# XRAY: Inspector Tools For Designers

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## ABSTRACT

Examples are widely used by both designers and developers in the creation of websites. Numerous tools have been created to facilitate developers' borrowing of code from live websites and design examples. However, little work has been done to improve the experience of designers working on partially-developed or live sites. This paper introduces XRAY, inspector tools for designers (Figure 1). Unlike traditional inspector tools, XRAY allows the designer to adjust fonts, colors, margins, and padding without ever needing to look at HTML or CSS, making this technical, traditionally code-based task more approachable for designers. XRAY promotes the use of design systems by only suggesting styling options that exist in the current design system and highlighting where current aesthetics violate the design system. XRAY also improves designer-developer communication by allowing people in different locations are able to make live edits to a website collaboratively. XRAY allows users to export a document with all changes at the end of their session. Moreover, a 12 person user study with novices and a 12-person user study with professional designers showed that people were xx% more efficient, yy% more successful, and experimented more by using zz% more styles when they used XRAY, than when they used the standard industry tools.

## ACM Classification Keywords

H.5.m. Information Interfaces and Presentation (e.g. HCI): Miscellaneous; See http://acm.org/about/class/1998/ for the full list of ACM classifiers. This section is required.

## Author Keywords

Web design; design systems; inspector tools; experimentation; human factors; developers; designers.

## INTRODUCTION

Both programmers and web designers look at websites for design inspiration and at snippets of code for guidance. Researchers and industry professionals have made developers tools to enable these programmers and designers to learn more from these examples. However, many of these tools are geared towards those who are comfortable with code.

**Figure 1. A screenshot of the XRAY user interface and the menu for [fonts? colors? margin/padding?]**

While there are some designers who can write code, and there are some developers who understand design, most professionals in industry specialize. Creating an app, website, or any product with a UI becomes a collaborative and iterative process. For example, if a company was preparing to launch a new website, the designer would create a mockup of how the product should look and send it to the developer. The developer would code it, and send it back to the designer. No first draft is flawless and the designer now needs to communicate the mistakes to the developer.

Some designers will meet with the developers, sitting next to them and explaining what needs to be changed. However, that is very time-consuming for both the developer and designer. Other designers might send an email with a checklist of what needs to be fixed, but matching the block of test to the website gets confusing very quickly. In reality, it is most common for the developer to "redline" by marking up a screenshot of the website using tools like Sketch or InVision, such as in Figure 2 as taken from Moore's 2017 Medium article [10].

The ability to write comments on a screen simplifies the revision process. Instead of writing an essay for each bullet point ("the icon of a drill on the top left of the home page should be enclosed by a circle instead of a square"), the designer can draw an arrow and say "should be a circle."

However, when it comes to colors, padding, and other sizing issues, detail is key. Instead of saying "this black should match the black background on the homescreen", why not just tell the

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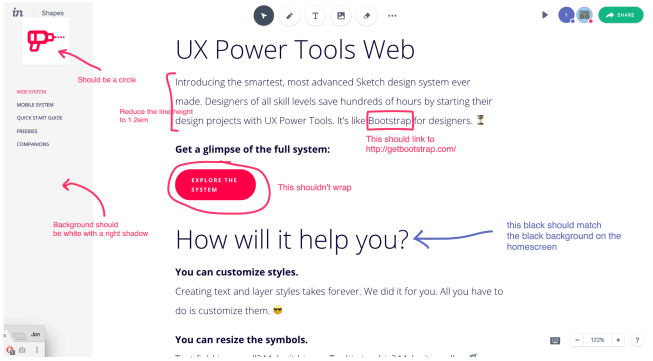

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You can resize the symbols.

Should be a circle

Reduce the line height to 1.2em

This should link to http://getbootstrap.com/

This shouldn't wrap

Background should be white with a right shadow

this black should match the black background on the homescreen

**Figure 2. Example of a "redline" or markup of website that a designer might send to a developer**

developer the hexcode of the color it should be? Additionally, prior work shows the benefits of experimentation. Ideally, when the designer notices that the line height is too large, they would have the opportunity to see what the page would look like with 1.0em, 1.1em, and 1.2em before telling the developer which one is best.

Currently, the programmers in this situation are gatekeepers: they control the design and aesthetics of a finished product even though they do not have the knowledge or training that a designer does. The designers are in the uncomfortable position of knowing exactly how the final product should look, but are unable to create it themselves.

To help address this problem, we built XRAY (Figure 1), design tools for developers. Unlike traditional inspector tools, XRAY allows the designer to adjust fonts, colors, margins, and padding without ever needing to look at HTML or CSS, making this technical, traditionally code-based task more approachable for designers. ALSO, (A. Allows designer to work in same medium as developers (as opposed to graphical tools like sketch), and B. Allows designer to better understand how websites are made/visualize element style and positioning i. Margin v. padding, etc)

XRAY makes the following contributions:

- XRAY promotes the use of design systems by only suggesting styling options that exist in the current design system and highlighting where current aesthetics violate the design system. (in other words: promotes the use of design systems by only suggesting styling options that exist in the current design system and highlighting where current aesthetics violate the design system.) only showing styling options that exist in the design system (this can be overridden). Highlighting where the current page aesthetics violate the design system, so these can be fixed or the design system can be updated.

- These features were designed to increase experimentation by automating consistency (percolating changes), (talk about how this facilitates designer to copy styles from other elements)

- XRAY also improves designer-developer communication by allowing people in different locations are able to make live edits to a website collaboratively.

- XRAY allows users to export a document with all changes at the end of their session (again, Improve designer-developer communication)

- Moreover, a 12 person user study with novices and a 12-person user study with professional designers showed that people were xx% more efficient, yy% more successful, and experimented more by using zz% more styles when they used XRAY, than when they used the standard industry tools.

## RELATED WORKS

MAYBE RE-ARRANGE ORIGINIAL RELATED WORKS TO FIT THIS PATTERN?

- Use of examples in design galleries
- Patterns found after design mining
- Actual design patterns for websites
- Using snippets of code from/understanding live sites
- Other tools for developers
- Transferring CSS from one site to other
- But there are few tools for designers (list)
- Sketching tools [4]
- Helping non-programmers select code [3]
- Overall, designers have it really rough, and a lot of research seems to be focusing on designers who can code and coders who can design. That isnâĂŹt what reality is like: many people in industry can either code OR design.
- Why are design systems important? WhatâĂŹs their benefit? [Maybe this belongs in the intro, but weâĂŹll want to have a reference].
- Linked Editing (https://dl.acm.org/citation.cfm?id=1034566) This might not fit here, but it should give us language when we talk about editing multiple instances at the same time.

(first pragraph explains how people copy aspects of designs/look at others for inspiration).

Designers often look at examples to find inspiration. Current example-finding practices include search engines to examine text on webpages, templates which show designs without any content or context, and design galleries.

Recent work has considered the use of design galleries to assist in web design [12, 8] and in animation [9].

[Author]'s [year] paper said there were over [number] of websites: with the multitude of examples of websites out there, some researchers have wondered how we can better harness that data. Webzeitgeist and other research projects have delved into the world of design-mining websites [7, 13] and mobile apps [1].

Other researchers have focused on smaller-scale projects. For instance, retargeting a design to a new size or aspect ratio [11], or reformatting text [5], or both text and images [2]. Others have focused on getting one document to be easily readable on different screen sizes and shapes [6].

## INTERFACE AND FEATURES OF XRAY

First: overall things. Is a chrome plugin? Can use on any website.

Lets you adjust and change: Fonts (family, weight), colors, margin, padding Automatically downloads Google fonts to make them available on the website. This is often a very tedious task that requires the designer to either install the fonts locally or have access to the code. You can copy and paste styles from one element to the next DoesnâĂŹt need to be same page Get an instant preview of those changes Can toggle on and off individual styles This means several sources can be pasted into same element (only really important because Web Crystal focuses a lot on this). Lets you download your changes (to give to developer) (final visual changelog) Developer now knows exactly what to do Which will result in less work for designer as well Whitespace is broken down into padding and margin. Normal redline documents only show spacing, but not whether it is margin or padding. Changes persist across page reloads Changes to symbols persist not only across page reloads but also across the whole website, even on different pages. Can have changes permeate through a whole page Many of these things help you see the design system (trees v. forest) Visualize website structure. Margin & Padding is invisible and it is often difficult to know how whitespace is assigned. This tool colors the whitespace to show the structure. Gives a live audit of the design system to show elements that diverge. I have implemented this yet, but we could make this collaborative, so two people could make live edits to a website collaboratively. ItâĂŹs not very practical I donâĂŹt think, but it is shiny. A corollary to this is instead of exporting a file to give to developers, the designer can just share the session with a developer and they can have a live editor of the changes.

## USER STUDY

### Participants

12 students 12 professionals

### Tasks

A, B, C (or) A, B

### Procedure

And fill in this section too

### Results

And put some graphs and stats and stuff in here

## DISCUSSION (HARD TO WRITE UNTIL WE HAVE RESULTS)

Implications of results to science Implications of results to practice Limitations Further research

## CONCLUSION

Discuss benefits...

Discuss harm/risks/dangers/drawbacks...

Discuss future work/room to grow...

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