



Journalist Fellowship Paper

A guide to lock-screen news consumption on Android devices

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Introduction

The proliferation of mobile devices has significantly changed the way people access the internet. In the third quarter of 2014, most of the world's internet usage was via desktop computers, while mobile devices accounted for just 33%, according to We Are Social's annual Digital Overview.¹ By 2019, traffic from mobile devices rose to more than 50% worldwide. A similar study found the proportion of mobile internet usage was even higher for mobile-first countries that skipped the desktop internet phase entirely. In India, 76.6% web traffic comes from mobile devices, while desktop only makes up 22.9%. This trend is also happening elsewhere such as Kenya where mobile devices contribute 74.3% of the overall web traffic and Indonesia, where I live, with 66.9%.

The increase of internet usage via mobile phone in the past few years has affected the way people consume news. Researchers confirm the size of mobile news audiences has overtaken desktop news audiences at most outlets.² This is certainly confirmed by my peers in Indonesia: at digital-born news outlet IDN Times, mobile contributes up to 90% of the overall traffic. The *Jakarta Post*, a daily English newspaper with an online presence, said mobile users make up around 60%-70% of the traffic, mostly dominated by young readers.

Mobile news consumption not only gives huge traction to news websites but it also allows news to better infiltrate the daily life of mobile users who were not engaged

¹ Kemp, S., 2021. *Digital in 2020*. [online] We Are Social. Available at: <<https://wearesocial.com/blog/2020/01/digital-2020-3-8-billion-people-use-social-media>> [Accessed 30 May 2021].

² Nelson, J., 2019. The Persistence of the Popular in Mobile News Consumption. *Digital Journalism*, 8(1), pp.87-102.

with it before.^{3,4} This is possible due to the nature of the device: unlike TV or desktop computers, which are bounded by time and space, a mobile phone can be used anytime and anywhere. As Leopoldina Fortunatia and John O’Sullivan put it: “...mobile has opened a perpetual access to news, extending beyond temporal and spatial boundaries in everyday life. It can do this because the space where it is situated is the human body, in all places and at all times, whether on the move or in sedentary settings.”⁵

Smartphone use is predicted to continue to grow, which means understanding the role of mobile phones in news consumption will become more important. Inspecting this device as a tool for distribution is what I set out to do in this project.

Specifically, the paper focuses on distribution of news to lock-screen on Android devices – the operating system with the dominant market share. According to the latest data from Statista, Android phones had 71.9% global market share in January 2021, followed by Apple with 27.47% share.⁶ The number is even higher in many Asian countries such as Indonesia with more than 90% market share.⁷

³ Westlund, O., 2015. News consumption in an age of mobile media: Patterns, people, place, and participation. *Mobile Media & Communication*, 3(2), pp.151-159.

⁴ Van Damme, K., Courtois, C., Verbrugge, K. and De Marez, L., 2015. What’s APPening to news? A mixed-method audience-centred study on mobile news consumption. *Mobile Media & Communication*, 3(2), pp.196-213.

⁵ Fortunati, L. and O’Sullivan, J., 2020. Understanding Mobile News: Looking beyond the Lockscreen. *Digital Journalism*, 8(1), pp.164-169.

⁶ O’Dea, S., 2021. *Mobile operating systems’ market share worldwide from January 2012 to January 2021*. [online] Statista. Available at:

<<https://www.statista.com/statistics/272698/global-market-share-held-by-mobile-operating-systems-since-2009/>> [Accessed 30 May 2021].

⁷ StatCounter Global Stats. 2021. *Mobile Operating System Market Share Indonesia* | StatCounter Global Stats. [online] Available at: <<https://gs.statcounter.com/os-market-share/mobile/indonesia>> [Accessed 24 July 2021].

In investigating the lock-screen, this paper primarily asks: Is the lock-screen a significant medium for news distribution? What does news consumption on lock-screen look like, and how does it benefit the publishers and its audience?

To answer these questions, I take a deeper look at two features available for news.

First, push notifications which have had plenty of research attention over the past few years. Second, news as wallpaper, a programme developed by a Bangalore-based startup company, Glance, that is currently only available in some Asian countries such as India and Indonesia. I currently work as a Managing Editor for Glance in Jakarta.

I will also contrast the user journey to finding news on mobile phones to see whether these two lock-screen products offer something different to the conventional way of consuming news on mobile (via apps on home screen). Finally, I conducted interviews with Indonesian publishers and content aggregation services such as Upday in Germany and Glance.

What is a lock-screen?

If you have a smartphone, research shows you likely look at its lock-screen as often as 70 times a day.

As the name suggests, the main function of your lock-screen is its unlocking feature – a gate to open and close access to the home screen. This function is crucial for at least two reasons. First, it acts to prevent accidental inputs that may result in unintentional phone calls or app activations.⁸ Second, it protects your personal data from unauthorised access.⁹

Beyond these functions, the lock-screen is also used to deliver quick information: time and date, battery level, mobile network signal, Wi-Fi connection, among other things. Users who access the lock-screen do not always intend to open the phone¹⁰.

I like to think of the lock-screen as a space: a porch, to be precise. It is the space you see before you enter a home. You can use your key – or in this context, a password – to enter through the door. But if you have a particularly good porch, you probably want to spend some time there, enjoying the view of the garden or sipping a cup of coffee while relaxing in a rattan chair.

How good your experience is on the porch depends heavily on what is available in that comparatively tiny space.

⁸ Jung, J., Nour, M., Allman-Farinelli, M. and Kay, J., 2017. Harnessing the "ambience" of the mobile-phone lockscreen for ultra-lite logging. *Proceedings of the 29th Australian Conference on Computer-Human Interaction*.

⁹ Harbach, M., De Luca, A. and Egelman, S., 2016. The Anatomy of Smartphone Unlocking. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*,.

¹⁰ Hintze, D., Findling, R., Scholz, S. and Mayrhofer, R., 2014. Mobile Device Usage Characteristics. *Proceedings of the 12th International Conference on Advances in Mobile Computing and Multimedia*,.

Researchers have noticed this potential. Because the lock-screen is accessed for short periods of time, and frequently (around 50 to 70 times per day), it is considered well suited to delivering micro information or even micro tasks.^{11,12,13} The most interesting studies on this topic can be broadly grouped into adding tasks, and adding functions.

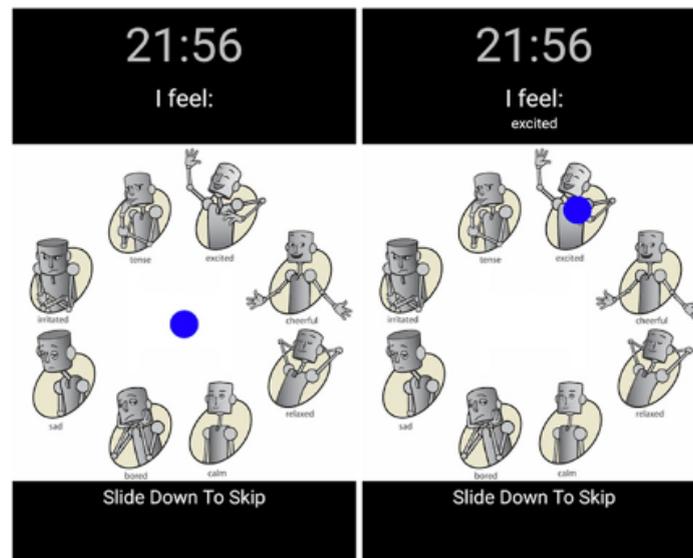


Figure 1: 'Mood tracker' by Ghandeharioun et al. (2016). To unlock the phone, users swipe in the direction of their mood.

Tasks

By combining the act of unlocking the phone with micro tasks such as math and recall tasks, Truong, Shihpar and Wigdor introduced a system called 'Slide to X' that can be used for data collection or human intelligence tasks¹⁴. A similar concept was developed by Vaish et al. in their 2014 paper, mainly for crowdsourced data, such as photo ranking. Meanwhile, Ghandeharioun et al. did an experiment where users log

¹¹ Vaish, R., Wyngarden, K., Chen, J., Cheung, B. and Bernstein, M., 2014. Twitch crowdsourcing. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*,.

¹² Harbach, M., De Luca, A. and Egelman, S., 2016. The Anatomy of Smartphone Unlocking. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems*,.

¹³ Glance, 2021. *What India Consumes on Lock Screen*. [online] Available at: <<https://glance.com/2021IndiaLockScreen>> [Accessed 16 May 2021].

¹⁴ Truong, K., Shihpar, T. and Wigdor, D., 2014. Slide to X: Unlocking the Potential of Smartphone Unlocking. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*,.

their mood on the lock screen to unlock the phone in order to track the user's emotion throughout the day.¹⁵

Function

By adding functionality that is separate to the act of unlocking, Banovic et al. created a system where users can organise email directly from the lock screen.¹⁶ An experiment by Jung et al. cited in their 2017 paper added more functionality on lock-screen by developing a system called FIT which is designed to track and monitor daily vegetable intake. Users swipe right to the carrot icon at the bottom of the screen to indicate that they ate one serving of vegetables.

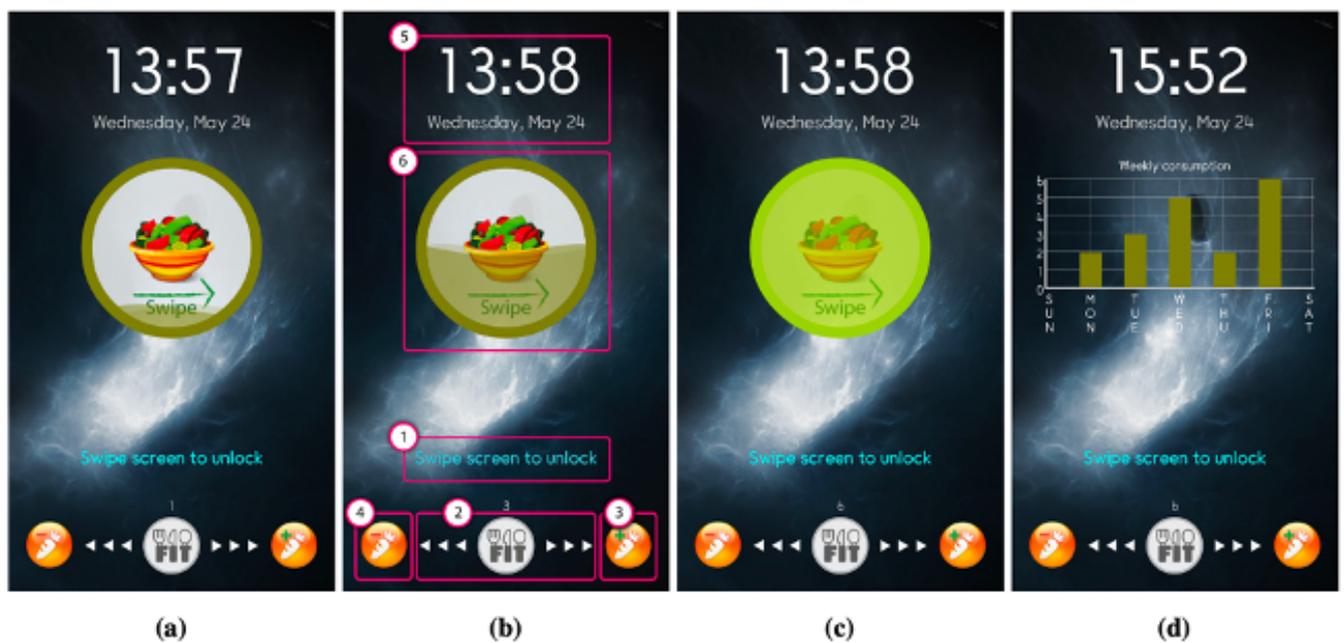


Figure 2 - From left: as users swipe more carrots to the FIT circle, shading increases to show progress towards the goal. A right swipe on the bowl shows a graph of last week's log. A lock-screen experiment by Jung, Nour, Allman-Farinelli and Kay (2017).

¹⁵ Ghandeharioun, A., Azaria, A., Taylor, S. and Picard, R., 2016. "Kind and Grateful": A Context-Sensitive Smartphone App Utilizing Inspirational Content to Promote Gratitude. *Psychology of Well-Being*, 6(1).

¹⁶ Banovic, N., Brant, C., Mankoff, J. and Dey, A., 2014. ProactiveTasks. *Proceedings of the 16th international conference on Human-computer interaction with mobile devices & services - MobileHCI '14*,.

While some experiments remain on paper, others are released into the Google Play Store. An app called [U-Dictionary](#) has a lock-screen feature that helps users learn new English words every time they open their phone.

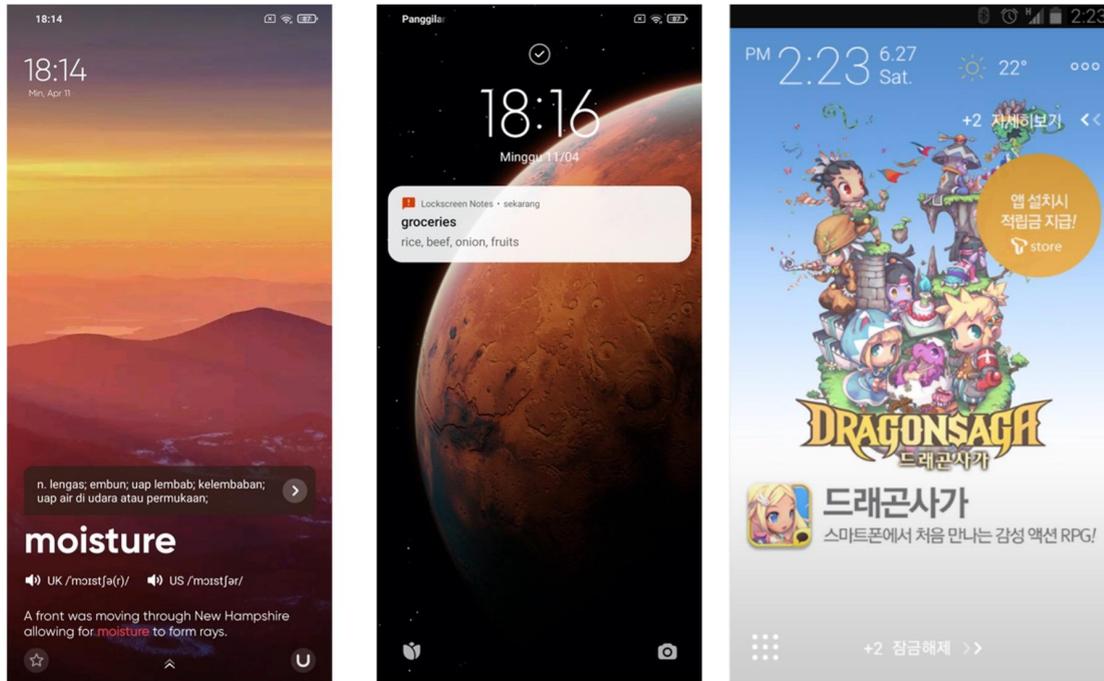


Figure 3- (From left to right) The U-Dictionary wallpaper feature which shows new words every time you open your phone, Lock-screen note app allows you to write memo on lock-screen, and HoneyScreen app offers rewards for displaying ads on lock-screen (Image source: <https://en.honeyscreen.com>)

It uses beautiful wallpaper images and concise information, but as a secondary lock-screen (a lockscreen built on top of the existing one), users still need to go through the original lock-screen in order to unlock. This adds a step to the user journey for everyone in a hurry to make a call or send a message. Another example is [Lockscreen Note](#) app where users can create and display notes on the lock-screen that mimic push alerts.

Monetized lock-screen

Other experiments worth mentioning include the rise of advertising apps that turn the lock-screen into a moneymaker. Cashtree¹⁷ is a lock-screen app available in Indonesia that displays ads on the lock-screen in exchange for reward points. Via these apps, users can redeem points for vouchers from merchants. In South Korea, Honey Screen app (developed by ad platform provider Buzzvil) has a similar lock-screen service. Recently, Buzzvil acquired lock-screen apps such as New York City startup SlideJoy in 2017 and India and Pakistan startup SlideApp in 2018.^{18,19}

¹⁷ Pratama, A., 2017. Strategi Aplikasi Iklan Cashtree untuk Dapatkan Lebih dari 2 Juta Pengguna Aktif. *Tech in Asia*, [online] Available at: <<https://id.techinasia.com/strategi-aplikasi-iklan-lock-screen-cashtree-raih-2-juta-pengguna-aktif>> [Accessed 10 July 2021].

¹⁸ Ha, A., 2017. Buzzvil acquires Slidejoy for a lockscreen ad consolidation. *Tech Crunch*, [online] Available at: <https://techcrunch.com/2017/01/20/buzzvil-acquires-slidejoy/?guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLnNvbS8&guce_referrer_sig=AQAAANPcLUgdKenTYApOWrWbFsoQ3gsqTmc2VbbwBK9srOfZiTa4BzvUcWpXicuiq6ynlm1t3ciMBWgg2zJlIr5IMQvKpf6beUxg9vOlnTqb3c3BLPpkmP2QTti5-dTvpKNdvkdN5EiBKsM0hIZuJPsqKVFgmgLBEBHiS-5GC2BCtr7R&guccounter=2> [Accessed 10 July 2021].

¹⁹ PR Newswire. 2018. *Largest Lockscreen Media Platform Buzzvil Acquires India and Pakistan's SlideApp*. [online] Available at: <<https://www.prnewswire.com/news-releases/largest-lockscreen-media-platform-buzzvil-acquires-india-and-pakistans-slideapp-300703902.html>> [Accessed 10 July 2021].

Lock-screen for news distribution

There are two known features for news distribution on lock-screen: push notifications and wallpaper stories. While push notifications have been used for many years to deliver news alerts, wallpaper stories are considered more recent and are currently only available on selected Android devices.

Wallpaper stories is a term used to describe an opt-in phone feature (not an App) that offers dynamic and design-led lock-screen content that updates throughout the day. It is currently provided by Glance in India (on Xiaomi and Samsung devices) and Indonesia (currently on Xiaomi only). Xiaomi and Samsung in India account for a 40% market share in a country with a population of 1.3 billion.²⁰ In Indonesia, Xiaomi had a majority market share in Q2 2021 of 28%. The concept is also available on some OEMs like Oppo and Vivo, who employ in-house content management teams, although less information is available about their editorial processes.

Mobile notification goes personal

By definition, push notifications are alerts sent automatically from mobile apps to all users who have opted to receive them.²¹ They can contain text, rich media such as GIF or video, and action buttons that appear when you swipe down from the top of your screen. Notifications can also appear on lock-screen and home screen (as a floating window) depending on the settings.

Commonly, users will get these alerts from the apps that they downloaded. This is called mobile app push notification. But there is another form of alerts called web

²⁰ Counterpoint Research. 2021. *India Smartphone Market Share: By Quarter - Counterpoint Research*. [online] Available at: <<https://www.counterpointresearch.com/india-smartphone-share/>> [Accessed 23 August 2021].

²¹ Chandler, D., & Munday, R. notifications. In *A Dictionary of Social Media*. : Oxford University Press. Retrieved 15 Jun. 2021, from <https://ezproxy-prd.bodleian.ox.ac.uk:2460/view/10.1093/acref/9780191803093.001.0001/acref-9780191803093-e-911>.

push notification that allows a website to send notification (with users' consent) via browser even if the user has not downloaded the app from said website. Web push notification usually works on desktop and Android phones, but not for iOS.

The Android operating system gives users a lot of control in terms of how these notifications work. Via phone setting, users can enable and disable push alerts at individual app level. For each app push alert, users are able to customise how they appear (either on lock-screen or not), sound (with ping or muted), and whether you want the content of the alerts hidden or not.²²

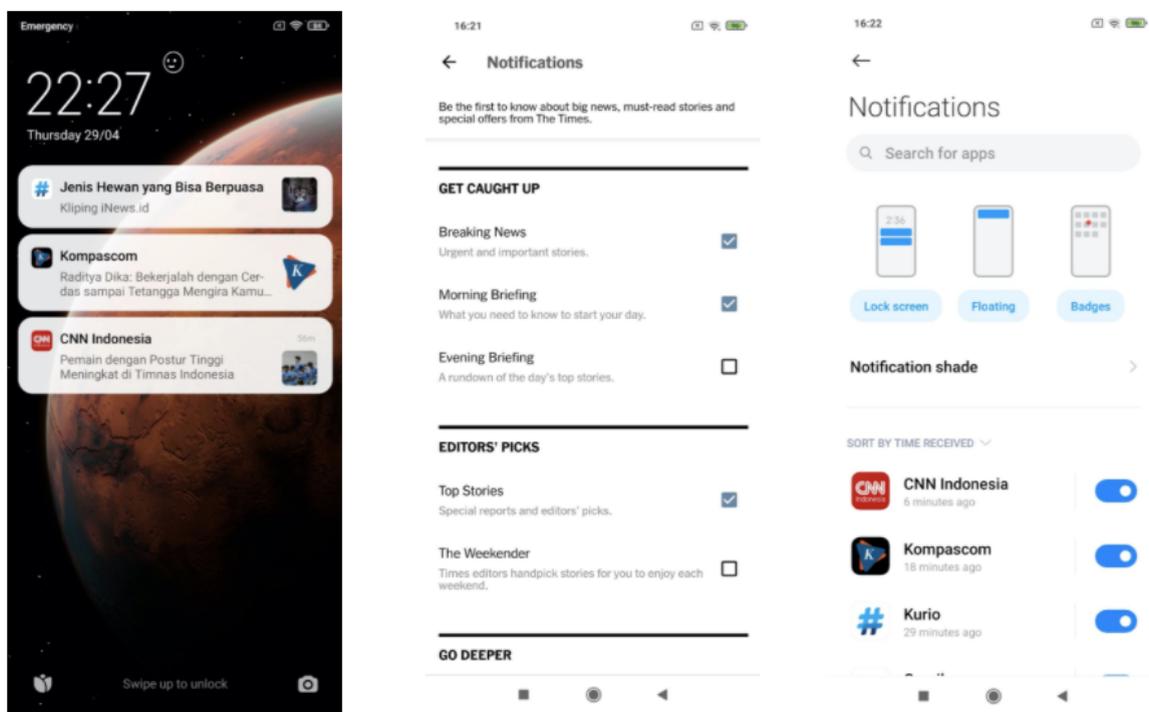


Figure 4: Push alerts from news outlets in Indonesia appear on Xiaomi phone; Push notification personalisation from New York Times app; Push notification setting on the mobile phone

Although Google introduced notifications in 2010, the buzz around their use for news consumption happened later, particularly after 2015 in the drive to attract more mobile user traffic. Overall, news is considered less important to users than personal

²² Google. n.d. *Control notifications on Android - Android Help*. [online] Available at: <<https://support.google.com/android/answer/9079661?hl=en-GB#zippy=%2Clear-notifications%2cSnooze-notifications%2Cturn-notifications-on-or-off-for-certain-apps%2Coption-hide-sensitive-content-from-notifications-on-your-lock-screen>> [Accessed 15 June 2021].

message alerts, but users still find it useful to keep informed about things relevant to personal interest.²³ And there is evidence that receiving and consuming news alerts on mobile can prompt passive learning.²⁴

There has been some pushback against notifications. Initially designed to make it possible to receive information from your device more easily, the feature has been abused by marketers who recognised its potential to increase app engagement.²⁵ The rise of non-stop intrusive alerts was the main reason both iOS and Android OEMs have given users more control to customise the function.

The 'new front page' of the internet?

If you are in India or Indonesia and have a specific Android phone, your lock-screen probably looks like the one pictured below. At first glance, it doesn't look much different to the lock-screen we usually know, but it allows you to swipe right to read and watch content before you unlock the phone and explore apps.

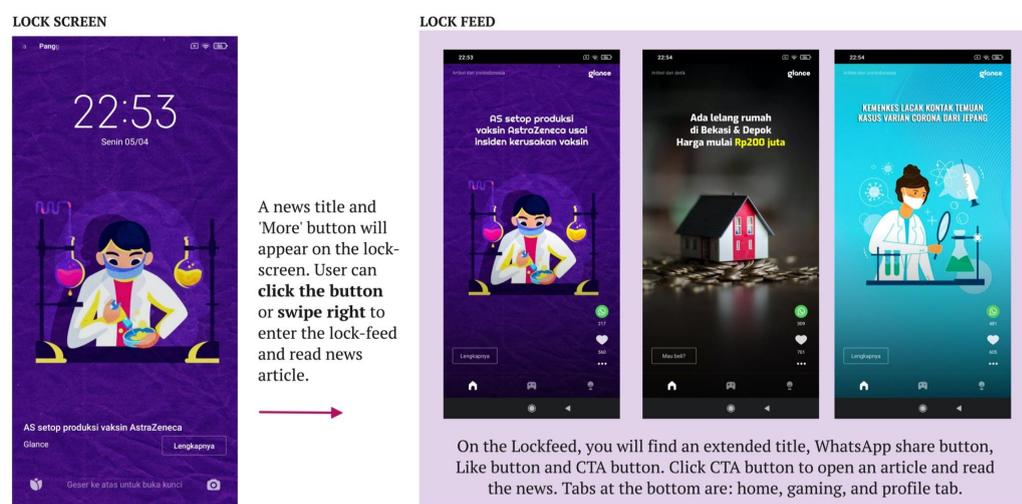


Figure 5: Glance user journey on Xiaomi Android phone

²³ Newman, N., 2016. *News Alerts and the Battle for the Lock-screen*. Reuters Institute for the Study of Journalism.

²⁴ Stroud, N., Peacock, C. and Curry, A., 2019. The Effects of Mobile Push Notifications on News Consumption and Learning. *Digital Journalism*, 8(1), pp.32-48.

²⁵ Pierce, D., 2017. *Turn Off Your Push Notifications. All of Them*. [online] Wired. Available at: <<https://www.wired.com/story/turn-off-your-push-notifications/>> [Accessed 15 June 2021].

The world's first lockscreen platform, Glance, reports 115 million daily active users (DAUs) in India and Indonesia.²⁶ To put this in context, YouTube has 225 million and Facebook has 290 million active users in India. Nitin Sundar, Glance's General Manager for News & Sport, said global digital audiences have shifted in nature "from the world of search to discovery, from static to video, from longform to short form, from self-curated to AI curated". "These shifts require the discovery layer to be fundamentally reimagined, and Glance is setting out to do just that," he said.

While its claim to being the first integrated lock-screen content platform is true, the idea of utilising lock-screen for news is actually not entirely new: in 2015, '[Corgi for Feedly](#)' and '[Swipe for Feedly](#)' were built as lock-screen replacement apps to display news via RSS Feed.

As a discovery platform, Glance offers a range of content – news aggregated from local publishers, social videos, and even casual gaming. Glance doesn't see push alerts as a competitor for audience attention because they serve different purposes. While push alerts want users to open one particular app, Glance wants people to discover other apps by promoting selected pieces of content on lock-screen.

"The lock screen is seen by users hundreds of times a day," Mr Sundar said. "And a high percentage of those visits is an opportunity to discover or experience something new. The four to five apps on the phone [that users open most frequently], and the notifications they push to us serve a very different, utilitarian function. They don't necessarily trigger the joy of discovery. So Glance doesn't look at itself as competing with app notifications."

²⁶ Moneycontrol. 2021. Glance Beats Instagram To Be Among Top Content Consumption Platforms Along With Facebook, YouTube. [online] Available at: <<https://www.moneycontrol.com/news/business/glance-beats-instagram-to-be-among-top-content-consumption-platforms-along-with-facebook-youtube-6628891.html>> [Accessed 23 August 2021].

What has made this product scaleable is its close relationship with original equipment manufacturers (OEMs), meaning the product can bypass the Google Play store entirely and come pre-installed in the Android operating system.

In an interview with *The Ken*, the CEO of Glance's parent company InMobi Group, Naveen Tewari, explained how they convinced the OEMs.²⁷

“We went to the OEMs and said we want to create a complete ecosystem on screen zero. We think screen zero is actually a much bigger screen and much bigger real estate and a much bigger consumption platform than what's inside the phone today. But if you work rightly on this and leverage all the AI that exists out there, we can change that and create a completely different ecosystem on top of it.”

Not every Android OEM in the region added Glance: as previously mentioned, Vivo and Oppo chose to run the lock-screen content management system on their own.

The battlefield for attention

Neither push notifications nor Glance were invented specifically as news products. Push notifications serve as an extended arm of an app to poke users via alerts into spending more time in their programme environment. Wallpaper stories want users to spend more time on the lock-screen.

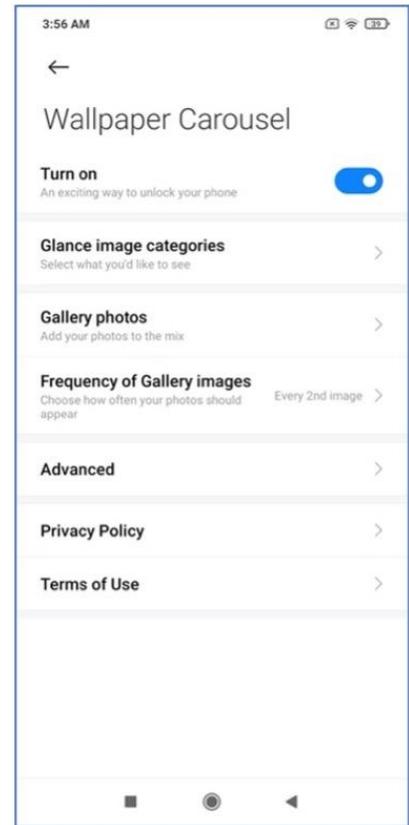


Figure 6: Mechanism to turn on and off Wallpaper Carousel on Xiaomi phone.

²⁷ Dharmakumar, R., 2019. With Glance, InMobi wants to rule Android's screens. *The Ken*, [online] Available at: <<https://the-ken.com/story/with-glance-inmobi-wants-to-rule-androids-screens/>> [Accessed 2 August 2021].

The proposition of the lock-screen content service is not to replace or compete with the home screen and its apps, but to ‘control the gate’. “We are not designing end-consumption, but steering it. We’re a gateway,” Mr Tewari explained.²⁸

Discussions about time spent on mobile devices and the battle for audience attention have been ongoing ever since the internet shifted from the Web 1.0 era to the Web 2.0 in early 2000. Mobile phones have only become more cluttered with utility in the form of apps, widgets, alerts and calls. Nic Newman’s research on this topic found that users found mobile notifications more intrusive than those of other devices.²⁹

Earlier, I imagined the lock-screen as a porch, but now we understand that this porch is not always neat and simple. How does the user react? Do they like it? If this is your own porch, would you enjoy the maximalism and stay on the porch a little bit longer, or would you want to declutter it?

²⁸ Dharmakumar, R., 2019. With Glance, InMobi wants to rule Android’s screens. *The Ken*, [online] Available at: <<https://the-ken.com/story/with-glance-inmobi-wants-to-rule-androids-screens/>> [Accessed 2 August 2021].

²⁹ Newman, N., 2016. *News Alerts and the Battle for the Lock-screen*. Reuters Institute for the Study of Journalism.

Why lock-screen matters

Journalism studies often position the audience at the centre of its work. Scholarly papers on this theme are extensive and have covered a range of topics, from audience fragmentation and polarization, to audience motivation and news consumption, news audience behaviour in digital platforms and fake news consumption.^{30,31,32,33,34}

In countries where most news consumption takes place on mobile devices, it has become important to see the audience not only as a news reader but also as a smartphone user who navigates their thumb inside the operating systems and between apps. While we need to ask about what motivates them to find news, we also need to ask how they find news on their phone. How many taps, clicks, and swipes before they read a news article on their device? And what does this process mean for news consumption on mobile?

Defining news on mobile phone

Unlike conventional media such as TV or radio, news on mobile devices doesn't have distinct characteristics. News in print newspapers, for example, is positioned in specific layout, typography, pages, sections, and so on. News on TV is situated in "an oral and visual context".³⁵

³⁰ Fletcher, R., Cornia, A. and Nielsen, R., 2019. How Polarized Are Online and Offline News Audiences? A Comparative Analysis of Twelve Countries. *The International Journal of Press/Politics*, 25(2), pp.169-195.

³¹ Yang, T., Majó-Vázquez, S., Nielsen, R. and González-Bailón, S., 2020. Exposure to news grows less fragmented with an increase in mobile access. *Proceedings of the National Academy of Sciences*, 117(46), pp.28678-28683.

³² Lee, E. and Tandoc, E., 2017. When News Meets the Audience: How Audience Feedback Online Affects News Production and Consumption. *Human Communication Research*, 43(4), pp.436-449.

³³ Nelson, J. and Lei, R., 2017. The Effect of Digital Platforms on News Audience Behavior. *Digital Journalism*, 6(5), pp.619-633.

³⁴ Nelson, J. and Taneja, H., 2018. The small, disloyal fake news audience: The role of audience availability in fake news consumption. *New Media & Society*, 20(10), pp.3720-3737.

³⁵ Fortunati, L. and O'Sullivan, J., 2020. Understanding Mobile News: Looking beyond the Lockscreen. *Digital Journalism*, 8(1), pp.164-169.

But news on mobile is isolated in a small and very personal space, and is delivered in many different shapes and sizes: from one line news alerts, one-minute native video on social media, a Twitter thread, a Facebook live to one-hour YouTube documentary and a long form article in a news website. News consumption on mobile devices can also be measured by many more values, such as video views, retweets, clicks, impressions, and else – depending on the goal that has been set.

The method

The walkthrough is the method most often used in user-centered app studies, particularly in assessing the visual interfaces we use to navigate our devices. In a 2016 paper, Light, Burgess and Duguay detailed a walkthrough: “The core of this method involves the step-by-step observation and documentation of an app’s screens, features and flows of activity – slowing down the mundane actions and interactions that form part of normal app use in order to make them salient and therefore available for critical analysis. The researcher registers and logs into the app, mimics everyday use where possible and discontinues or logs out while attending to technical aspects, such as the placement or number of icons, as well as symbolic elements, like pictures and text.”³⁶

As a methodology, walkthrough is usually conducted by documenting three stages of user journey: registration and entry; everyday use; and suspension, closure and leaving. Through each stage, we can understand the app's technical and cultural influences by looking at ‘mediator characteristics’ (such as user interface arrangements; function and feature; textual content and tone; and symbolic representations).

³⁶ Light, B., Burgess, J. and Duguay, S., 2016. The walkthrough method: An approach to the study of apps. *New Media & Society*, 20(3), pp.881-900.

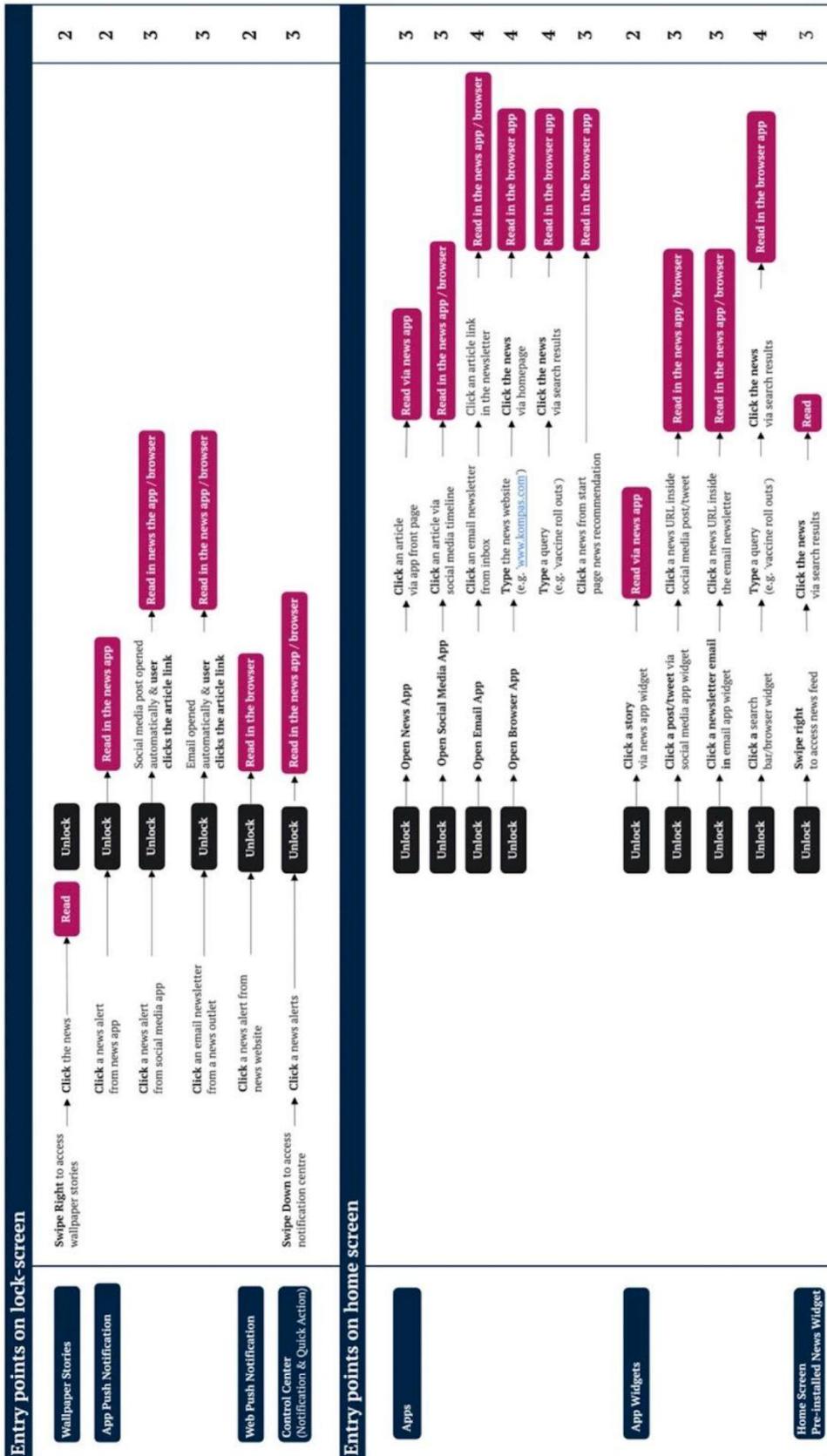
The fundamental exercise for this particular walkthrough is to find as many possible journey variations that connect users and news articles on mobile phones. To achieve this goal (comparing different entry points of news consumption), this report skips the first and the last stage of user journey entirely, focusing only on the everyday use stage. This means I did not include onboarding and leaving steps, such as authorising push alert display on lock-screen or turning off home screen content service in the settings.

In this analysis, the walkthrough also ignores some mediator characteristics such as context, tone, or symbolic representation, and only focuses on the number of steps users need to take to read news articles on news domains. This doesn't mean the visual aspects are not important, but a walkthrough works best when contrasting a series of interfaces because it can reveal the behavioural aspect of a technology. As Dieter et al. explain in *Multi-Situated App Studies: Methods and Propositions*:³⁷

“The screen captures used to document or annotate the walkthrough are, we suggest, not to be reduced to images and analysed primarily through semiotic methods. Apps are first and foremost operational media; they are applications, things for doing. Importantly, apps are typically designed with behaviours – not meanings – in mind. App developers aim to get their users to do specific things – to change their behaviour – and the walkthrough method can be used to reflect this behavioural focus.”

On device perspective, this report inspects three Android phones: Vivo and Xiaomi (purchased in Indonesia) and Samsung (bought in India). I divide the walkthrough into two clusters, on lock-screen and on home screen.

³⁷ Dieter, M., Gerlitz, C., Helmond, A., Tkacz, N., van der Vlist, F. and Weltevrede, E., 2019. Multi-Situated App Studies: Methods and Propositions. *Social Media + Society*, 5(2), p.205630511984648.



Graph 1 - A walkthrough on how people access a news domain on their phone

Findings

A pole position

The most obvious finding from the graphic representation of the walkthrough on page 22 is the main characteristic of a lock-screen itself: its frontness. It offers a good head-start for any publishers who want to grab users' attention. In the era of the attention war, where publishers need to compete with social media content, who doesn't want to have this advantageous position in the race?

The fastest access

On lock-screen, there are at least four main entry points for accessing news: wallpaper stories, web push notification, app push notification, and notification centre (which can usually be accessed by swiping down the screen). The image below illustrates these four options.

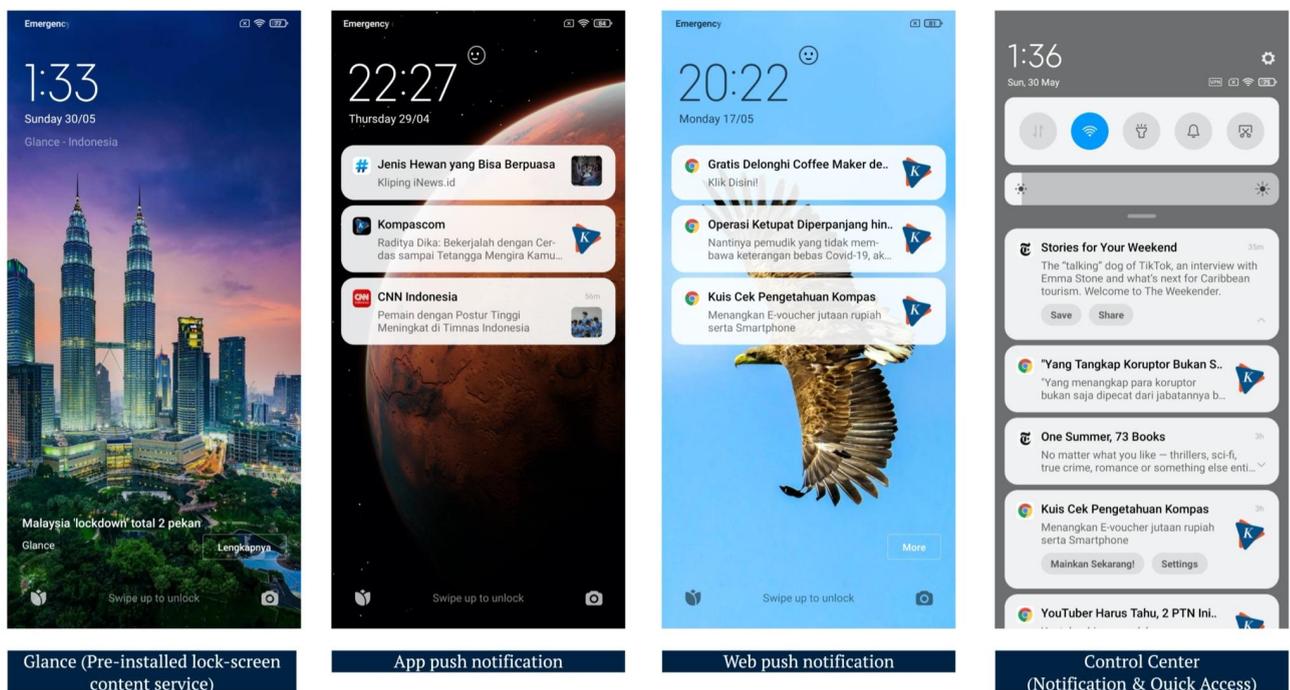
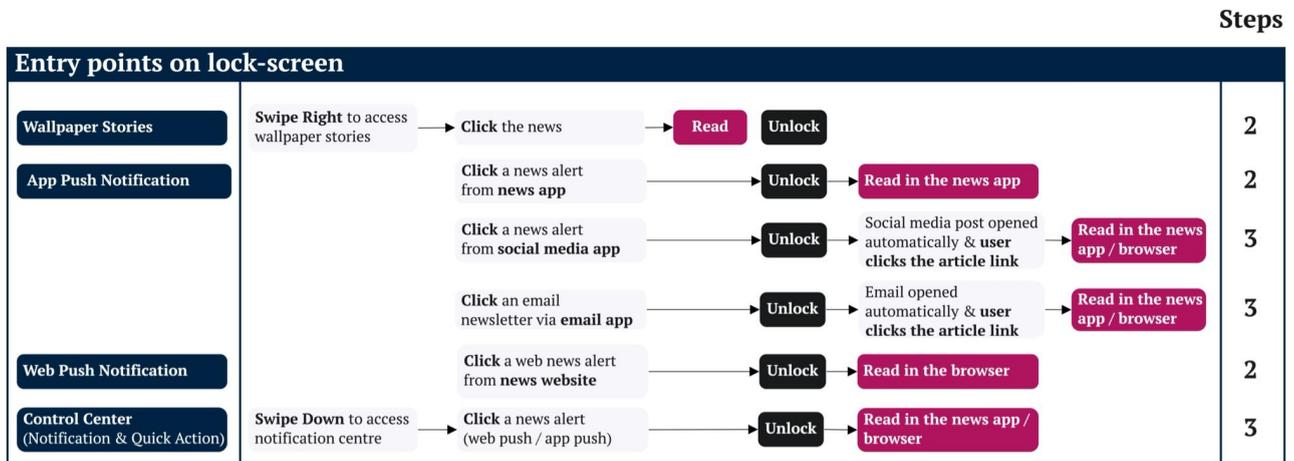


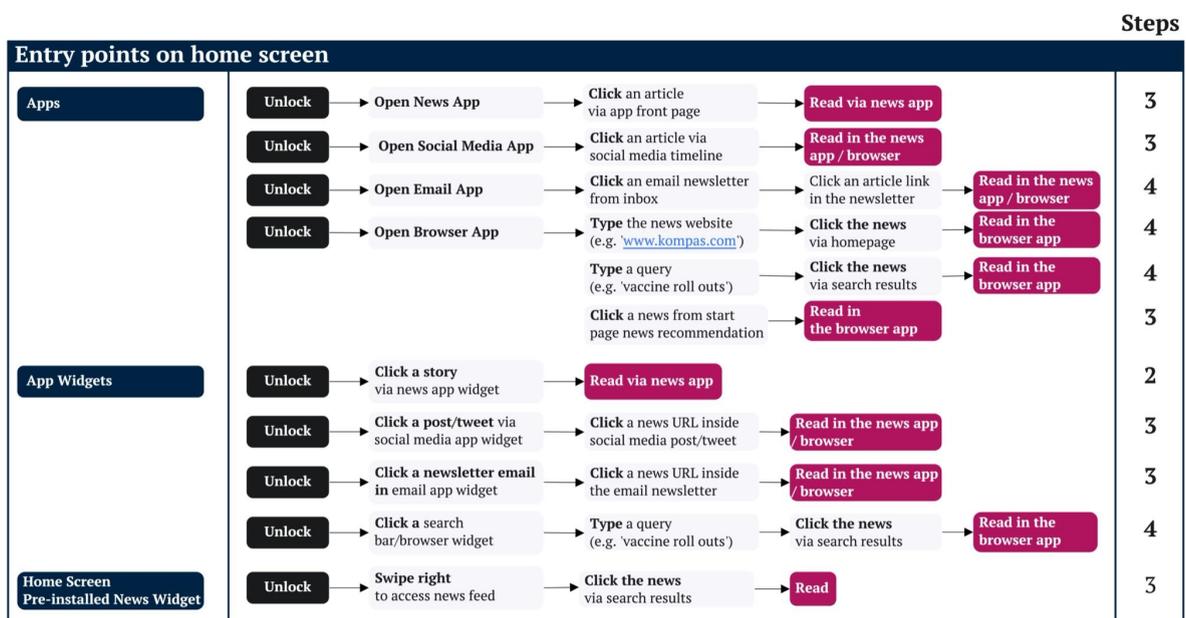
Figure 8 - Entry points of accessing news on the lock-screen of Xiaomi device

The walkthrough reveals that users are able to access news domains with only two steps via wallpaper stories and push alerts (both web and app) and three steps away via notification center.



Graph 2 - A walkthrough on how people access a news domain on lock-screen

These are the fastest if we compare it to the home screen user journey. As the graph below suggests, accessing news via home screen requires mostly three to four steps depending on which entry points users take the journey from.



Graph 3 - A walkthrough on how people access a news domain on home-screen

In general on the home screen, users can access news via three main doors illustrated below: apps (browser, news, social media, email, etc), app widgets, and pre-installed news widget on home screen.

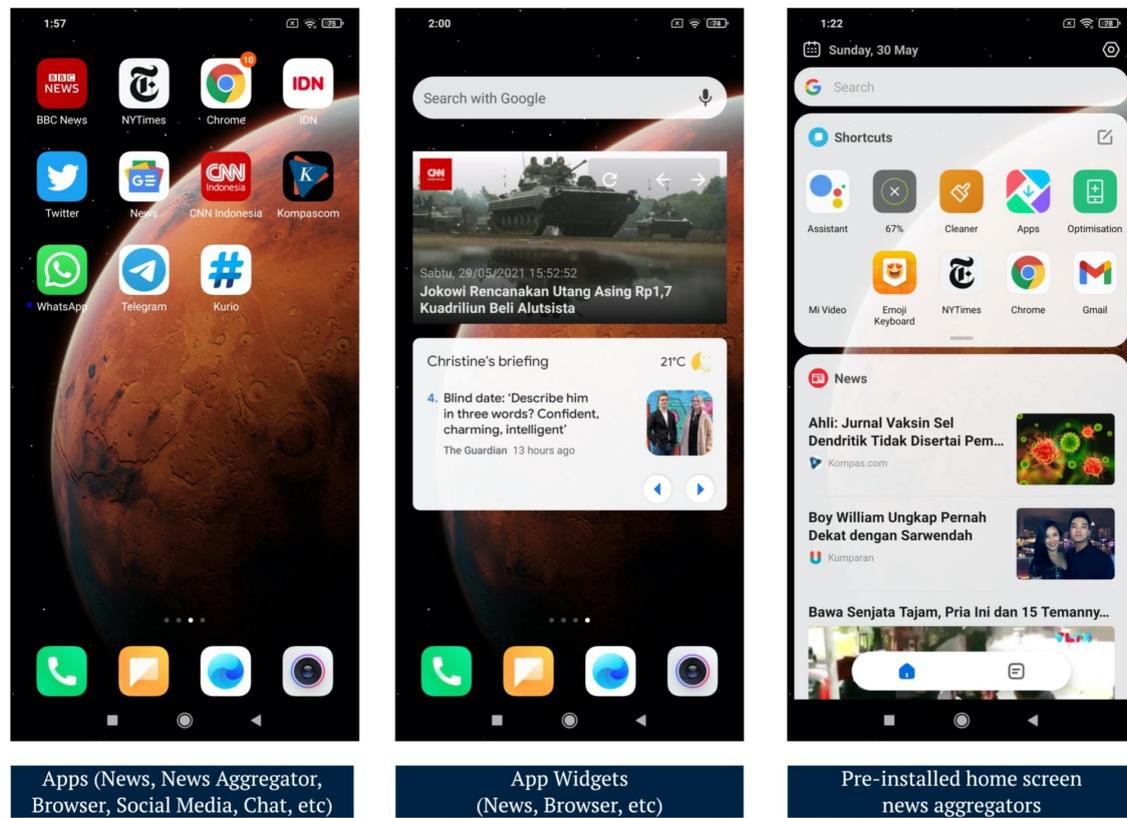


Figure 9 - Entry points of accessing news on the home screen of Xiaomi device

While apps and app widgets are common, the latter is less well known despite being available on many Android phones. Samsung, for example, has partnerships with news aggregator Upday in Europe and DailyHunt in India to provide widget services. Xiaomi has a similar service partnering with MSN.com in Indonesia. Generally, these are used to access the news from different outlets with a swipe right gesture on their home screen.

Lock-screen, however, is the fast lane to news consumption. Based on the notion that the quickest route is the preferred route, this characteristic can be an advantage for publishers and a convenience to readers.

A public space

Based on the basic function of lock-screen and what the walkthrough shows, lock-screen acts as a public news space. This informs the discussion about what news should be shown in private and which news should be shown in public.

Lock-screen is naturally a public space and home-screen is a private one. What is being presented in push notification and wallpaper stories is visible not only to the owner of the device but also to others – since you needn't unlock it.

Here is the catch: unlike magazine covers or newspaper front pages, a mobile device is very personal. All the things that appear on the lock-screen of a phone can be subject to judgement if it is seen by friends and relatives. People will know what kinds of news you subscribe to, from which news sources and make inferences. How should we deliver news in a public space on a device that is also very personal?

For alerts that are mainly text, this is not a big issue. Most newsrooms I spoke with thought breaking news and top stories were the best candidates for notification because they warrant the urgency and are considered acceptable for most of the audience who opt-in to the push services.

This becomes more complicated for a visual product like Glance. And because users can also see whole articles and videos before unlocking, the curation process should be very thorough. One of the most heavily debated topics in our newsroom is about whether a particular news item would be suitable if children were to see it. News about rape or drug abuse, for example, seems ill-suited for lock-screen because a child can take and use their parents' phone without consent.

On the other hand, public space can carry advantages too because a ‘public’ mindset encourages both publishers and Glance to promote content that is broadly acceptable to a wider audience. With the rise of partisan news outlets, is it helpful that we feel pressure to think about the needs of a wider group of readers and their communities?

A heavily-curated news space

As a consequence of being “front and centre”, news on lock-screen tends to be subjected to higher standards of scrutiny compared to apps on home screen. It is not surprising that publishers and Glance both emphasise the importance of human curation as part of, or over algorithmic solution.

While publishers heavily curate their pushes to reduce the intrusiveness, Glance is more conscious about the sensitivity of delivering heavily-visual content on lock-screen. “It is important to ensure every piece of content, and every image we carry adheres to the aesthetics and sensitivity of the real estate,” said Mr Sundar. “Hence, human involvement is important to Glance. That said, as a platform, it is important for us to build scalable systems that make it easy for human editors to do a large number of content pieces, and rely on automation to do the heavy lifting.”

Researchers have been studying new classifications for news on mobile in order to understand more about news consumption on this small device. One study by Stroud et al in *Digital Journalism*, for example, acknowledges push notification as “an incidental and, sometimes serendipitous, news exposure” that offers a level of passive learning.⁵⁸ News on social media is also considered “incidental” because people who log in to the platform may not necessarily search for news. Meanwhile, for news on

⁵⁸ Stroud, N., Peacock, C. and Curry, A., 2019. The Effects of Mobile Push Notifications on News Consumption and Learning. *Digital Journalism*, 8(1), pp.32-48.

search engines some researchers feel more confident using the term “automated serendipity”.³⁹

The term “incidental” can be problematic because it is true that users get alerts from various topics in incidental time, but they do opt-in deliberately beforehand. Van Damme et al, writing in the *Digital Journalism* journal, suggests a different approach to classifying news on mobile by proposing a new model to conceptualise mobile incidental news.⁴⁰

News on mobile, they note, is seen as an interplay between recommendations from different sources such as peers, editors and the omnipresent algorithms. “Editorial recommendations result in topic diversity. Both peer and algorithmic recommendations lead to brand diversity, yet this remains unnoticed to audiences. Peer recommendations mostly do not lead to topic or view- point diversity, but are perceived as valuable when they do.”

	User's intention	Recommendation by	Connection	Implication
Push alerts	Incidental	Editors	Direct to publishers	Topic diversity
Wallpaper	Incidental	Editors first, then algorithm	Mediated by platform	Brand diversity

There is no easy way to conclude how news on lock-screen should be classified, but it is fair to say that both Push Alerts and Wallpaper are incidental because although users deliberately opt-in to the services, they don't control when or what specific news they received. While alerts are good for pushing topic diversity, *Glance* as an

³⁹ Fletcher, R. and Nielsen, R., 2021. *Why people that use search, social, and aggregators have more diverse news diets*. [online] Reuters Institute for the Study of Journalism. Available at: <<https://reutersinstitute.politics.ox.ac.uk/why-people-use-search-social-and-aggregators-have-more-diverse-news-diets>> [Accessed 6 August 2021].

⁴⁰ Van Damme, K., Martens, M., Van Leuven, S., Vanden Abeele, M. and De Marez, L., 2019. Mapping the Mobile DNA of News. Understanding Incidental and Serendipitous Mobile News Consumption. *Digital Journalism*, 8(1), pp.49-68.

aggregator is good for pushing brand diversity. Moreover, the emphasis on the role of editors has positive implications for quality control and the reduction of misinformation. Editors' recommendations can also offer a wider variety of expert voices to those with social media-heavy news diets.

The micro-moments

Research suggests that mobile news consumption is shorter, less deliberate, and happens more frequently throughout the day on mobile phones compared to other modes of distribution.

Young audiences tend to consume bits of news on social media, creating the habit of snacking. This snacking habit is more extreme in the lock-screen environment. Thinking back to the examples we discuss in the first chapter, lock-screen experiments and products usually aim to harness the potential of micro moments by giving users micro tasks.

In this case, the task created is consuming micro-news. Push notifications usually only have one or two sentences, as do wallpaper stories which only have one line title on the lock-screen. For push alerts, 'open rate' and 'click-through-rate', which measure how many users clicked and read the story in the news domain, are important metrics to define success. For wallpaper stories, reading only the title can be measured, but the action of swiping right to explore more content is considered the success metric to track.

Some would argue that quick hits of news impart less information, and risk failing to convey the complexity and depth of a story.⁴¹ But users and publishers alike are not opposed. In Mr Newman's 2016 study, one user surveyed said: "It's ideal to get 80% of information just from the notification without clicking into the full article." said one

⁴¹ Molyneux, L., 2017. Mobile News Consumption. *Digital Journalism*, 6(5), pp.634-650.

respondent in a 2016 study about push alerts by Newman. Cory Bergman from Breaking News app agrees with that sentiment: “It’s a win for us if you can just glance at your phone or your watch and get the information you need. We just want to tell you and save you time and send you on your way.”⁴²

⁴² Lichterman, J., 2015. *Push it: How Breaking News notifies users of news stories before they become big*. [online] Available at: <<https://www.niemanlab.org/2015/08/push-it-how-breaking-news-notifies-users-of-news-stories-before-they-become-big/>> [Accessed 10 July 2021].

The opportunities and threats of lock-screen for publishers

At this point, we understand lock-screen can give publishers a head start and quick access for users to consume snackable and incidental news in a public space. But how can publishers take advantage of this? What are the challenges?

News alerts

Alerts were once considered a powerful tool that would allow publishers to tap users on the shoulder.⁴³ They provide the “most direct and most intimate connection” according to NiemanLab research, which should make them very useful in the long term to maintain digital readership.⁴⁴ But the benefits for publishers are varied depending on their product and audience.

No one uses news apps anymore?

For IDN Times, a digital-born news outlet in Indonesia, push alerts are only beneficial for maintaining a very small segment of its audience, because most of them do not use the app. “Of 40 to 50 million monthly active users, only around 140,000 to 150,000 users access our news via mobile app,” said Dhany Damara, Product Marketing Associate at IDN Times. “We conducted a study and found that most Millennials and Gen Z do not feel any urgency to download news apps. They are satisfied enough by consuming news on social media and occasionally go to the mobile website if they want to find out more.”

⁴³ Lichterman, J., 2015. Push it: A look behind the scenes of a New York Times mobile alert. *NiemanLab*, [online] Available at: <<https://www.niemanlab.org/2015/08/push-it-a-look-behind-the-scenes-of-a-new-york-times-notification/>> [Accessed 15 June 2021].

⁴⁴ Brown, P., 2017. Push alerts, personalized. *NiemanLab*, [online] Available at: <<https://www.niemanlab.org/2017/12/push-alerts-personalized/>> [Accessed 15 June 2021].

This is in line with a Reuters Institute study on younger audiences that found less than 1% of their time spent on mobiles was used for accessing news apps.⁴⁵ That finding was echoed again in the Digital News Report 2020, which stated: “Generation Z has a much weaker direct connection with news brands and is almost twice as likely to prefer to access news via social media.”

English news outlet the *Jakarta Post* found app push alerts unhelpful. As a traditional newspaper that recently transformed into the digital format, *Jakarta Post* hasn't been promoting its app much and traffic to it is still relatively small. “Most of our audience [on the app] are from outside of Indonesia and mostly not [heavy users]. They only observe over time,” said Adisti Sukma Sawitri, Managing Editor at the *Jakarta Post*.

As most traffic comes via browser, web pushes were more beneficial than app pushes, she said. “Push notifications and newsletters are important for us. We send five to six alerts every day, and it is quite effective. Stories we publish late at night tend to not perform well, but when we send push alerts for the same story the next morning, the story often goes to the top news.”

Double-personalisation is a kill

Kompas.id, the digital arm of one of Indonesia's most prominent newspapers, found updates to Android OS hampering their news alerts. “Many users asked, why didn't I get any notification from Kompas.id on my lock-screen even though I activated the option on the app? It turns out, the default setting from the operating system denied it. Alert is a very useful tool, but now the problem is users need to customise the notification settings on their individual phones. We can't do anything about it,” said Eko Prabowo from Marketing Strategic Manager Kompas.id.

⁴⁵ Reuters Institute for the Study of Journalism, 2019. *How Young People Consume News and The Implications For Mainstream Media*. [online] Available at: <<https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2021-02/FlamingoxREUTERS-Report-Full-KG-V28.pdf>> [Accessed 16 August 2021].

In writing this paper, I downloaded many news apps onto my two Android devices. I activated notifications from all the apps, but as days went by, not a single alert appeared on the lock-screen. On Samsung, for example, alerts only appeared as icons to expand. It then directs me to the notification center where you can read all the notifications that I subscribed to. On Vivo, I needed to go to Settings > Status bar & notification > manage notification > choose a news app > turn on 'show on lock-screen' feature. This 'show on lock-screen' feature was off by default for every news app I downloaded. If I do not turn the feature on, the only way I could access all the alerts was via quick access – swiping down the screen to the notification center.

A few years ago, Mr Prabowo said, he did not hear frustration like this from users. He learnt that most mobile operating systems had given users more setting options to make push notification less intrusive. “Only roughly 40% of our total app audience have activated push alerts. The rest, they probably don’t know how to turn it on. So, it feels like the users are at war with their own phone settings,” he laughed.

Evidence shows that too many irrelevant alerts can indeed lead users to uninstall an app.⁴⁶ That is why news outlets tend to be selective about the number of alerts they send. *IDN Times* only provides two or three alerts for all audiences, and sends up to 11 alerts for audiences who opt-in to several categories provided. Aligned with this, the *Jakarta Post* only publishes five to six carefully-selected alerts a day – mostly from their top stories section. Kompas.id sends only six notifications a day, ranging from news alerts to subscription promotions.

⁴⁶ Newman, N., 2016. *News Alerts and the Battle for the Lock-screen*. Reuters Institute for the Study of Journalism.

In addition to this, most news apps provide in-app personalisation, too.⁴⁷ Users can opt-in to different categories of news alerts, from morning briefings and breaking news to lighter content such as K-Pop or Astrology.

Double personalisation procedures for push notifications (app and phone settings) may be good for users who like to explore their phones, but it's frustrating for some who aren't deeply engaged with their devices.

Wallpaper stories

Wallpaper stories are promising because they are less intrusive. Because the product is integrated into the lock-screen wallpaper, it's also appealing to users who enjoy visual content.

A recent report by Glance on lock-screen content consumption in India found that those who activated it have an interest in news. Out of the content categories that Glance provided on lock-screen, 22% of users opted for Entertainment, followed by News and Nature/Wildlife as the second and third most popular categories, with 20% and 11% of users opting for them respectively.⁴⁸

“A lot of our qualitative user studies have yielded responses that suggest that users love this product since it keeps them updated on news without any effort to open an app, or check platforms like Whatsapp and Twitter,” Mr Sundar explained. “News is among the most popular categories on Glance. Younger audiences see news as an essential service they need to stay updated about, but also do not want to spend time learning it [from newspapers or TV channels]. Glance serves this requirement really well.” The most popular news and current affairs categories on Glance were

⁴⁷ Lichterman, J., 2016. The New York Times is giving readers more control over email and mobile push alerts. *NiemanLab*, [online] Available at: <<https://www.niemanlab.org/2016/07/the-new-york-times-is-giving-readers-more-control-over-email-and-mobile-push-alerts/>> [Accessed 15 June 2021].

⁴⁸ Glance, 2021. *What India Consumes on Lock Screen*. [online] Available at: <<https://glance.com/2021IndiaLockScreen>> [Accessed 16 May 2021].

Politics, national and international news, entertainment and sports are the most popular news categories on Glance.

It's convenient, but not for everyone

From a user's perspective, Glance provides convenience similar to that of news aggregators such as Upday or Line Today because it is part of the handset itself. Users who buy a Samsung phone in Europe can access Upday without downloading its app. In Korea, users don't need to download Line Today to consume news because it is embedded in the LINE chat app.

This is a double-edged sword, because phone users who have a strong preference about what they want to see on their phone may not like it. Search either product on Google, and you will find tutorials, comments and questions about how to remove the Glance feature from Xiaomi, or Upday from Samsung devices.

Thomas Hirsch, COO and deputy CEO of Upday says they are aware of this, but notes many users also stick with them and consume news from it. "Upday is not – I wouldn't call it – a product mostly for news junkies. It is a product which is specifically designed for the mass market. The average user of smartphones should have a news platform that they can efficiently use."

Glance doesn't see it as a problem either: "Yes, we understand that a dynamically changing lock-screen isn't for everyone, but the fact that majority of Glance's users continue to love and use the product regularly, months after discovering it is a resounding reinforcement for the product-market fit," said Mr Sundar.

Less control

Glance's wallpaper stories are not something publishers themselves can control.

Glance acts as an intermediary, and has its own editorial team that carefully selects what stories are suitable for lock-screen consumption. Compared to sending their own push alerts, publishers do not have the same level of distribution authority.

Content aggregation services play a significant role in news consumption in many Asian markets such as India, Indonesia, South Korea, and Thailand, and publishers need to engage with them for best exposure. Daily Hunt, Smart News, Naver, and Line Today are among the prominent players. According to the 2021 Digital News Report, the increased popularity in aggregators could be for several reasons, including the strong penetration of Android devices in this region, service-bundling options with local phone operators, and a history of early mover advantage.⁴⁹

Beyond the loss of agenda control to a third party, the relationship between publishers and aggregators has faced other issues, especially in the case of Facebook and Google who are facing legal negotiations over compensation in Australia, France and the UK.

As the Digital News Report put it: “Younger groups are not going to abandon the platforms and aggregators, which provide a quick and convenient way to check the news, but many publishers are unhappy with the current arrangement, which in most cases involves providing content in return for access to audiences. They argue that this approach is unsustainable, especially for expensively produced original reporting, and are demanding better terms, if necessary brokered by governments.”

⁴⁹ Newman, N., Fletcher, R., Schulz, A., Andi, S., Robertson, C. and Nielsen, R., 2021. *Digital News Report 2021*. [online] Reuters Institute. Available at: <https://reutersinstitute.politics.ox.ac.uk/sites/default/files/2021-06/Digital_News_Report_2021_FINAL.pdf> [Accessed 27 June 2021].

Collaboration allows the traditional to become modern

No form of digital news distribution is completely free of intermediaries. The way push alerts work is heavily controlled by the operating system. Adisti Sukma Sawitri, Managing Editor at the *Jakarta Post*, said even publishers wanting to reclaim their independence by pursuing a paywall strategy still needed to work with intermediaries. “For the subscription model, we also rely on e-payment such as Google Pay, GoPay, and Apple Pay. The fee isn’t cheap. But this is the reality, we need to live with it.”

Conclusion

The next innovation in news distribution and consumption is not likely to come from Facebook, Google or even Apple. Pay close attention instead to the mobile network operators, handset manufacturers, and the companies they partner with in an attempt to ‘hack’ the app ecosystem.

As Fortunati and O’Sullivan’s *Digital Journalism* paper put it: “news [...] delivered on a smartphone comes actively seeking readers”.⁵⁰ I find this phrase a very accurate way of describing what we need to embrace in the future. In the battle for attention, news inevitably should come to users, not the other way around. The trend is shifting from search to discovery, and the race is fierce.

My key takeaways for journalism about news consumption on a lock-screen are these: it is here, and it will last. In Western countries, the role of Apple and its iOS is significant, but if we want to understand mobile news consumption in Asia, where Android handsets pervade, we need to start looking at the actors influencing distributions on this particular device. Content intermediaries such as news aggregators like Line Today and Glance offer convenience for users, and adaptations to the technology that newsrooms will be hard-pressed to compete with.

Lock-screen as a medium for news distribution has five distinctive characteristics that may be beneficial to news publishers:

1. The medium can be utilised to capture attention before any apps are opened.

As the front page of a mobile phone, it can be optimised for news delivery.

⁵⁰ Fortunati, L. and O’Sullivan, J., 2020. Understanding Mobile News: Looking beyond the Lockscreen. *Digital Journalism*, 8(1), pp.164-169.

2. It offers a fast lane to news consumption. Users do not need to click four to five times to access the content, but can instantly read the whole story by double-clicking on push alerts or swiping and clicking the wallpaper stories.
3. As a public space, news selection on lock-screen has very high standards. News delivered on this space tends to bear the best interests of the community. In an increasingly partisan world, this may be a helpful characteristic.
4. Lockscreen news offers a return to incidental news exposure in a curated news space. This can contribute to audiences who read more widely and have a better understanding of the broader world around them. Because it is incidental and curated, quality standards are more likely to be strictly enforced.
5. It is short. This can be beneficial in reaching young users who don't want to engage deeply with news.

There are downsides too. All of the characteristics above, in the hands of bad actors, could be misused. Misuse, or foolish use of the lock-screen space could result in news being removed entirely from this space by users or even the handset manufacturers. And personalisation of alerts is becoming more complicated and confusing – users who are willing to opt-in may have some difficulty seeing alerts on lock-screen.

Wallpaper stories are also deeply mediated by content platforms like Glance and phone manufactures which hold ultimate power over technology and mobile infrastructure. Both have demands on what kind of news is suitable for them. That alone makes this an important space to watch.