



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 organisation 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 colour 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 recognised 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 colour 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 behaviours. 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 recognise the name “VeriSign.” The CA with the next-highest recognition factor is recognised 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%**.

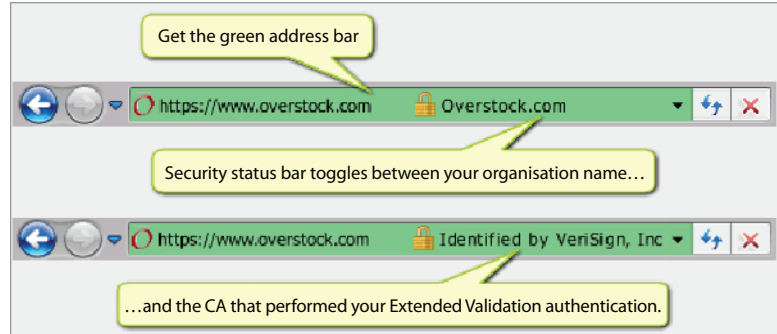
About Extended Validation SSL Certificates

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, standardised 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 organisation 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 organisation can pass. Extended Validation requires that the CA confirm the requesting organisation’s:

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

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 organisation 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 organisation.

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 organisation 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 recognised 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. 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 recognise 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 organisations. 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 behavioural 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. (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 authorised 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 favourable 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 colour.

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 recognise than just the lock icon

Knowing what it means, the green colour 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 recognise any of these names?

Users were asked to acknowledge all companies they were familiar with. 97% of the participants recognised the name "VeriSign." This contrasted with 65% of users who indicated the next-most-commonly recognised 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 recognise 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 realise 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 recognise the VeriSign name and associate it with security far more than any other CA name.

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