Best practices for reading online

2021

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1. Background

Background

The act of reading has evolved considerably throughout human evolution, The Canadian novelist and essayist [Alberto Manguel](#) describes a significant shift in the 10th century A.D with the idea of silent reading. Before this point, the normal behaviour was to read aloud, this change in behaviour has allowed the reader's brain time to think and reflect.

The switch from paper to online reading has the potential to dwarf other changes in reading behaviour. There are a number of considerations presented by this shift in cognitive behaviour.

This report outlines these considerations as well as making recommendations for best practice approaches.

The science of reading online

In today's information-rich world there are a significant number of challenges on the reader's attention, with the perception that reading online can cause the mind to wander off.

There is evidence to indicate that this may not necessarily be due to the digital media format, but in fact relates to several associated factors:

- The perceived quality of online content

- The perception that paper is better suited for "effortful learning," whereas screen is for "fast and shallow reading of short texts such as news, e-mails, and forum notes."

If a users perception is that screen reading is for fast and shallow reading, then that is the experience they are likely to have. It is true to say that several additional factors have an impact, such as the distractions posed by viewing content on a multi-use device.

This is also supported by Nielson Norman who describe "Though light scanning is the primary method used to process information online, the amount of time any individual user is willing to spend reading depends on four factors: Level of motivation, Type of task, Level of focus and Personal characteristics."

The Evolution of Reading in the Age of Digitisation (E-READ) is a COST-funded European research initiative bringing together almost 200 scholars and scientists of reading, publishing, and literacy from across Europe. This network examines the effects and consequences of digital developments in terms of reading and in particular relation to education.

The Chair of the Action, working at the Reading Centre at the University of Stavanger, explains some of the principles:

- "When reading long, linear, continuous texts over multiple pages that require a certain amount of concentration, referred to as 'Deep Reading', the reader often experiences better concentration and a greater overview when reading from a printed medium compared to a screen."

- "When we are reading from a screen, only one section can be seen at a time and the available reading surface area is limited. If you read a printed medium such as a book, several text areas are available simultaneously and it feels easier to form an overview and make notes in the margins."

- "An interesting finding in some of the empirical studies is that we tend to overestimate our own reading comprehension when we read on screen compared to on paper."

The organisation has published '[The Stavanger Declaration on the Future of Reading](#)', this document calls for caution when introducing digital technologies to education and urges for further research on pressing issues regarding screen technologies and cognition.

Research has found that humans use different parts of the brain when reading from a piece of paper or from a screen. The more you read on screens, the more your mind shifts towards "non-linear" reading- skimming the pages with the eyes darting around from section to section. There is a documented concern that the more people read online, the more this behaviour continues and that there is then a danger that humans will lose the ability to deep read.

2. Considerations

Considerations around media

This report focuses on the display of content delivered via the internet, as the medium the content is consumed on can differ and pose individual challenges. Due to the multifunctional nature of certain mediums, such as a laptop, as opposed to a single-function device, such as an e-reader, the user may be prone to distraction. For example, email notifications may affect comprehension and retention of information.

In 'Reading linear texts on paper versus computer screen: Effects on reading comprehension' it is noted that the screen resolution, backlighting and illuminative effect of an LCD screens may affect the visual processing of text and therefore a reader's comprehension.

With lower resolution monitors subtle details of the type are missed, the more pixels available on a monitor the better reading experience.

Navigation

Considerations around navigation depend on how the user is consuming the content and whether this is a 'deep dive' or 'fast and shallow' scanning for information. Being able to quickly and easily navigate to relevant content is a core activity where a digital version can easily out-perform a printed copy.

Making content printer friendly

Depending on site content there may be a percentage of audiences that will look to print a copy of the page to read offline, as such some considerations will be required in order to optimise this experience. A recommendation would be to open a PDF when 'print' is selected. There are considerations around this approach, for example whether all content will have a PDF version.

Representation of charts and diagrams

First and foremost digital versions should deliver access to the core information and then supplement this with additional features or elements. There is a need to consider graphical elements and figures within this delivery of core information, particularly across devices. If a certain graph or chart is inaccessible to the user it's likely to have a negative impact on the reading experience and could even render the written content useless.

Adoption of technology

A trend identified in research conducted by Make it Clear with students and academics was the increased amount of digital reading with the younger researcher demographic. Younger users were generally more open to using digital tools and often investigate new options on the market.

For example, formats such as video and audio are seen as an alternative option to both printed and digital text. There is an openness to using a mobile device for consuming longer-form digital content, where generally older generations have a reluctance to using mobile devices for in-depth academic work.

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3. Visual style best practice

Font selection

There are contradicting arguments around whether serif or sans serif fonts are better for online legibility. Serif typefaces are used to guide the horizontal "flow" of the eyes, however when we read text our eyes do not glide along the page they move in a series of quick jerks which are called saccadic movements. There are no strong arguments to pick either serif or sans serif fonts.

A font that clearly separates each letter is preferred for digital reading. Bold versions should be used to add emphasis and guide users to important text. Italics should be avoided due to the difficulty added for dyslexic users.

The human brain prefers symmetry and balance, the selected font should have a good sense of this, otherwise the reader will feel something is not quite right.

Font size

Often online font sizes are described using points, however, this actually refers to how much of your field of vision an object takes up. Furthermore, font size is difficult to specify as depending on the design of the typeface, the height of individual letters can differ quite dramatically. The same can also be said for pixels within screens as for example a 100 pixel TV differs from a 100 pixel laptop.

As a minimum, 16px is suggested for readability, but this needs to account for medium and typeface.

Line height (leading)

This refers to the amount of vertical space between lines of type. The correct amount of spacing will help the eye and the brain decipher the letter shapes and grouping so text can be read easily. The amount of space required will be determined by the size of the font used. There is an impact on accessibility for users with cognitive disabilities or visual impairments having trouble tracking the lines. W3C accessibility guidelines suggest paragraph spacing that is at least 1.5 times larger than the line spacing.

Structuring content for digital reading

The arrangement of text is an important aid to its readability, this is due to readers scanning a text and passively reading in an F-shaped pattern initially to locate the information they need. Research from Nielson Norman describes a more recent reading pattern "zig zag layouts.. has coincided with the development of a new gaze pattern. On pages with distinct cells of content, people often process those cells in a lawn-mower pattern they begin in the top left cell, move to right until the end of the row, then drop down to the next row".

The use of sections and clear subheadings can help the reader to be more active and support navigation to the section of interest whilst scanning the page. Additionally visuals help to break up text and improve the reader's comprehension of a text.

This also affects line and paragraph lengths, readers tend to prefer shorter lines of texts around 45 to 72 characters.

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Specific considerations for mobile

There are a number of considerations when displaying content for consumption on mobile devices, particularly in regards to a desktop version of the same content:

- Display content in a single column layout: fill the width of the screen, the majority of users will read content in portrait view so layouts should be optimised for this orientation

- Reformat the navigation: the screen size is small and navigation needs to adjust to prioritise the most relevant content for the user

- Adjust interactions: actions such as 'hover' do not work well on mobile, ensure the interaction layer is adjusted to be optimised for mobile. This includes increasing selection areas to account for a finger-tip press

Use of contrast

Several studies have looked at the legibility of messages based on different colour contrast with the majority finding that dark text on a light background provides the best legibility. Using black text on either a white or yellow background avoids difficulties associated with red/green colour blindness, which will help to ensure content is accessible to a larger percentage of the population.

Other studies have looked into the benefits of dark mode. From a technological point of view, the device uses less light and therefore consumes less battery or electricity. Moreover, for the user a dark mode reduces video glare and eye fatigue. There are however instances, for example when a device is being used in a well-lit room, where lighter backgrounds are better.

Becoming increasingly popular, the most successful examples of dark mode in use offer the user the option to switch between light and dark modes for different times of the day.

Accessibility

There are a number of accessibility factors which should be considered when displaying content for reading online. Accessibility principles to follow which directly impact the visual design include:

- Live text - all text should be 'live'

- Captions - all pre-recorded audio and video should have text captions

- Contrast - text must have a visual contrast ratio of at least 4.5:1, excluding text which is incidental or part of logos and brands

- Resize text - allow text to be resized up to 200 percent without loss of content or functionality (excludes captions and images of text)

Designing for disability

When designing we need to consider the following accessibility factors: Age, eyesight, dyslexia. Dyslexia occurs in at least one in 10 people so it really is something that should be considered as part of an accessible design.

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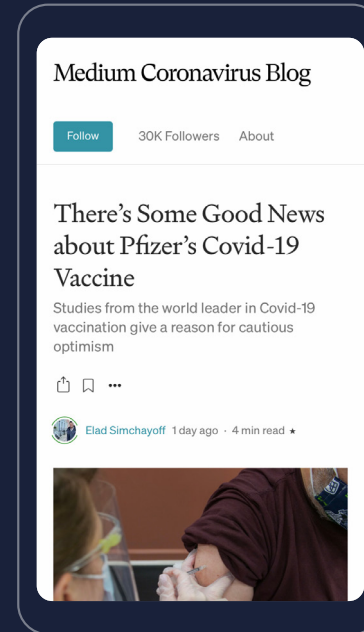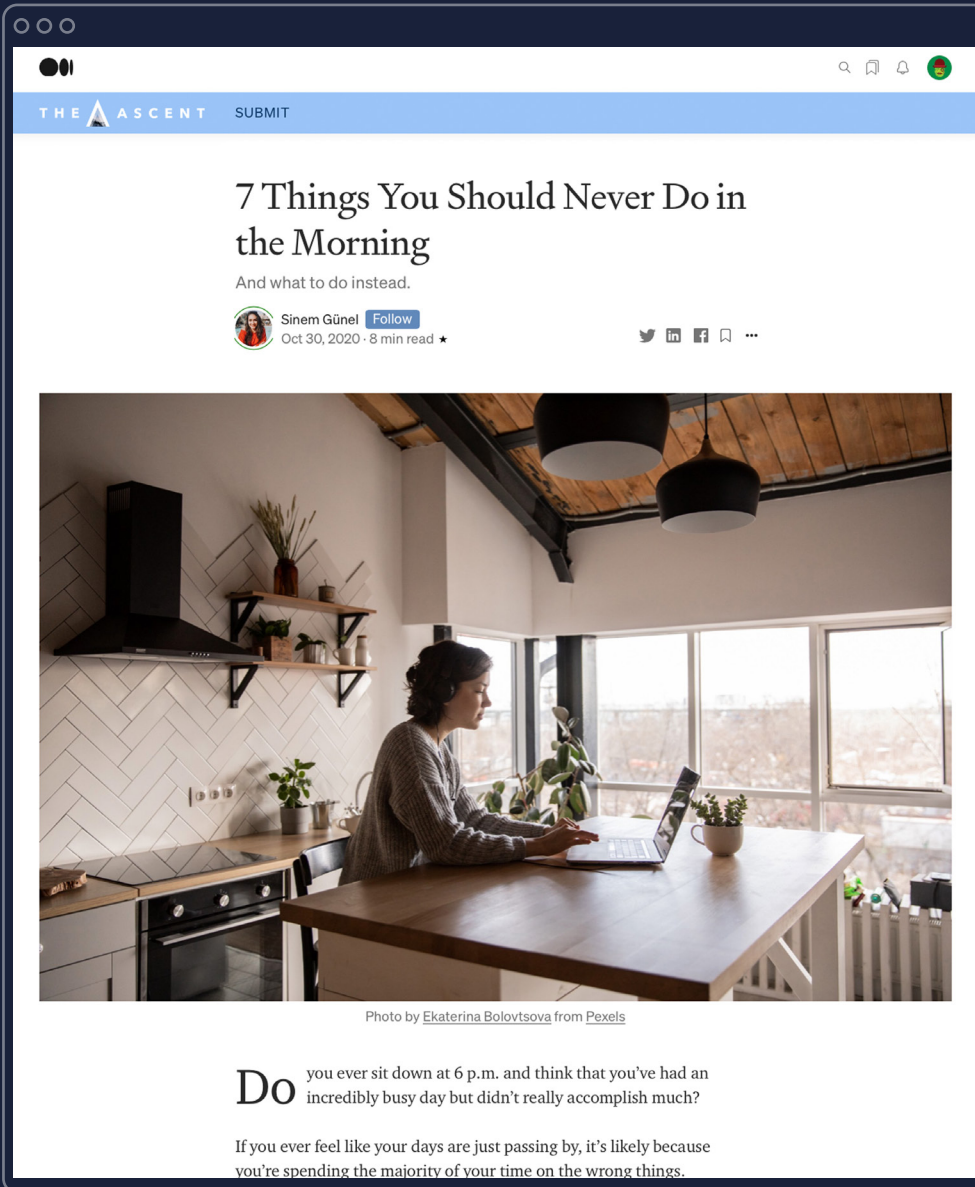# 4. Examples of good implementations

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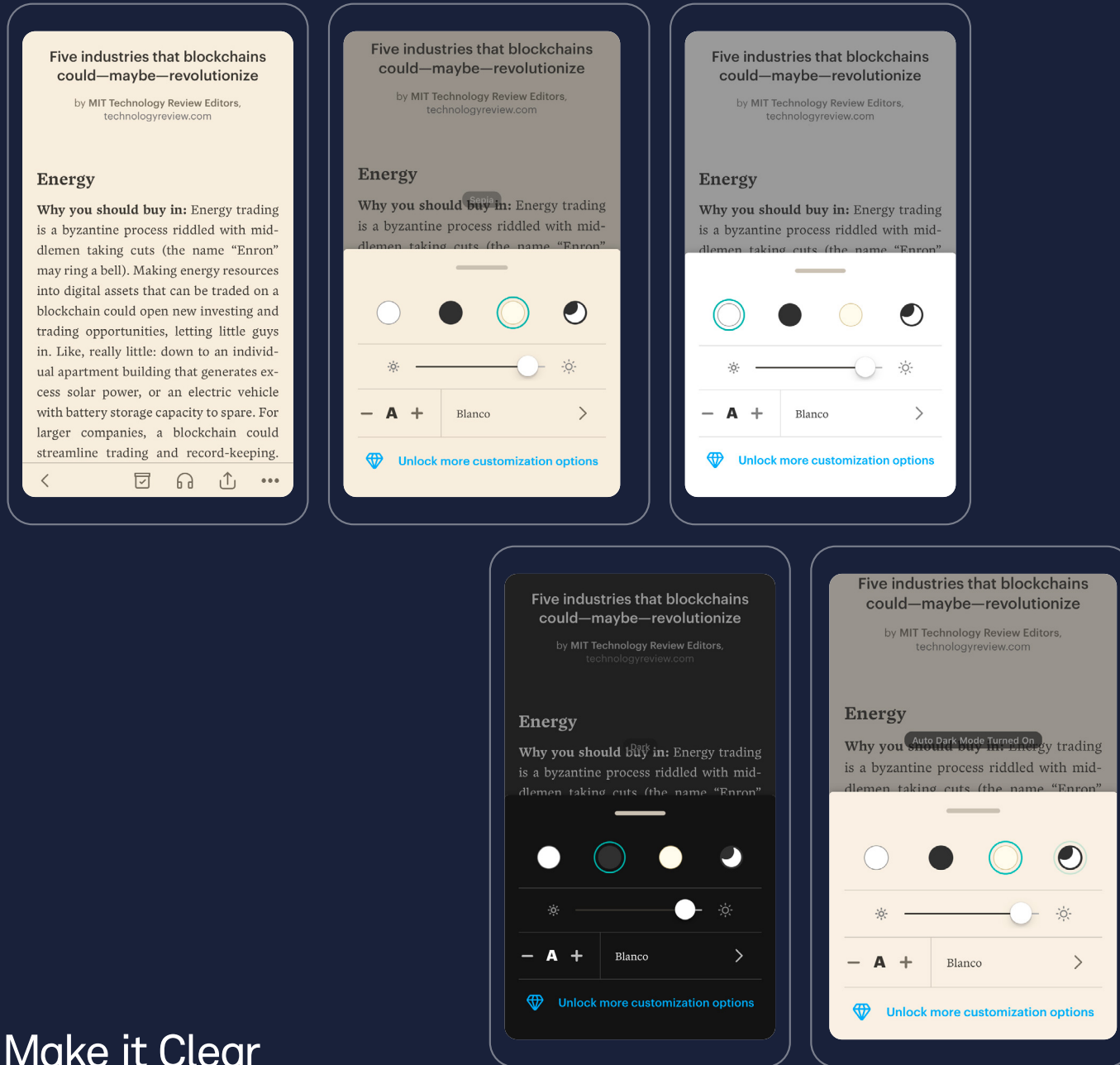
Pocket

Pocket is an application that allows users to save articles, videos and stories from any publication, page or app. Users can save content and also tag content as they add it to quickly organise it.

There are a number of reading modes, including 'sepia' which helps to reduce strain on the user's eyes.

7 Things You Should Never Do in the Morning

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Do you ever sit down at 6 p.m. and think that you've had an incredibly busy day but didn't really accomplish much?

If you ever feel like your days are just passing by, it's likely because you're spending the majority of your time on the wrong things.

Photo by Ekaterina Bolovtsova from Pexels

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Medium

Medium is a content publishing platform centred around people. 'Medium taps into the brains of the world's most insightful writers, thinkers, and storytellers to bring you the smartest takes on topics that matter. So whatever your interest, you can always find fresh thinking and unique perspectives.'

- As the majority of users will read in a portrait view, Medium's layout is optimised for this behaviour, with content displayed in a single column layout which fills the width of the screen.

- When the screen size is small as shown on the mobile view, the navigation adjusts to prioritise the most relevant content for the user.

- Medium also offers 'Night mode' within settings to adjust for users preference.
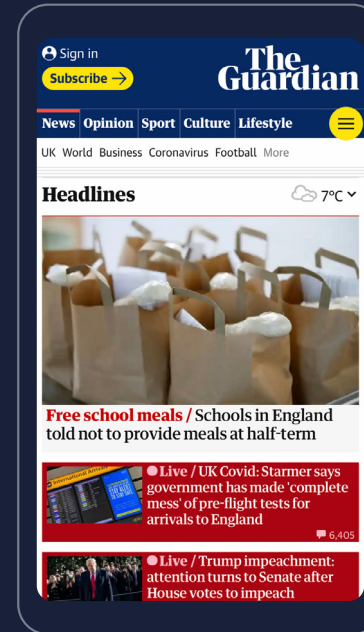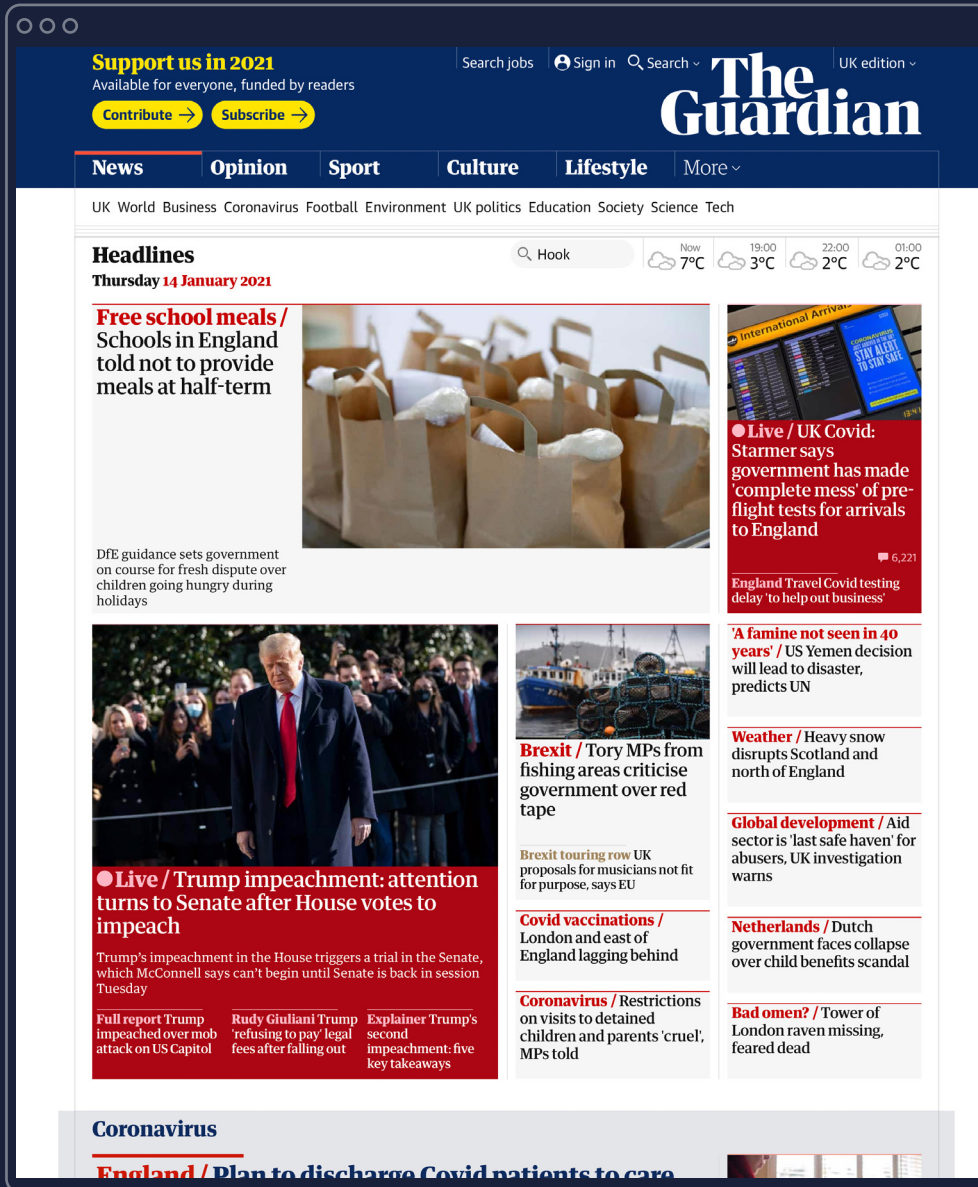
The Guardian

The Guardian redesigned their website and app in order to provide a design that works well on all applications.

They created a unique font called Guardian Egyptian, which has evolved from their original font with changes made to size, line spacing and typesetting to make pages more readable. They've also created a more flexible page layout in print and online and enhanced their use of photographic journalism and graphics to help readability.

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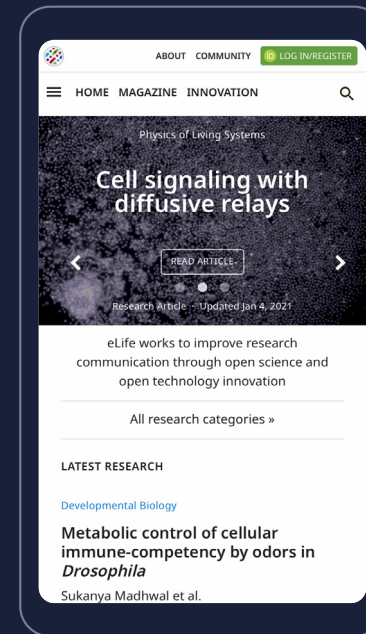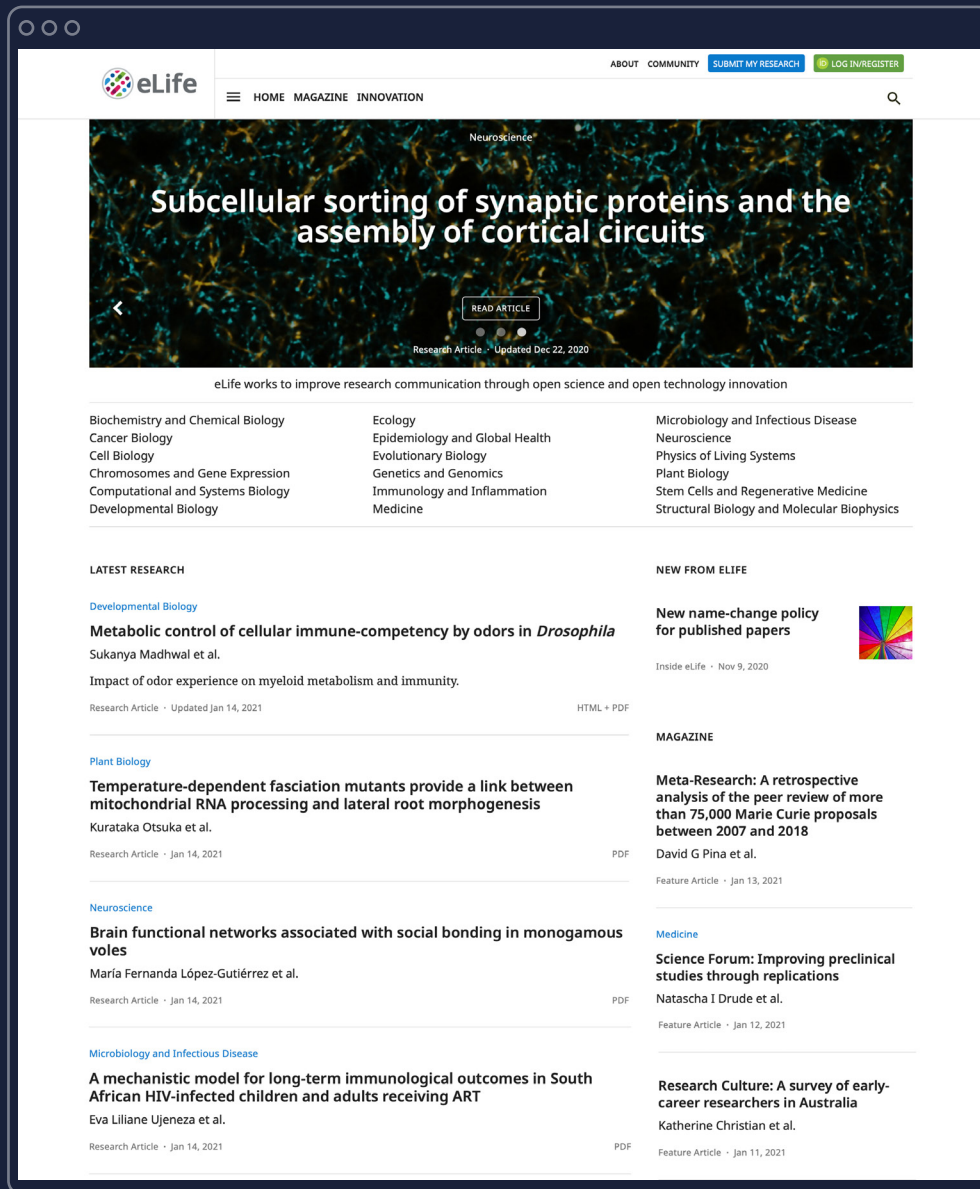
eLife

eLife redesigned its reading experience to optimise the user experience for readability. They have removed site 'furniture' to create a greater experience on the article. It's optimised for speed to improve load times. In addition they have provided the UI pattern suite as an open-source component of eLife Continuum.

Appendix

Academic papers

[A Study Of The Readability Of On-Screen Text](#)

[The Elements Of Text And Message Design And Their Impact On Message Legibility: A Literature Review](#)

[Reading Revolutions: Online Digital Text And Implications For Reading In Academe](#)

[Do We Read Differently On Paper Than On A Screen?](#)

[Metacognitive Regulation Of Text Learning: On Screen Versus On Paper. The Evolution Of Reading In The Age Of Digitisation: An Integrative Framework For Reading Research](#)

[Screen And Paper Reading Research – A Literature Review](#)

[Reading Linear Texts On Paper Versus Computer Screen: Effects On Reading Comprehension](#)

[Effect Of Screen Reading And Reading From Printed Out Material On Student Success And Permanency In Introduction To Computer Lesson](#)

Articles

[Best Practices To Improve Text Readability For Optimal User Experience](#)

[What's The Best Font Size For The Web? Well, It Depends…](#)

[Advantages Of Dark Backgrounds On Computer Displays](#)

[Welcome To A New Look For The Guardian](#)

[How Dark Mode Took Over Our Screens](#)

[Legibility: 7 Typographic Tools To Create Readable Screens](#)

[Which Are More Legible: Serif Or Sans Serif Typefaces?](#)

[The Deep Space Of Digital Reading](#)

[The Reading Brain In The Digital Age: The Science Of Paper Versus Screens](#)

[Why You Should Go Big With Line Spacing](#)

[Reading Content On Mobile Devices](#)

[How people read online new and old findings](#)

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