

ISAD 135 – Website Development

Analysis of Sennen- Cove.com for usability

2000 Words

By Anthony Edwards

Contents

Executive Summary	3
Introduction	3
Usability Evaluation	4
Analysis	6
Navigation	6
Accessibility	7
Page speed	7
Page size and mobile viewing	8
Identifying a typical user	8
Projected user profile	9
Conclusion	9
Re-development goals	10
References	10
Appendix	12

Executive Summary

This report provides analysis and evaluation on the usability of Sennen-Cove.com. Methods of analysis include observation, questionnaires' and page speed testing.

Results of the study show significant failing of core usability principles'. The biggest issue identified is the lack of persistent navigation alongside multiple page layouts, increasing cognitive load. In addition, users suggested that they would leave the site before completing the intended task.

The report suggests a typical user profile based upon the analysis of the sites user base alongside usage data from another similar community site from the same geographical area.

I conclude that although the site fails on a range of usability principles', users we able to find (in most cases) the content they were looking for, therefore the problem lies in the way the content is presented and not with the content its self.

Based on the findings I have made a number recommendations for the redesign of Sennen-Cove.com, including;

- Introducing persistent navigation
- Structure the site using standard HTML and CSS practices
- Present the content in an easy to scan format
- Optimise images and remove structural tables to reduce page load times

Introduction

Neilson (2012) defines usability as "quality attribute that assesses how easy user interfaces are to use". Usability can be broken down into 3 key attributes (Forde, 2014);

- Easy to learn
- Easy to use
- Satisfying to use

The usability of a website or application is a key factor in whether it performs its intended goal and if users are likely to return in the future. If a user is not able to perform the task they intended they're likely to leave and look elsewhere.

Sennen-Cove.com is a locally run community site for the Cornish village of Sennen. It's regularly updated with relevant and engaging content. It seems to have a loyal user base who visit the site often.

To establish how well the website conforms to the core principles of usability I will performed an evaluation. I plan to give five users six simple tasks to perform followed a questionnaire based on their experience.

By observing the user during the tasks, analysing the results will highlight any potential faults. I'll then be able to present recommendations on how these areas can be improved.

Following this I will project a profile of the typical user, and make recommendations of how to improve the usability of the site based on my analysis.

Usability Evaluation

To evaluate the site I asked five participants to perform six tasks under observation. For each task I recorded if the user was successful in finding the information, the number of clicks and the time taken (appendix 1). This had the aim of highlighting problems with the design and structure of the site.

During the observation users verbalised their thoughts to provide some qualitative data, giving an understanding of why users were completing the tasks in the way they did. Following the completion of the tasks, participants filled in a questionnaire (appendix 2).

Fig 1 – Clicks for each user performing each task.

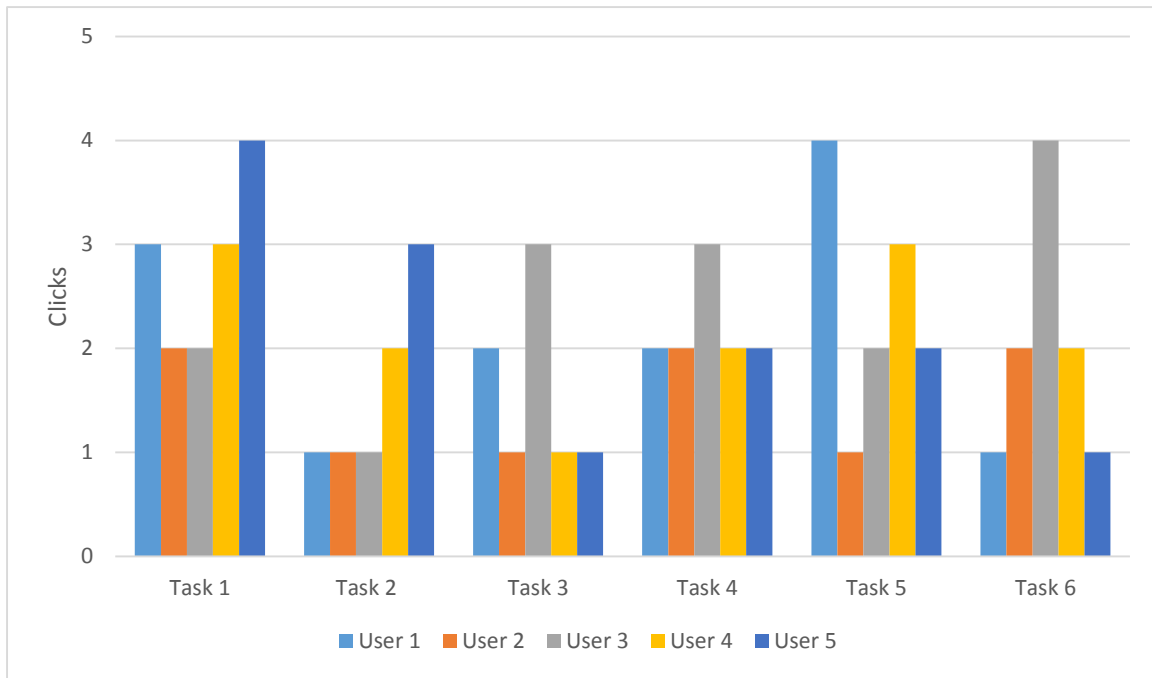


Fig 2 – Time taken for each user to complete task.

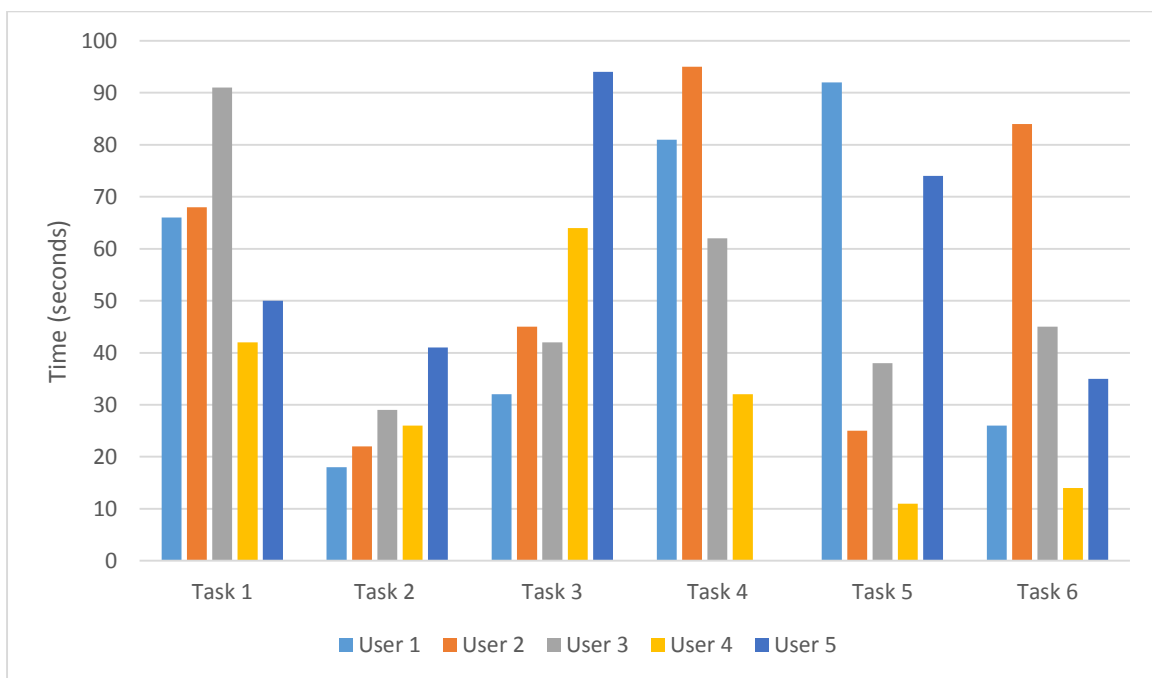


Fig 3 – Breakdown of quantitative results

Task success rate	90%
Total user clicks for all tasks	63
Average user clicks for all six tasks	12.6

Minimum clicks needed to perform all tasks	8
Average user clicks for each task	2.1
Total time for all users and tasks	1543 seconds
Average time per task	51.4 seconds
Average time per click	24.4 seconds

Analysis

The average time taken for a user to perform a task was 51 seconds, equating to 24 seconds per click. During this time the users were seen to slowly scan the page, looking at each element whilst scrolling to find the required information. This indicates a high interaction cost, a "direct measure of usability" (Budi, 2014).

Three of the five users indicated that they would have left the site quicker than they did during the test if they were not under observation. Studies show that web users will often leave a web page in under 20 seconds if they are unable to find the information they require (Neilson, 2011).

This indicates that the pages have a low level of scannability. Many pages of the site are not structured with headings as users have come to expect. By using a familiar hierarchical structure through headings and sub headings, pages are broken down into manageable pieces for the user to digest quickly. This is an important factor in cognitive content processing, whether online or in print (Krug, 2014, pp. 31-33).

Navigation

The most commented on feature of the site was the lack of consistency in the navigation. Problems include;

- No designated area for the navigation.
- No search function.
- External links were included within the navigation without indication that they led to another website.
- Not every page had navigation.
- When navigation was present, it often contained differing links.
- Link opens a new tab/window.

By not having persistent navigation, the site forces the user to re-learn the layout with each page load. This increases the cognitive load needed to process a webpage. (Whitenton, 2013) This additional load often deters users from using a site because

of the high interaction cost. It's also been found that "navigation is a key factor in a users' judgement of website quality" (Stewart, 2012, pp. 645--646).

One function of navigation is to give the user feedback on where they are (Krug, 2014, pp. 59). Without this it's easy for a visitor to get lost, which happened on the three occasions when the testers failed to perform a task. However, the low average number of clicks per task suggests content is organised into intuitive sections, finding these sections is the issue.

Studies indicate that people have a limit of 7 (plus or minus 2) pieces of "information that they are able to receive, process, and remember" (Miller, 1956, p. 81). The navigation on Sennen-cove.com contains upwards of 19 links. Giving users this number of links reduces their ability to use the navigation effectively, forcing them to consider each option on each page, instead of remembering them.

The site also lacks both a search function and a human usable site map, two things that can aid a lost visitor find what they are looking for. When users loose the information scent, the majority will turn to the search function to find content (Neilson, 2003).

Accessibility

Contrast between text and the background is important for the accessibility of a website for users with colour blindness or poor vision. W3 recommends that text should have a contrast ratio of 4.5:1 (W3.org, 2014). Appendix 3 shows that the homepage of Sennen-cove.com failed to have an acceptable contrast ratio for 37 elements, with the page containing two elements with a 1:1 ratio.

Page speed

Page speed is a large factor in determining if a user is likely to stay on a webpage. Neilson suggests "new pages must display within 1 second for users to feel like they're navigating freely" (Neilson, 2009). The 6.2 second page load time is beyond this, but still falls under the 10 seconds it takes for users to loose attention (Neilson, 2009).

Fig 4 – Page speed test of Sennen-Cove.com via www.webpagetest.org.

	Load Time	First Byte	Start Render	DOM Elements	Document Complete			Fully Loaded		
					Time	Requests	Bytes In	Time	Requests	Bytes In
First View	6.278s	0.105s	0.754s	525	6.278s	63	697 KB	12.093s	67	757 KB
Repeat View	5.153s	0.352s	0.440s	525	5.153s	4	88 KB	8.270s	4	88 KB

Considering the homepage consists of 4 images, an embedded YouTube video and various links, this is a high page load time. Contributing factors include the images taken directly from a non-video webcam stream directly (instead of caching), the page layout being constructed from tables and slow server responses.

Page size and mobile viewing

StatCounter finds mobile computing (tablet and phone) accounts for 23.9% of web browsing worldwide (Gs.statcounter.com, 2013), and growing (Keizer, 2013). With this trend looking to continue, it's important for sites to be mobile friendly.

Average 3G speed is reported to be between 1 and 4 MB (Marling, 2013) with my own experience of 3G in Cornwall being around 1MB. It's likely that the page load time is higher than the above speed test for the projected site user.

The majority of the site resizes down to 800px with very few resizing to mobile friendly widths. It achieves this through the use of complex tables for its layout. Unlike with media queries, tables cannot be manipulated to suit a mobile browser, instead stretching the content vertically. Neilson suggests that long pages are "problematic because of users' limited attention span" (Neilson, 2010), potentially leading to users leaving the page.

Identifying a typical user

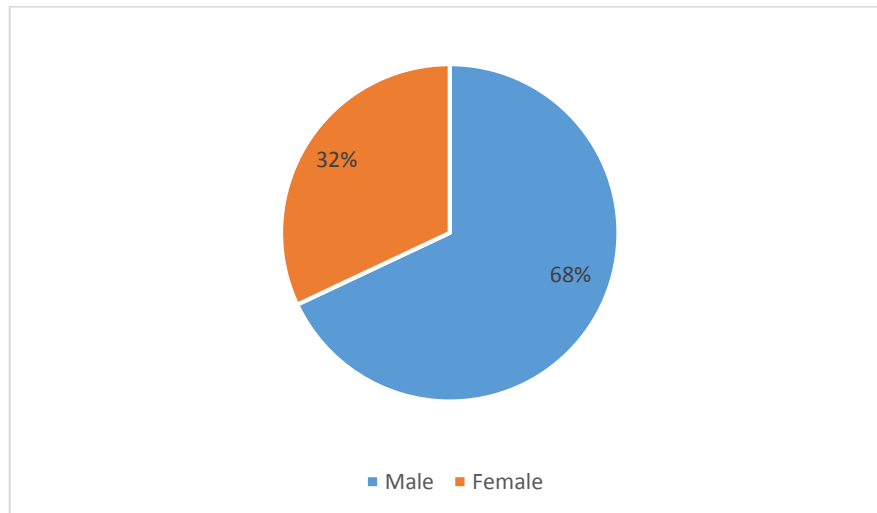
In order to successfully redevelop the website, it's necessary to think about a typical user profile. To generate a user profile I have used user opinion, my own estimation and analysed the sites users submitted elements. In addition I have used the Facebook user statistics (Appendix 4) for another West Cornwall community site, Purely Penzance. If this were an official redesign I would use the data from the actual website along with the insights of the webmaster.

During the user testing, I included the question "who do you think the intended audience is?" (Appendix 2). By including this I have the opinion of a range of potential users. The two popular responses were 'people local to the area' and 'tourists'. From this I expect that the average user is local to Sennen, or planning on visiting the area. The location data of the comparison site's users (Appendix 4) supports this view.

The site runs a "fun quiz", where a local landmark is photographed and users email their answer in. This leads me to think that intended visitors are local to the area. The

names of those with the correct answer are published on the site, and male's names outweigh that of female.

Fig 5 – The gender of respondents to the “Fun Quiz”



Projected user profile

Name – Mark Trevithick

Age – 55

Marital status – Married with 2 children

Location – West Cornwall

Employment – Semi retired

Mark is a semi-retired professional who lives in Sennen, West Cornwall. In his free time he enjoys many aspects of rural life including coastal walks and has a keen interest in photography. Mark plays a part in the local community, proactively helping with issues that affect the area, having been a RNLI volunteer in the past.

Conclusion

It is clear from the analysis that Sennen-Cove.com fails on a number of core usability guidelines. All though users were able to find, in most cases, what they were looking for, it took longer than would be expected from well-designed site.

The lack of persistent navigation is the biggest failure, making it difficult for users to quickly find the information they require. The slow page load, coupled with links opening in new tabs is likely to reduce users' confidence and at worst their trust.

The wide variety of page layouts increases the mental load, causing users to think about each and every option presented to them on page, greatly reducing the speed at which they can access the content

Regular users of the site may have come to accept this and, over time, learned to work around the flaws. Re-developing the layout and re-formatting the content would allow all web users effective access to content, resulting in a better experience for all.

Following this analysis of Sennen-Cove I will redesign the site to follow core usability guidelines, as outlined below.

Re-development goals

- Introduce persistent navigation to the site.
- Structure the site using standard HTML and CSS techniques.
- Present content in an easier to digest format using headings, paragraphs and grouping like content together.
- Make the site mobile friendly using responsive design and reducing the image size.
- Make the site accessible by improving the formatting of text and including alt tags where necessary.

References

Budiu, R. 2013. *Interaction cost: Definition*. [online] Available at:

<http://www.nngroup.com/articles/interaction-cost-definition/> [Accessed: 28 Feb 2014].

Forde, J. (2014, February 13th). *Usability evaluation*. [PowerPoint slides]. Presented at an ISAD 135 lecture at Plymouth University.

Gs.statcounter.com. 2013. *New StatCounter data finds that tablet internet usage is less than 5% globally / StatCounter Global Stats*. [online] Available at:

<http://gs.statcounter.com/press/new-statcounter-data-finds-that-tablet-internet-usage-is-less-than-5-percent-globally> [Accessed: 2 Mar 2014].

Keizer, G. 2013. *Mobile browser usage share hits 20% for the first time*. [online]

Available at:

- http://www.computerworld.com/s/article/9244639/Mobile_browser_usage_share_hits_20_for_the_first_time [Accessed: 2 Mar 2014].
- Krug, S. 2014. *Don't make me think, revisited*. Berkeley, Calif.: New Riders.
- Liu, C., White, R. W. and Dumais, S. 2010. Understanding web browsing behaviours through weibull analysis of dwell time. pp. 379--386.
- Marling, C. 2013. *How Fast Is Mobile Broadband? A Guide To 3G and 4G Broadband Speed - Mobile Internet Genie*. [online] Available at: <http://www.broadbandgenie.co.uk/mobilebroadband/help/how-fast-is-mobile-broadband-a-guide-to-3G-broadband-speed> [Accessed: 2 Mar 2014].
- Miller, G. A. 1956. The magical number seven, plus or minus two: some limits on our capacity for processing information. *Psychological review*, 63 (2), p. 81.
- Neilson, J. 2012. *Usability 101: Introduction to Usability*. [online] Available at: <http://www.nngroup.com/articles/usability-101-introduction-to-usability/> [Accessed: 27 Feb 2014].
- Neilson, J. 2011. *How Long Do Users Stay on Web Pages?*. [online] Available at: <http://www.nngroup.com/articles/how-long-do-users-stay-on-web-pages/> [Accessed: 28 Feb 2014].
- Neilson, J. 2009. *Powers of 10: Time Scales in User Experience*. [online] Available at: <http://www.nngroup.com/articles/powers-of-10-time-scales-in-ux/> [Accessed: 2 Mar 2014].
- Neilson, J. 2010. *Scrolling and Attention (Jakob Nielsen's Alertbox)*. [online] Available at: <http://www.nngroup.com/articles/scrolling-and-attention/> [Accessed: 2 Mar 2014].
- Neilson, J. 2003. *Information Foraging: Why Google Makes People Leave Your Site Faster*. [online] Available at: <http://www.nngroup.com/articles/information-scent/> [Accessed: 3 Mar 2014].
- Stewart, T. 2012. Websites--Quality and Usability. *Behaviour & Information Technology*, 31 (7), pp. 645--646.
- W3.org. 2014. *Understanding Success Criterion 1.4.3 / Understanding WCAG 2.0*. [online] Available at: <http://www.w3.org/TR/UNDERSTANDING-WCAG20/visual-audio-contrast-contrast.html> [Accessed: 2 Mar 2014].

Whitenton, K. 2013. *Minimize Cognitive Load to Maximize Usability* / Nielsen Norman Group. [online] Available at: <http://www.nngroup.com/articles/minimize-cognitive-load/> [Accessed: 3 Mar 2014].

Appendix

Appendix 1 – Table showing the results of users performing tasks under observation.

Task (minimum clicks needed to perform task)	User 1			User 2			User 3			User 4			User 5		
	Successful	No. Clicks	Time (seconds)	Successful	No. Clicks	Time (seconds)	Successful	No. Clicks	Time (seconds)	Successful	No. Clicks	Time (seconds)	Successful	No. Clicks	Time (seconds)
1 - How far east of Penzance is the Marazion RSPB bird reserve? (2 clicks)	Y	3	66	N	2	68	Y	2	91	Y	3	42	Y	4	50
2 - What are the surf conditions for Sennen this coming Saturday? (1 click)	Y	1	18	Y	1	22	Y	1	29	Y	2	26	Y	3	41
3 - Who is the current minister of Sennen parish church? (1 clicks)	Y	2	32	Y	1	45	Y	3	42	Y	1	64	Y	1	94
4 - What tourist landmark / attractions are located at Porthcurno? (2 clicks)	Y	2	81	Y	2	95	Y	3	62	Y	2	32	N	2	99
5 - Find the images of the Olympic torch relay through Sennen. (1 click)	N	4	92	Y	1	25	Y	2	38	Y	3	11	Y	2	74
6 - Contact the webmaster. (1 click)	Y	1	26	N	2	84	Y	4	45	Y	2	14	Y	1	35

Appendix 2 - Responses to the questionnaire after performing the tasks from appendix 1.

Question	Response
How intuitive and helpful was the sites navigation? (1 – 10)	<ul style="list-style-type: none"> - 2 – There was no flow to the site. - 5 - 3 – It was different on every page. - 1 – I have never seen such poor navigation. - 2 – The new window after every link click made it hard to find where I was on the site without consistent navigation.
What do you think is the purpose of the website?	<ul style="list-style-type: none"> - To promote Sennen (2 x responses) - Community information website - Tourist information - No idea (2 x responses)
Was there anything missing from the site that you expected to see?	<ul style="list-style-type: none"> - Consistent navigation (2 x Responses) - Search (4 x Responses) - Same styling for each page / section
What element (good or bad) would you change about the website?	<ul style="list-style-type: none"> - The different styling on each page (2 x responses) - Add search to the site (4 x responses) - Links opening in new windows / tabs (2 x responses) - The amount of unused space
Was it easy to return to the homepage once you'd left it?	<ul style="list-style-type: none"> - No (4 x responses) - Yes, once I realised I could close the tab to return to previous page.
Who do you think is the intended audience?	<ul style="list-style-type: none"> - Tourists (3 x responses) - Surfers - People local to Sennen (3 x Responses) - Old people

Testing done on 463 elements

Luminosity Contrast Ratio: 31 failures
 Brightness difference: 23 failures
 Color difference: 23 failures

[full report](#)
[only errors](#)

Click on the rows to test other colours

Node	Foreground	Background	Sample	Contrast Ratio	Brightness difference	Color difference
BODY	#000000	#0000FF	Sample Text	2.44:1	29	255
TABLE	#000000	#0000FF	Sample Text	2.44:1	29	255
TBODY	#000000	#0000FF	Sample Text	2.44:1	29	255
TR	#000000	#0000FF	Sample Text	2.44:1	29	255
SPAN class='style5'	#FF0000	#0000FF	Sample Text	2.15:1	47	510
SPAN class='style5'	#FF0000	#0000FF	Sample Text	2.15:1	47	510
SPAN class='style5'	#FF0000	#0000FF	Sample Text	2.15:1	47	510
SPAN class='style5'	#FF0000	#0000FF	Sample Text	2.15:1	47	510

Appendix 4 – User locations for Purely Penzance Facebook fan page.

Country	Your Fans	City	Your Fans
United Kingdom	5,244	Penzance, England, United Kingdom	2,670
Australia	58	London, England, United Kingdom	184
United States of America	55	Hayle, England, United Kingdom	170
France	14	Truro, England, United Kingdom	159
Spain	12	Plymouth, England, United Kingdom	155
New Zealand	11	Newlyn, United Kingdom	118
Germany	10	Camborne, England, United Kingdom	105
Indonesia	10	Bristol, England, United Kingdom	94
Ireland	10	Redruth, England, United Kingdom	94
Canada	8	Helston, England, United Kingdom	88
Netherlands	7	Saint Ives, United Kingdom	71
Portugal	6	Falmouth, England, United Kingdom	48
India	5	Marazion, England, United Kingdom	47
Switzerland	4	Newquay, England, United Kingdom	41
Turkey	4	Saint Just, United Kingdom	36