Stanford-Makovsky Web Credibility Study 2002

Investigating what makes Web sites credible today

A Research Report
by the Stanford Persuasive Technology Lab
and Makovsky & Company

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Introduction

When it comes to credibility, the World Wide Web is unusual. For some purposes, the Web is highly credible. After stock traders access information on the Web, they make decisions where thousands, and sometimes millions, of dollars hang in the balance. It's arguable that for these stock traders the information they find on the Web is the most credible information available.

However, the Web can also be the least credible source of information. Many pages on the Web reflect incompetence, and some are pure hoaxes[1]. Because few barriers stop people from publishing on the Web, the online world contains deceptive coverage of current events, health information that is factually incorrect, and ads that promise the impossible.

Web users are becoming increasingly skeptical of the information and services offered online[2]. As a result, those who offer Web sites—from large companies to single-person operations—now face increasing pressure to enhance the credibility of their sites.

Because the Web is a relatively new medium for information and transactions, little quantitative research exists about what leads people to believe—or not believe—what they find online. To enhance Web site design and promote future research on Web credibility, we launched our lab's research on Web credibility in 1998. As researchers, our hope was to create a broad understanding of what makes Web sites credible, as well as providing a foundation—both in method and content—for future quantitative investigations. As designers, our hope was to enhance the practice of designing for Web credibility, offering Web site creators concrete data for design decisions they make on a daily basis.

This document is a preliminary report of our latest effort in understanding Web credibility, a project we did in collaboration with Makovsky & Company, a New York-based public relations agency.

What is credibility?

(from Fogg & Tseng, 1999[3])

What is "credibility"? Simply put, *credibility* can be defined as *believability*. Credible people are believable people; credible information is believable information. In fact, some languages use the same word for these two English terms. Throughout our research we have found that *believability* is a good synonym for *credibility* in virtually all cases. The academic literature on credibility, which dates back to the 1930s[4], presents a more sophisticated view of credibility, although the essential meaning is similar to what we propose. Virtually all credibility scholars describe credibility as—

- a perceived quality
- made up of multiple dimensions[5]

First, credibility is a perceived quality; it doesn't reside in an object, a person, or a piece of information. Therefore, in discussing the credibility of a computer product, one is always discussing the *perception* of credibility.

Next, scholars agree credibility perceptions result from evaluating multiple dimensions simultaneously. Although the literature varies on how many dimensions contribute to credibility evaluations, the vast majority of researchers identify two key components of credibility:

- trustworthiness
- expertise

What this means is that in evaluating credibility, a person makes an assessment of both trustworthiness and expertise to arrive at an overall credibility assessment.

Trustworthiness, a key element in the credibility calculus, is defined by the terms *well-intentioned*, *truthful*, *unbiased*, and so on. The trustworthiness dimension of credibility captures the perceived goodness or morality of the source. Rhetoricians in ancient Greece used the terms *ethos* to describe this concept.

Expertise, the other dimension of credibility, is defined by terms such as *knowledgeable*, *experienced*, *competent*, and so on. The expertise dimension of credibility captures the perceived knowledge and skill of the source.

Taken together, these ideas suggest that *highly credible computer products will be perceived to have high levels of both trustworthiness and expertise*.

Why Does Web Credibility Matter?

The success of most Web sites hinges on credibility. Those who create Web pages hope people will adopt specific behaviors, such as the following:

- register personal information
- purchase things online
- fill out surveys
- click on ads
- contribute content to a community
- download software
- bookmark the site and return often

If Web designers can influence people to perform these actions, they have been successful. When people believe the information on a Web site, the site is more likely to achieve its goal. However, Web site designers will probably fail to reach their goals if people doubt the information, or if they find the Web experience to be deceptive (lacking trustworthiness) or amateurish (lacking expertise). When a site lacks credibility, users are unlikely to remain on the site for long. They won't buy things, they won't register, and they won't return. They certainly won't think favorably of the organization that sponsors the site.

Although designing for Web credibility is one of the most important issues for Web sites, a search reveals little public information on this topic and very little empirical research. To be sure, many have researched and shared views on Web usability, navigation, security, and so on; all these play a role in credibility. But few have focused on helping Web site creators design for credibility.

The Purpose of this Study

Our purpose in the Stanford-Makovsky Web Credibility Study 2002 was to examine how a broad range of factors affects people's perception of Web credibility. In other words, we wanted to cast a wide net in understanding what features of Web sites lead people to believe what they find online. An accompanying goal was to replicate in part the study the Stanford Persuasive Technology Lab conducted in December of 1999 in order to confirm our research method and take a current snapshot of how people respond to Web credibility[6].

What this Report Covers

This document reports on the findings from the latest large-scale study, the Stanford-Makovsky Web Credibility Study 2002. We report the major findings, taken from the mean responses for each item. Although we have not yet performed more sophisticated analyses on the data set, we hope the findings we report here will be notable and interesting.

Research Method

The Questionnaire

The data for this study was collected through an online questionnaire[7]. Using this self-report method allowed us to accumulate users' perceptions on a wide range of Web site characteristics. The questionnaire consisted of 55 items that each related to an aspect of Web credibility (e.g., "the site has a typographical error", "the site is rarely updated with new content"). The majority of the credibility items were taken from our first large scale study on Web credibility that ran in 1999. The credibility items were selected though an extensive, iterative process, a method described in our previous publications[8]. Given that the Web is a dynamic medium, some changes were necessary for this new study. Several original survey questions were discarded, some were reworded, and others were added to account for the shifting landscape of Web use and technology.

Participants rated the credibility items on a 7-point Likert-type scale. For each credibility item, participants indicated whether the Web site element would make a Web site more or less believable, selecting from the range "-3" ("Much less believable") to "+3" ("Much more believable"). Each participant was asked to answer the questions based on his or her cumulative experience using the Web. Consistent with our online research methodology, the order of the questions was randomized for each participant to avoid an ordering effect.

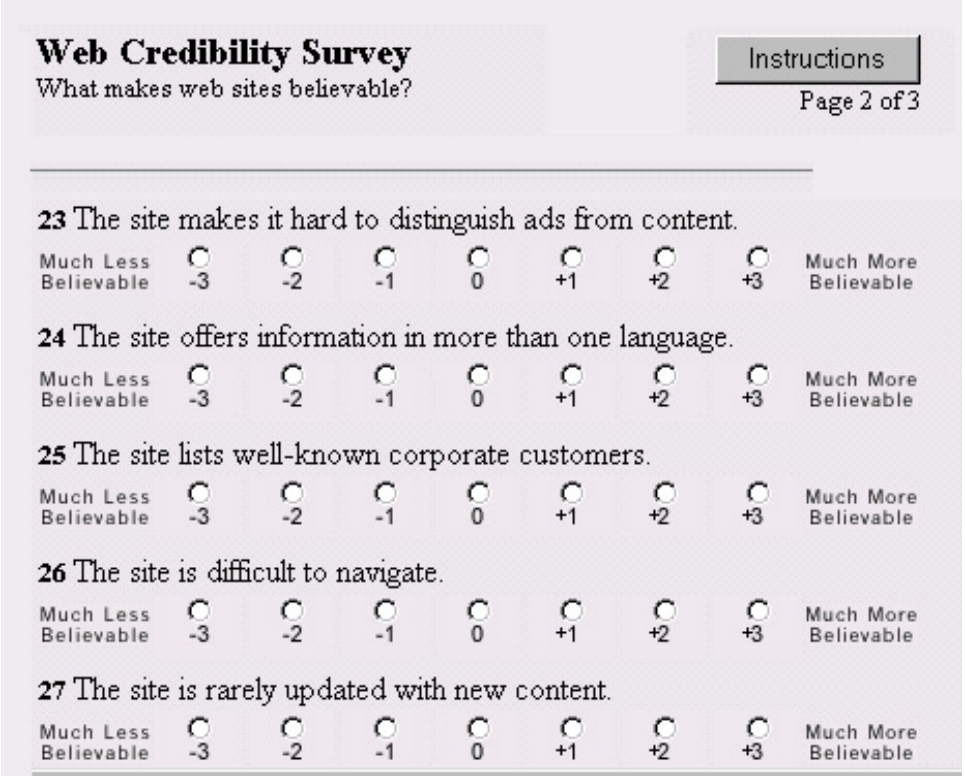

Figure 1: A sample of our online questionnaire, showing the format.

Recruiting Study Participants

In planning previous studies of this nature, we have acknowledged that recruiting a representative sample of all Web users throughout the world is extremely difficult, if not impossible. As a result, to include a wide range of people for this research, we recruited study participants in two ways: through the cooperation of charitable groups and through a news media organization in Finland. In addition to increasing diversity, the range of participants allow for a cross-cultural analysis of the data.

United States participants were recruited through charity groups and Makovsky & Company, our collaborators in this study. Charity groups (such as the American Brain Tumor Association) received a donation of $5 for every person who completed the study on their behalf, up to a maximum donation of $3000. Other United States participants were drawn from online solicitation conducted by Makovsky & Company.

The rest of the participants were drawn from Finland. European participants came to the study by following a link provided on the Alma Media Web site, a Finnish news media organization that had collaborated with us in the 1999 study and continues to support this research.

Running the Study

The main part of the study ran during the winter of 2002. Participants went to http://www.webresearch.org at their convenience to take the questionnaire. Once the number of participants neared 1500, we stopped data collection and began the analysis.

Overall Demographics

Who participated in this study? Table 1 shows the overall demographic information for the 1481 participants. The median age was 32 years old. The sample was 44.8% female, and 33.1% of the sample was from the United States. The participants had extensive experience with the Web; most had more than 5 years of Web experience, spent 10 hours online every week, and had made more than 5 purchases online.

Table 1: Summary of Participants' Demographic Information

Demographic item	Overall
Age (median)	32 years old
Gender	44.8% female, 55.2% male
Country	33.1% U.S., 57.1% Finland, 9.8% from elsewhere
Education level (median)	College graduate
Annual Income (median)	$40,000 – 59,999
Years on the Internet (median)	More than 5 years
Average number of hours spent online a week (median)	10 hours/week
Average number of purchases online (median)	More than 5 purchases

Results & Discussion

For the first part of our data analysis, we took the responses from 1481 people and calculated the means for each of the 55 items in the study. Figure 2 shows the results for each item placed along a continuum of Web credibility. Toward the top are items that boost credibility the most (highest mean is +2.0); toward the bottom are items that decrease credibility the most (lowest mean is –1.9). (Note: In Figure 2 the means have been rounded to the nearest tenth.)

Figure 2: This figure shows the means for each item in the study, arranged along a continuum. The items are worded exactly as they were in the study.

Presentation and Discussion of Overall Results

There are many ways to examine and interpret the data from this study. In this document we place the individual items – the specific questions asked in the survey – into one of four categories: expertise, trustworthiness, ads, and other. While categorizing the data in this way has limitations, it succeeds in showing some general trends in the data. A factor analysis, as we have done with previous data, may provide a different grouping of the individual items.

Table 2: Expertise Factors

Expertise Factors that Affect Web Credibility	Mean
The site provides a quick response to your customer service questions.	1.83
The site provides comprehensive information that is attributed to a specific source.	1.45
The site lists authors' credentials for each article.	1.31
The site has articles that list citations and references	1.30
The site has search capabilities.	1.18
The site offers information in more than one language.	0.98
The site contains user opinions and reviews.	0.77
The site has ratings or reviews of its content.	0.72
The site selects content according to your preferences.	0.57
The site recognizes that you have been there before.	0.39
The site displays an award it has won.	0.31
The site provides comprehensive information that is unattributed to any source.	-0.53
The site has a typographical error.	-1.26
The site is sometimes unexpectedly unavailable.	-1.29
The site has a link that doesn't work.	-1.42

Table 2 shows that eleven out of fifteen expertise factors increase the perceptions of credibility. Sites were reported to be most credible when they were responsive in providing customer service (mean = -1.83), making it clear that credibility can be enhanced from the operational backend.

Sites were rated as more credible when they had standards for their content—such as when they attributed content to specific sources, listed the credentials of authors, and provided references (means = 1.45, 1.31, 1.30). Web operators—particularly content providers like magazines and journals—could take advantage of these factors by implementing strict content guides for their sites.

Sites with extra features, such as search capabilities and multilingual support, were also given positive ratings of credibility (means = 1.18, 0.98). Reviews and user opinions were fairly important to users for credibility, with means of 0.77 and 0.72. The least dramatic increase in credibility came from a type of personalization: sites recognizing when a user had been there before (mean = 0.39).

Our data show that sites which failed to meet some of these standards would receive negative ratings on credibility. For example, sites that did not attribute their content to any source were reported to lose credibility. Technical problems such as broken links, site downtime, or typographical errors were rated the most negative on this scale, with a broken link receiving a mean of –1.42.

The next group of items is related to trustworthiness, one of the key elements that make up perceptions of credibility. Table 3 shows the items and the resulting means.

Table 3: Trustworthiness Factors

Trustworthiness Factors that Affect Web Credibility	Mean
The site has proven useful to you before.	2.02
The site lists the organization's physical address.	1.67
The site gives a contact phone number.	1.56
The site gives a contact email address.	1.47
The site is linked to by a site you think is believable.	1.26
The site states its privacy policy.	1.21
The site links to outside materials and sources.	1.17
The site was recommended by a news media outlet, such as a newspaper, magazine, or email newsletter.	1.14
The site was recommended to you by a friend.	1.03
The site lists well-known corporate customers.	0.67
The site represents a nonprofit organization.	0.66
The URL for the site ends with ".org".	0.25

One notable finding in Table 3 is the significant impact of a site having been useful to someone before. This high value of 2.02—the highest recorded in the study—shows that previous positive experience with a Web site will cause a dramatic change in a process we call *earned credibility.* On the other end of the scale, a domain name that ends in ".org" caused little change in perceptions of credibility.

Sites with clear connections to the real world fared best in credibility. For example, the availability of a physical address, a contact phone number, and an email address were rated highly (means = 1.67, 1.56, 1.47). Further down the scale, a site received nearly equal boosts in credibility when it was recommended by a news media outlet (mean = 1.14) or by a friend (mean = 1.03). (While statistically significant, the difference in these two values is not likely to be practically significant.)

As for privacy and credibility, the study finds that sites which state a privacy policy were reported to be more credible (mean = 1.21).

Many of these items, from providing contact information to having a privacy policy, are under control of those who operate or design Web sites. In contrast, some items are not under direct control of the site designer: having well-known corporate customers (mean = 0.67) and representing a nonprofit organization (mean = 0.66).

Five items are grouped into a category we call sponsorship – issues relating to ads and advertising.

Table 4: Sponsorship Factors

Sponsorship Factors that Affect Web Credibility	Mean
The site is advertised on the radio, billboards, or other media.	0.77
The site has ads that match the topic you are reading about.	0.22
The site has one or more ads on each page.	-0.60
The site automatically pops up new windows with ads.	-1.64
The site makes it hard to distinguish ads from content.	-1.90

Sponsorship provides an interesting lens through which to view Web credibility. Sites that were advertised on the radio or other media were reported to get a moderate credibility boost (mean = 0.77). Asking about advertising from a different angle, our study found that the credibility gained by using targeted online ads was nearly negligible (mean = 0.22).

For the most part, our respondents reported that advertising damaged a site's credibility. Simply having an ad on the site led to a slight decrease in credibility (mean = -0.60), while pop-up ads were regarded even more harshly, seriously damaging the perceived credibility of the site (mean = -1.64). Finally, sites that made it difficult to distinguish between ads and content were reported to be the least credible of all; the mean here of -1.90 was the most negative score in this study.

Table 5: Other Factors

Other Factors that Affect Web Credibility	Mean
The site is by an organization that is well respected.	1.97
The site has been updated since your last visit.	1.65
The site looks professionally designed.	1.54
The site is arranged in a way that makes sense to you.	1.46
The site's design is appropriate to its subject matter.	1.21
The site sends emails confirming transactions you make.	1.20
The site provides printer-friendly pages.	0.99
The site provides live chat with a company representative.	0.62
The site appeared on the first page of search engine results.	0.60
The site was the first site listed by a search engine.	0.51
The site is designed for e-commerce transactions.	0.20
The site contains content that differs from your opinions.	0.11
The site requires you to register or log in.	-0.14
The site has a commercial purpose.	-0.28
The site is hosted by a third party (e.g. AOL, Geocities).	-0.43
The site requires a paid subscription to gain access.	-0.88
The site takes a long time to download.	-1.00
The site's domain name does not match the company's name.	-1.07
The site represents a company that is having financial or legal difficulties.	-1.08
The site links to a site you think is not credible.	-1.38
The site is difficult to navigate.	-1.38
The site is rarely updated with new content.	-1.65

Table 5 shows how other factors affect Web credibility, both positively and negatively. Here we report on a few of these items in no particular order, even though many findings in this other category are notable.

The data show that Web credibility can be earned by an organization that is respected offline (mean = 1.97). Next, it appears that one of the surest ways to create a credible site is to arrange the site in a way that makes sense to the users (mean = 1.46), and one of the surest ways to lose credibility is to make it difficult to navigate (mean = -1.38). Furthermore, sites that are updated "since your last visit" are reported to be more credible (mean = 1.65), while sites that are "rarely updated with new content" received the exact negative score (mean = -1.65)

Interestingly enough, sites requiring paid subscriptions to access content did not gain in credibility—they lost credibility (mean = –0.88).

Finally, the recent proliferation of dot-com financial troubles might have contributed to one finding: sites representing a "company with legal or financial difficulties" were viewed to have low credibility (mean = -1.08).

Table 5 lists other factors that significantly impact credibility.

Design Implications

Looking at the findings in this study as a whole, we have compiled six overall design implications, each of which will help boost a Web site's credibility. We present these design implications as a summary of the data reported in this document.

Design Implication #1 Add value to each Web visit

In general, our data suggest that sites gain credibility when they are able to recognize the needs of their audiences and provide tools or content to meet those needs. People who found Web sites useful in the past were likely to assign high levels of believability. Many of the highest-ranking statements in terms of credibility cited features that improved a person's Web experience, such as fresh content, quick responses to customer questions, email confirmations of online transactions, search capabilities, printer-friendly pages, and contact information (either by phone, mail or email).

Design Implication #2 Guard the integrity of your content

In general, our data suggests that integrity of content has considerable impact on how people evaluate the credibility of a Web site. Study participants gave some of their lowest scores on

credibility to sites that fail to separate advertising from editorial content, run too many ads on a page, or display ads through pop-up windows. At the same time, users gave strong marks to site content that identified its sources and provided its authors' credentials.

Design Implication #3 Make it simple to get around

Our findings show that the quality of a site's navigational system can directly impact perceptions of credibility. While the statement "the site is difficult to navigate" was reported to hurt credibility considerably, its polar opposite ("The site is arranged in a way that makes sense to you") was reported to be among the biggest contributors to credibility. The implication of these and other results is clear: Web sites need to be easy to use.

Design Implication #4 Appearances matter

Beautiful graphic design will not salvage a poorly functioning Web site. Yet, the study shows a clear link between solid design and site credibility. Participants said they were more likely to believe Web sites that looked professionally designed and appeared visually appropriate to the subject matter. It’s clear from the data that Web users do not overlook simple cosmetic mistakes, such as spelling or grammatical errors. In fact, the findings suggested that typographical errors have roughly the same negative impact on a Web site's credibility as a company's legal or financial troubles.

Other appearance issues matter as well. Web users have expectations about a company's domain name. Companies that fail to include their name in their Web site's URL impact perceptions of believability. Third-party hosting addresses (such as those found through AOL or Geocities) are also detrimental to a Web site's credibility.

Design Implication #5 Make sure everything works

Simple technical errors can have the same devastating impact on credibility as poor design or navigation. Broken links and unexpected downtime received some of the lowest marks on our survey. Site developers should also remain sensitive to the wide variance in access speeds throughout the globe. Because slow download times impact site credibility, Web sites with simple designs may have a credibility advantage over Web sites that rely heavily on graphically rich elements, such as animations.

Design Implication #6 Watch your reputation and your affiliations

An organization's standing in the real world impacts the credibility of its institutional Web site. Not surprisingly, the results say that "well respected" companies also enjoy high levels of online credibility, while companies with legal or financial troubles garner low rankings. At the same time, the study indicates that Web credibility can also be positively or negatively affected by

outside associations. A credible site can bestow credibility on another site by linking to it, while links to non-credible sites poisons the originating site's own reputation.

These design implications represent our overall interpretation of the data at this stage. But our general interpretations may not apply to everyone. We encourage readers to examine each item in the study and determine how the finding applies to their own situation.

Some Next Steps

This study sheds new light on what factors affect the perception of Web credibility. However, as we noted earlier, the findings presented in this document are an early step. While the mean scores for each item convey an overall picture, we intend to perform other analyses to generate new insights. For example, a factor analysis of the data may show the underlying forces at work when people evaluate the credibility of a Web site. In addition, analyzing people's responses according to demographics will show how credibility evaluations differ according to education level, gender, country of origin, income level, and experience with using the Web. These are the types of analyses we will soon undertake with this rich data set.

Furthermore, we will take advantage of the opportunity to compare the findings from this 2002 study with a similar study we performed in late 1999. This earlier study asked many of the same questions to over 1400 people with nearly the same demographics. Putting the two data sets together will allow us to compare how things have changed—or not changed—over time. We may be able to identify trends in how credibility is being evaluated and, perhaps, predict future developments in this area.

Acknowledgements

The Stanford Persuasive Technology Lab received help from various parties during this study. Makovsky & Company was our main collaborator, contributing time, expertise, and financial support. Also, we want to acknowledge the role of Alma Media in helping recruit participants from Europe. We interacted with Alma Media purely via email, and their messages were always filled with humor and charm. Finally, we appreciate the role of the nonprofit organizations that took an interest in this work, as well as the hundreds of people who found time to participate in this study without compensation. These people and organizations made this study possible.

Endnotes

[1] You can find a few dozen examples of web site hoaxes at http://www.museumofhoaxes.com.

[2] The most recent study to show that people are skeptical of what they find on the web is a study by Consumer WebWatch, part of Consumers Union (disclosure: BJ Fogg is an adviser to this organization). The study can be found at http://www.consumerwebwatch.org/news/1_TOC.htm.

[3] The section defining credibility is taken from:

> Fogg, B.J., & Tseng, H. (1999). The Elements of Computer Credibility. *Proceedings of ACM CHI 99 Conference on Human Factors in Computing Systems* v.1, 80-87. New York: ACM Press. http://www.acm.org/pubs/articles/proceedings/chi/302979/p80-fogg/p80-fogg.pdf

[4] For a review of credibility research, see:

> Self, C.S. (1996). Credibility. In M. Salwen & D. Stacks (Eds.), *An Integrated Approach to Communication Theory and Research*. Mahway, NJ: Erlbaum.

[5] For discussions about how credibility is made up of muliple dimensions, see the following:

> Gatignon, H., & Robertson, T.S. (1991). Innovative Decision Processes. T.S. Robertson & H.H. Kassarjian (Eds.), *Handbook of Consumer Behavior*. Englewood Cliffs, NJ: Prentice-Hall.
>
> Petty, R. and Cacioppo, J. (1981). *Attitudes and Persuasion: Classic and contemporary approaches.* Dubuque, IA: Brown.
>
> Self, C.S. (1996). Credibility. In M. Salwen & D. Stacks (Eds.), *An Integrated Approach to Communication Theory and Research*. Mahway, NJ: Erlbaum.
>
> Stiff, J. (1994). *Persuasive Communication*. New York: Guilford.

[6] The reference for our 1999 study is:

> Fogg, B.J., Marshall, J., Laraki, O., Osipovich, A., Varma, C., Fang, N., Paul, J., Rangnekar, A., Shon, J., Swani, P., & Treinen, M. (2001). What Makes A Web Site Credible? A Report on a Large Quantitative Study. *Proceedings of ACM CHI 2001 Conference on Human Factors in Computing Systems.* New York: ACM Press. http://www.acm.org/pubs/articles/proceedings/chi/365024/p61-fogg/p61-fogg.pdf

[7] Each research method has its own set of weaknesses, including surveys. Surveys don't always capture how people actually feel or behave. However, we chose the survey method because it was the most efficient means of gathering a significant amount of data to build a foundation for future research, including controlled laboratory and contextual field studies with behavioral measures.

[8] We've described the iterative process for developing the questionnaire items and the online research method in:

> Fogg, B.J., Marshall, J., Laraki, O., Osipovich, A., Varma, C., Fang, N., Paul, J., Rangnekar, A., Shon, J., Swani, P., & Treinen, M. (2001). What Makes A Web Site Credible? A Report on a Large Quantitative Study. *Proceedings of ACM CHI 2001 Conference on Human Factors in Computing Systems.* New York: ACM Press. http://www.acm.org/pubs/articles/proceedings/chi/365024/p61-fogg/p61-fogg.pdf