

# MOBILIZE ME! APPS FOR MOBILE DEVICES OR MOBILE WEB APPS – TECHNOLOGIES, TOOLS, ASSESSMENTS

The uptrend in mobile web apps is continuing. More and more people are tending to their private and professional lives using smartphones and tablet computers. This accounts for the tremendous growth in tools used for approaching customers online. These tools allow companies to get their messages to their audiences and arouse needs. This white paper provides an overview of the most important Web technologies.

## WHY IS THE MOBILE WEB SO POPULAR?

There is a war being waged for the attention of users on the mobile Internet. Carriers, content providers, consumers and not least of all community operators such as Google, Amazon, Facebook and many others are – each in its own way – courting the Web crowd . At the same time some of these players are interesting newcomers. Generally speaking, the big deal here is focusing on soft skills: Attention, rating and recommendation. Only those who know how to organize these soft factors will make hard dollars. Whether as established players or newcomers only those companies are successful which exceed critical mass with their tools and tactics and thus achieve relevance in the advertising marketplace.

In the ocean of user profile data these can be the school of fish, the whale or the giant octopus. The main thing is that the catch is good and your own company is high enough up in the food chain. The required tools and strategies for doing this are provided by specialists in setting up networks on the Internet, in plain terms: apps. Properly conceptualized and placed, apps give those who offer them, those companies aspiring to gain relevance and size in the data ocean, the chance to target very large customer groups.

There are currently two technology approaches competing with each other: on the one hand the native apps sold in the Apple, Google/Android, Samsung or RIM/Blackberry web stores. On the other, the Web sites adapted for access using smartphones, to use the specialist term: mobile web apps. Hybrid solutions are positioned between these two.

## MOBILE WEB APPLICATIONS ARE GENERALLY EASIER TO HANDLE

Mobile web apps, also called "HTML5 apps," are conventional websites which have been optimized for access by smartphones. Devices without or with only limited keyboards, small monitors and longer page-loading times call for special forms of user interface. These include the option of accessing menu items by using simple arrow keys. In addition, mobile Web sites have a far simpler structure, allowing users to access them faster and navigate them more easily.



Compared to native apps, however, most of all mobile web apps offer one thing: independence. Native apps must first pass elaborate and expensive certification approval testing by the platform operator before they appear in the web stores. Mobile web apps by contrast need only a Web address (URL) and are thus independent of third-party sales policy and restrictions. Every app developer knows of cases where a flawless app was not accepted just because it failed to conform to some guideline or other applied by the web store operator. In addition, profits that are achieved do not have to be shared with anyone. A further positive feature is that possible legal problems arising from in-app purchases are avoided. These derive from in-app payment solutions which can lead to unpleasant surprises for users. They lead to a kind of payment *en passant*, where a user makes a payment mostly with a single click, which at first glance is not perceived to be a payment at all.

## KEEP COSTS DOWN WITH MOBILE WEB APPS

Compared with native apps, where sellers are required to administer and support all mobile platforms of their target groups, with a mobile web app it is much easier in many ways. Only having to develop and make available a single mobile web app facilitates a number of things. Of course, not all mobile devices are equipped with the same browser and not all browsers are easy to use and of top quality. In addition, the behavior of different browser versions can differ a little or even quite a lot. Nonetheless, with appropriate planning and development the costs for a browser-spanning application are substantially less than for the administration of your own native app for every individual mobile platform. In comparison with the non-mobile world that is nothing new.

## THE CHALLENGE OF LOOK-AND-FEEL AND USAGE

One of the greatest disadvantages of a mobile web app is the user interface, which lacks the navigation elements otherwise found in the desktop world. In considering this, sellers should not underestimate the force of habit. The way users experience their applications is closely linked to the user interface to which they are accustomed from stationary use of the Web, i.e. with a PC or laptop monitor and keyboard. Thus, users should not be exposed to too steep a learning curve. The ease of use which a user needs in order to become confident with a new app should not be missing either.

Lack of access of the mobile web app to most hardware elements of the device is a further point which must be kept in mind. As a rule, the app can obtain access to the geolocation function and local memory of the mobile device, but not to the camera, the accelerometer or contacts list. Depending on the size of the app the user can also get by without these functions.

## MOBILE CLONE TECHNOLOGY FOR STATIONARY WEB SITES SIMPLIFIES MANUFACTURE

In addition to consideration of advantages and disadvantages from a business perspective, technical conditions must be considered when launching a mobile web app.

Thus, there are only small differences between developing a mobile web application and one for a desktop. Both require HTML, CSS and Javascript. If certain design and development techniques are applied and ad hoc frameworks are employed, the realization of a single web app which can be elegantly slimmed down for a mobile version is sufficient. The use of media queries makes this possible.

Media queries consist of a sequence of programming commands which the browser can handle. According to the result of the evaluation the browser depicts the same content differently. Media queries was not specifically developed for the adaptation of content to mobile requirements but quite generally for adapting the same content to the requirements of different media. In addition to media queries other techniques, tools and frameworks are available, which however are all based on more or less the same concept: the adaptation of content to the particular medium being used. This technology is known by the term "responsive web design."

## CHOOSING THE RIGHT TOOL GIVES YOU AN EDGE

The debugging strategy for mobile web apps strongly resembles the one for desktops. On the one hand, there are tools such as FireBug or WebKit Inspector allowing code to be tested on any modern desktop browser. Now there are also a few debugging tools

for remote use. Debugging of apps can be carried out with these solutions while they are running on a mobile device. The advantages are obvious. When an app is running on a mobile device, its look and feel is maintained. Detecting and repairing potential glitches and performance problems resulting from the limited resources of the mobile device itself is significantly easier as a result.

## HYBRID APPS – FOR THOSE LIVING IN BOTH PLATFORM WORLDS

A proportion of the problems which arise through the use of purely mobile web apps can be avoided by using so-called cross-compiled or hybrid apps, which are neither “native” nor based on the Internet. This kind of app is typically developed as a mobile web app. However, by means of an external middleware solution it obtains access to the hardware sensors of the mobile device as well as to other functions which are not available to normal mobile web apps.

An app like this also consists of HTML, Javascript and CSS code, which is then packaged in a native application. This then executes the code in the native standard component of the web engine. According to the tool with which the packaging is carried out the developer has access to even more functions. However, even when such frameworks are used there is only one possible way of being absolutely certain that the application will run without problems on every kind of device: by testing it. The reduced development time will perhaps be cancelled out by the testing effort required.

## VERSATILE HYBRID TECHNOLOGY ALSO HAS ITS PITFALLS

The advantage of the hybrid approach is that the mobile web app is perceived by the end user in precisely the same way as a native app, whereas most of the advantages of a mobile web app are retained. This means that this approach would be close to ideal if only a few of the disadvantages were not also retained: One disadvantage is the necessity of using the sales channels of third parties and thus having to comply with approval procedures. As has already been mentioned, an advantage of the hybrid app lies in the fact that the core code of the app remains essentially unchanged for all platforms. Because a mobile web app is being packaged within a native app, more time is required for testing the end product. Testing has to be done on every single platform to make sure the app runs smoothly.

## THE CHOICE OF TOOLS IS CRITICAL FOR SUCCESS

There are many different tools on the market with the goal of simplifying and improving such mobile hybrid apps. PhoneGap and Titanium Mobile are clearly the most widely known. Although it was recently acquired by Adobe, PhoneGap will soon belong to the Apache Software Foundation and will thus remain (even if possibly under a different name) free for developers. PhoneGap provides a plugin for all larger developer kits for mobile software, including iPhone, Android cell phones, BlackBerry and others. Developers simply use the standard Javascript API of the framework to interact with device-specific functions. One problem with this is the one-to-one relationship between plugin and target platform. This forces the developer to install, along with the specific PhoneGap plugin, all the various SDKs (software development kits) for all platforms which they want their app to run on.

Based on PhoneGap, Apparat.io, an online tool which is still in the closed beta phase, provides an additional promising approach. With this tool a native mobile app, which the developer pushes to a GitHub repository, i.e. a directory controlled by Git, can be built from the code. All that is required for this is to develop the app with only one code version, as with every other mobile web app, push the code to the GitHub directory and in a few easy steps create a fork to the Apparat.io dashboard. The result is the desired Android or iPhone application. According to reports, BlackBerry RIM and WebOS (HP is to become available as Open Source very soon) will soon be supported.

Titanium Mobile from the platform and services company Appcelerator is another commercial platform for implementing mobile hybrid apps. With its somewhat more extensive solution it offers the developer a series of advanced functions such as native UI elements, integrated social-sharing libraries and analysis tools, as well as a complete development environment.

## NATIVE APPS ARE THE MOST SECURE OPTION, BUT THE MOST DIFFICULT FOR SALES

Anyone who decides to develop native applications must support many different platforms. Practical problems arise because of differing development kits, different user interfaces of devices and differences in user experience, and also in connection with the programming languages used such as Objective-C/C++ on Apple iOS, Java on Android, C# on Windows Phone 7, or C++ or Java ME on Symbian and Bada.

In addition to the technical basis for the app itself, another pressing issue is the question of the most frequently used devices in the target group. Even within a given group of devices there is quite a lot of fragmentation. On the one hand there are the latest cell phones which run on Windows Phone 7 (WP7). Up until now the family of WP7 devices is the least fragmented group. This is because of the strict rules of Microsoft, according to which all cell phones which use Windows Phone 7 are only

authorized to have a certain resolution and a general minimum features set ist.

## EVERY DEVICE GROUP PRESENTS ITS OWN SET OF UNIQUE NATIVE APP ISSUES



The family of Apple iOS devices is subdivided into more branches. The hardware differences regarding display size, RAM, CPU type and speed, and GPU between an early iPod Touch, an iPhone 3GS, an iPhone 4 and an iPad 2 are clearly evident. It even depends on the OS version. If an app needs to be backwards compatible for older devices on which the most up-to-date OS version won't run, API differences also have to be considered. It also has to be borne in mind that ARMv7 code does not run on iPhone 3G or the second generation of iPod Touch.

Then there is still Android. It is not only that applications for Android cell phones are supposed to consist for the most part of Dalvik bytecode, but also that the different hardware, the different sizes of the displays (from 240x320 resolution in the case of the simplest devices to a resolution similar to tablets) and the various firmware do not contribute to making life easier for developers. To this must be added further differences through new versions of the operating system, i.e., Android 2.1 and the newly introduced Android 4.0. In addition, many parts of the Android operating system are specifically adapted by hardware manufacturers with the result that their behavior changes, sometimes only slightly but still significantly for developers. This is the case even within the same group of devices depending on whether the device has the trademark of the cellular provider or not.

All in all, it becomes clear that: If it is already difficult to guarantee the consistency of an application within the same product family, in the second step it is even more costly to achieve consistency across all targeted platforms.

## WHEN THE GOING GETS ROUGH – THE MORE COMPLICATED THE MACHINE THE GREATER THE INCENTIVE

The final consideration regarding native apps has to do with their performance. Here the grain is separated from the chaff, because when it comes to tuning devices, heavy reliance on the developers' bag of tricks is called for. Anyone who develops high performance applications like games or multimedia applications not only wants to take advantage of native framework functions, but also the hardware capacities of the mobile device. Desirable functions include the graphics accelerator provided by the cell phone hardware, working with fast mathematics libraries integrated in addition to

certain CPU functions and in the extreme case even the use of the assembler. There is no question that in the case of such magic tricks vendors must provide their own native app for every targeted platform.

For games and multimedia-intensive applications the Unity game engine is currently the most supported framework. Even if it is especially suitable for games, it can significantly reduce the effort required for providing convincing 3D applications such as virtual catalogs on iOS and Android cell phones. However, here too an optimal end result can only be achieved through fine tuning.

## THE ABILITY TO RUN COMMUNITIES IS DECISIVE FOR THE DEPLOYMENT OF MOBILE WEB TECHNOLOGY

Innovative apps will make smartphones and tablets not only a new low-threshold way to access IT, communication or entertainment but can also be used at any time by mobile CRM systems. Establishing and shaping customer relations is the growth path par excellence in mobile commerce which is now just getting off the ground. To those operating online communities cell phones have become devices consumers are willing to be carried away with in their use. Today Google, Facebook, banks or telematics providers are already in a position to create user profiles. The next step is the analysis of behavior and activity patterns and the design of marketing strategies coordinated with them. Once appropriate apps and infrastructures are available nothing more will stand in the way of all further mobile applications such as augmented reality or extended packaging. The art of product vendors and service providers in these new markets will involve being able to position themselves as trustworthy partners for operating a community.



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