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Improving User Experience for the Visually Impaired in Online Forms

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A B S T R A C T :

Context: Okay so the internet's huge demand, and lots of things use online forms to grab your information. Loads of sites still don't play nice with accessibility stuff, so it's a pain for people with sight issues to fill out forms. To fix this some web developers made something called WAFI (Web Form Accessibility Framework for the Visually Impaired).

Objective: Created a system to help web people build web forms that work for people facing with visuals problems. It help those users fill the forms faster. Marking a line on mistakes when filling the forms. Make filling the forms easier to do on their own. Make the whole things better for people with visual problems dealing with web forms.

Method: The developers create WAFI with all the components needed to make forms accessible. They tested it in two types: AWF – the accessible one, built with WAFI.

IWF – the not-so-accessible one, without WAFI.

They got users with visual problems and some experts to solved out by these two types. How fast people filled the info. How many mistakes they made. Turns out, AWF was faster and had fewer errors than IWF.

Results: Okay let us discuss what people said the people said WAFI is good for accessibility, but a checklist part need some improvement. People with vision problems using screen readers had problem with regular forms. But with WAFI web form is filled out AWF forms faster and better, with less mistakes, compared to using IWF forms. Afterward, people said that WAFI's parts were helpful and they liked and comfortable using it.

Conclusions: The study tells us WAFI-a Web Form Accessibility system for people who can't see well to fill online forms easier for them. The system has six parts and was checked by developers and people with sight problems. The study showed that when people used forms made with WAFI, they filled the forms faster and avoiding mistakes and made less mistakes than compared to regular forms. This shows that WAFI can really help people with sight problems feel more comfortable of themselves and do things on their own. It also can show developers how to make web forms that everyone can use, no matter what language they speak or what type of device they are using.

Keywords: Brain Stroke, Demographic, pathological, extraction techniques, stroke
Keywords: Web accessibility Web forms Inclusive design Visual experience

1. Introduction

Having trouble for seeing is a really common disability all over the globe, in now a days and it might be uncomfortable for some people. The internet is a big opportunity to learn & getting help from the government, doing business, chilling out, and staying in contact. But if you can't see properly getting around websites can be a real hurt because they're mostly made for people who can see, even if you're using tools to help. Online forms like the ones you use to book tickets, shopping, sign up for things, or apply for courses, are little bit tough for people who can't see well. They confused a lot and wasting time a lot. Even though there are things are there to help, like some platforms & a lot of websites still don't follow them by some people. So to sort out this issue & some people introduced the Web Form Accessibility Framework for the Visually Impaired (WAFI). It's there to show designers how to build web forms that are simple, quick, and more comfortable so that people who can't see well can do their own thing and have the same feel as everyone else. This article which implies the moto of the use of methodologies within the Ecuadorian development market, also its degree of implementation and working within the process.
For these conditions we surveyed developer companies in Ecuador that allowed us to know whether the methodology with greater use in practice is the same from developers, as from authors of the literature, as well as, the difference, similarities, and the degree of involvement.

As a consequence, the main objective of the research is to compare web software development methodologies based on society environments presented during the life cycle to identify their use, relevance, and characteristics during the process; through an SLR and field research to Ecuadorian developer companies. Besides, to propose the most suitable methodology for quick development processes, considering indicators that affect their employment, such as the type of company and type of project. The rest of this document is based on these sections: Section 2 presents the framework used for the analysis of related research. Section 3 provides the search methodology used to classify and analyze primary studies on these issue Section 4 exhibits a description of web development methodologies of chosen. In Section 5 we present the results of the comparison and field research. Finally, Section 6 provides a discussion of the findings followed by conclusions and future work in the web.

CONCEPT OF WEB ACCESSIBILITY

Web engineering :-

In today's online world it is very important that everyone can use the internet no matter what the purpose is. Availability let people with disabilities use electronic gadgets safely. If websites are accessible, everyone get a chance at finding information in online. The W3C says it's vital for website creators and companies to build sites that don't leave anyone out. The Web Accessibility Initiative also says accessibility is good for all. It's not just about how a site looks it's about understanding that everyone has different needs when they go online. Each person may need something a bit different.Web accessibility means making websites and apps usable for everyone, including people with disabilities like vision, hearing, duff or learning issues. This is important so everyone can join in education, jobs, government works, and social activities. To make things accessible, developers stick to standards like the Web Content Accessibility Guidelines (WCAG). These guidelines have rules for things like text for images, keyboard use easy-to-read and write, understand and designs that adjust to different screens. The rules follow four main ideas: Things need to be noticed (so people can see or hear them), usable so people can click and type & people can observe them easily, and they need to work on different devices and browsers. Accessibility is a choice and It helps people with disabilities, and it also makes things easier for aged people, people with temporary injuries, and those on phones.

Web form development methodologies

We built WAFI step by step. First we need to looked at what problems people with uncomfortable vision have when filling the online forms. Then, we came up with a basic ideas with six parts. These ideas covered how to make forms, enter info, fix mistakes, deal with those image tests (CAPTCHAs), make things easy to use, and check if it all works well.

Developers checked our plan to make sure it made sense and was easy to use, and they guide us how to make it better. After that people with impaired vision tried out web forms built using WAFI (AWF) and forms without it

(IWF). We watched how fast they were, how accurate they were, and what mistakes they made. In the end we changed our plan based on what the developers and users thought to create the finished version. This made sure web forms were quicker, easier, and accessible.

Research methodology

The WAFI research is divided into five steps. First we to know all about web accessibility, web forms, and the problems that people with sight problems, and also to see what was missing from current fixes. Second we put together the basic things for our framework idea. Third, we had experts give us their opinions and tested it out with real users who are facing sight problems. Fourth, we looked at what we learned to see what worked well and what could be better. Last, we made the framework better using all that gathered information, which gave us a final version that makes web forms easier to use and way better for people with sight problem.

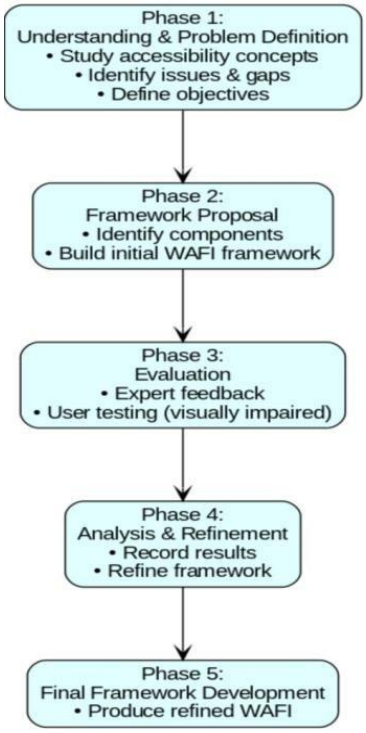
We checked out our framework using two methods: getting opinions from people and running tests with visually impaired people. The final thing has six parts: how the form looks, putting info in, telling you about mistakes, the CAPTCHA thing, some extra features and a way to see how well it works. In the tests, we looked at how long things took if they were done right, and

how easy they were to handle. We tweaked the frame work

,so anyone can use it, no matter what language they speak or what device they're using. The way we did things makes sure it's not just a good idea on paper. It makes filling out web forms quicker, simpler, and more accurate for people with sight problems.

Phases of Research Methodology in WAFI Development

FIG-1



1. First we need to check accessibility in ideas, web form parts, and how people with sight problems use them. This helped us see what problems exist and set our main moto to sort out.
2. Second, we came up with the old version of WAFI. We figured out what parts and rules would help make web forms easier to use.
3. Third, we tested it. Web experts and usability pros gave their opinions, and users with impaired vision tried it out. With this, we measured how accurate, fast, and easy it was to use.
4. Fourth, we wrote down what we found, looked at how well people did, and improved WAFI based on the results. We fixed weak spots and added new techniques to our WAFI.
5. Fifth, we created the better version of WAFI. It makes web forms easier to use, gives instructions, checks if it works right and offers a checklist to keep things usable. This way, WAFI is helpful for visually impaired users. The activities estimated to carry out in this stage are:
6. An author made a data extraction form, which covers the fields required and stipulated in the data collection section.
7. The form is subject to evaluation whereby pilot tests with random selection of primary studies.

Manually, an author extracted the results from each study, due to the small number of studies obtained.

Key Framework Components

Making websites easy for everyone to use, no matter what, is what web accessibility is all about. It is important for people who can't see well, since a lot of info online is still hard for them to get to. The World Health Organization (who) says that at least 2.2 billion people around the world have problem in vision, and a lot of the time requires to the forms. Studie shows that if a website isn't easy to use, businesses can miss out, users with impaired vision people approximately two-thirds them make mistakes in their online shopping because the website is difficult to use, which adds up to billions of dollars lost each year. Making Web Forms Easy to Use To fix things, web creators check the Website Content Accessibility Guidelines (WCAG). These are rules that everyone agrees on for web accessibility.

These are based on four main ideas:

1. Easy to See Users should be able to see and sense information and what they clicking. This means using alt text for images and making sure text and backgrounds don't blend together.

2. Easy to Use: People should be able to get around on the site and click on information. The site should work if you only use a keyboard, and there shouldn't be a time limit for filling the forms.

3. Easy to Figure Out: The site and what you do on it should make sense. Forms should have labels that describe what each spot is for. If there are mistakes on the form, the error messages should be easy to read and tell you how to fix the problem.

4. Works with Everything: The Web Form Accessibility Framework for the Visually Impaired (WAFI), which the paper talks about, uses these ideas and gives tips for making forms. For example, it remembers to people fill in forms from a file they already have, using ways to type with speaking, and having an easy-to-use option if a CAPTCHA test comes up. It also says to make it clear when mistakes are made and to tell people about them in the same way every time.

Ways to Check If a Site is Easy to Use To be sure a site follows all of these instructions :

1. Navigation model design.
2. Presentation design
3. On the other hand, the comparison of characteristics of methodologies relays on the requirements engineering patterns presented in the Schön et al. research which refers to agile requirements within the development process detailed.

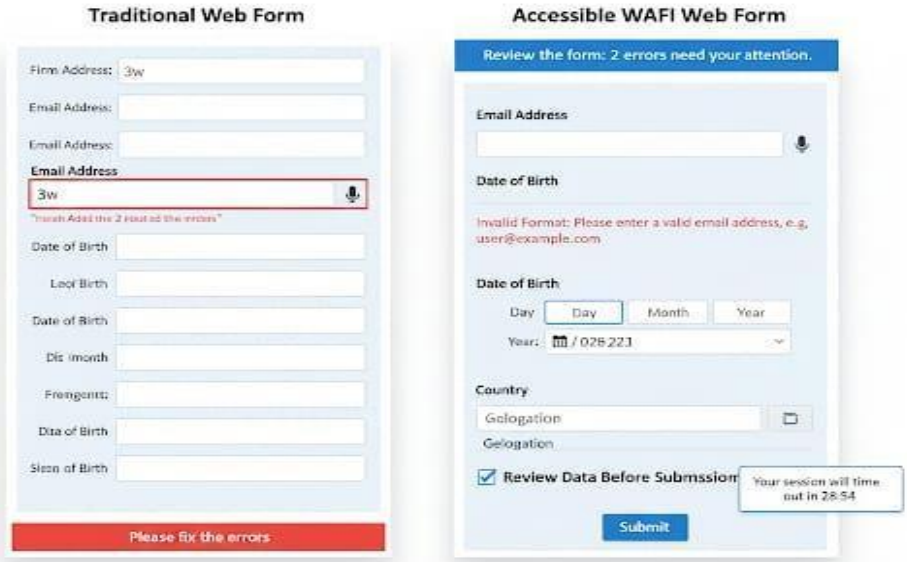


FIG-2 detecting the errors

CAPTCHA – Say the Word

- How it Works: This checks you're human by using voice:
- You hear a random word.
- You say the word back.
- You can replay the word if you need to hear it again.
- The words are short and simple.

Making Web Forms Easier :

Instructions: Give clear instructions clearly and as you go. Tell people what's needed, what's optional, and how to type things in.

Timeout: Let people adjust how long they can be idle before the form times out. Give them a warning before it does, and let them add time with a key press (like the space bar).

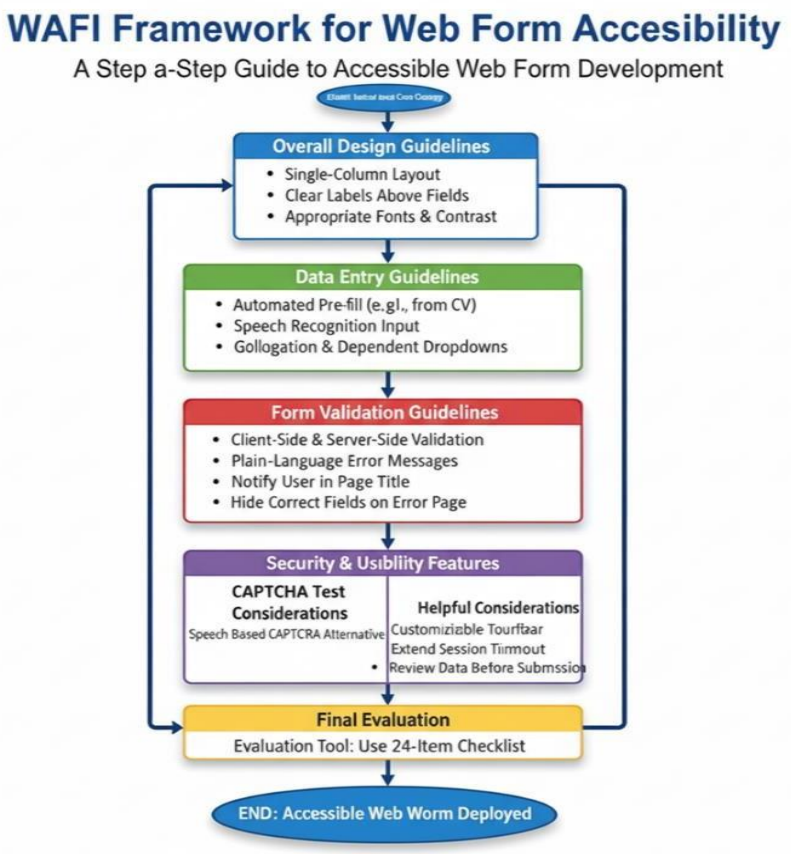
For Users with Vision Problems: Add a toolbar where users can change the colors, fonts, and sizes to what works best for them.

Check Your Answers: Before sending the form, let users look over what they typed to be sure it's all correct Customer's analysis.

Put the instructions right at the top and also next to each box.

* Keep the language easy and skip the techy stuff.
* Make it obvious which boxes you have to fill in and which ones you
*can skip. Like this: Instead of Enter DOB, say Enter your date of birth like this: DD/MM/YYYY (you have to fill this in).

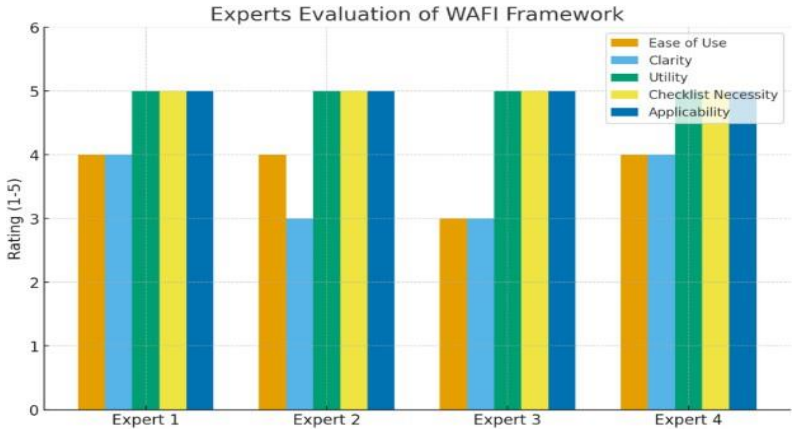
FIG-3



To see how well WAFI does its job, the researchers tried it out on Web forms : One form IWF was a regular form without any accessibility help. It was based on a real job form.The other AWF was made using WAFI to be easier for people with sight problems to use. Both forms had about the same kinds of fields, so the test was fair. They got few volunteers with sight problems who knew how to use the internet and tools that help them. They found these volunteers on Twitter and through groups that work with people who have sight issues.

Feature between two forms :-AWF (Easy Web Form) | IWF (Hard Web Form)

Results:-



What the Experts Said after testing with vision impaired peoples review Experts looked at the WAFI framework and rated it on a scale of 1 to How the Framework is Used:

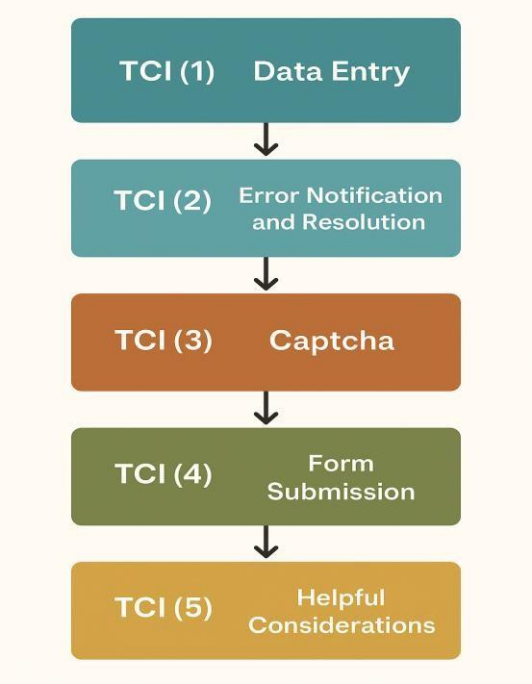
The experts mostly thought the framework had what it takes to make web forms easier for people with sight problems.

Participants Information Table

Category	Number of Participants	Percentage
Total Participants – Men	4	30.77%
Total Participants – Women	9	69.23%
Education - High School	3	23.08%
Education - Bachelor's Degree	9	69.23%
Education - Master's Degree	1	7.69%
Language - Arabic	13	100%
Eyesight - Totally Blind	9	69.23%
Eyesight - Partly Blind	2	15.38%

Common thing was using them for surveys, talking to others, or taking tests. They had some trouble filling out the forms, though. The biggest issues were labels that screen readers couldn't read, struggles fixing mistakes, captchas, hard-to-read fonts, and sessions that timed out too fast. A few also mentioned mismatched colors, error messages that didn't make sense, and form parts they couldn't access. During testing, people did different kinds of data entry. Filling PDF text fields that were already partly filled took about 52 seconds on average. Voice recognition was quicker, at 29 seconds, but only one person used it. Picking dates with a date picker was the slowest and had the most mistakes, taking about 79 seconds. Using a selection box for dates was faster, at 38 seconds. Everyone got the address entry right when using the API, while using a selection box for addresses took about 38 seconds on average. Entering phone numbers with hints and country codes was the fastest, at around 27 seconds. Basically, the results show that people could usually do most things, but some things like date pickers and screen reader support made it tough. taking about 79 seconds. Using a selection box for dates was faster, at 38 seconds. Everyone got

FIG-4 indicates the tabular form flow chart



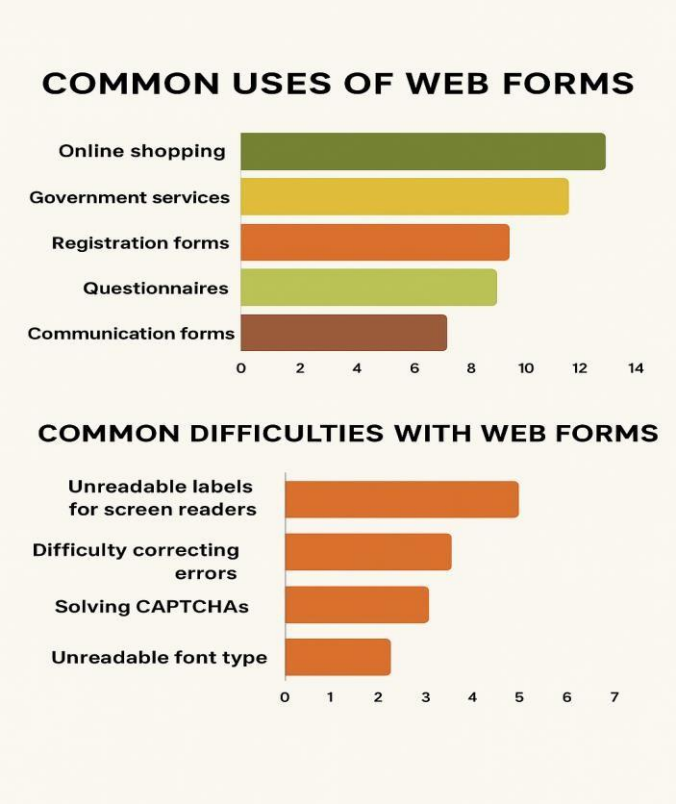
the address entry right when using the API, while using a selection box for addresses took about 38 seconds on average We checked how easy web forms are to use with five tests.

- Test 1 looked at how people type info into forms, with seven things to do.
- Test 2 watched how people saw and fixed mistakes.
- Test 3 checked how people dealt with those CAPTCHA things.
- Test 4 looked at how people sent in forms.
- Test 5 was about helpful information added to make forms simpler. For each test, we saw how many people finished, how many messed up, how many did it right, and how long it took on average. To see if our WAFI setup was any good, we checked out two forms: one easy to use (AWF) and one not so much (IWF).

Both had the same stuff to fill in. We looked at how fast people were, how correct they were, and if they sent the form okay.

Afterward, people answered some questions about how happy they were with the AWF parts. They rated 13 things from 1 to 4, with 1 being not useful and 4 being very useful. Then, we figured out some numbers to sum up what they said. The results showed that who people were didn't matter much because everyone knew their way around the internet and helpful tech. But, how fast people finished changed a bit depending on how fast their screen reader was and how well they got quick talking. For instance, everyone filled out forms with pre-filled PDFs just fine, likely because it let them do lots of fields at once. People who could see had already put the right info in the PDF, so it was easier. Still, people on phones sometimes took longer to find the file compared to computer users since stuff can be hidden on phones

FIG-5 service of web forms



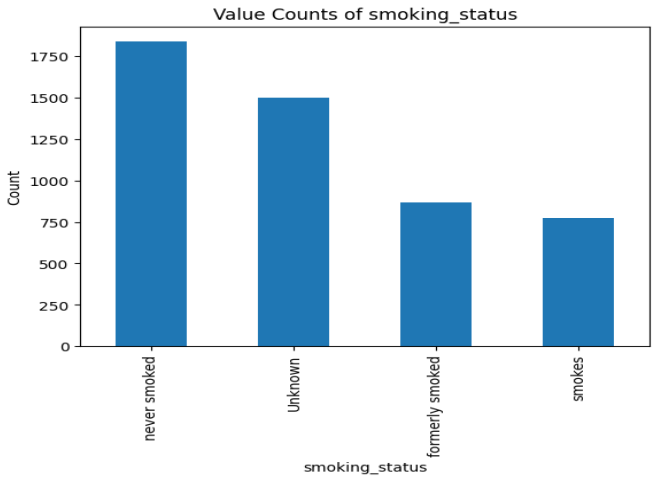


FIG-6 enter data

(v) Residence Type

We ran five tests (TC1-5) to see how easy web forms are to use for everyone. These tests looked at things like filling in info, getting error messages, solving captchs, sending forms, and getting help. We checked out two types of web forms: one designed to be easy to use (AWF) and one not so much (IWF).
We then looked at how correct people were and how long it took them to do stuff.
Turns out, AWF had better results. People got more right, did things faster, and made fewer mistakes compared to IWF.
Afterward, we talked to people, and they said the AWF stuff was more helpful and easier to use.
Turns out that things like gender or how much school someone had didn't really change how people did on the task.

Everyone already knew how to use the internet and the tools we gave them. But, how long it took people to do stuff changed a bit based on how fast their screen reader talked and how well they understood fast talking.

The paper says WAFI was given the thumbs-up by experts and also tested by folks with sight problems.
That's how things usually go when you're trying to make the web easy for everyone to use. Why Expert Opinions Matter Basically, accessibility pros check a site or setup against rules everyone knows, like WCAG. They're important because they spot stuff that automatic checkers miss – things about how stuff fits together, how it feels to use, and if it makes sense. Turns out, these experts are speedy at finding problems, way more than people who aren't in the know, especially when you're talking about tricky stuff like online forms. Why Real User Tests Are a Big Deal But, getting those expert opinions isn't everything.

Future works

1. To make WAFI even better, there are a few things we could do next.
2. First, we should test it with more blind users, ideally in person, to get a better sense of how it works for everyone.
3. We can also tweak WAFI so it's easier to use for people who have other disabilities, like trouble moving or thinking.
4. And making it work great on phones and tablets is a must. It would be really cool if WAFI played well with tools that people who are blind already use, like screen readers or voice commands.
5. Using AI to spot mistakes and find better CAPTCHAs would be a big win, too. Putting WAFI on real websites would tell us a lot about how well it actually works.

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