



WHITE PAPER

Extended Validation SSL: Green Address Bar Consumer Research

Tec-Ed Study





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Executive summary

Late in 2006, the industry standards body called the CA/Browser Forum released its specification for a new class of SSL Certificate called an Extended Validation (EV) SSL Certificate. According to the specification, the Certificate Authority (CA) that issues each Extended Validation certificate must first authenticate the organization that owns the site using specific, proven methodology. Because these certificates reliably demonstrate a site's ownership, the designers of Microsoft® Internet Explorer 7 have built in a series of interface conventions to indicate the presence of Extended Validation certificates, most notably by changing the background color of the browser's address bar to green.

Customers are concerned about security, and because of that, some of them are afraid to enter sensitive data online. Recent surveys show that about half of Internet users are still fearful about purchasing online. 65% of online shoppers have abandoned at least one online purchase because they didn't get a sense of security when it came time to provide payment information. 53% of those shoppers report that they would have completed the transaction if the site had a recognized online security mark (TNS Research, April 2006).

The Extended Validation green address bar appears to play the same role as one of these security marks—allowing online customers to see at a glance if the site they are visiting is one they consider trustworthy. Microsoft's interface designers specifically selected the color green because of its widely understood connotation of safety or “okay to go” around the world, both in computer interface conventions and external conventions.

While these assumptions seem intuitive and form the basis for effective interface design, the specific effect of the green address bar deserves scientific examination with its target audience. With many new features and functions to learn about in a major product release like Internet Explorer 7 or Windows Vista, one cannot assume that they indeed will notice this bar nor interpret it as an indicator of site security.

In October and November of 2006, VeriSign® commissioned a study of 384 Internet users across the United States to better understand their responses to a green address bar in Internet Explorer 7 and the green address bar's effect on their online financial behaviors. The results showed that there is no doubt that an Extended Validation certificate will play a major role in determining if an IE7 user who has even a minimum concern about online security will shop at or conduct financial transactions such as banking on a given site.

The results show that with even a small amount of education about the EV green address bar, users will notice it and expect it to positively influence their online use. Some of the highlights of the VeriSign study show that:

- **93%** of users prefer to shop on a site that displays the green EV address bar.
- **100%** of users expect to notice sites with the green EV address bar in the future.
- **97%** of users say they are likely to share their credit card information with sites that show the green bar, contrasted with only **63%** of the participants who are likely to share credit card information with a non-EV site.



- **77%** of users say that if a site they do business with stopped displaying the green EV bar, they would be concerned enough to investigate further or would even abandon the purchase.
- **97%** of users recognize the name “VeriSign.” The CA with the next-highest recognition factor is recognized by **65%** of users.
- **88%** of users stated a preference for or a feeling of trust or security using a VeriSign-protected EV site. The next-highest response to any other CA was **22%**.

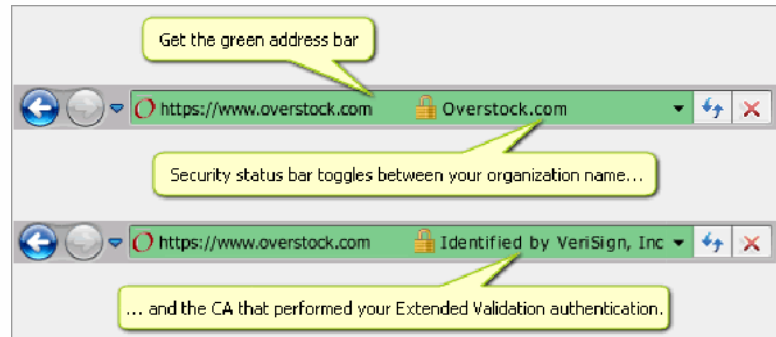
About Extended Validation SSL Certificates

From the middle of 2005 through 2006 the CA/Browser Forum—an industry consortium of leading Web browser manufacturers, SSL Certificate Authorities, and other parties—created and implemented Extended Validation SSL Certificates to strengthen the security of Internet transactions and to demonstrate that security with an eye-catching change to the browser. Using methods and standards agreed upon by this body, certificate requestors will be subject to a thorough, standardized vetting process. The Certification Authority (CA) that issues the certificate must be able to perform the authentication procedures required, thereby confirming the genuine identity of the requesting organization and placing that identity information securely in the certificate for display in the browser interface.

Before obtaining an EV certificate, an online owner must go through a vetting process that not every CA is equipped to handle and not every applying organization can pass. Extended Validation requires that the CA confirm the requesting organization's:

- legal existence
- identity
- governmental registration number
- registered agent, and
- right to use the specified domain name, as well as
- the requesting individual's authorization to obtain certificates on behalf of this organization.

Newer browsers will incorporate interface changes so visitors can see that the site has undergone these stringent requirements. The first EV-compatible browser, Internet Explorer 7 (IE7), employs what appears to be an obvious display, the green address bar. The URL field turns a glowing soft green if an EV SSL Certificate secures the Web server for the URL in question.



The SSL lock icon, formerly at the bottom of the browser interface, now appears at the top of the application window as part of the address bar. To the right of the lock icon, IE7 displays the name of the organization that owns the EV SSL Certificate, which it extracts from the certificate itself. When a visitor first loads the page, the green address bar also displays the name of the CA, the trusted third party that issued the certificate to the organization.

The combination of EV SSL Certificates and new browser versions promises to help Internet users easily discern a difference between Web sites. They will be able to know that the Web sites they are visiting indeed are the ones they expect to access and not frauds masquerading as popular sites. This interface will make it considerably more difficult for perpetrators of phishing schemes to successfully impersonate high-traffic Web sites.

Many site visitors also perceive a difference in the site's willingness to take care of its customers. To many of them, the fact that an organization went to the trouble of getting an EV certificate implies that the online business cares about the security and well-being of the customers who use its site.

User research and observation lead to conclusive results

In January of 2007, VeriSign hired Tec-Ed, Inc. of Ann Arbor, Michigan, to perform testing and analysis of Internet users as they visited sites with and without EV certificates. VeriSign wanted to learn:

- If users quickly saw the difference between a site with a green EV address bar and a site without
- If users would prefer to do business with an EV site
- If the VeriSign name in the CA portion of the address bar had any significance for the users.



The study consisted of 190 women and 194 men, from 38 states in the United States, plus two users from two provinces in Canada. Participants represented a wide range of age and income levels. They had no known affiliation with VeriSign and did not know VeriSign was sponsoring the research. Participants were selected based on the following criteria:

- They conducted online financial transactions such as shopping and banking at least once a week;
- They used the Internet Explorer browser;
- They had at least a minimum concern about online security and recognized the purpose of the SSL lock icon.

Methodology

Testing comprised more than just survey questions. Tec-Ed engaged 384 participants in a one-on-one 20-minute WebEx session, during which each user was shown two fictional Web site mockups: GordonShopping.com with a green EV address bar, and WhitleyShopping.com, without EV. Half the users saw the EV site first and half the users saw the other site first. The first site the user saw did not contain any CA name in the EV field.

After seeing the two sites and having an opportunity to learn about EV, users were asked if they were familiar with any of a list of six CAs, including VeriSign. Only after answering that question did users see the VeriSign name and VeriSign Secured Seal in the following prototypes.

All participants saw the same images and were asked to respond to the same questions. The testers read from a script so there would be no variation in the questions asked of the participants. Users went through a two-step process where they viewed a purchase flow at the two sites, during which they were asked to enter their name and address, and then their credit card information. Refer to Appendix A to see the script testers followed.

All sessions were documented and recorded.

Statistical significance

The responses of 384 test subjects provide a very close parallel to the answers we could expect to get from any population of users, including the total estimated number of 118 million Internet shoppers, or more specifically, the number of those users who have some concern about security while conducting financial transactions online. The VeriSign study focuses on users who recognize the lock icon but otherwise have no special knowledge of security (and did not necessarily have knowledge of what the lock meant; many were unaware of certificates or Certificate Authorities). Participants ranged from a “little concerned” (20%) to “moderately concerned” (43%) to “very concerned” (37%) about Internet security.

The number of 384 test subjects provides a confidence level of 95% with a confidence interval of plus or minus 5%. The confidence level means that there is an expectation of



95% certainty that the responses gathered will be within the range of the confidence interval of plus or minus 5%. Therefore, we are 95% certain that if the entire target population had been tested, the result answers would fall within a range of 5% less or more than the numbers provided within this document.

About Tec-Ed

Founded in 1967, Tec-Ed, Inc. is an award-winning user research firm whose clients include Fortune 500 companies and international organizations. Tec-Ed has been consulted as a neutral third-party firm in competitive and benchmarking research engagements for Google, Intuit, Yahoo!, Comcast, Microsoft, and others. Tec-Ed's consultants share their methodology and case studies in professional journals and conferences (including ACM SIGCHI, Human Factors and Ergonomics Society, IEEE PCS, and Usability Professionals' Association).

Tec-Ed was selected for this research because of its ability to bring user-experience analysis into the project. Because of the newness of and lack of education about EV, it was felt that simply performing focus-group techniques would miss collecting important data. Tec-Ed analysts conducted each session with individual users, gathering not only quantitative data but also behavioral data and comments as each user stepped through a simulated task.

Findings

As the participants reviewed the sample Web sites, they spoke aloud about their reaction to Extended Validation and VeriSign. Their comments were documented and recorded, and some of the more representative comments are in this report. The executive summary is found in Appendix B. (Further details from their report are available upon request.)

Users like the green address bar

Participants were shown two Web sites in the new Internet Explorer 7 browser with and without a green EV address bar. Since most had not seen IE 7 before and none had familiarity with EV, there were a lot of new components to observe. 27% of participants noticed and commented on the green address bar without knowing what it signified.

The moderator told the participants:

The green address bar in Internet Explorer 7 means that this Web site is an Extended Validation Web site. Extended Validation, or EV, means that the Web site owner has gone through extra, rigorous steps with an authorized Certificate Authority to prove they are a secure site.

Users were allowed to click links that provided different levels of information about EV, including an online article, and simulated Microsoft Internet Explorer help that explained EV and secure sites. In addition, the EV site had a graphic on it stating: "The green address bar you see above means your information is safe. You are shopping at an extra-secure



site.” Such an announcement is considered to be typical of what an online storefront might display if they acquired an EV certificate.

Users showed a favorable response to the green bar when told what it means. 64% of participants made positive comments about the green address bar as a sign of security.

+ What the users said

I like the fact that it’s green—draws your eye to it more than if it was white. I like having the CA name scrolling up there.

Turning it green is a very easy and quick way to see it has the extended security feature. The lock is a little hard to find sometimes.

Now that I know that green means added security, I like the feature because it stands out immediately.

Green catches your eye right away...It’s green, I’m good to go.

I like the green feature. It automatically tells me that I’m on a safe site. I’ll be looking for that, that I’m on a trusted site. Definitely will be helpful...not sure how easy it is to hack in and change that color.

It really catches my attention. I like that it shows who it’s certified by... makes me feel more secure, like the Web site goes through the extra steps.

Interesting that it’s green. I immediately thought it was environmentally green. Then I noticed the name next to the lock changing.... I like the idea that the lock at the other end is with the name of who is securing it.

The green bar is easier to recognize than just the lock icon

Knowing what it means, the green color means go and has a positive connotation. The green and the lock would make me feel better. I like it a lot.

Users are more willing to share sensitive data with a site that shows an EV certificate

Participants were asked to rank the likelihood of entering first their name and address, and then their credit card details into both sites, both of which they were told that they had never shopped on before, but they had an item they wanted at a good price.

When it came to entering credit card details, a total of 97% of participants said they would probably or most likely enter their credit card information on Gordon, the site with the EV certificate. (The breakdown was 87%-*most likely enter* and 10% - *probably enter*.) This contrasted with Whitley, the site without an EV certificate, with a total of 63 who would



probably or most likely enter. (Only 28% of participants said they would *most likely enter* their credit card information on this page, with 35% who said they *would probably enter*).

After going through the session, users were asked which site they preferred doing business with. 93% of the users stated that they preferred doing business with the EV site. (5% had no preference, and 2% preferred the non-EV site either for design reasons or because they preferred having the lock icon closer to the URL.)

Users were also asked what they would do if they visited an unfamiliar site with no EV certificate. 67% of users said they would consider abandoning a site if it did not display EV. As described in the next section, a far greater number of participants said they would abandon or consider abandoning a site that once had EV and later stopped.

+ What the users said

Extended Validation seems like a rigorous test of the site's security, so I would feel pretty comfortable with that.

[I prefer Gordon because] although both sites have the lock icon, Gordon has the green bar.

The green address bar is the main reason. It shows they care about security and they care about their customers.

Now knowing that the green bar is telling me this vendor has gone through extra steps for validation, my shopping experience should be more secure. I have always looked for https.

Because they're extra secure. It tells you who has validated when it blinks back and forth, and I would feel more comfortable using it.

They went through extra measures to get secure, and they have the green toolbar to show me they did.

With Whitley you only get small indicators [of security] with this lock. With Gordon you have many more indicators, including the name of the validating company in the address bar.

There's quite a bit more security information on the site. Displaying the certificate and the issuer of the certificate is important. Green is not a huge influence but part of the package.

Users would be very concerned if a site stopped displaying the green EV bar

Participants had a lot to say about the possibility of using a site that displayed EV, only to come back one day and see that it was no longer green.

A total of 77% users indicated that they would be hesitant about shopping at, would check into problems with, or would abandon a site that once showed EV and no longer did. 59% of all users said they would stop their transaction if they noticed that a site that once showed the green bar no longer did. 18% of all users said they would continue but would worry, wonder, hesitate, or call customer support.

+ What the users said

I'd have second thoughts. They'd gone to an extra extent and now don't care to make me safe.

I'd be concerned. Would double-check address entered to make sure I'm on the right site. Might contact the company or click around for more info.

I'd worry the site has been compromised. I'd stop until I know for sure.

I'd assume it was broken. Would come back in a few days later. I'm not comfortable with a company going backwards with security.

That would stop me in my tracks. I would want to find out why. If the certificate was still there, I would see what happened. Maybe it expired. Maybe it was just a glitch in the regulations. I would be concerned. I might also close my browser and open a new browser session.

Users prefer VeriSign

Near the beginning of the session, after seeing the initial sites and before going through the simulated shopping session, users were shown a list of six CAs and their logos in alphabetical order: COMODO, Entrust, GeoTrust, Go Daddy, thawte, and VeriSign. The users were asked:

We saw that the green bar displays the name of the Web site owner and it toggles back and forth with the name of the Certificate Authority that issued the certificate. There are several companies that issue certificates. I'm going to show you some of them as they might appear in the EV address bar. Do you recognize any of these names?

Users were asked to acknowledge all companies they were familiar with. 97% of the participants recognized the name "VeriSign." This contrasted with 65% of users who indicated the next-most-commonly recognized CA name.



After identifying the CAs, the users then continued by stepping through tasks on GordonShopping.com and WhitleyShopping.com. This time, the EV certificate in GordonShopping.com displayed the VeriSign name. Users were asked about their reaction to seeing VeriSign as the CA in the EV address bar.

88% of the users made positive statements referring to feelings such as “comfort,” “security,” “safety,” and “trust” or “preference” about using the VeriSign-protected site. When asked if they would proceed with a CA other than VeriSign and shown the same list of CAs as shown previously, responses ranged between 2% to 22% of users who indicated they would proceed with one of the other CAs.

+ What the users said

I know VeriSign. To me it's one of the most well known companies that does that so it would make me more secure. It's branding. It carries a lot of weight to be familiar.

[I feel] a lot more secure with that. VeriSign is an added bonus.

I'm totally comfortable with VeriSign. They've been around for a long time.

I like VeriSign. It makes me feel more secure and safe.

I would feel very secure shopping at this site, more likely to do it than on a Web site that didn't have the VeriSign next to Gordon in the green URL part.

Good. I recognize VeriSign and trust them. It's an extension of trust. GordonShopping is trusted by VeriSign. I can trust GordonShopping as well.

I think that was one thing that stuck out to me. Seeing VeriSign always makes me feel more secure.

I'd feel safe. VeriSign to me is THE name out there.

[VeriSign] would be my number one choice for authenticating company. Actually means a lot to me.

I would not hesitate to shop on this —green bar, lock, identified by VeriSign as safe, and I trust VeriSign and Internet Explorer.

Users will look for the green bar in future online sessions

At the end of the session, the moderator asked:

When you shop online in the future, will you be likely to notice sites that show the EV green address bar versus those that do not?



100% of the participants responded yes.

+ What the users said

Now that I see it I will look for it and I would rather shop at a site that has it.

Now I'm aware. Once I'm aware I would definitely pay attention. I feel it's there to help me.

It means, Wow! I can go shopping now and can be comfortable.

After this, yes! Before I wouldn't. I do a lot of shopping with companies I'm used to. I haven't branched out. Having a green bar would make me more likely to since they've gone through extra steps.

Now, yes! Without question. Plus it looks nice. I like the green. Thank you for telling me about the green bar!

I like that they're more secure and I'd notice, now that I know what it means.... if I had a choice of two Web sites, one with and one without, I would go with the more secure site.

Conclusion

The results show definitively that users like having the easy recognition of the green address bar to indicate an Extended Validation certificate and will want to conduct transactions on sites with the green Extended Validation bar. Education about Extended Validation is critical, although even a small amount makes a great difference. While a user may identify the green bar, they are unlikely to realize its significance until it is explained. Once explained, users are very happy to have this easy way to make the identification.

The results also show that the VeriSign name is an important component of a secure site. Users recognize the VeriSign name and associate it with security far more than any other CA name.

Extended Validation makes it easy for an organization to show potential and existing users it can be trusted, and it makes it easy for the users to see at a glance which organizations they can trust.



Appendix A. Test Script

The following pages reproduce the script followed by the Tec-Ed testers. Pictures of the test module have been inserted to show what the users saw.

There were two sites used in the test:

- GordonShopping.com had an EV certificate
- WhitleyShopping.com did not have an EV certificate.

Half the users saw GordonShopping.com first and the other half saw WhitleyShopping.com first. The script in this appendix is the script where GordonShopping.com was shown first. Questions are identical in the other test sample except for the order in which they appear.

Neither of the sites included the name “VeriSign” until after the users were shown a list of CA names and asked to identify which ones they were familiar with.



VeriSign, Inc.

Gordon
Shopping-First
Test Materials

Extended Validation
Research Study

487 E Middlefield Ave
Mountain View, CA
94043

January 2, 2007

Participant name: _____

Participant time zone: _____

Participant state: _____

Session number: _____

Date and time: _____

Researcher name: _____

1 Overview

1.1 Goals

To learn and gather percentages on the following:

- If users notice the green address bar when they don't know what it means
- If users think the green EV bar will make a difference in their online habits once they know what it means
- If users are familiar with VeriSign
- If users would be concerned if a site that once had the green bar no longer does when they return to it
- If users prefer to see VeriSign in the green address bar

All participants (users) must conduct online transactions at least once per month, be familiar with Internet Explorer, and be concerned with online security.

Participants will receive \$25 Amazon.com Gift Certificates by email.

Sessions will be held using a WebEx account and will be recorded using WebEx.

1.2 Scenarios

There will be two fictitious shopping sites, each with a home page plus two pages containing fields for entering information. Users will see both sites.

Users will be split by gender into two groups. Within each gender, half will see the site with the green EV bar first for each task, and half will see the non-EV site first for each task.

1.2.1 Part 1

Home page: Introduce the EV bar.

Then ask users if they recognize any of the names shown.

1.2.2 Part 2

1. Enter Your Address page

User reviews both sites and rates likelihood they would enter name and address information on this page on each site.

2. Enter Credit Card Information page

User reviews both sites and rates likelihood they would enter credit card information on this page on each site.

3. Follow-up questions

2 Test Session Setup

2.1 Before each day's tests:

- Start the WebEx session.
 1. [Tec-Ed will complete this section after practice sessions on 1/3/2007.]

- Run the Gordon Shopping-first test module (“Extended Validation Test Module 12_21_06 Gordon first.exe”) or Whitley Shopping-first test module (“Extended Validation Test Module 12_21_06 Whitley First.exe”), as appropriate for the day’s first participant, and minimize the window.
- Prepare the backup audio recorder.
- Review the first participant’s characteristics as captured by the screening survey.

2.2 Between sessions:

- Name the just-recorded WebEx file, which is saved on the server. The filename is the researcher’s initials, participant’s state, and participant’s sequence number for that researcher—for example, LA-NY-001.
- Enter the participant’s data into the spreadsheet.
- Review the next participant’s characteristics as captured by the screening survey.
- Close the current test module and run the other version (Whitley Shopping first or Gordon Shopping first), as appropriate for the next participant, and minimize the window. Counterbalancing should occur within gender groups.

2.3 After the last session each day:

- Transfer the day’s backup audio files to your computer.
- Tec-Ed will download the day’s WebEx recording files, convert to WMV format, and copy to DVD. The recording files will remain on the server for three days.

3 Starting the session: Connecting the user to WebEx [3-5 min]

Call the user and have them connect to the WebEx session.

>> To start, we’re going to get you connected to my computer through an online meeting tool called WebEx. WebEx will allow you to view and move things on my computer screen, but I will not be able to see or control yours.

>> To connect, go to your email Inbox and find the email from Study 0107 with the subject line “Meeting: Online Research Study.” The email has a link to our WebEx meeting, plus a user ID and password for signing in. Click the link and then sign in.

Once the user has connected to WebEx, explain how they can take control of the mouse.

>> You are now connected to my local computer through WebEx. Please maximize the WebEx window so that it fills your entire screen.

Share the test module. Choose Share > Application, and then select the test module and click the Share button in the dialog.

>> During this session, it is important that I know which parts of my screen you are referring to. When you talk about a specific part of my screen, please point to it with your mouse.

>> For me to be able to see you pointing the mouse, I need to pass control of the mouse to you.

On the Sharing menu, choose Allow to Control Remotely and the user’s name.

>> To take control of the mouse, click your mouse. After a moment, you'll be able to move the mouse pointer for both of us. Go ahead and try that now—take control of the mouse and point to the center of the screen.

4 Session introduction [3 min; elapsed 3-5 min]

Start time _____

>> Now that we're connected through WebEx, I'll take control of the mouse back for a second. After I start the recording software, I'll introduce you to our session.

Click the mouse to take control, and then start the WebEx Recorder and hide it. Also start the backup audio recorder.

Thank you for agreeing to take part in our research study. Today you will look at two fictitious Web sites as they would appear in the new Internet Explorer 7 browser. As you look at the Web sites, I'll ask you to imagine that you are doing some online shopping. Along the way, I'll ask you questions about what you see and what you think about it. We're interested in finding out how the new security features in Internet Explorer 7 may affect your online experience.

Because we want to hear what you're thinking as you look at the Web sites, I'm going to ask you to "think out loud" during this session. Don't hesitate to tell me whatever is going through your mind as you look at the different pages.

Please know that this is not a test, and there is no such thing as a wrong answer. We're not here to sell you anything.

Your comments are very important, so I'll be taking notes as well as recording the session. But rest assured that this information is confidential. We will not give anyone your name, telephone number, or email address. We may use quotes from you in published materials, but we will not use your name or other identifying information. The recordings are confidential and will be securely archived and not distributed.

The whole session will take about 20 minutes. Within a few days, you'll receive a \$25 Amazon.com gift certificate to thank you for your time and input.

Do you have any questions before we begin? *[Answer any questions.]*

5 Part 1: Introduction to green EV bar and new lock placement [5 min; elapsed 6-8 min]

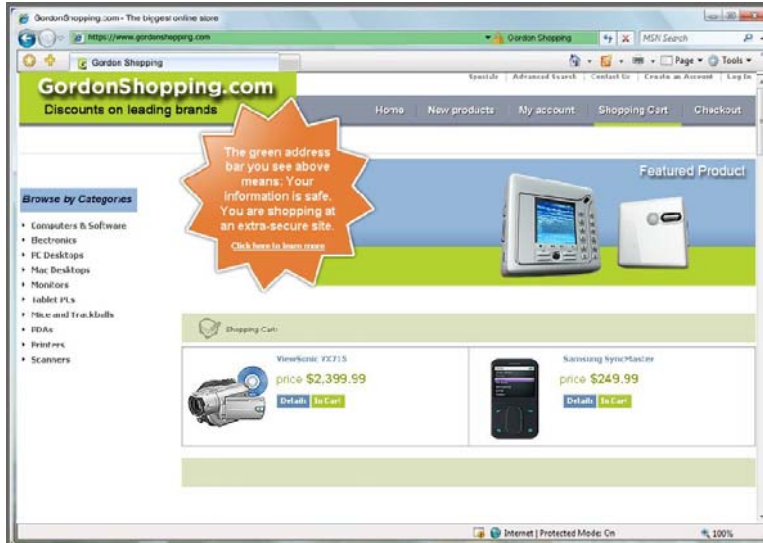
Start time _____

Maximize the test module with images of IE7 with GordonShopping.com and WhitleyShopping.com:

- *GordonShopping.com has the Extended Validation bar with its company name displayed, which toggles to a line that says "Identified by [CA name]." This site contains a "Click here to learn more" link, which participants can click to read a page about what the green address bar means; in addition, clicking the "Gordon Shopping/Identified by..." section brings up a certificate.*
- *WhitleyShopping.com has no green bar or associated live links.*

Press the right arrow to show the Gordon Shopping site.

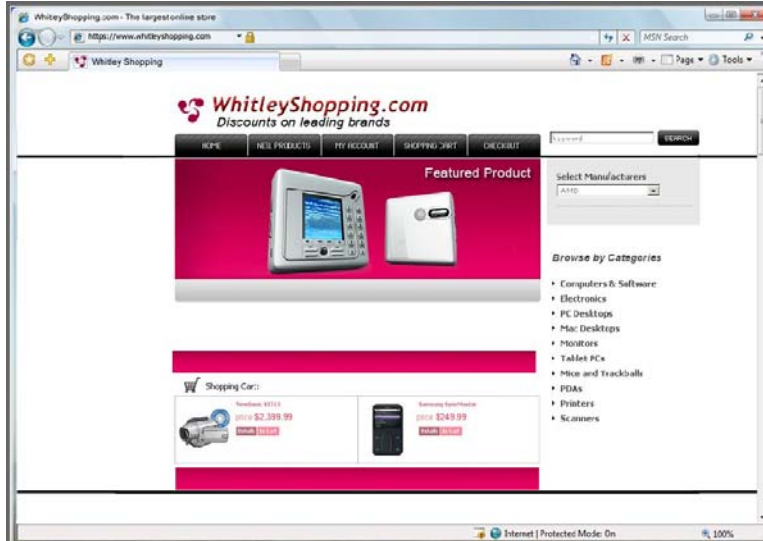
>> This is a picture of a fictitious Web site, GordonShopping.com, in the latest version of the Internet Explorer browser, version 7. Version 7 has some new security and privacy features. Click the mouse to take control, then look at the top of the Internet Explorer browser and briefly tell me what security and privacy features you see.



User actions	What to look/listen for on GordonShopping.com
Comments on:	<input type="checkbox"/> Lock at top of browser <input type="checkbox"/> Green address bar
Clicks working links:	<input type="checkbox"/> Click here to learn more <input type="checkbox"/> Gordon Shopping/Identified By <input type="checkbox"/> Should I trust this site? <input type="checkbox"/> View Certificates <input type="checkbox"/> None clicked

Press the right arrow to show Whitley Shopping site.

>> This is a picture of a fictitious Web site, WhitleyShopping.com, also in the latest version of the Internet Explorer browser, version 7. Take a look at the top of the Internet Explorer browser and briefly tell me what security and privacy features you see.



User actions	What to listen for on WhitleyShopping.com
Comments on:	<input type="checkbox"/> Lock at top of browser <input type="checkbox"/> No green address bar

Click the mouse so you can use it to indicate the lock icon.

>> [As you noticed/You'll notice] at the top of each browser, in the address bar, there's a lock icon. As you know, the lock icon means that both Web sites are secure.

Press the left arrow to display Gordon Shopping again.

>> [You also noticed/You'll also notice] the address bar and lock area of GordonShopping.com is green. The green address bar in Internet Explorer 7 means that this Web site is an Extended Validation Web site. Extended Validation, or EV, means that the Web site owner has gone through extra, rigorous steps with an authorized Certificate Authority to prove they are a secure site.

Use the mouse to point out where it shows [CA name].

>> The name of the Certificate Authority, or CA, is displayed in this area, alternating with the name of the company that owns this Web site. We will show you some CA names later, but for now, this just says "CA name".

>> If you want to review more information about Extended Validation, there are many references online. You will also learn more about it if you upgrade to Internet Explorer 7 or another new browser.

- User clicks "Click here to learn more" link
- User clicks Gordon Shopping/Identified By

- Should I trust this site?
- View Certificates

Use the mouse to indicate the Extended Validation bar.

>> What do you think when looking at this area?

If the user says “I don’t know” or gives a similarly short answer, wait 10 seconds or so and then ask “Anything else?” before proceeding.

6 Part 1, continued: Familiarity with CAs [2-3 min; elapsed 11-13 min]

Start time _____

>> Now I’m going to show you another picture. We saw that the green bar displays the name of the Web site owner and it toggles back and forth with the name of the Certificate Authority that issued the certificate. There are several companies that issue certificates. I’m going to show you some of them as they might appear in the EV address bar.

Press the right arrow two or three times to show the picture of COMODO, Entrust, GeoTrust, Go Daddy, Thawte, and VeriSign.



>> Do you recognize any of these names?

- COMODO
- Entrust
- GeoTrust
- Go Daddy
- Thawte

[] VeriSign

Comments on VeriSign:

If the user does not volunteer comments about any companies s/he recognizes, wait 10 seconds or so and then ask "Anything else?" before proceeding.

7 Part 2: Does the user prefer a green EV bar for somewhat sensitive information? [3 min; elapsed 13-16 min]

Start time _____

Press the right arrow two times to show the Gordon Shopping Enter Address page with the VeriSign name toggling. Toggle is at least 10 seconds on site name, then CA name.

>> Now let's imagine that you have found an item you want to buy at GordonShopping.com. You have added the item to your shopping cart and now are thinking about checking out. Keep in mind that this is your first experience at this site. The site is now asking you to provide your name and address.

>> Please tell me what you would do at this point. *[If the user wants more information, you can add as necessary:*

- *If the site is new to them, how did they find it? They found the site through a search. This is their first time on the site.*
- *What are they buying? They found something they want at a price they think is good.*

Press the space bar to display the rating scale.

>> Please use this scale to indicate how likely you would be to enter your name and address on this page of this Web site. Please read the top row of the scale out loud and then choose your answer.

1 Would not	2 Probably not	3 Somewhat likely	4 Most likely
I would not enter my personal information on this page	I would probably not enter my personal information on this page	I would probably enter my personal information on this page	I would enter my personal information on this page

If the user chooses "1", it's okay later to show them the credit card details page (section 8) but their answer there will be "1" for the same site.

Press the space bar and then the right arrow to show the Whitley Shopping Enter Address page.

>> >> Now let's imagine that you have found an item you want to buy at WhitleyShopping.com. You have added the item to your shopping cart and now are thinking about checking out. Keep in mind that this is your first experience at this site. The site is now asking you to provide your name and address.

>> Please tell me what you would do at this point. *[If the user wants more information, you can add as necessary:*

- If the site is new to them, how did they find it? They found the site through a search. This is their first time on the site.
- What are they buying? They found something they want at a price they think is good.

Press the space bar to display the rating scale.

>>Please use this scale to indicate how likely you would be to enter your name and address on this page of this Web site.

1 Would not	2 Probably not	3 Somewhat likely	4 Most likely
I would not enter my personal information on this page	I would probably not enter my personal information on this page	I would probably enter my personal information on this page	I would enter my personal information on this page

If the user chooses “1”, It’s okay later to show them the credit card details page (section 8) but their answer there will be “1” for the same site.

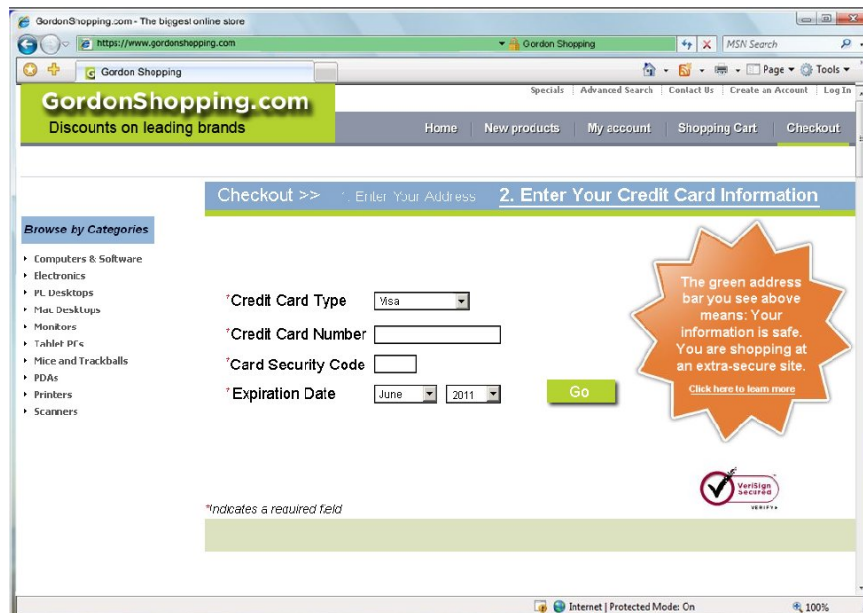
Press the space bar to remove the rating scale.

8 Part 2, continued: Does the user prefer a green EV bar for more sensitive (credit card) information? [3 min; elapsed 16-19 min]

Start time _____

Press the right arrow two times to show the Gordon Shopping Enter Credit Card Information page with the VeriSign name toggling.

>> Let’s imagine you are asked to provide your credit card details at GordonShopping.com. Please tell me what you would do at this point.



The screenshot shows the GordonShopping.com checkout page. The browser address bar displays "https://www.gordonshopping.com". The page header includes "GordonShopping.com" and "Discounts on leading brands". The navigation menu contains "Home", "New products", "My account", "Shopping Cart", and "Checkout". The main content area is titled "Checkout >>" and "2. Enter Your Credit Card Information". On the left, there is a "Browse by Categories" sidebar with a list of product categories. The main form contains the following fields: "Credit Card Type" (dropdown menu with "VISA" selected), "Credit Card Number" (text input), "Card Security Code" (text input), and "Expiration Date" (dropdown menu with "June" selected and "2011" selected). A green "Go" button is located to the right of the expiration date field. A starburst callout box on the right side of the form contains the text: "The green address bar you see above means: Your information is safe. You are shopping at an extra-secure site. Click here to learn more". Below the form, there is a VeriSign Security logo and a note: "*Indicates a required field". The browser status bar at the bottom shows "Internet | Protected Mode: On" and "100%".

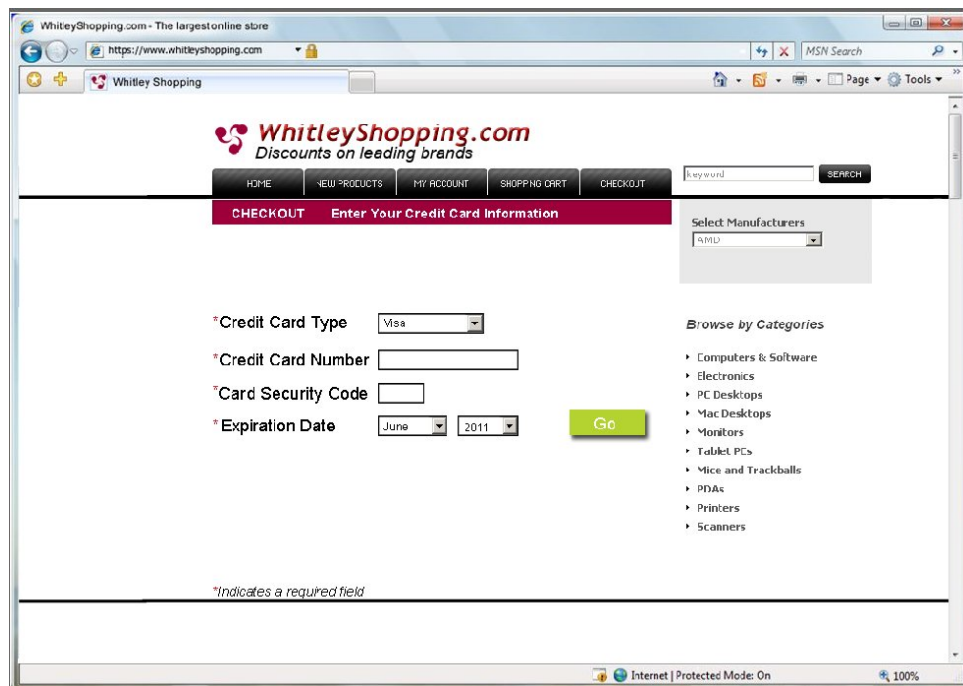
Press the space bar to display the rating scale.

>> Please use this scale to indicate how likely you would be to enter your credit card details on this page of this Web site.

1 Would not	2 Probably not	3 Somewhat likely	4 Most likely
I would not enter my personal information on this page	I would probably not enter my personal information on this page	I would probably enter my personal information on this page	I would enter my personal information on this page

Press the space bar and then the right arrow to show the Whitley Shopping Enter Credit Card Information page.

>> Now let's imagine you decided to buy the item and are at the checkout page of WhitleyShopping.com. You are asked to provide your credit card details. Please tell me what you would do at this point.



Press the space bar to display the rating scale.

>> Please use this scale to indicate how likely you would be to enter your credit card details on this page of this Web site.

1 Would not	2 Probably not	3 Somewhat likely	4 Most likely
I would not enter my personal information on this page	I would probably not enter my personal information on this page	I would probably enter my personal information on this page	I would enter my personal information on this page

Press the space bar to remove the rating scale.

9 Part 2, continued: Follow-up questions [3-5 min; elapsed 19-22 min]

Press the right arrow to advance to the page showing the 2 sites' home pages side-by-side.

Start time _____

>> Today we looked at two different Web sites: GordonShopping.com, which had the green Extended Validation address bar and lock icon, and WhitleyShopping.com, which had only the lock icon. Which site do you believe you would feel more secure doing business with?

GordonShopping.com WhitleyShopping.com No difference

Why?

>> If you were shopping at an unfamiliar Web site and it had no green EV bar, would you consider abandoning your purchase? [If the user answers only "yes" or "no" and time permits, probe why.]

Yes No

>> Indicate the EV bar where it shows the VeriSign name. I'd like to direct your attention to the green bar again. As I described before, the name in the bar changes back and forth, from the name of the secured Web site to the name of the company that issued the secure Extended Validation certificate.

>> GordonShopping.com has used VeriSign to issue its Extended Validation certificate. How do you feel about shopping on this site that shows the VeriSign name in the green address bar?

>> Would you proceed on a Web site that shows the green bar with a CA name other than VeriSign here? [If the user answers only "yes" or "no" and time permits, probe for preferred companies.]

Yes (___said "probably")

Note any preferences mentioned: Volunteered Prompted

COMODO Entrust GeoTrust Go Daddy Thawte

No (___said "probably not")

>> Let's say that you are a regular shopper at GordonShopping.com, and that one day you return and the address bar is no longer green. What would you do?



Continue shopping

Abandon shopping

Other: _____

>> When you shop online in the future, will you be likely to notice sites that show the EV green address bar versus those that do not? [If the user answers only "yes" or "no" and time permits, probe reasons.]

Yes (___said "probably")

No (___said "probably not")

>> I think we've got what we need. Thank you again for taking part in this research study. Your input is very valuable to us.

>> To thank you for participating, you will receive a \$25 Amazon.com gift certificate at your email address within the next week. Please confirm which email address we should send the certificate to:

email address: _____

If you have any problems, feel free to email Tec-Ed at:

- [address]

>> You can close your browser now and I'm going to end the session. You might see a screen asking for your feedback about Webex. You don't have to fill that in if you don't want to. Thank you very much for your participation. Goodbye.



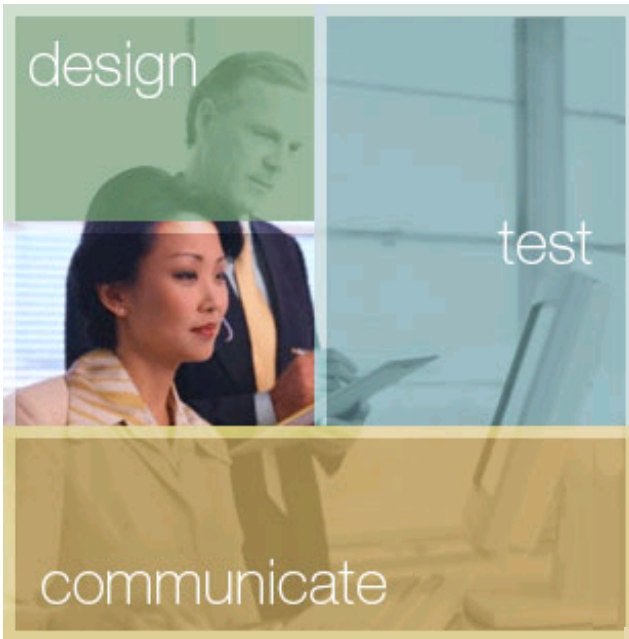
Appendix B: Tec-Ed Executive Summary

The following pages contain the executive summary prepared by Tec-Ed, Inc.



VeriSign

Extended Validation Research Study



Executive Summary

Prepared by Tec-Ed, Inc.

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February 2, 2007

research



Executive Summary of Study Findings

The Extended Validation Research Study explored people's awareness of Extended Validation before and after receiving an explanation of it. Conducted as a "blind" study in which Tec-Ed did not reveal that the study sponsor was VeriSign, it consisted of 384 sessions 20 minutes long, facilitated remotely via WebEx. Participants viewed images of fictitious websites in one of two Flash prototypes (for order counterbalancing) and responded to the facilitator's scripted questions and to a displayed rating scale.

The session protocol presented imagined scenarios of performing online shopping tasks at two websites, one with and one without Extended Validation, and elicited participant reactions, ratings, and predictions of their future actions. It also explored participants' recognition of VeriSign and other companies as Certificate Authorities.

From this study, Tec-Ed offers the following conclusions.

Recognition of EV Security

- The first time users see a green address bar, they will be unlikely to recognize that the green color has a relationship to site security.
- Users who hear a simple description of what the green EV address bar indicates about site security see value in it. The simple description participants heard in this study was: "*The green address bar in Internet Explorer 7 means that this Web site is an Extended Validation Web site. Extended Validation, or EV, means that the Web site owner has gone through extra, rigorous steps with an authorized Certificate Authority to prove they are a secure site.*" For most participants, this description was sufficient for them to prefer sites with the green EV address bar to sites without it.
- Some users who look for the lock icon at the bottom of the browser window may have difficulty seeing it in the green EV address bar on their first encounter or first few encounters.

Predicted Future Actions

- It was not surprising that participants said they would feel more secure using the site with the green EV address bar. More interesting are their reasons for this preference: the sense that **companies care more** about their feeling of comfort by taking this extra measure, the easily accessible **additional information about site security** they have trouble finding on non-EV websites, and the belief that the measure means **extra security**, even though they don't know exactly what extra steps were taken.

- Although most participants said they would stop shopping—at least temporarily—on a site that no longer had the green EV address bar, 35% said they would continue, primarily if the site had https and the lock icon, VeriSign Secured or another CA logo, or good prices. These features would be enough for a similar percentage to shop on an unfamiliar site that did not have the green EV address bar.
- It is unclear from this research whether online shoppers will notice if a website they visit frequently no longer has the green EV bar. Users focus on the web page for their transactions, not on the address bar. Once they trust a website, people are less likely to notice changes that are not in their focus area.

However, the participants in this study were screened for concern about online security (which included choosing a level of concern that was not “none” and conveying an understanding of the lock icon in their screening survey), and most also responded in their screening survey and in their sessions that they look for the lock icon in their transactions. The act of looking for the lock icon will bring their attention back to the address bar, where they may notice a change in the EV status.

Familiarity with VeriSign

- Users who see the VeriSign Secured Seal logo near the bottom of secured web pages trust the security of those web pages. Many users will continue to use the VeriSign Secured Seal as their primary indicator of a site’s security
- VeriSign has extremely strong name recognition (97%) in the area of site security. The name with the next strongest recognition is GoDaddy (65%), which many participants attributed to television advertising, although some participants said they equated GoDaddy with site hosting, not site security.
- When asked what other Certificate Authority names they would proceed with in the address bar other than VeriSign, most participants could not remember the names of other CA authorities.
- If the words in the green address bar for a site secured by VeriSign were to say “VeriSign Secured” instead of “Identified by VeriSign,” this consistency with the language of the “stamp of security” users recognize may give them added comfort. Adding the logo checkmark symbol would be even more recognizable.
- The VeriSign name has a strong positive association to security in online financial transactions. Participants described their recognition and feeling about VeriSign in superlatives, with words and phrases such as “more secure,” “good,” “very good,” “very safe,” “very comfortable,” “totally comfortable,” “more assured,” “confident,” “trusted name,” “definitely secure,” “number one choice,” “without hesitation,” “feel secure,” and “safer” appearing in 88% of the participant comments when asked about shopping on a site with VeriSign as the Certificate Authority in the green EV bar.