Transport for London (TfL) Case Study

Connectivity Status Design Pattern

Problem

As part of a large-scale digital transformation and modernisation project, Transport for London (TfL) has provided mobile devices to its station-based customer service staff. These devices are customised with various apps designed to help staff offer more robust, responsive, and timely customer service.

During a user testing session for one of the apps, a test participant mentioned that she encounters network difficulties on a daily basis. She said that when she is working on the ticket hall level, she prefers to use a 3G/4G mobile network connection. However, when working underground on the platform level, she uses the WiFi connection, which she said is slower and sometimes disconnects without warning.

Due to these network issues, she did not use certain apps because they relied on having a consistent network connection. For example, rather than use the fault reporting app, she called the fault reporting call centre. This presented a problem for TfL because many of these apps were created to streamline and improve internal processes (e.g. reduce call volumes and time spent responding to fault reports).

Research Findings

In subsequent user testing sessions, I asked participants about their work patterns, network preferences, and network issues they encountered on a daily basis. After reviewing and analysing the interview transcripts, I categorised participants into two groups:

Users who worked in suburban stations: These users worked at stations outside of central London, many of which are open-air. These users preferred to use the WiFi connection because should that connection fail, their device would automatically connect to a 3G/4G mobile network. They also reported fewer network-related issues.

Users who worked in central London stations: These users worked at stations inside of central London, most of which are located underground with a ticket hall area that is at street level. The majority of users reported that when working on the ticket hall level, they would turn WiFi off and rely on the 3G/4G mobile connection. However, if they were working on the platform level located underground, they relied on the WiFi connection and tried to ensure that they were positioned close to a network router. Because of the constant switching back and forth between WiFi and mobile networks, many users reported that they experience network issues that impact their ability to use the device and apps properly.

Proposed Solution

I recommended that a common design pattern should be applied to all mobile apps to create a consistent user experience when notifying users about connectivity status and network issues. Although network issues were more frequent with users who worked in Central London stations, those that worked in suburban stations could also benefit from timely and relevant network information.

The pattern uses red/green/yellow/orange colour blocks, simple icons, and a short text description to communicate network status and connectivity information. And because of a particular quirk with the Microsoft Azure user interface - specifically a grey bar that runs across the bottom of the app with a “Cancel” button - I also recommended that the colour block cover the grey bar. As such, on tablets, the colour block measured approximately 70px high and on a mobile phone, it measured between 35px and 40px high (depending on the device).

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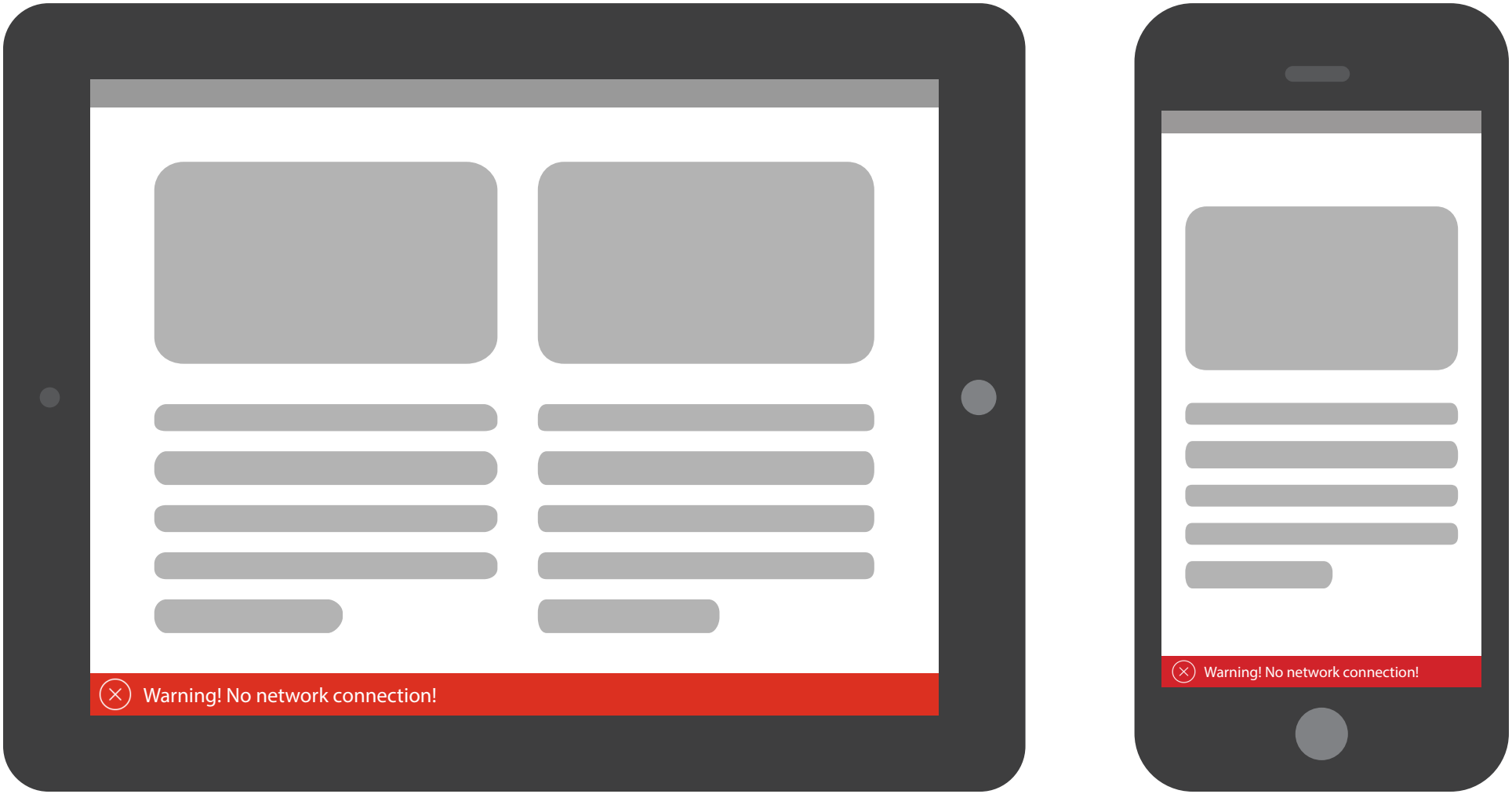

No Connection:

When the device has lost its connection to either a 3G/4G mobile network or a WiFi network, a warning message is displayed and persists until the connection is restored. Because many of the apps rely on a consistent network connection, there is no option to dismiss the notification - the only way it disappears is when the connection is restored.

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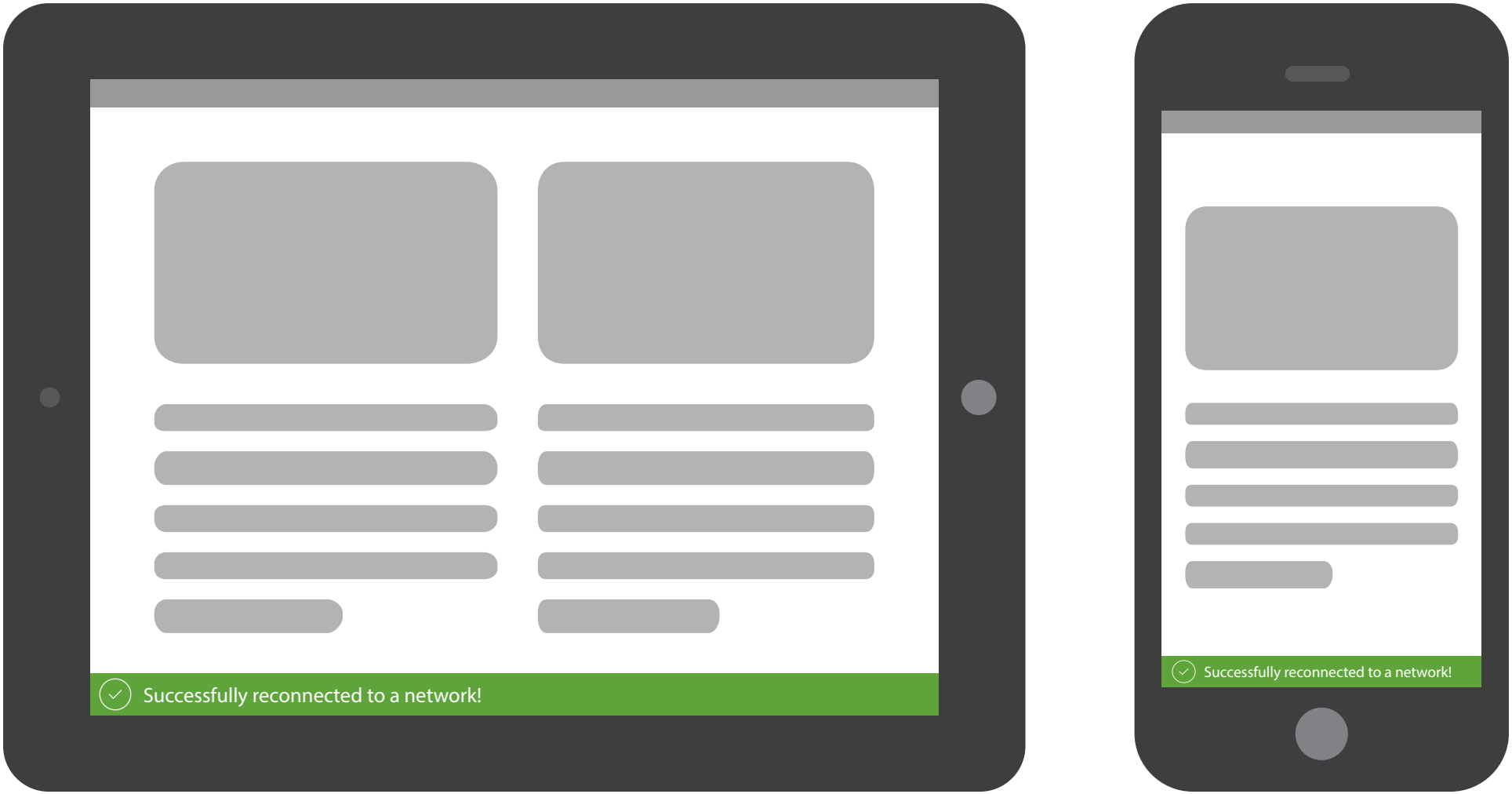

Successfully Reconnected To Network:

When the device has successfully reconnected to a network - either mobile (3G/4G) or WiFi - a message is displayed and persists for 10 seconds before fading into a black bar. If the user is on the login page, the black bar will persist to cover the Azure-based grey bar with the "Cancel" button. However, if the user is within the app, the black bar will immediately fade out to provide maximum screen space for the app itself.

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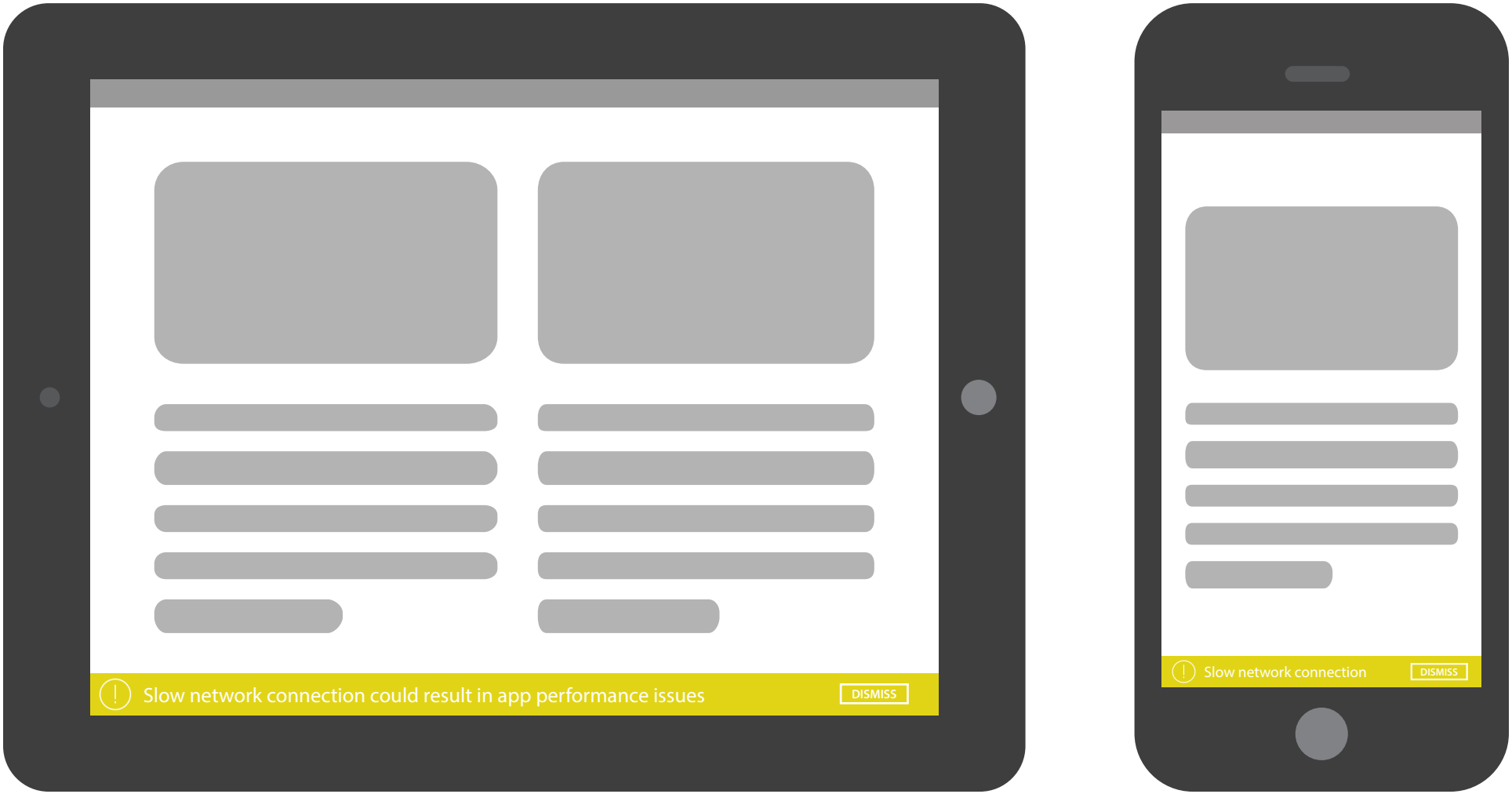
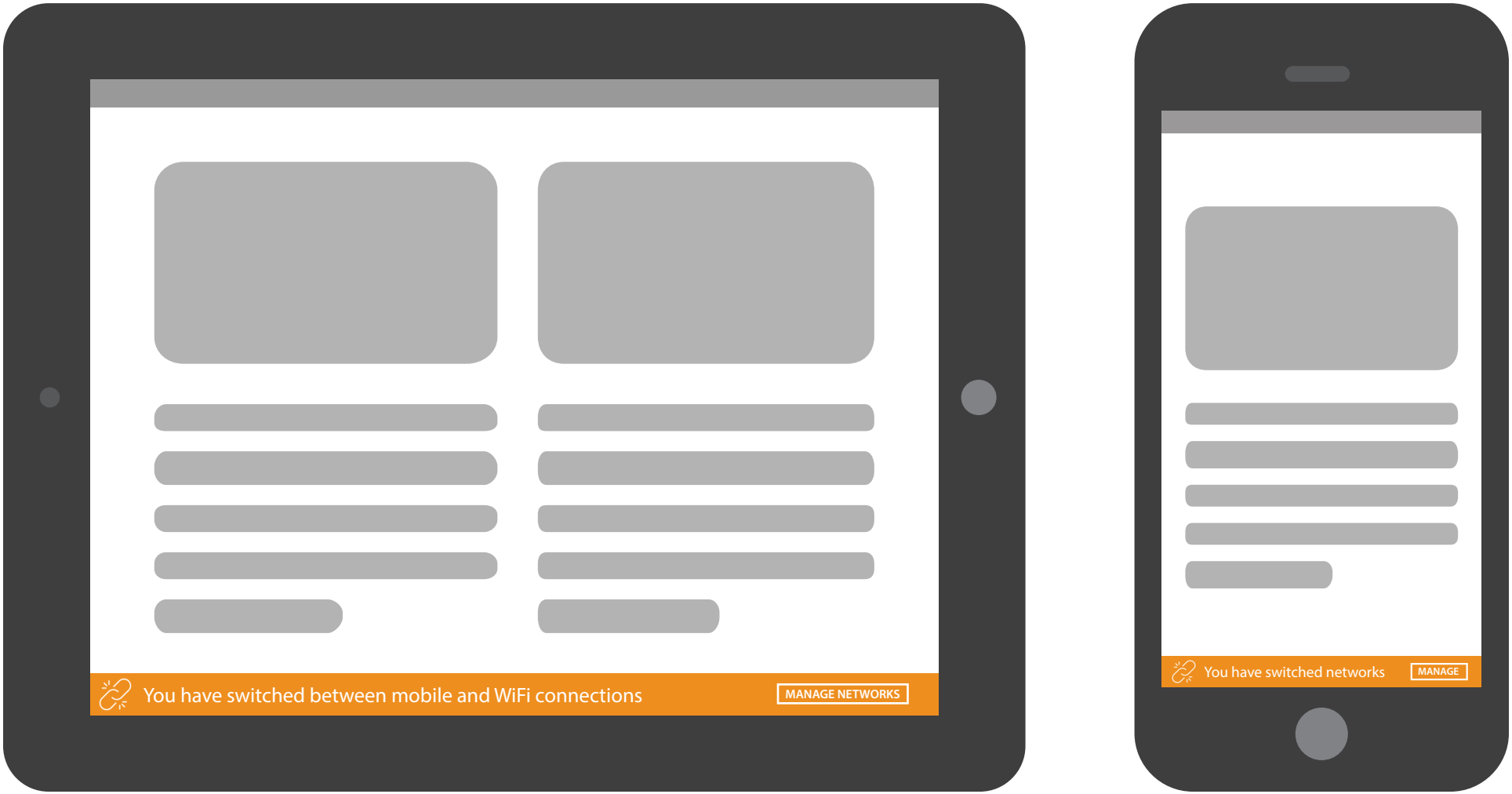


Slow Connection:

When the device has a slow connection - regardless of whether the user is on a mobile (3G/4G) or WiFi connection - a yellow bar with a warning message persists until the user either: 1) clicks the "DISMISS" button; or 2) the network speed increases to a point at which app performance is not negatively impacted.



Connection Changed:

Note: this aspect of the design pattern is a draft, pending further user and technical research

When the device connection changes between mobile (3G/4G) to WiFi, an orange bar with a notification message persists for 10 seconds before fading out. There is a button "MANAGE NETWORKS" ("MANAGE" on mobile phones) that takes users to the network settings page for their device. This will allow users to manage their network preferences and to turn WiFi on or off, depending on their work location and work pattern.