadsheet applications without HTML and script languages can greatly reduce the complexity of developing Web

Figure 6: Quattro Pro File of Financial Trend Analysis on Internet Explorer

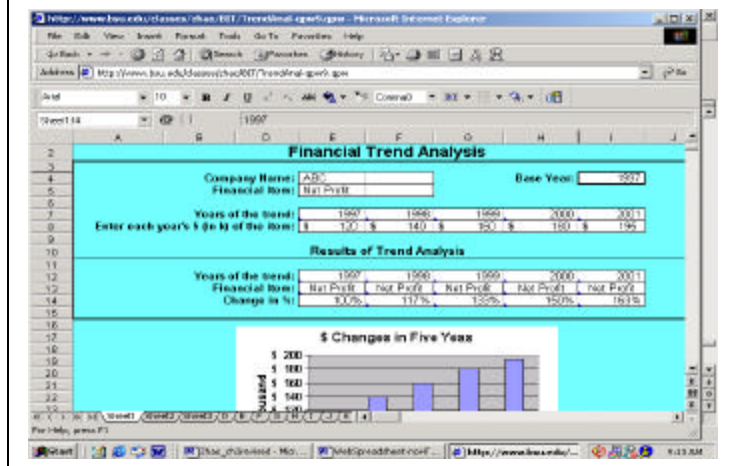
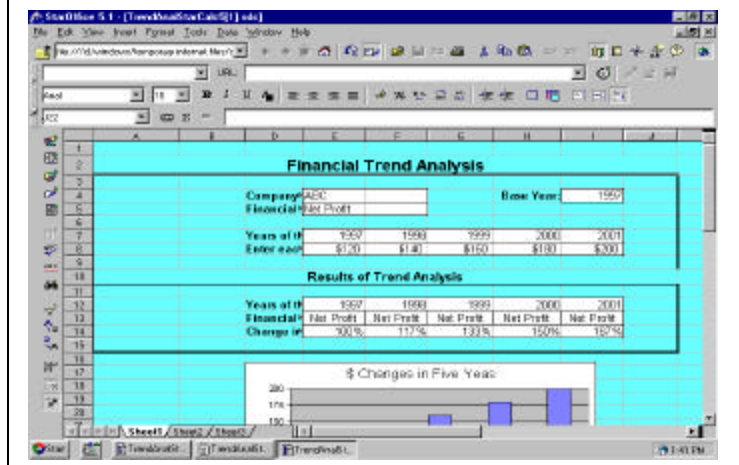


Figure 7: StarCalc File of Financial Trend Analysis on StarOffice Web Browser



calculators. This approach enables not only Web developers but also business professionals to develop Web-enabled calculators at high speed and low cost and then easily publish them on organizational Web sites. However, since such Web applications require compatible spreadsheet software on client computers, they are more appropriate for organizational intranets rather than for broad use on the Internet.

With this non-HTML and non-scripting approach, business educators can easily teach students to develop a wide variety of Web-enabled, interactive spreadsheet applications such as calculators for loan payment, retirement planning, financial forecasting, investment growth analysis, bankruptcy prediction analysis, growth rate analysis, and dividend discount modeling.

According to the theory of creative intelligence (Gardner, 1983, 1993, 1995; Sternberg, 1988; Sternberg & Lubart, 1991), innovative ideas such as developing Web-enabled interactive financial calculators without HTML and script languages can widen students' vision and stimulate their creative thinking in generating innovative ideas and conducting experiments for new product development.

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