Standards Assessment Criteria

## ----Mobile Web Application Best Practices

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### The Goal of the Recommendation

In the past decade, the dramatic improvements in the wireless technology have led to the boost of web application on mobile devices. Following the trend of the increasing popularity of mobile devices, the standardization of mobile web is of great importance. The goal of the recommendation “Mobile Web Application Best Practices” is to give the mobile web developers a guide of how to build rich and dynamic mobile web applications. It is to be used by mobile web application creators, maintainers and operators of mobile websites.

### Prime Movers of the Area

The recommendation was completed by the mobile web best practices working group who belongs to the W3C organization. The group is now closed from operation and they used to serve as part of the Mobile Web Initiative which is sponsored by Ericsson, France Telecom, HP, Nokia, NTT DoCoMo, TIM Italia, Vodafone Group Services Limited Afilias, Opera Software, etc. We could see a bunch of mobile network carriers and mobile browsers are involved in the development of this standard, since they are directly related to the mobile web applications. They would like to improve the quality of the mobile web applications and therefore the user experiences, so that more users will be attracted by the favorable characteristics of mobile web and bring more business profit to the area. They are considered the most active group who would like to push the implementation of this standard.

### Related Standards and How Problem Break Up

The standards are composed of six parts: application data, security and privacy, user awareness and control, conservative use of resources, user experience, and handling variation in the delivery context.

1. Application Data

This part standardizes the data management of web applications. First, it makes some suggestions on the way of using cookies. Although the use of cookie can store state on the mobile devices such as user identity and so on, there are things to pay attention to. According to the nature of mobile web connection, the cost of mobile data is relative high. So overusing of cookies may bring the problem of consuming too much data. On the other hand, because cookies could be disabled on some mobile devices, web applications should not fully base its operation on cookies. Second, the standards of client-side storage are stated. Good application of client-side storage can provide the advantages of shortening start-time, making web application more responsive and so on, since a certain amount of data has been stored locally and made available offline. Third, when necessary, a web application can copy over local data to a server. Common situations for copying data to server include when the data needs to be kept from lost, or consistency of stages needs to be updated and maintained across different equipment.

2. Security and privacy

This part put standards on the measures that should be taken to ensure the security of mobile web application users. Before the use of information and the running of code, the trustness should be testified. Especially, untrusted or unescaped JSON data should not be executed, because the direct execution may cause security risk. The suggested solution is to use JSON parser when possible. If not, the web application should make sure the data doesn’t contain any user-generated content or user-generated content is correctly escaped.

3. User awareness and control

The standards require the developer to design the web applications to be controllable by users. For instance, when the applications need to send and receive information through network or read and change local data, such as media files, contacts, current locations, software updates and so on, the decisions of whether to perform these operations should be made by the users. Especially, when the users start the web application the first time, the users should be informed of necessary information about the resources that are involved in the application operations. Furthermore, pop-up confirmation dialog should be used to let the users confirm the operations are allowed and acceptable. If the access or requirements by the application is declined by users, the intended behaviors must be stopped and the application recovered properly. Another aspect of user control is related to the automatic sign-in of applications. The applications, if applicable, should provide the choice of automatic sign-in function so that users are allowed to save account ID and password without typing every time they want to sign-in. It is important as the input of mobile devices is usually not as convenient as desktop computers. Simultaneously, a sign-out link should come with the automatic sign-in function.

4. Conservative use of resources

Standards are recommended on the minimization of system and network resources usage. The mobile devices usually don’t possess as good performance and advanced hardware as the desktop devices. So by conservative use of resources, the application can achieve smoother running effect. It is crucial to minimize application and data size, avoid redirects, optimize network requests, minimize external resources, aggregate static images into a single composite resource, include background images inline in CSS style sheets, cache AJAX data, do not send cookie information unnecessarily and keep DOM size reasonable.

5. User experience

From the user side, the user experience is one the most important factors to evaluate a mobile web application. The standards state several aspects that are critical to good user experience. The first impression of the web applications may come from the start-up time. Measures that can help decreasing start-up time are: using offline technology (save part of the data needed for the start-up in the cache of local storage which can compress the amount of data required through the web connection to the server), considering partitioning large scripts (divide the large scripts into parts so that start-up time can be saved by not parsing everything during start-up), using local storage (store snapshots of application status), minimize number of local storage queries (only generate requisite queries at the start-up period). Other than the start-up time, perceived latency is also an important factor that affects user experience. So the standards recommend following the rules below: enable incremental rendering, keep the user informed of activity, avoid page reloads and preload probable next views.

Mobile web applications should also be designed for multiple interaction methods mainly including focus based, pointer based and touch based interaction. Also, the developers can use the focus method in JavaScript when moving the focus to part of a page is essential and doesn’t influent user control. Using fragment ID’s to drive application view is another factor to improve user experience. It can be accomplished by enabling deep links and the browser history. Especially for mobile phones, it would be helpful if telephone numbers can be made “click-to-call”. Due to the small screen nature of mobile devices, especially mobile phones whose screen is of portrait orientation, a horizontal scroll bar usually doesn’t seem to be a good choice. So it is suggested make the text flows and use relative measures for containers. Several other standards include ensuring consistency of state between devices, considering mobile specific technologies for initiating web applications and use meta viewport element to identify desired screen size.

6. Handling Variation in the delivery context

Since different types of mobile devices have different specifications, the context delivered to different mobile devices should be adjusted according to the client conditions. The variations of context needed by different devices require the web applications to have attributes stated below by the web application standards group. When possible, server-side detection is preferable. The HTTP request header fields of devices, usually including accept, user-agent and X-wap-profile, can provide the evidence of device capabilities. On the other hand, when necessary, developers may use client-side capability detection. Recommended solutions are using JavaScript, CSS media types and CSS media queries. Furthermore, classification can be used to simplify content adaption. Different classification methods can apply. Supporting a non-java Script variant is sometimes appropriate. Finally, while multiple versions of web applications exist, the application can let users decide which version to use.

7. Future considerations

Future considerations in the standard recommendations mention the use of canvas element or SVG for dynamic graphics, notification to users about automatic network access and providing of multiple means to control automatic network access.

How are objections being dealt with

### Importance of the Standards

Although it will save a lot of effort if the web on mobile devices displays websites as they are on a normal PC without changing anything, the sites that are designed specifically for mobile devices are of much better quality on mobile devices. Without the standardization of mobile web applications, the use of these applications would be hindered by many constrains held by mobile devices such as the screen size, storage capability, processor work load, etc. It implies the necessity of the development of standards to improve user experience.

1. The standards are extremely important as a reference for mobile web application development. Especially for developers, the standards can be a checklist for what the mobile web applications should be like. By going through all the criteria, developers can avoid missing any major quality that their web application should include, and therefore avoid severe loss or bad user experience. Sticking on these standards can improve the average quality of the mobile web application market.

2. The lacking of standards may hinder retard the spread of mobile devices. Without standards, user experience of mobile web applications will be severely affected, which will highly probably decrease the situations in which users would like to use mobile devices. It will definitely stop a portion of the customers from buying mobile devices such as tablets.

3. The standards can serve as a potential regulation in the future to regulate the behaviors of mobile applications. For example, some web applications tend to steal the users’ private information through network. However, according to the standards, these activities of the mobile web applications should be confirmed by the users before execution. In this manner, the standards can to some extent be considered as a reference of what actions of the web applications are legal and what are not.

Reference:

[1] Mobile Web Application Best Practices, W3C Recommendation 14 December 2010, Editors: Adam Connors, Google; Bryan Sullivan, AT&T (until 2008)