Cruise Mobile Apps

2019 Annual Report

sourcetoad

Contents

Introduction

Mobile apps are increasingly important for gaining a competitive advantage in the cruise industry. Cruise guests are beginning to expect that a useful and reliable mobile app will be part of their experience.

Most major cruise lines now have at least one primary guest-facing mobile application. The purpose of this white paper is to publish our research on these apps and their features. We will also identify best practices based on our research and in-depth experience as cruise guest app developers, and share our perspective on trends.
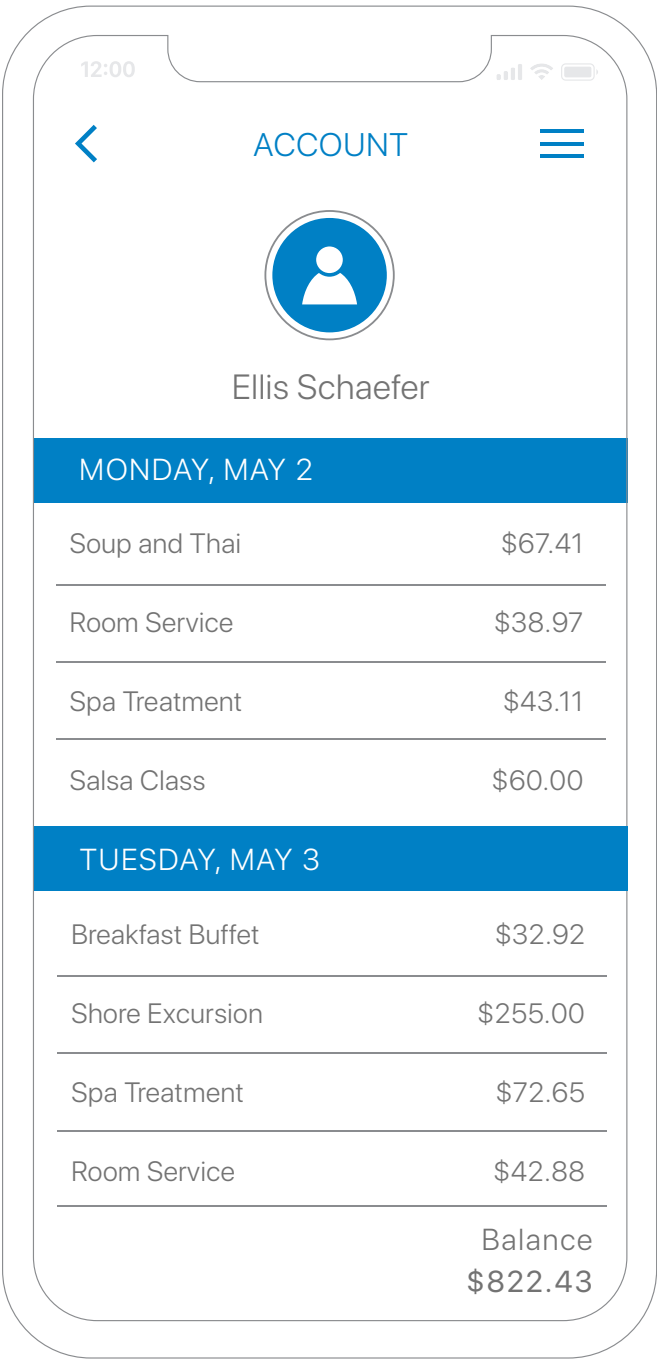
Scope

The apps we chose to research for the purposes of this paper met the following criteria:
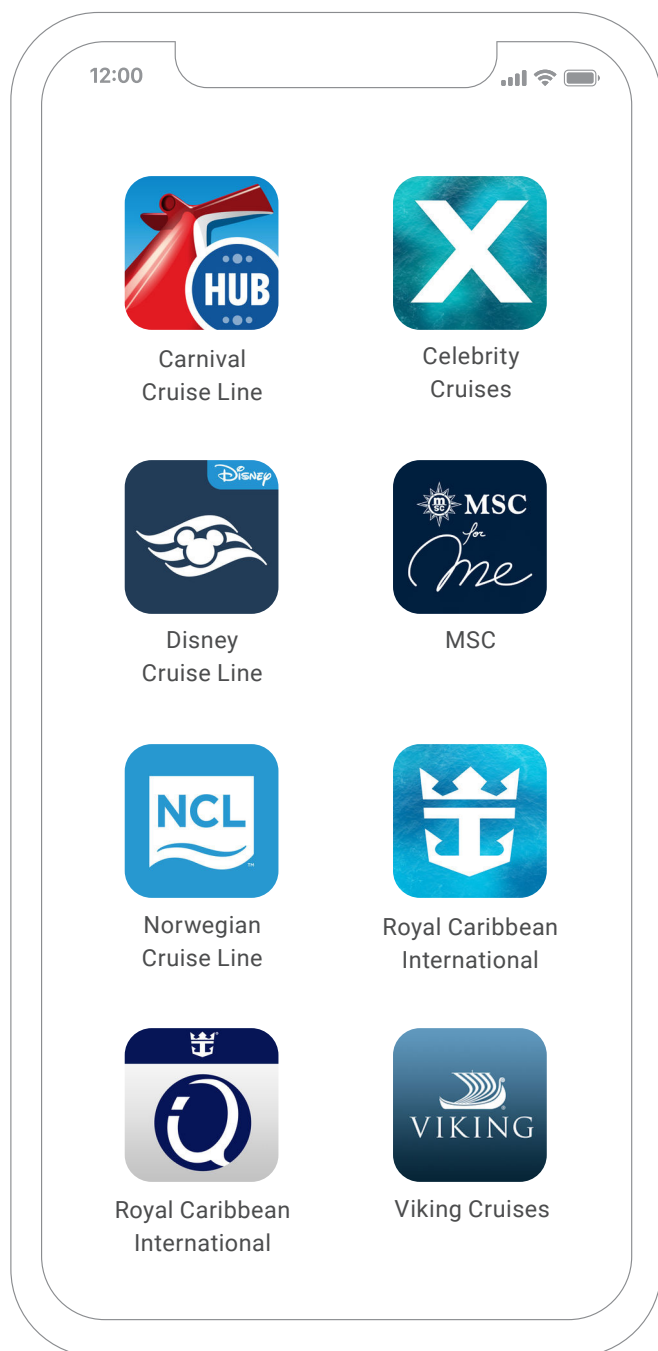
- They are designed to be the primary guest-facing app that passengers use while onboard.
- They work on at least two ocean ships in a fleet.
- They are downloadable mobile apps and are not web-based.
- They are not crew apps, brochure apps, entertainment apps, or supplemental mobile applications.
- They are available primarily in English.

Methodology

The data and information in this paper were collected from a number of sources, including app analyses from VirusTotal, discussions with professionals in the cruise industry, first-hand experience, articles, online reviews, and demonstration videos.

12:00

<   ACCOUNT   ☰

Ellis Schaefer

MONDAY, MAY 2	
Soup and Thai	$67.41
Room Service	$38.97
Spa Treatment	$43.11
Salsa Class	$60.00

TUESDAY, MAY 3	
Breakfast Buffet	$32.92
Shore Excursion	$255.00
Spa Treatment	$72.65
Room Service	$42.88
Balance	$822.43

Mobile Applications

Carnival Cruise Line

Carnival HUB was released in January 2015 and works across the cruise line's entire fleet.

Celebrity Cruises

Celebrity Cruises was released in November 2017. It currently works on four ships in their fleet (Constellation, Equinox, Reflection, and Edge), with features varying by ship. This app appears to share much of the same code base as the Royal Caribbean International app, which is to be expected as the brands share an IT department.

Disney Cruise Line

Disney Cruise Line Navigator has been around since August 2013, but it was redesigned in February 2018. It works across all four of Disney's ships.

MSC

MSC for Me works on four ships in MSC's fleet (Meraviglia, Seaside, Splendida, and Seaview). The app went live in June 2017.

Norwegian Cruise Line

Cruise Norwegian was released in October 2017 and up until the end of 2018, it worked on Norwegian Cruise Line's newer ships (Sky, Bliss, Gem, Getaway, and Pearl). The app was rolled out across the fleet for 2019, and now works on all ships.

12:00

Carnival Cruise Line

Celebrity Cruises

Disney Cruise Line

MSC

Norwegian Cruise Line

Royal Caribbean International

Royal Caribbean International

Viking Cruises

For most of 2018, **Norwegian iConcierge** was the only option of Breakaway, Dawn, Epic, Escape, Jade, Jewel, Spirit, Star, Sun, and Pride Of America. The app released in April 2012, and updates stopped in October 2017.
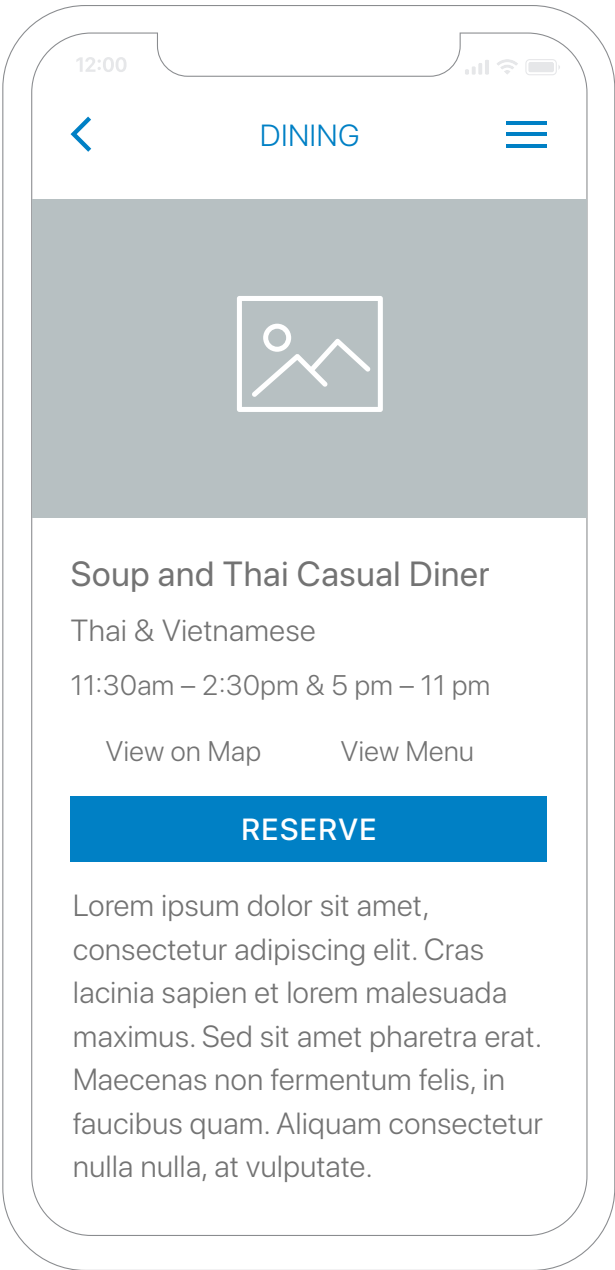
Royal Caribbean International

Royal Caribbean International became available for download in November 2017, and it currently works on 13 ships in the fleet (Adventure, Allure, Brilliance of the Seas, Enchantment, Harmony, Independence, Liberty, Majesty, Mariner, Oasis, Serenade, Symphony, and Vision), with features varying by ship. As mentioned before, this app shares much of the same code base as the Celebrity Cruises app, which is to be expected as the lines share an IT department.

Royal IQ is no longer being updated; however, it is still the only app available on three Royal Caribbean ships (Quantum, Anthem, and Ovation). The app was originally released in 2014.
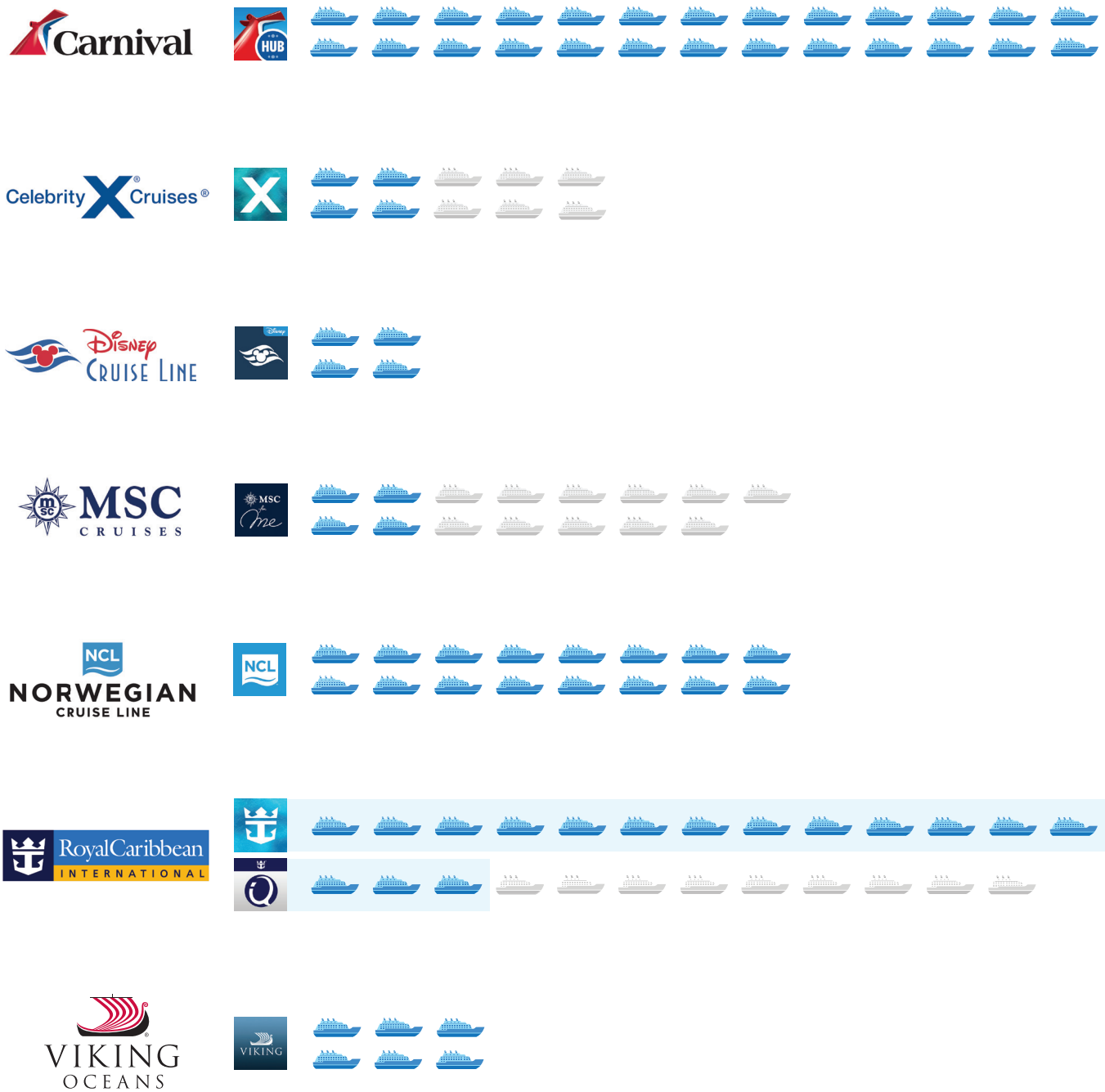
Viking Ocean Cruises

Viking Voyager was released in June 2017 and works across the cruise line's entire ocean fleet (Star, Sea, Sky, Sun, Orion, and Jupiter).

12:00

< DINING ≡

Soup and Thai Casual Diner

Thai & Vietnamese

11:30am – 2:30pm & 5 pm – 11 pm

View on Map   View Menu

RESERVE

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras lacinia sapien et lorem malesuada maximus. Sed sit amet pharetra erat. Maecenas non fermentum felis, in faucibus quam. Aliquam consectetur nulla nulla, at vulputate.

Availability

The infographic below shows how many ships across each cruise line's fleet support a mobile app.

Carnival

Celebrity X Cruises®

Disney CRUISE LINE

MSC CRUISES

NCL NORWEGIAN CRUISE LINE

RoyalCaribbean INTERNATIONAL

VIKING OCEANS

Supports mobile app onboard   Does not support mobile app onboard

Features

Each app that we analyzed contained a fairly broad selection of features and options. To better compare and contrast the applications' offerings, we broke down their features into three categories: common (almost standard), popular (appearing in at least three apps), and unique (differentiating, or found in only one app).

Common Features

There are several features shared by the majority of the apps we reviewed.
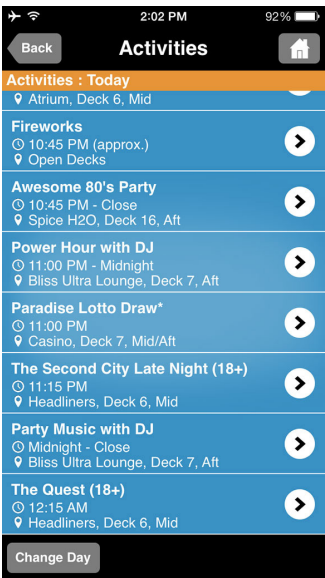
Daily Schedule

The daily schedule is the main stop when planning your activities for each day. You can usually add, book, or mark an event, which then moves to your personal calendar.
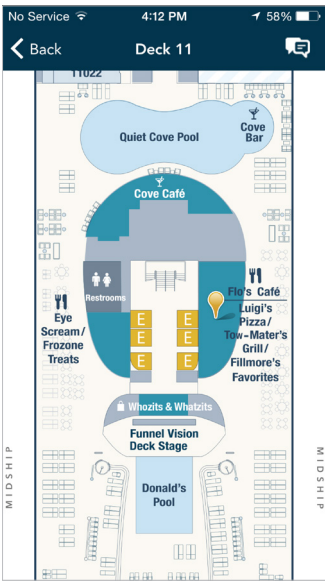
Dining

Every app has at least some information on dining options. Dining features across applications include hours, menus, images, locations, dress attire, reservations, and reservation cancellation.
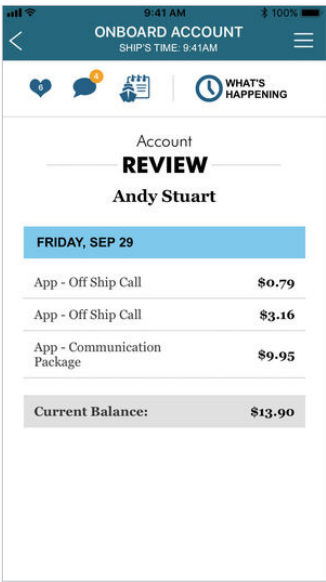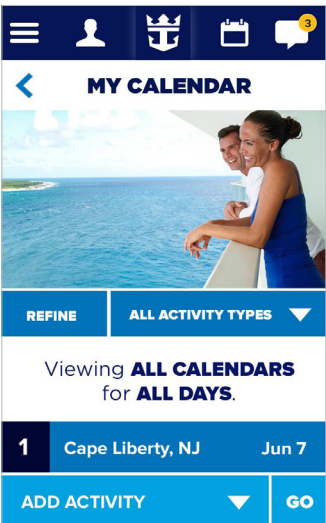
Folio

The folio is an itemized billing statement that updates when you make purchases. This feature is important for avoiding bill shock at the end of a cruise.
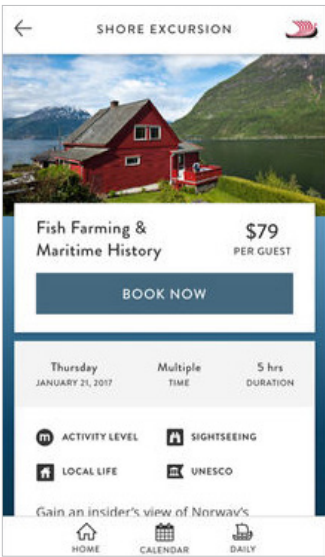
Map

Although there are varying levels of detail and interactivity across the apps we reviewed, deck plans are a ubiquitous feature.

Personal Calendar

The personal calendar is your customized schedule. Once you have chosen or booked an activity, it will appear on this calendar.

Shore Excursions

There is a range of levels of detail and booking ability across apps, but most of the mobile applications we reviewed allow you to both research and book an excursion from your phone or tablet.

Popular Features

The following features were shared by at least three of the apps we researched, indicating that more apps will be adopting them in the next couple of years.
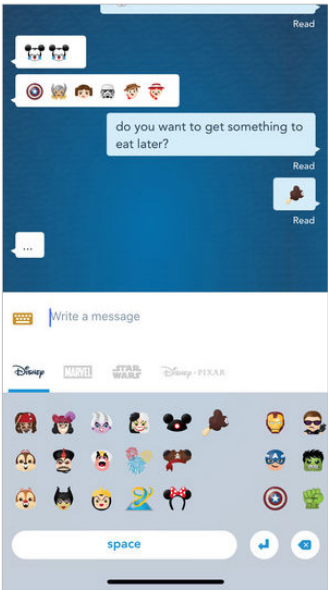
Chat

Chat is starting to become an expected feature. A handful of the apps offer the ability to message members of your party. This feature usually comes with a small additional fee.

Countdown Clock

Some of the apps include a pre-cruise countdown that works before you board the ship. Because this feature builds anticipation for a cruise, it is becoming more popular across mobile applications.
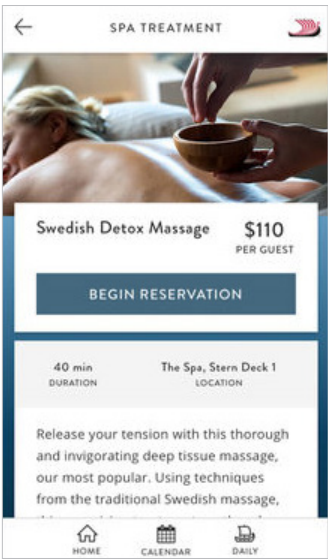
Spa Services

Most cruise lines have some kind of spa service. On a few of the apps, you can view the options and even make your reservation.
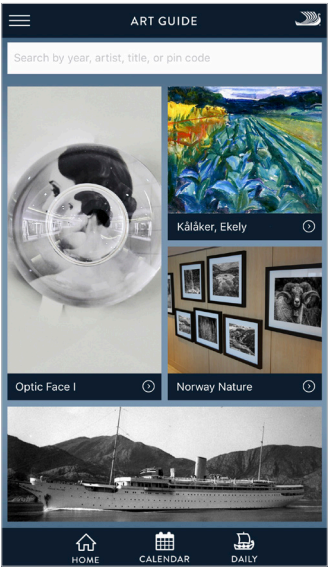
Weather

Having the current weather and the weather forecast available is a useful feature, especially if you are planning a shore excursion or deciding on your activities for the day. This feature is growing in popularity.
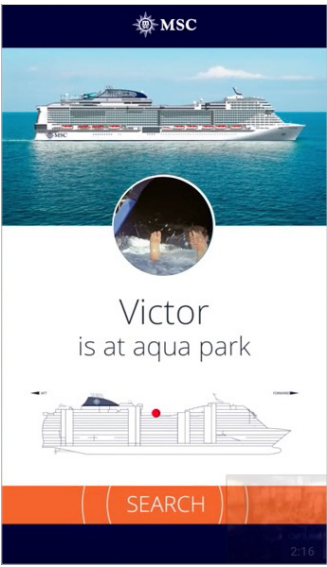
Stand-Out Features

Below are some of the unique features that stood out to us.

Art Guide

Viking Voyager, Viking Cruises' primary guest-facing app, includes the Viking Art Guide. Guests can listen to audio clips about historical pieces, works of art, and different areas of the ships. This feature is available to any Viking guest.

Kid Tracker

Parents can keep track of their children using *MSC for Me*. The kid tracking feature is enabled for public areas of the ship and uses the app and an optional locator chip for the children's wristband. The wristbands are provided to children for free, with the optional tracker offered as a partially refundable fee.
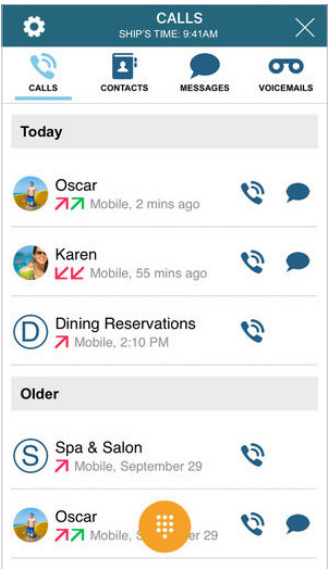
Guest Calling

Along with a chat system, *Cruise Norwegian* also has a call feature that allows guests to make unlimited calls to other guests for a small, one-time fee.

Note: Royal IQ also has a call feature; however, the app is being phased out.

Live Television

Another complimentary feature on the *Viking Voyager* app is live television. The app works anywhere on the ship, allowing guests to sit by the pool and watch the news on their phones or tablets.
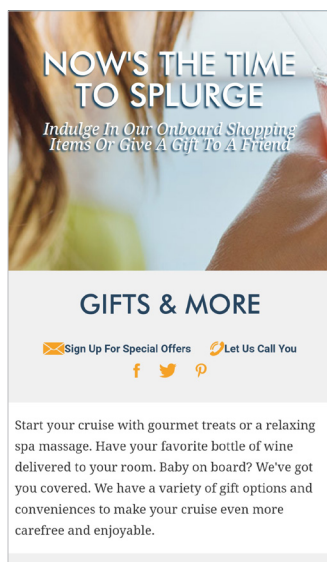
Purchase Merchandise

With **Cruise Norwegian**, you can purchase gifts via the app before you even board the ship. Options include wine, flowers, and treats.

Trivia

Viking Voyager also has a trivia feature. Guests can answer trivia questions from the app on their phones or tablet while they are attending a scheduled trivia event.
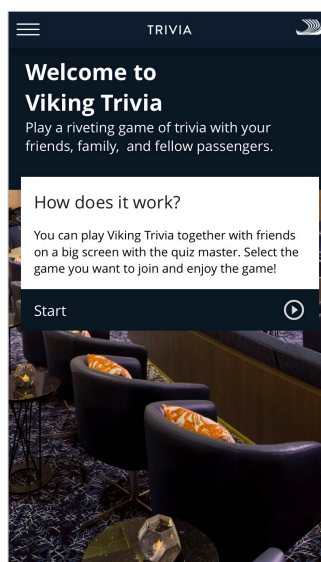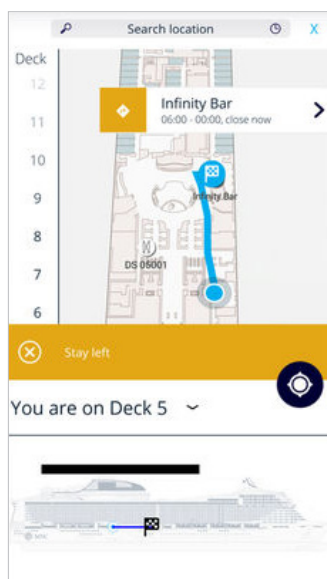

Wayfinding

Although other major cruise lines are using geolocation technology around their ships, **MSC for Me** incorporates it into the mobile app's map feature. The feature uses a Bluetooth Low Energy (BLE) beacon system to help guests find their way within 16 feet of precision.

X-Ray Vision

Cruise lines are rapidly adopting virtual reality (VR) and augmented reality (AR) technology for multiple purposes, but Royal Caribbean International has incorporated an AR-like experience into their primary guest-facing apps. With **Royal Caribbean International** and **Celebrity Cruises**, you can use the X-ray Vision feature to virtually look through the walls to explore areas of the ship not usually accessible, like galleys and the bridge. Although this just connects to a live video feed, it is a unique and entertaining feature.

Update Frequency

Once an app is live, regular updates are important. As operating systems are updated and new hardware devices are released, software has to adapt. Although the frequency of version releases is not indicative of the quality of an app, it does give us a general idea of how often developers are fixing bugs, responding to feedback, and making improvements.

Number of times updated in 2018

App	Number of times updated in 2018
Royal Caribbean International	23
Celebrity Cruises	19
Viking Voyager	17
MSC for Me	16
Carnival HUB	12
Cruise Norwegian	10
Disney Cruise Line Navigator	6
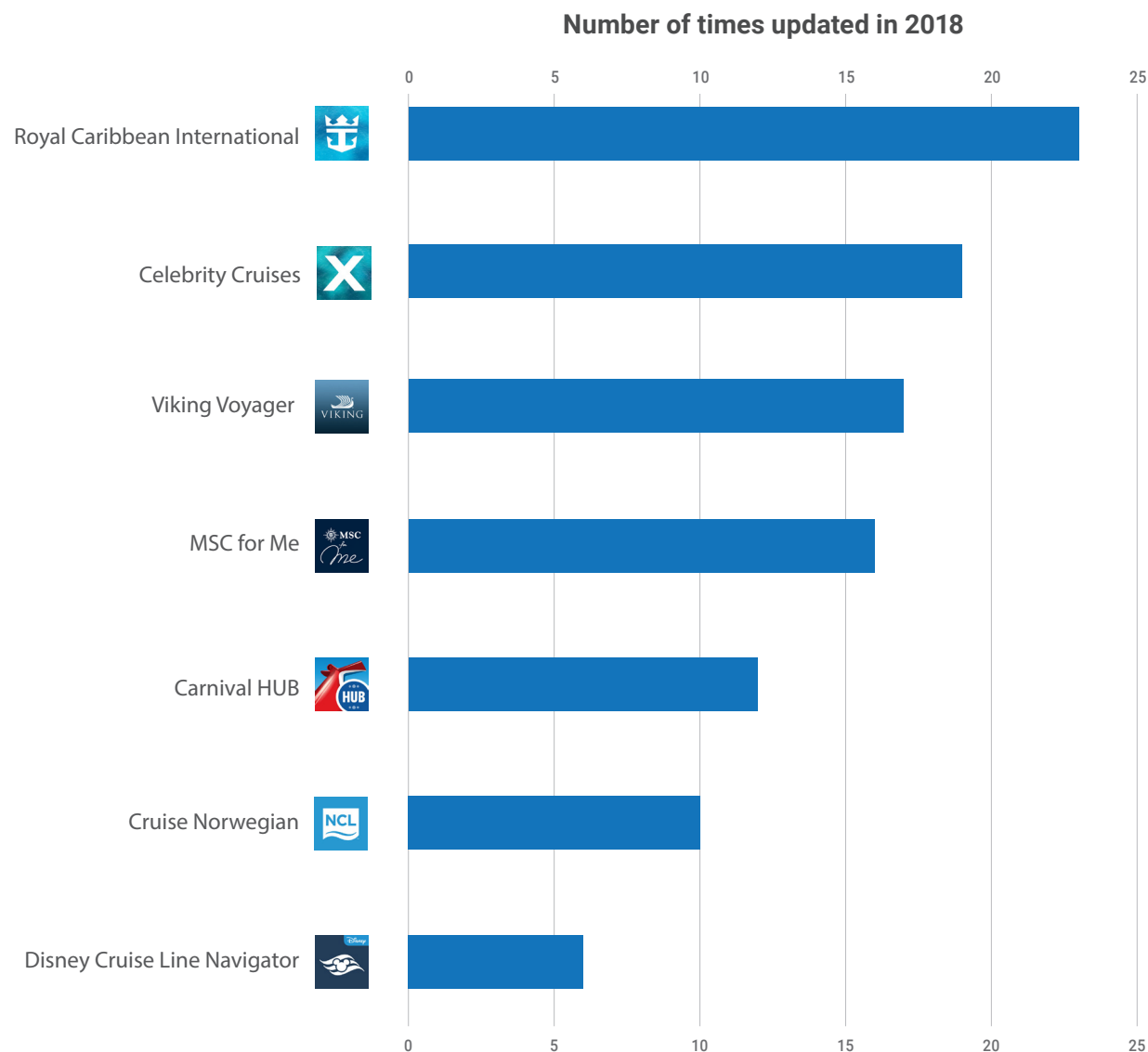
Tools and Key Players

ProGuard

Proguard works like many obfuscation tools by optimizing the Java bytecode. This tool is joined by many on both Android and iOS for the purpose of optimization and security protections at the application level. The benefit being that any prying eyes have a lot more work to do instead of looking at bytecode equivalents of the protected source code of each application.

Charles

A common challenge while developing mobile applications for cruise lines is the debugging of issues discovered. No amount of logging and exception logging is the same as a developer being on the ship and experiencing the issue first hand. Replicating the same issue locally might be difficult due to a variety of services not available in a test environment. Charles works by allowing you to proxy onto the ship to test the issue directly on a real device. We discovered a number of applications that contain a Charles SSL certificate, hinting towards multiple cruise lines using this type of debugging.

External Settings Files

Cruise applications have an uncommon constraint: they act differently based on the network you have joined. The idea of the application acting differently automatically requires a solution that works without the guest noticing anything. An external settings file works by requesting a file from a specific domain with configuration flags. Once connected to the on-board network, this file will return different flags than it returned when connected to a normal internet connection. This can be expanded greatly to include more than simple configuration flags. We noticed this pattern of development in many of the applications.
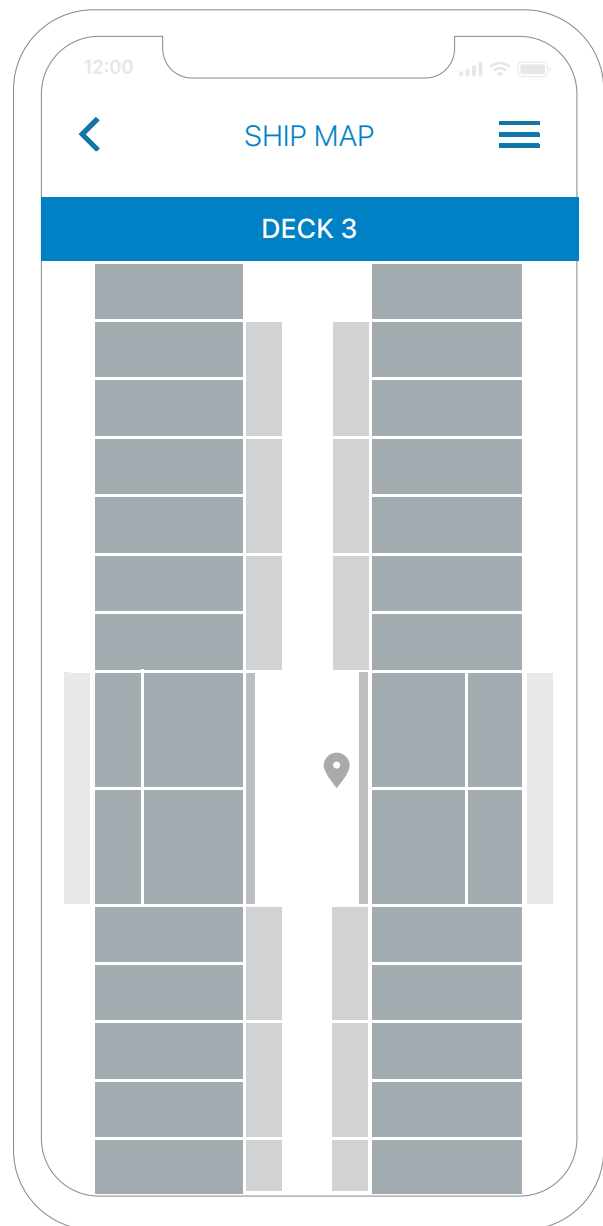
Developers

Analyzing the apps provided insight into the development team behind the code. Package names and test account information was often clearly visible. However, it is problematic to make assumptions about developers unless it is quite obvious. Developer vendors can provide external libraries that cruise internal teams ingest into the in-house code base to add an out-of-the-box feature. External development teams may also be augmenting in-house developers with outside vendors. An exception is Accenture.

Accenture

We discovered a number of apps in testing that strongly suggested the multibillion-dollar consulting firm's involvement in the programming. Accenture has extensively publicized their involvement in the development of the Carnival Medallion project. Accenture appears to be offering both full application development to the cruise space, as well as augmenting in-house teams.

Liferay

Liferay is an open-source enterprise CMS. We found that at least two cruise applications were using some part of their Digital Experience Platform, most likely as a way of delivering marketing content and images to the app. Liferay is also likely being used as an EFSS (Enterprise File Synchronization and Sharing) tool to coordinate shoreside digital assets for synchronizing to onboard systems.

Cruise Director (Sourcetoad)

Sourcetoad's Cruise Director is a suite of onboard and shoreside software tools designed to manage various aspects of guest- and crew-facing applications.

Cruise Director contains out-of-the box modules for entertainment (i.e., iTV and music), digital signage, captive portal, mobile app creation, IOT device management, crew rosters, and PMS front ends. Custom modules are easily added for creating interfaces for any new technology, dashboard, or interface.

The framework is built on providing shared API management, shoreside synchronization, content management, and analytics across the suite. This allows all modules to have a cohesive interface, which can be managed from a shoreside office, while sharing data with other modules and funnelling into a combined analytics system.

SIP Providers

A couple of cruise apps currently use a VoIP phone system for making onboard, cabin-to-cabin calls. Some of the applications, however, have a SIP client library (the software required to make VoIP calls) inside of them but do not have a phone feature. When we dug into the possible reasons, we decided it might be to enable push notifications.

If a ship is not connected to the internet, you cannot send push notifications to passengers. One way around this is to have an app that listens in the background for notifications from a local server. Back-

ground pushes are useful but are not instantaneous. In fact, they can take up to an hour in some situations. The potential for long delay defeats the purpose of push notifications, especially if the cruise line wants to alert guests to a whale sighting off the port bow.

The exception is if the app has SIP permissions built into it. Because a VoIP app needs to get messages instantly for incoming call alerts, including a SIP library in the app can enable real-time background push notifications, even if there is no onboard VoIP system. This is risky, however, because Apple has caught apps doing this before and banned them from the App Store. It also has been deprecated by Apple, and is no longer available in later versions of iOS. Instead, Apple requires all VoIP apps to use PushKit (which requires connectivity to Apple's servers in order to function).

Test Data/Shim

Many of the apps we researched included test, or "shim," data inside of them. This is basically a text file containing a fake passenger's details, calendar, folio, and any other items needed for testing. This shim data will also include items such as restaurant menus, available spa treatments, and shore excursion offerings. The reason the data is included in the actual app is so Apple (or other testers) can test the app without connecting to a PMS (property management system) or shoreside test databases. The

risk with this data remaining in the application is it could expose vectors of attack for hackers by providing insight into other onboard operations.

Test Logins

About 50 percent of the apps we investigated contained clear text usernames and easily visible passwords. This might sound more alarming than it actually is, but it is interesting to note. These credentials are for testing purposes, specifically for Apple's testing. Unlike the Google Play store, which relies solely on automated tests, Apple has real people try out the apps. Because most cruise apps are designed to only work shipboard, testers need a way to trigger "onboard mode" with fake credentials to log in. Of course, this leaves open the possibility that someone could log into the apps without having to pay for a ticket.

Crashlytics

When issues arise, there might be thousands of miles between the developers and the cruise ship. Crashlytics works by detecting a crash and sending all the associated details to a specified location. If no internet is detected, Crashlytics will store that error and upload the crash when internet connectivity is detected. With the large amount of details associated with every error, this is crucial for fixing problems. We noticed multiple applications with the configuration required for utilizing Crashlytics.

Security

The days of cruise ships being completely disconnected from the Internet are quickly fading. Guests are no longer disconnected from the world when cruising, and other applications on their phone can continue to work for communication back home. However, a new world of exploits is opened with a connected cruise ship. Imagine if a rogue application on a device pivoted to the shipboard network. This means the communications that the cruise line applications make available must be authenticated to prevent abuse.

We saw plenty of applications that have no authentication on the requests being passed back and forth. For some apps, it was as easy as visiting a URL and changing parameters to change the responses given. This lack of authentication is of concern because it could be used for discovering guest information, or it could be used to book reservations and purchase items on behalf of guests without their permission.

Publicly accessible development and test environments were also common among the apps we ana-

lyzed. These are necessary so developers can demonstrate their updates to the cruise organization without sending staff onboard every time there is a release. However, many of these systems were not secured. The concern is these can be particularly useful staging grounds for hackers. Unsecured test systems can teach intruders how an application works, so they could possibly buy themselves a cruise after wreaking havoc on these unsecured systems.

Overall, we are seeing cruise applications doing more and more. Reservations, purchases, passport management, and passenger communication are all available now. Each app has various vectors for attack and significant consequences if cracked. Security cannot be taken lightly. Protecting guest information is extremely important, not just for public opinion and optics, but to address legal concerns as well. Statutes such as the General Data Protection Regulation (GDPR) are making it tougher on developers and cruise lines to manage their production and test data while remaining in compliance to protect personal data.

Looking Ahead

There is an increasing number of unique or stand-out features, and we have identified a few emerging trends among the various brand categories.

More "Offline" Features

Apps require data to be relevant to their users. This data can be preloaded or dynamically accessed from the Internet or shipboard servers.
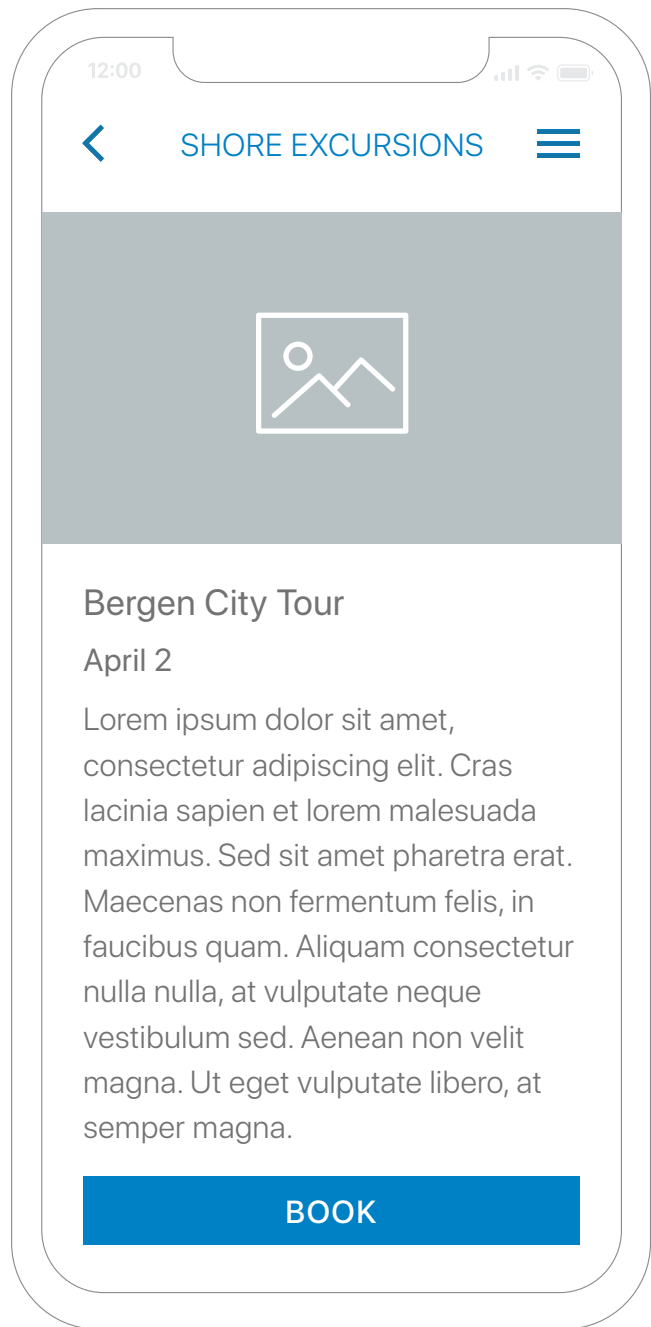
One area that few cruise apps have entered is the downloaded "packaged" data. This is data that is downloaded and stored locally on the user's device to be used later in an offline context. Examples are walking maps, tour suggestions, guidebooks, language tools, shorex retailer offers, or any number of digital assets useful to an explorer in a strange city. These could be stored locally on shipboard servers and then dynamically downloaded into the guest's onboard app. For example, a pre-downloaded shore excursion survey could be background pushed to guests when the app connects to BLE beacons on a tender.

Providing guests with additional data to take with them while in port means less international bandwidth charges, instant load times, and the opportunity to deliver additional brand-tailored content.

More Shoreside Content

Most apps do not offer much before the guest steps onboard. Because shoreside booking applications and shipboard booking systems are often from completely different vendors, cruise operators have prioritized guest app development for onboard systems.

Other guest-facing tools are left to the web only. This will change industry-wide as guest expectations continue to rise and the value of BND (booked not departed) mobile cruise management grows.

12:00

‹ SHORE EXCURSIONS ≡

Bergen City Tour

April 2

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras lacinia sapien et lorem malesuada maximus. Sed sit amet pharetra erat. Maecenas non fermentum felis, in faucibus quam. Aliquam consectetur nulla nulla, at vulputate neque vestibulum sed. Aenean non velit magna. Ut eget vulputate libero, at semper magna.

BOOK

Guest Loyalty

Guest engagement is just as important post-cruise as it is pre-cruise. Features in this category are likely to be further down the road than BND features because they are marketing efforts, rather than immediate revenue generators or customer satisfaction tools. Post-cruise engagement will push next cruises and planning tools, display special offers for returning guests, collect and present logo versions of photos taken during the voyage, entice guests to join membership clubs to earn loyalty benefits, and provide interactive marketing material of every kind.
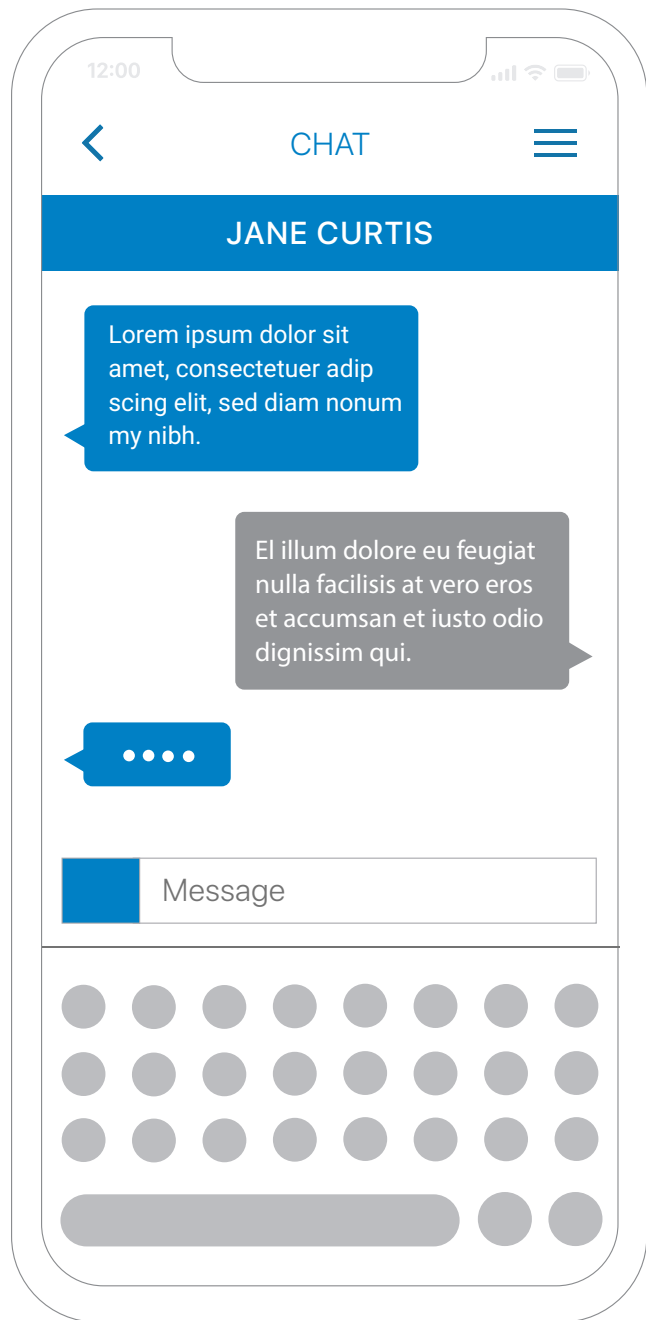
Augmented and Virtual Reality

AR and VR are rapidly becoming both technologically accessible and operationally desired. VR systems onboard could range from the simple to complex. An app might allow for navigating a virtual ship tour on a phone screen. It could also be as ambitious as supplying VR headsets in every stateroom so guests can explore upgraded shore excursions and walk through premium suites to consider for their next cruise (try before you buy).

Augmented reality is a larger technological challenge but has beneficial use cases for the future of mobile apps onboard and at port.

Contextual navigation is the ability to view information on what is around you through your mobile device's camera display. This feature is already offered in major tour and dining apps, and it is planned for a number of cruise apps. It can help passengers navigate the ship by looking at their phone or tablet camera display for turn-by-turn directions superimposed on the deck. It could also display the names of volcanoes, islands, glaciers, and other points of interest on the horizon as the ship approaches.

Social

Social-based features are rapidly rising in significance, with simple chat services being the most common. The next set of enhancements likely to follow is more involved and tricky to execute. Systems designed to encourage onboard passenger interaction could walk the fine line of privacy intrusion. However, if guests see value and decide to opt in, social features we might see include "find a shore excursion buddy" or "find a chess partner" before the cruise, geolocation-based "dropped" notes, guest forums during the cruise, and even shipboard business networking.

Environmental and Sustainability Features

With the increase of eco-conscious travellers, cruise lines are making environmental responsibility a selling point. New lines like Virgin Voyages are highlighting sustainability as a key concern for corporate staff, crew, and guests. Technology clearly has a direct impact on sustainability goals while also improving the bottom line financially for cruise lines. Digital newspapers, the daily cruise compass, guest surveys, shorex tickets, and any paper product that can be replaced by an app is a clear win.

Educational messaging for how guests can contribute to the health of the planet can be pushed digitally (e.g., towel and bedding laundry options and recycling suggestions), as well as guest conduct messaging (e.g., onboard tobacco use and alcohol policies).

Integration with health apps can add to an overall improved guest experience by suggesting menu items that fit within caloric goals, suggesting fitness classes and spa treatments, or providing virtual exercise instruction.
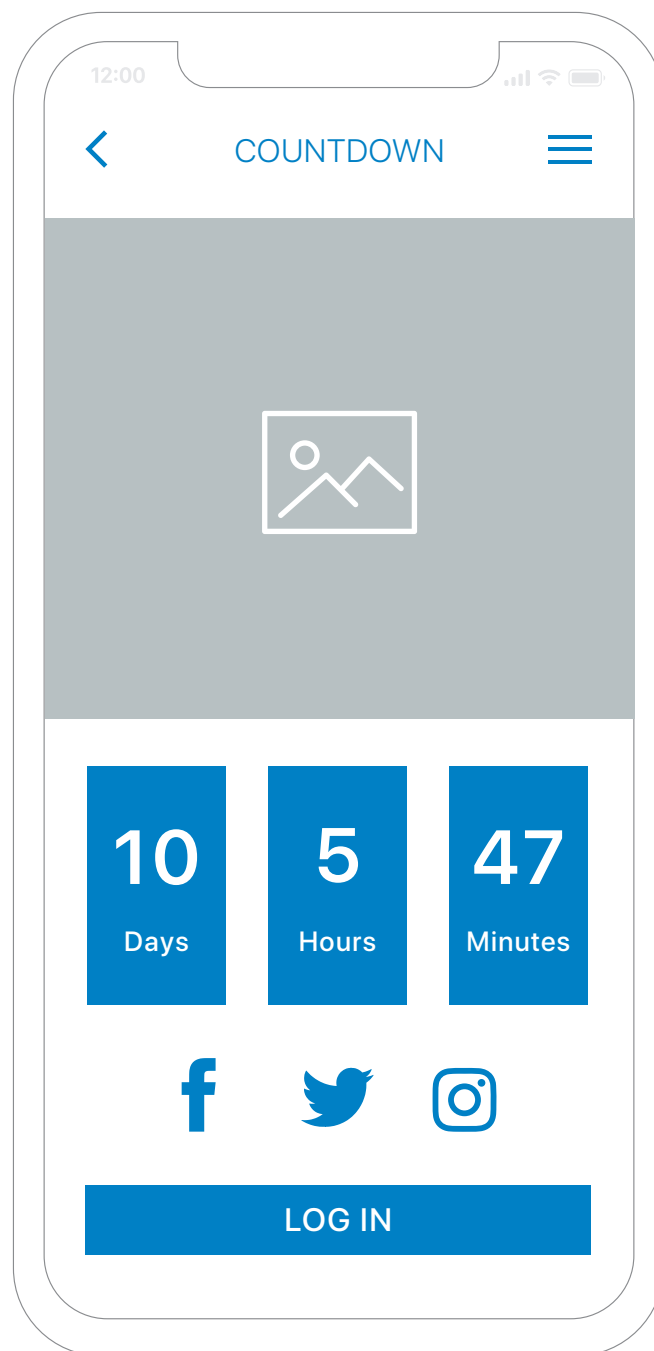
Conclusion

The future for guest-facing cruise apps looks bright. There is clearly a handful of features that are becoming standard, but cruise operators are prioritizing very different features for enhancing their apps. This speaks to the number of unique perspectives on what each cruise line delivers for brand differentiation, and these priorities play out in actual guest-facing software that directly impacts each brand's product. More practically, it could also be based upon technical limitations within their onboard and shoreside systems that prevent them from delivering certain features they desire.

Cruise lines are taking their guest mobile apps quite seriously as evidenced by the amount of work invested in them. Most of the development teams are releasing updates every eight weeks or less.

The number of developers working on each app is also indicative of the size of the investment by the industry. Development teams range in size from two full-time programmers to teams of around 20.

As the expected features become standardized across the industry, opportunities for real innovation will present themselves. Differentiation and new features are competitive drivers in everything from shipboard amenities to online pre-boarding to booking systems, so get ready to see the guest mobile app front join the branding features arms race.

About the Author

Sourcetoad is an award-winning enterprise application development firm specializing in cruise industry solutions.

Sourcetoad's mission is to solve complex operational problems and bring convenience and delight to guests.

Sourcetoad is based in Tampa, FL and Perth, Australia.