

The Right Strategies to Mobile-first

Photon's Best Practices

Unlocking forward-looking mobile strategies

PHOTON

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Overview

The mobile-first approach has transformed how companies engage with their customers and employees. In today's digital and interconnected world, mobile apps are not just another ideal thought but rather a prerequisite to stay ahead in this highly competitive business landscape.
Mobile apps have become a primary touchpoint in the digital stack that connects customers with their favorite brands anytime and everywhere.

From product discovery to decision-making, customers are using mobile apps to achieve various outcomes based on intent and industry. Creating seamless, delightful in-the-moment experiences—which drive consumer engagement and convince the user to keep your app on their mobile devices—is the driving force behind the most successful apps today.

This guide discusses why implementing a mobile-first digital strategy is a crucial part of powering digital transformation and delivering seamless customer experiences. The guide explains the ideal mobile solution architecture and reveals the best SDLC tools that ensure efficiency and productivity. We also present examples of how Fortune 500 companies have created real business impact by leveraging Photon's mobile-first strategy.

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Why **mobile-first?**

With digital users increasingly expecting more from their mobile apps—in terms of user interface, design, ease of use, and functionality—and growing market demands, companies are faced with the following challenges:

- Time to market of new business capabilities across channels takes longer when a channel is introduced
- The total cost of ownership of building capabilities is high since the same features have to be replicated in each channel
- Achieving consistent, best-in-class user experience across channels is difficult
- Integration and adaptation of external or internal systems to a new channel is not seamless

Companies are implementing mobile-first strategies to achieve the following:

1. Provide customers with the best user experience given a particular channel
2. Quickly adapt to the addition of a new channel and achieve feature parity
3. Reduce the time to market and the cost associated with developing and testing a new channel

"Mobile apps that merely deliver on customer needs won't help in the long run. Creating feature-rich apps capable of disrupting CX and delighting users in ways unimagined is the key to acquiring and retaining digital customers."



Mukund Balasubramanian,
CTO at Photon

$311 billion
will be garnered by the mobile app market by 2023 with a CAGR of 19.2%[1]

61%
of consumers have a better opinion of brands when they offer a good mobile experience[2]

90%
of smartphone time is spent in apps[3]

49%
of online retail sales will be captured by mCommerce by 2020[4]

$156 billion
global mobile app spending by 2023[5]

$188.9 billion
revenues via mobile apps by 2020[6]

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Native vs. hybrid mobile apps

Native apps

Native applications are developed using the technology native to the platform such as iOS (Xcode), Android (Android Java), and Windows (C#). Native apps typically provide a richer user experience because of controls that the operating systems provide—smoother transitions, better performance, and enhanced functionality such as access to the device's camera, accelerometer, GPS, and Bluetooth capabilities.

Hybrid apps

Traditional hybrid apps are web pages wrapped in a native container with the ability to control device-specific features using native code. They are primarily built using HTML5 and JavaScript, with native components for device-specific features. Hybrid apps are typically cheaper and faster to build when you consider multiple platforms because of the reusability across operating systems. However, they don't provide as rich a user experience as native apps do.

	Pros	Cons
Native apps	▪ Better user experience ▪ Fluid animation ▪ Better performance ▪ Documentation and debugging tools are better	▪ Requires different skill sets and separate code base across platforms—making Total Cost of Ownership (TCO) high ▪ Slower time to market ▪ Challenging to keep the apps in sync with desktop web experience
Hybrid apps	▪ Lower TCO across platforms ▪ Faster time to market ▪ Easier to maintain feature parity ▪ Expandable across channels and brands	▪ Performance not on par with native apps ▪ Compromise on user experience ▪ Technical complexity is higher ▪ Debugging tools are sub-standard

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How does the **API strategy** fit in?

- Open API is the bedrock that powers omnichannel experiences and makes true omnichannel strategy a reality.
- Availability of a robust set of APIs will allow for making decisions based solely on the criteria (and not on the presence or absence of APIs) of going native or hybrid.
- Availability of APIs will achieve the longer term strategy of:
  - Building reusable adaptive/responsive widgets that can be utilized across all channels or brands
  - For omnichannel user experiences that are selected as native—time to market will be shorter and TCO will be lower since development effort with APIs will be lesser



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Photon's **mobile solution architecture**

The recommended approach follows a multi-layered approach where each layer will serve as the foundation to the next. Such a layered approach promotes decoupling that allows easier technology replacement or adaptation if the need arises.

Level 1 Enterprise System: The core systems live in this layer. These layers are exposed for others to consume via Enterprise Service Bus. Other systems typically consume using SOAP Web Services.

Level 2 Internet Architecture: All the services in the Level 1 Enterprise System are arranged to create a higher level domain level business logic.

Level 2-Level 3 Integration: Level 2 Internet Architecture will be available for other consumers through the creation of microservices. These microservices are a collection of REST API that conforms to the business canonical model.

Level 3 Omnichannel Delivery: Level 3 represents the delivery mechanism for the consuming application. This layer can be divided into these logical separations:

- **Channel API:** A thin service layer that is configurable to cater to a specific channel. This layer is configurable via a simple Service Description Language that specifies the composition of several microservices along with the field projections.
- **Open Web SDK:** Collection of reusable UI components using web standards (Javascript, CSS, HTML5) that are deployable in any browser. These Web SDK could also be integrated into a native application where hybrid features are desirable.
- **Native Mobile SDK:** Similar to the web counterparts, we will also be providing the collection of reusable native UI components that can be deployed to multiple channels.



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Best **SDLC tools** for efficiency and productivity

During software development, we will come across various tools that are needed to develop the application. While there are various tools out there, the minimum recommendation is for us to utilize the following technology in each phase:

Create: The create phase is intended for the development of the project. Different tool sets cater to different needs. As of now, our standard is to use the following tools:

- **Source Control:** We have now moved entirely to Git as the default source control. Git allows greater flexibility of local branching and management of features and bug fixing phase.
- **Mobile Development:** Mobile development will leverage either iOS or Android native SDK. We are also recommending ZXing as a default barcode scanner, Urban Airship as notification API. CSS3 should be abstracted via SASS to increase the efficiency of the development.
- **Web Development:** We recommend utilizing Angular as it contains the necessary component for mobile development without us being dependent on other libraries. Another strong contender is ReactJS.
- **Hybrid Development:** Cordova is our recommendation. It has a core framework to access native interface and allow extension to other functionality that we may need.
- **API Development:** In Java stack, Spring is our recommendation. The combination of the annotation and robustness of the framework allow us to extend the API functionality. Further, Spring Boot allows the developer to run and develop quickly.

Validate: Validation of the code is automated through the use of static code analysis. We recommend Sonar as a default implementation to allow various language plug-ins. Sonar also has the flexibility for us to extend and define our own rules.

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Configure: Managing multiple configuration files and properties in multiple environments could hassle the admin and developers. Our recommendation is to centralize the configuration file in a master server and distribute it to the other nodes.

Build: Build phase is designed to manage the dependencies as well as coordinating the build stages. The final product of the build phase is ready to deploy packages such as EAR or WAR in Java or .apk in Android.

Deploy: Deployment refers to two deployment layers:

- **Physical Layer:** Aside from the onsite data center, we recommend that systems that require scalable load (such as Browse and Search in the retailer context) to be deployed in the cloud. That allows the flexibility of auto-scaling and flexibility to add or remove the cloud node.
- **Container Layer:** The container is a layer within the physical VM layer that allows a very specific application to be hosted in a container. It allows modularization of each individual component without the need for a full-blown setup. An example of a container layer would be an ATG in docker container that allows the developer to get up to speed without the effort associated with setting up ATG from scratch.

Run: This phase deals with stringing previous phases and the ability to make the system ready to use and run. A CI framework such as Jenkins remains our recommendation to automate the daily build and run for a system that is continuously ready to test.

Test: Once the build is ready to test, we will run a set of automation tests to cover at least 70-80% of the functionalities. Our recommendation is to use the Selenium framework and its associated projects such as Appium to handle the functional testing. A unit testing framework such as Unit is used to cover method level testing within the code and checked in along with the source code.

Report: Finally, whenever the system is in production, we implement a series of tag in both client and server side to identify patterns and possible issues that might arise during the run. Spunk or Dyna Trace is typically implemented on the server side to collect logs and other metrics that can be displayed in their respective dashboard. Tools such as Adobe Analytics or Gomez can be used to monitor the health of the system. All reporting can be pushed to a big data framework for an aggregated visualization.



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How Photon's expertise in **mobile** helps global companies elevate **user experiences**

Photon leverages the power of mobile applications to connect enterprises with consumers in the moments that matter and deliver digital experiences at scale. Photon has developed award-winning mobile applications for 37 of the Fortune 100 companies.

Below are instances wherein Photon helped global companies leverage best-in-class mobile applications to solve critical challenges.



Client: A Fortune 500 multi-brand restaurant chain

Requirement: Transform CX digitally for one of the client's largest restaurant brands

Photon's approach: Photon played a crucial role in developing a multi-platform mobile application, which created a frictionless mobile experience and transformed sit-down family style table service into a digitally enhanced "On-The-Go" service.



Client: The world's largest drugstore chain

Requirement: Build a feature-rich app and drive customer engagement

Photon's approach: Photon developed a hybrid application leveraging the best of smartphone native features & HTML5 technology. The app allowed for seamless CX and engagement with features like "Refill by Scan." This feature allows users to use their mobile camera to scan the barcode printed on either a prescription bottle label or prescription receipt to order a refill in seconds.



Client: One of the largest apparel and home furnishings retailers

Requirement: Revamp the legacy website and create an omnichannel strategy for multi-channel shoppers

Photon's approach: Photon built an entirely new Digital Platform architecture to enable a redesigned adaptive-responsive website for better user experience across all digital channels. Photon proposed and implemented the adaptive-responsive architecture blueprint to bring to life omnichannel personalization across all touchpoints.

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Design thinking for stunning **mobile CX**

How do you build new business models and products that are capable of catering to the ever-changing customer needs? Where do you begin? And how do you get there? Design thinking plays a major role in answering these pressing questions.

In our view, there are two salient parts of mastering design thinking.

Empathy: The first is EMPATHY. Designing your product, features, and processes with the customer in mind. This is a non-trivial task even though it seems simple. In our experience, the change in the mindset of putting yourself in the shoes of the customer and then envisioning or re-envisioning a product is the central pivot to getting this right. We believe that the design thinking mindset will evolve to encompass not only the product design process but an organizational design methodology as well.

Channels: The second is the number of channels across which brand experiences are to be designed. The channels may be right from wearables to connected devices or personal computing to VR experiences. The blurring of the lines between physical and virtual is not a vision anymore, it is already a reality today.

> "Creating a compelling user experience is no longer an afterthought but rather an inextricable part of the core strategy of forward-thinking enterprises, to reimagine customer experiences in the mobile age."



Jim Kim,
VP, Executive Creative Director
at Photon

Enterprises have recognized mobile as their main touchpoint to engage with today's on-demand customers. They are increasingly leveraging mobile-first strategies to deliver seamless, highly personalized experiences. Mobile-first is a forward-looking approach that helps in connecting and engaging with consumers in the moments that truly matter—enabling enterprises to acquire and retain their customers.

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Recognized as **Walgreens Boots Alliance Technology Partner of the Year,** Photon powers many award-winning mobile presences such as **Walgreens (Best Retail app of the year at SXSW, Webby award winner, 5-star app), KeyBank, L'Oréal, and Olive Garden.** Photon works with 37 of the Fortune 100 companies to drive powerful digital strategies and deliver a more timely, outcome-based customer experience.

Connect with Photon now and learn how to leverage the power of Photon's mobile solution architecture in developing world-class mobile applications.

References

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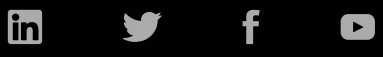
Connect with Photon now and accelerate your **digital transformation journey.**

Photon works with 40% of the Fortune 100 as their digital agency of choice. One of the largest and fastest-growing global agencies, Photon supports over 1 billion daily consumer digital touchpoints. Photon has the largest pool of experienced digital engineers with over 6000 across offices in the US, UK, Canada, Mexico, India, France, Sweden, China, and Indonesia.



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