Offline UX Considerations

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This article will take a look at multiple design considerations needed to create a great experience on both slow networks and offline.

The quality of a network connection can be affected by a number of factors such as:

- Poor coverage of a provider.
- Extreme weather conditions.
- Power outages.
- Users travelling into “dead zones” such as buildings that block their network connections.
- Travelling on a train and going through a tunnel.
- Internet connection is managed by a third party and time boxed when it will be active or inactive like in an airport or hotel.
- Cultural practises that require limited or no internet access at specific times or days.

Your goal is to provide a good experience that lessens the impact of changes in connectivity.

What to show your users when they have a bad network connection?

The first question that must be asked is: what does success and failure of a network connection look like? A successful connection is your app's normal online experience. The failure of a connection however can be both the offline state of your app as well how the app behaves when there is a laggy network.

When thinking about the success or failure of a network connection you need to ask yourself these important UX questions:

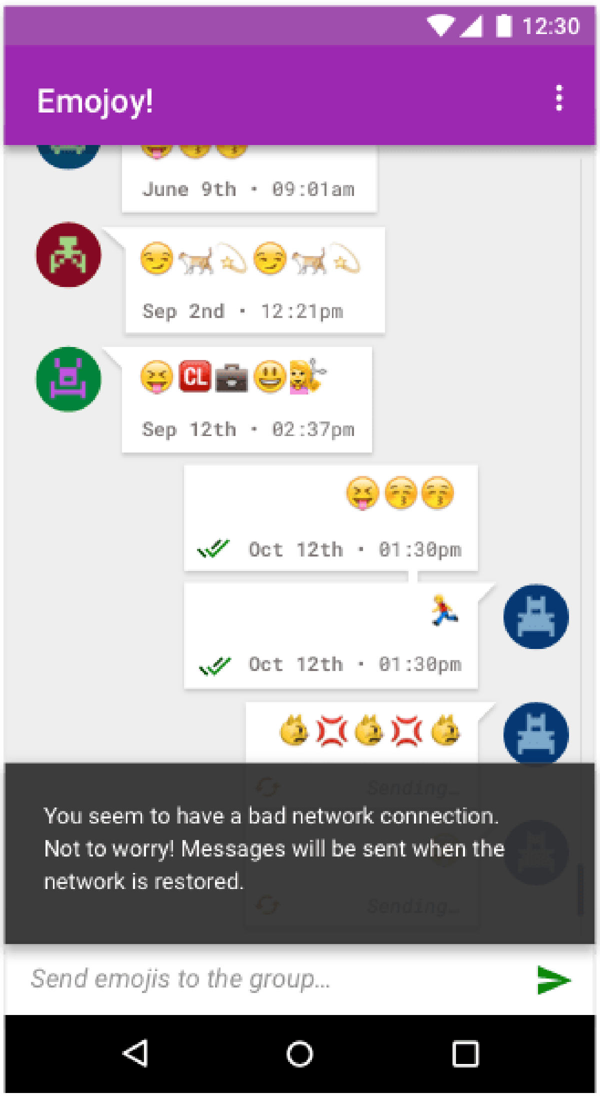
- How long do you wait to determine success or failure of a connection?
- What can you do while success or failure is being determined?

- What should you do in the event of failure?
- How do you inform the user of the above?

Inform users of their current state and change of state

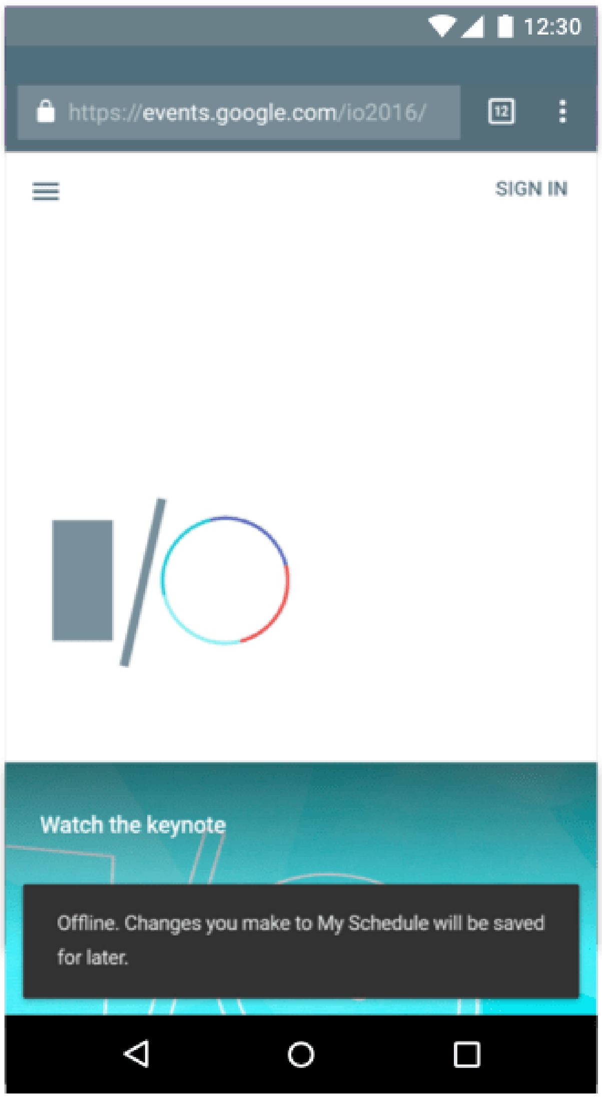
Inform the user of both the actions they can still take when they have a network failure and the current state of the application. For example, a notification could say:

“You seem to have a bad network connection. [Not to worry!] Messages will be “sent when the network is restored.”



You seem to have a bad network connection. Not to worry! Messages will be sent when the network is restored.

Clearly inform the user when a change in state occurs as soon as possible.



Offline. Changes you make to My Schedule will be saved for later.

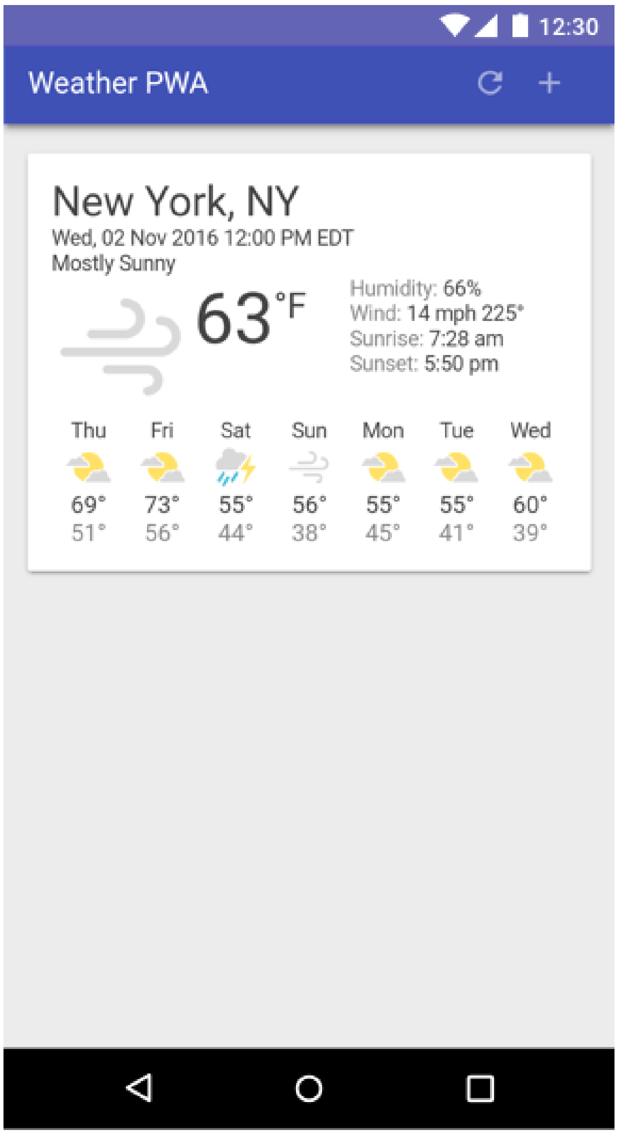
The Google I/O app used a material design "toast" to let the user know when it was offline.

Network connection improves or is restored

How you deal with informing the user once their network connection has improved will depend largely on your application. For apps that require update information displayed as a priority such as a stock market app, auto-updating and notifying the user as soon as possible is crucial.

It is recommended that you let the user user know that your web app has been updated "in the background" by using a visual cue such as a material design toast element. This involves detecting both the initial registration of your service worker and that there's been an update to the service worker-managed content. You can see a code example of this function at work here.

Once example of this would be www.chromestatus.comwhich posts a note to the user when the app has been updated.



New York, NY
Wed, 02 Nov 2016 12:00 PM EDT
Mostly Sunny
63°F
Humidity: 66%
Wind: 14 mph 225°
Sunrise: 7:28 am
Sunset: 5:50 pm

Thu	Fri	Sat	Sun	Mon	Tue	Wed
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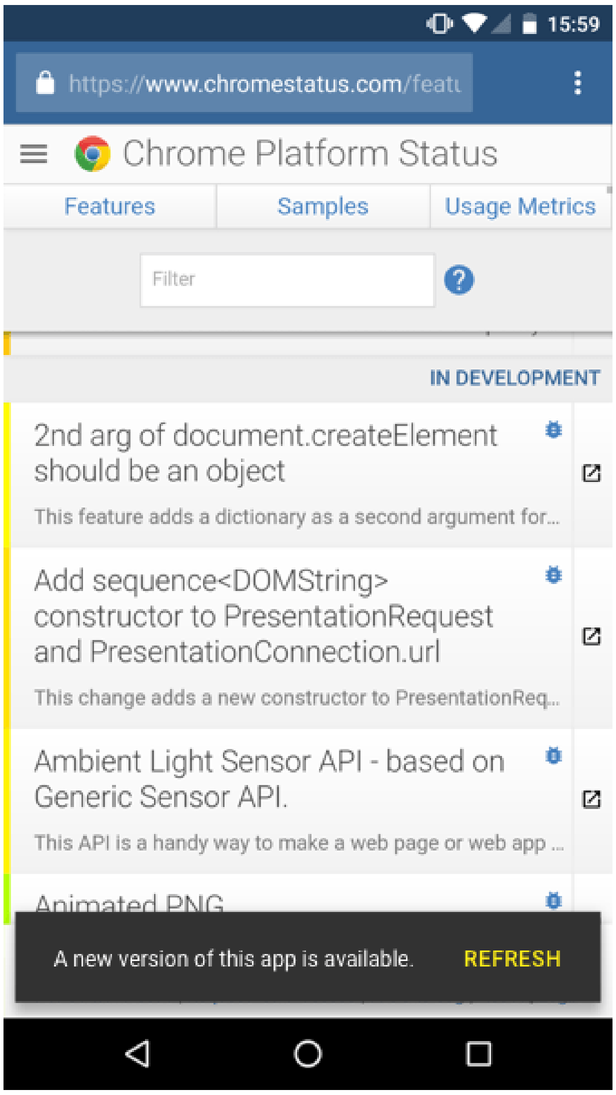


2nd arg of document.createElement should be an object
This feature adds a dictionary as a second argument for...

Add sequence<DOMString> constructor to PresentationRequest and PresentationConnection.url
This change adds a new constructor to PresentationReq...

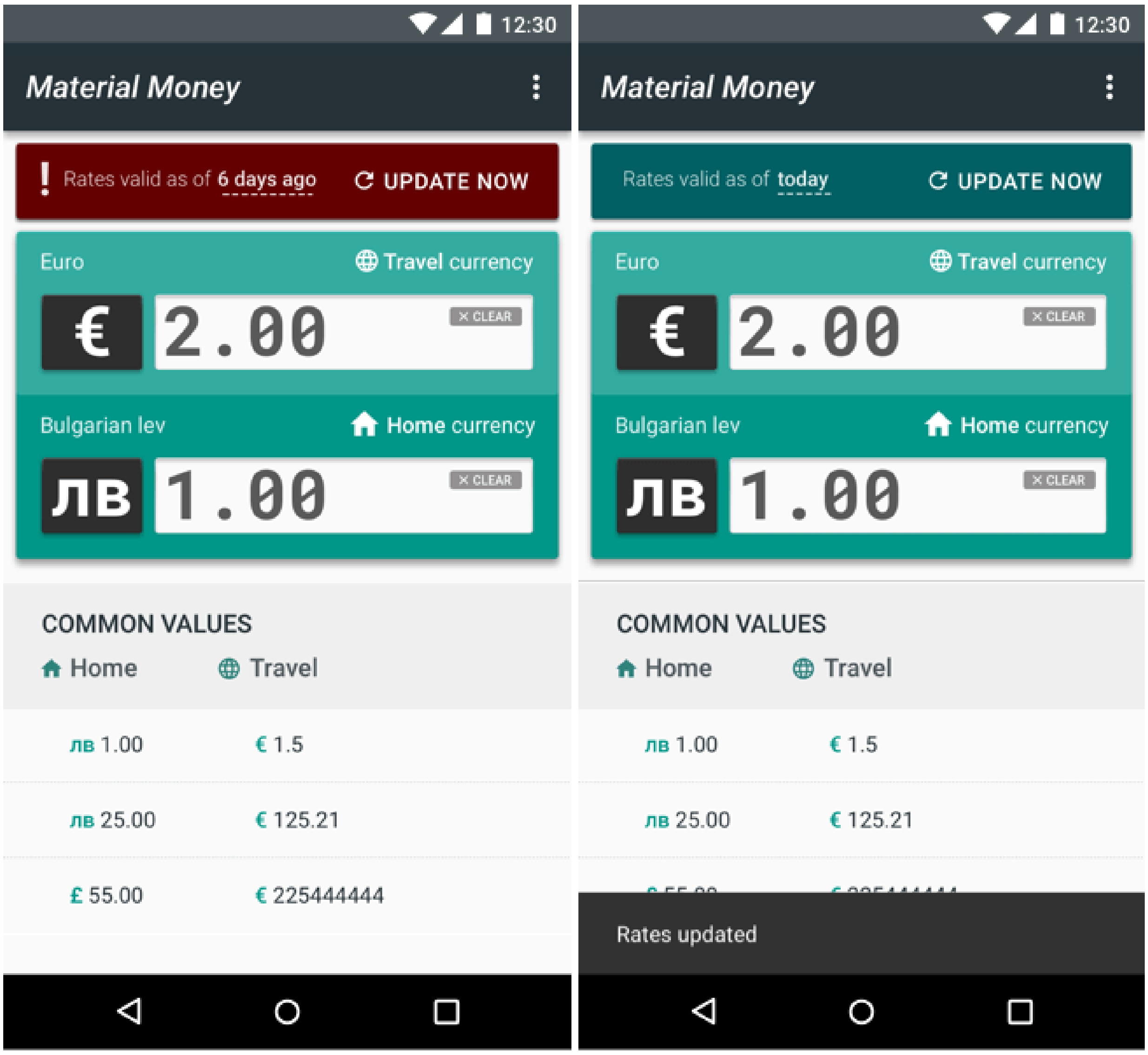
Ambient Light Sensor API - based on Generic Sensor API.
This API is a handy way to make a web page or web app ...

Animated PNG

A new version of this app is available. REFRESH

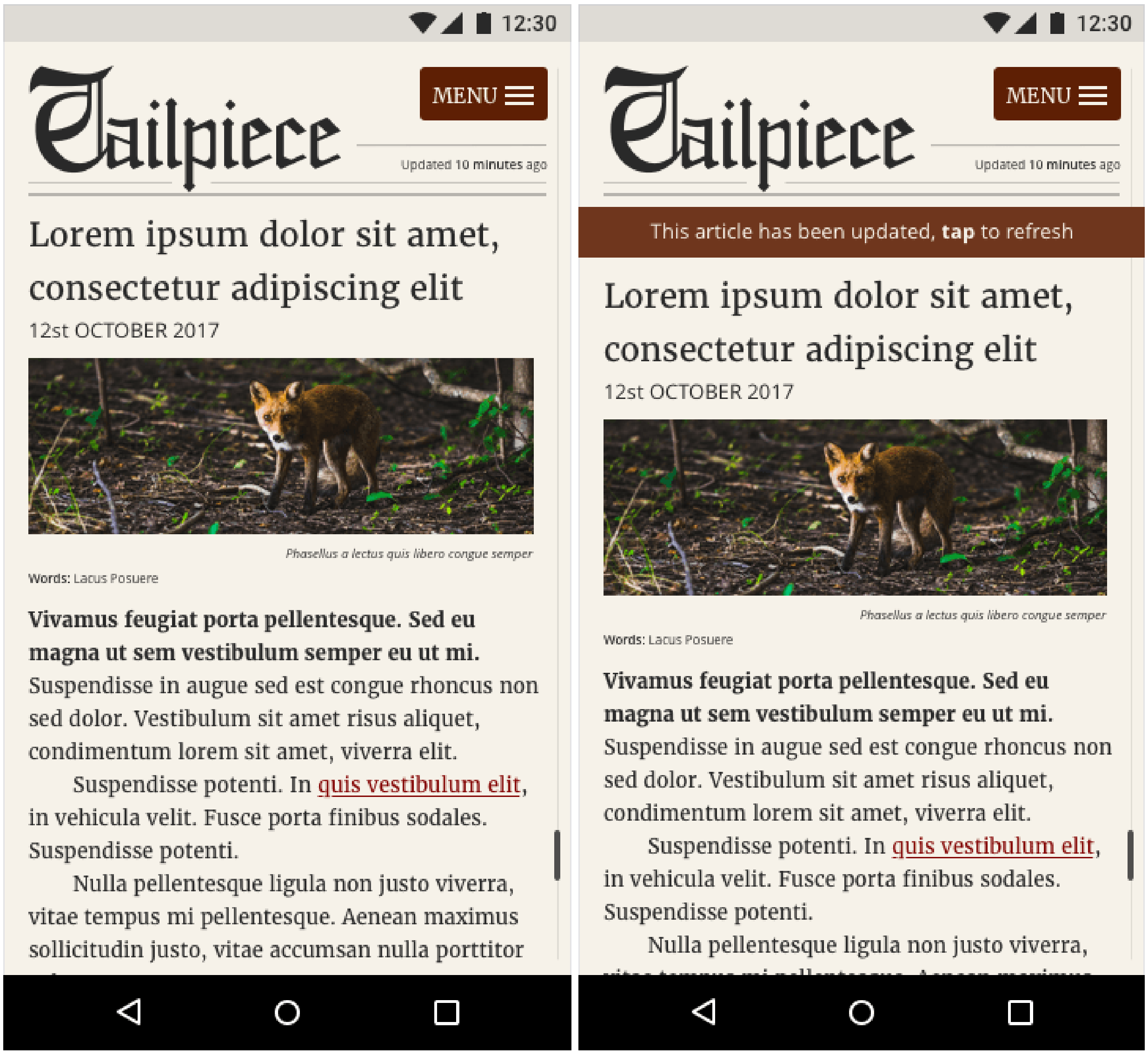
Some apps, like the weather app, need to auto update as old data is not of use to the user. Where Chrome Status lets the user know when content has been updated via a material design toast element.

You may also show the last time the app was updated at all times in a prominent space. This would also be useful for a currency converter app, for example.



Material Money shows the latest currency where possible and notifies the user when the app hasn't been updated.

Other applications such as a news app could show a simple notification informing the user that there is newer content, with a tap-to-update function. The reason for doing that is if a user is currently reading an article an auto-update would refresh the page and they would lose where they were reading last.



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This article has been updated, **tap** to refresh

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Tailpiece, an online newspaper will auto download the latest news but allow the users to refresh manually so they do not lose their place in the article.

Contextual states and browse mode

Each bit of UI may have its own context and functionality that will change depending on if it requires a successful connection. One example would be an ecommerce site that can be browsed offline though the Buy button and pricing is disabled until a connection has been reestablished.

Other forms of contextual states could include data. For example, the financial application Robinhood allows users to buy stock and uses color and graphics to notify the user when the market is open. The whole interface turns white and then grays out when the market closes. When the value of stock increases or decreases, each individual stock widget turns green or red depending on its state.

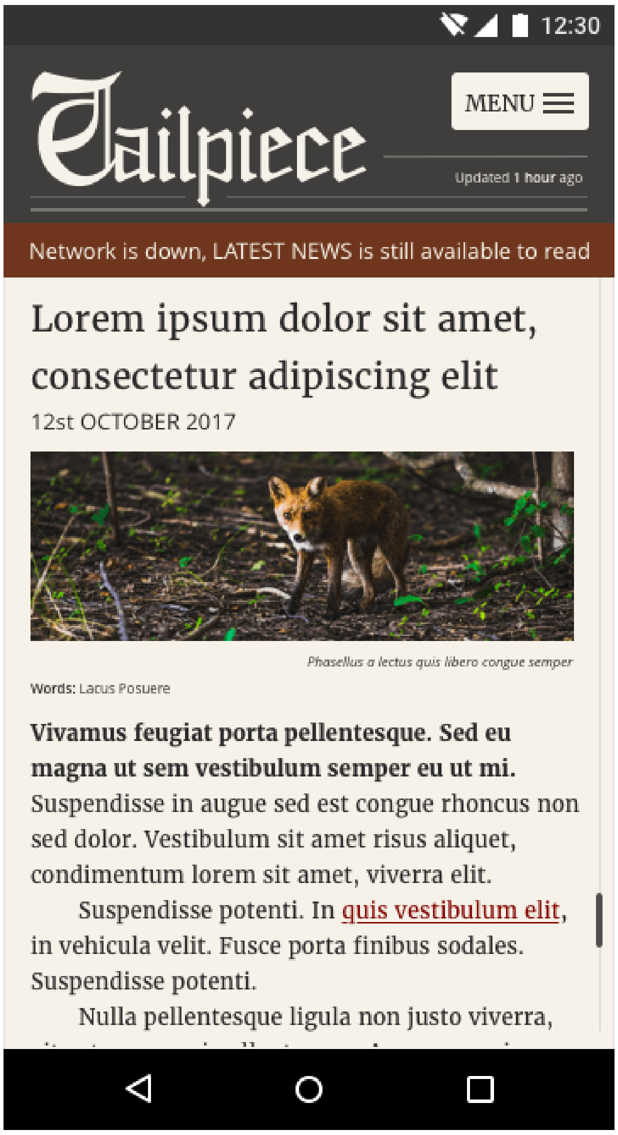
Educate the user so they understand what the offline model is

Offline is a new mental model for everyone. You need to educate your users about what changes will occur when they don’t have a connection. Inform them of where large data is saved and give them settings to change the default behavior. Make sure you use multiple UI design components such as informative language, icons, notifications, color and imagery to convey these ideas collectively rather than relying on one design device, such as an icon on its own, to tell the whole story.

Providing an offline experience by default

If your app doesn't require much data, then cache that data by default. Users can become increasingly frustrated if they can only access their data with a network connection. Try to make the experience as stable as possible. An unstable connection will make your app feel untrustworthy, where an app that lessens the impact of a network failure will feel magical to the user.

News sites could benefit from auto downloading and saving the latest news content of the day so a user could read today's news without a connection, perhaps downloading the text without the article images. Also adapt with the user's behaviour so if the sports section is what they typically view, perhaps make this the priority data that is downloaded.



Network is down, LATEST NEWS is still available to read

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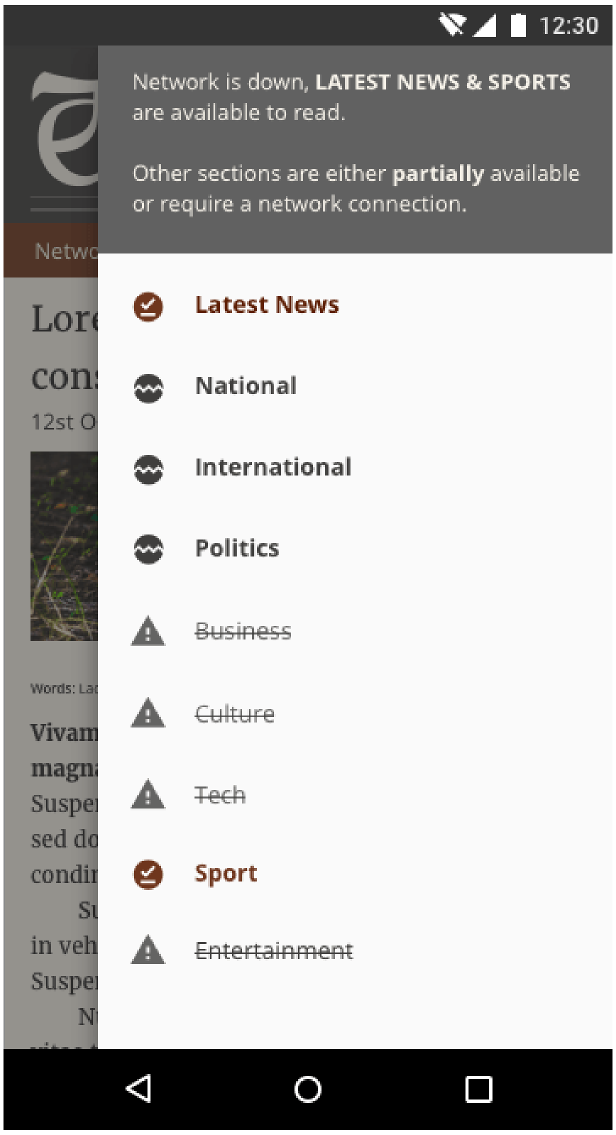


Network is down, **LATEST NEWS & SPORTS** are available to read.

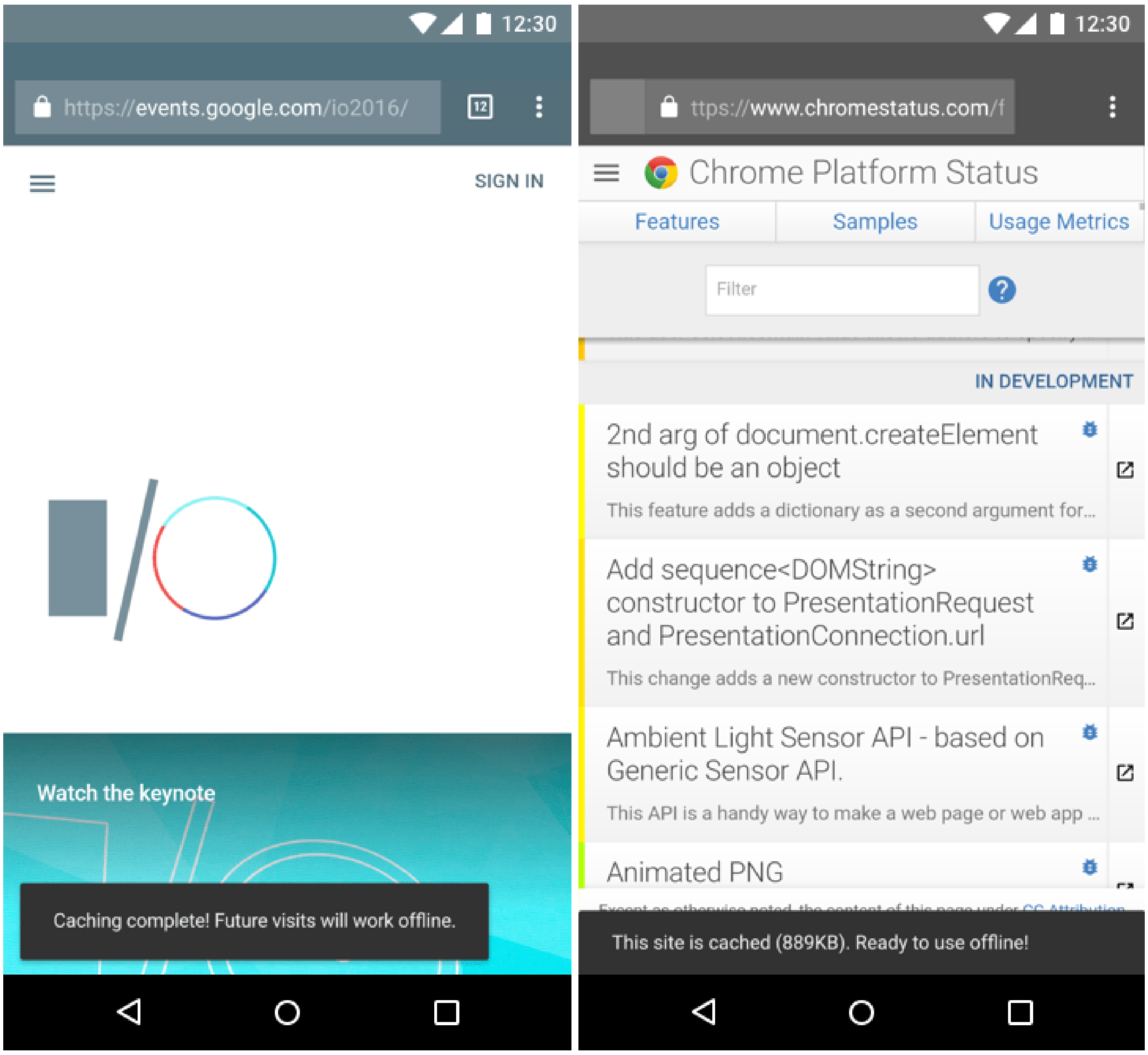
Other sections are either **partially** available or require a network connection.

If the device is offline Tailpiece will notify the user with a status message letting them know that they can still use the app.

Inform the user when the app is ready for offline consumption

When a web app first loads you need to indicate to the user if it is ready for offline use. Do this with a widget that provides brief feedback about an operation through a message at the bottom of the screen, for example when a section has been synced or a data file has downloaded.

Again think of the language you are using to make sure it is fit for your audience. Ensure the messaging is given the same in all instances where it’s used. The term offline is generally misunderstood by a non-techie audience so use action based language that your audience can relate to.


12:30

https://events.google.com/io2016/

SIGN IN

Watch the keynote

Caching complete! Future visits will work offline.

12:30

ttps://www.chromestatus.com/f

Chrome Platform Status

Features | Samples | Usage Metrics

Filter

IN DEVELOPMENT

2nd arg of document.createElement should be an object

This feature adds a dictionary as a second argument for...

Add sequence<DOMString> constructor to PresentationRequest and PresentationConnection.url

This change adds a new constructor to PresentationReq...

Ambient Light Sensor API - based on Generic Sensor API.

This API is a handy way to make a web page or web app ...

Animated PNG

This site is cached (889KB). Ready to use offline!

Both the Google I/O 2016 app and Chrome Status site notify the user when the app is ready for offline use.

Make 'save for offline' an obvious part of the interface for data heavy apps

If an application uses large amounts of data, make sure that there is a switch or pin to add an item for offline use rather than auto downloading, unless a user has specifically asked for this behavior via a settings menu. Make sure that the pin or download UI is not obscured by other UI elements and that the feature is obvious to the user.

One example would be a music player that requires large data files. The user is aware of the associated data cost, but is also aware that they may want to use the player when they they are offline. Downloading music for later use requires the user to plan ahead, so education about this may be required during onboarding.

Clarify what is accessible offline

Be clear as to the option you are providing. You may need to show a tab or setting that shows an “offline library”, so the user can easily see what they have stored on their phone and what needs to be saved. Make sure the settings are concise and be clear where the data will be stored and who has access to it.

Show the actual cost of an action

Many users equate offline capability with 'downloading'. Users in countries where network connections regularly fail or aren't available often share content with other users, or save content for offline use when they have connectivity.

Users on data plans may avoid downloading large files for fear of cost, so you may also want to display an associated cost so users can make an active comparison for a specific file or task. For example if the music app above could detect if the user is on a data plan and show the file size so that users can see the true cost of a file.

Help prevent hacked experiences

Often users hack an experience without realizing they are doing it. For example before cloud sharing apps like Google Drive, it was common for users save large files and attach them to emails so they could carry on editing from a different device. It is important not to be pulled into their hacked experience but rather look at what they are trying to achieve. In other words instead of thinking of how you can make attaching a large attachment more user friendly, solve the problem of sharing large files across multiple devices.

Transferable experience from one device to another

When making an experience with a flaky network connection, seek for it to sync correctly once the connection improves so that the experience is transferable. For example, imagine a travel app losing a network connection mid-way through a booking. When the connection is reestablished, the app syncs with the user's account and then they can continue their booking on their desktop device. Not being able to transfer experiences is incredibly jarring to users.

Inform the user of the current state of their data, for example if the app has managed to sync or not. Educate them where possible but try not to overburden them with messaging.

Create inclusive design experiences

When designing seek to be inclusive by providing meaningful design devices, simple language, standard iconography, and meaningful imagery that will guide the user to complete the action or task rather than hinder their progress.

Let simple concise language be a guide

Good UX is not just about a well designed interface. It includes the flow a user takes as well as the language used in the app. Avoid using tech jargon when explaining the state of the app or individual UI components. Consider that the phrase “app offline” might not convey to the user the current state of the app.

DO: Use language and imagery that describes the action.

“Service Worker Ready”

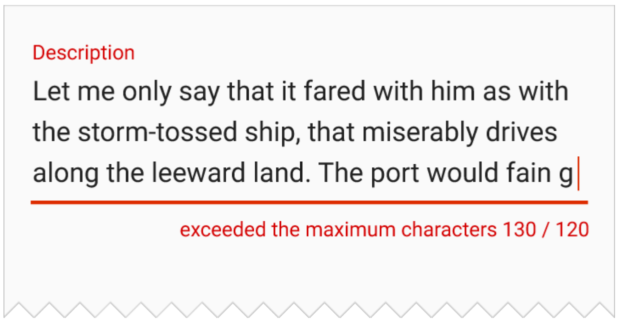
DON'T: Avoid abstract terms that may not be accessible.

Use multiple design devices to create accessible user experiences

Use language, color and visual components to demonstrate a change of state or current status. Solely using color to demonstrate state may not be noticed by the user, and may be inaccessible to users who suffer from visual disabilities. Also, the gut instinct for designers is to use grayed UI to represent offline, but this can have a loaded meaning on the web.

Grayed UI is also used to mean that an element is disabled, such as input elements on a form. This can cause confusion if you ONLY use color to depict state.

To prevent misunderstandings, express different states to the user in multiple ways: for example with color, labels and UI components.

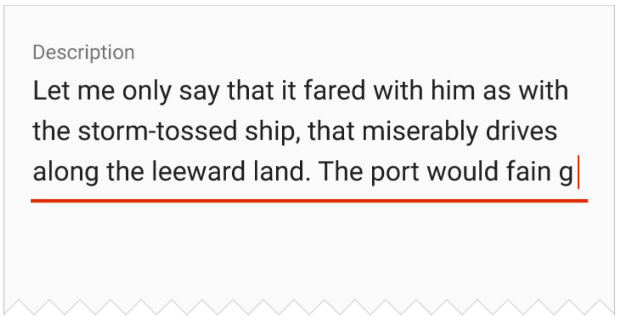


Description

Let me only say that it fared with him as with the storm-tossed ship, that miserably drives along the leeward land. The port would fain g

exceeded the maximum characters 130 / 120

DO: Use a mixture of design elements to convey meaning



Description

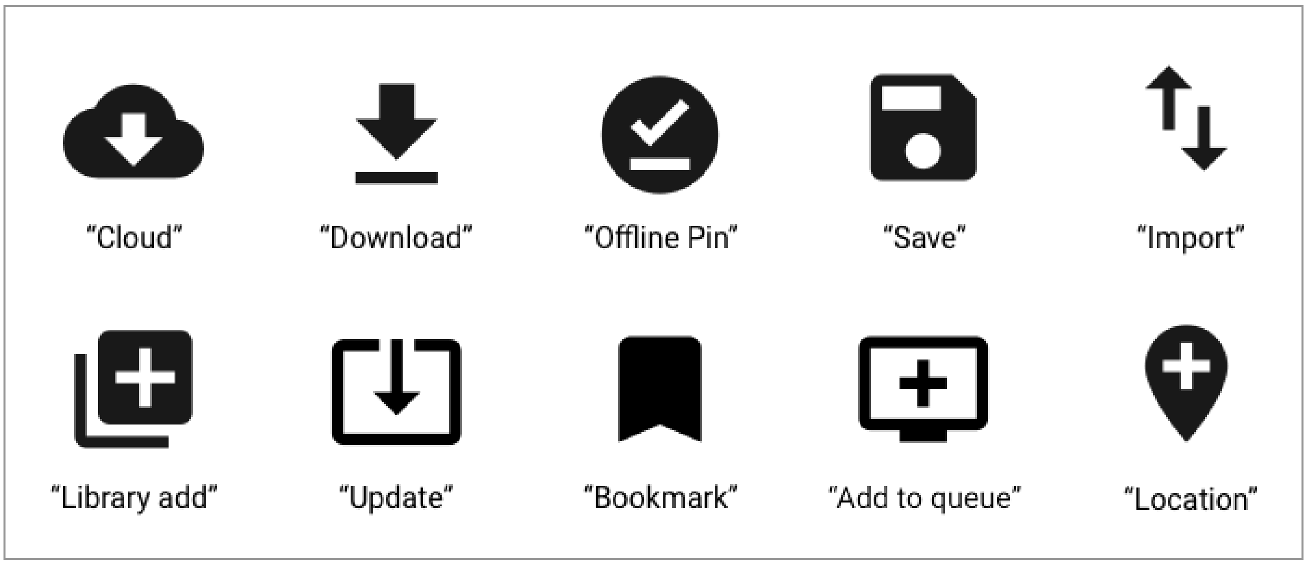
Let me only say that it fared with him as with the storm-tossed ship, that miserably drives along the leeward land. The port would fain g

DON'T: Only use color to describe what is happening.

Use icons that convey meaning

Make sure that information is conveyed correctly with meaningful text labels as well as icons. Icons alone can be problematic, since the concept of offline on the web is relatively new. Users may misunderstand icons used on their own. For example, using a floppy disc for save makes sense to an older generation but young users who have never seen a floppy disc may be confused by the metaphor. Likewise, the 'hamburger' menu icon has been known to confuse users when presented without a label.

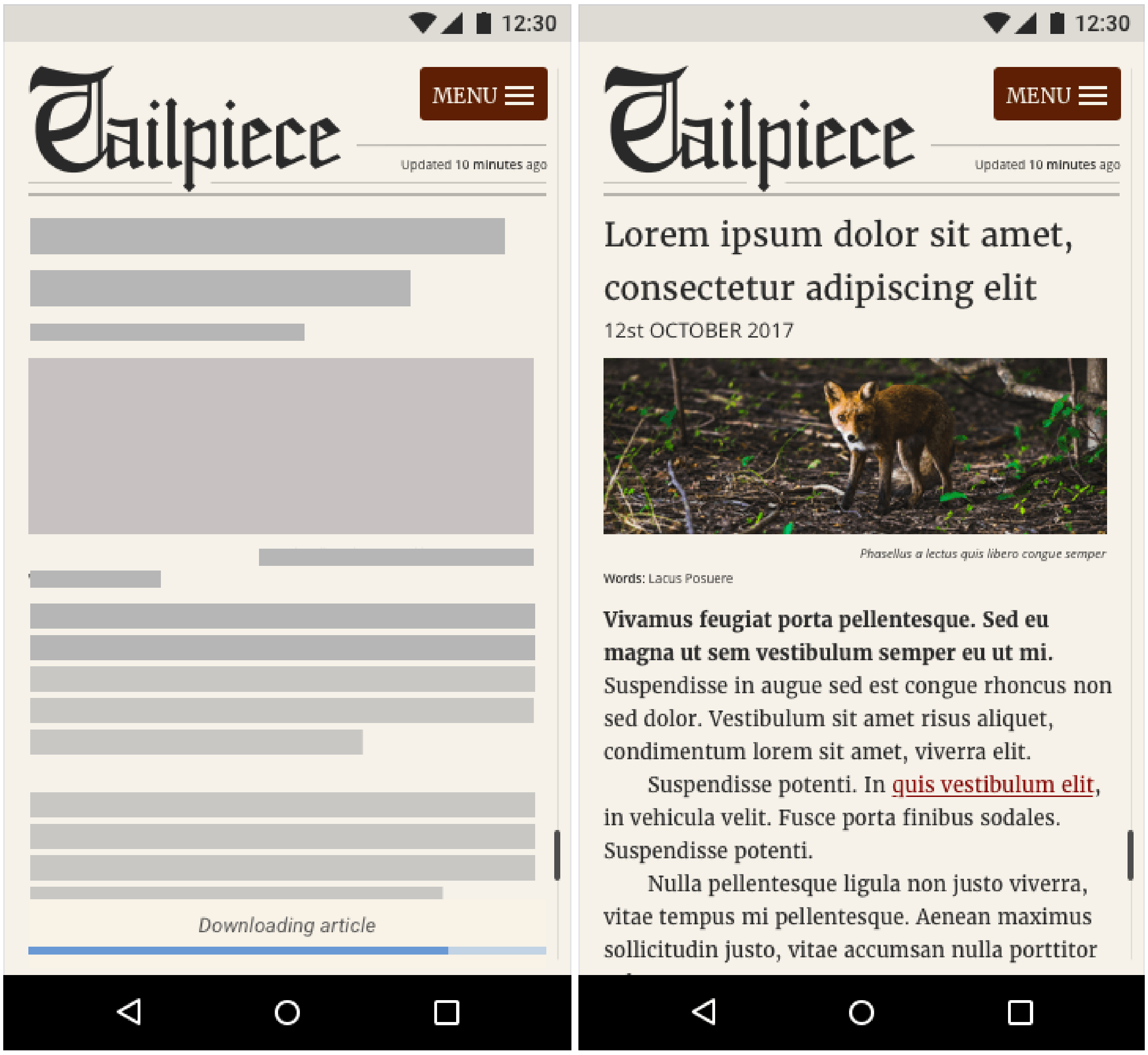
When introducing an offline icon try to remain consistent with the industry standard visual (if one exists) as well as providing a text label and description. For example, saving for offline might be a typical download icon or perhaps if the action involves syncing it could be a syncing icon. Some actions may be interpreted as saving for offline rather than demonstrating a network's status. Think of the action you are trying to convey rather than presenting the user with an abstract concept. For example save or download data would be action based.



Offline can mean a number of things depending on the context, such as download, export, pin etc.. For more inspiration checkout the material design icon set

Use skeleton layouts with other feedback mechanism

A skeleton layout is essentially a wireframe version of your app that displays while content is being loaded. This helps demonstrate to the user that content is about to be loaded. Consider also using a preloader UI as well, with a text label informing the user that the app is loading. One example would be to pulsate the wireframe content giving the app the feeling that it is alive and loading. This reassures the user that something is happening and helps prevent resubmissions or refreshes of your app.



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Before and after of a skeleton layout.

Don’t block content

In some applications a user might trigger an action such as creating a new document. Some apps will try to connect to a server in order to sync the new document and to demonstrate this they display an intrusive loading modal dialog that covers the entire screen. This may work fine if the user has a stable network connection, but if the network is unstable they won’t be able to escape from this action and the UI effectively blocks them from doing anything else. Network requests that block content should be avoided. Allow the user to continue to browse your app and queue tasks that will be performed and synced once the connection has improved.

Demonstrate the state of an action by providing your users with feedback. For example, if a user is editing a doc, consider changing the feedback design so it is visibly different from when they are online but still shows that their file was “saved” and will sync when they have a network connection. This will educate the user about the different states available and reassure them that their task or action has been stored. This has the added benefit of the user growing more confident using your application.

Designing for the next billion

In many regions, low end devices are commonplace, connectivity is unreliable and, for many users, data is unaffordable. You will need to earn user trust by being transparent and frugal with data. Think about ways to help users on poor connections and simplify the interface to help speed up tasks. Always try to ask users before downloading data-heavy content.

Offer low bandwidth options for users on laggy connections. So if the network connection is slow provide small assets. Offer an option to choose high or low quality assets.

Conclusion

Education is key to this as users are unfamiliar with these concepts. Try to create associations with things that are familiar, e.g downloading for later use is the same as offlining data.

When designing for unstable network connections, use these:

- Think how you design for the success, failure and instability of a network connection.
- Data may be expensive, so be considerate to the user.
- For most users globally, the tech environment is almost exclusively mobile.
- Low end devices are commonplace, with limited storage, memory and processing power and, small displays and lower touchscreen quality. Make sure performance is a part of your design process.
- Allow users to browser your application when they are offline.
- Inform users of their current state and of changes in states.
- Try to provide offline by default if your app doesn't require much data.
- If the app is data-heavy, educate users about how they can download for offline use.
- Make experiences transferable between devices.
- Utilize language, icons, imagery, typography and color to express ideas to the user collectively.

- Provide reassurance and feedback to help the user.
