Design and Development of Agricultural Mobile Learning Courseware Based on HTML5

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ABSTRACT

With the popularity of mobile Internet learning, training institutions, schools and enterprises have launched a mobile learning platform, mobile courseware development industry to flourish.

Based on the actual work of tomato water-saving practical technical training courseware design and development as an example, the paper describes the integration of HTML5, CSS and JavaScript technology to develop cross-platform agricultural technology training courseware. The courseware will be able to provide reference for the design and development of agricultural mobile courseware Internet plus situation.

Keywords: HTML5, Web development, Multimedia courseware, Agriculture

INTRODUCTION

The content and way of training innovation is the realistic requirement of the new professional farmers' cultivation. It is in line with the needs of the new professional farmers "anytime, anywhere, everywhere" and personalized training [1].

Mobile learning breaks through the time and space constraints, it has the characteristics of strong interactivity, fast acquisition, fast propagation and fast updating. It is in line with the needs of the new professional farmers "anytime, anywhere, everywhere" and personalized training [2].
With the development of mobile Internet technology and the popularity of mobile terminals, mobile learning will become an important way of training of new professional farmers.

HTML5, the core language of the WWW, is one of the five major modifications of the application of the hypertext markup language (HTML) under the standard General Markup language [3]. HTML5 provides a unified solution to the adaptation problem of different operating systems with its good cross platform performance. HTML5 has a significant application prospect in the M-Learning products development.

DESIGN SCHEME OF TRAINING COURSEWARE FOR TOMATO WATER SAVING AND PRACTICAL TECHNOLOGY

Design Objectives

The overall design of tomato water-saving practical technical training courseware is designed for the user experience, the target in the key technology of integrated application, virtual demonstration, tomato water-saving multimedia information resources navigation training and online video on demand function, online interactive training and testing functions etc.

Content and Function Design of Courseware

The training course of water saving and practical technology of tomato adopts the modular design idea. The contents of the courseware design, focusing on Tomato water-saving practical technology theme, design of drought resistant varieties, tomato irrigation, fertilization and seedling, cultivation, pest technology display module six aspects of prevention and control. In the system structure design, the use of the three level hierarchical module design, the level of content can be seamless switching browsing, directory menu integrated navigation. Courseware structure is shown in figure 1.
USING HTML5 TO DEVELOP THE TRAINING COURSEWARE OF TOMATO WATER SAVING AND PRACTICAL TECHNOLOGY

Based on the actual development of tomato water-saving practical technical training courseware as an example, described in detail the use of HTML5 language and integrated CSS and JavaScript technology to achieve smooth development of pages, multimedia courseware optimization experience, front end performance and realize the cross platform application technology courseware, which fully embodies the use of HTML5 language to develop mobile multimedia courseware advantage.

Developing and Defining Page Elements Using HTML5's New Tag Elements

HTML5 as a new generation of hypertext markup language, such as increasing the <canvas> (definition graphics) and <article> (as defined in article), <source> (media elements), <nav> (menu navigation) and <video> (media) and other new label elements. The courseware page in the development process, make full use of the new label elements of HTML5, to make HTML documents more readable, users can search information faster and more accurate, interactive performance between pages and more uniform effect.
CSS3 STYLES ADD NEW PROPERTIES

The courseware in the CSS3 style sheet effect processing, in addition to the shadow box (box-shadow), the background gradient (background: linear-gradient(#000, #fff)), 2D transform (transition) and other common attributes, but also the use of -webkit-mask, -webkit-box and WebKit kernel of private property, at the same time according to the page of the scene using the flexible. Call. Here, it is necessary to mention a point, the mobile terminal of the two camps IOS and Android are based on the WebKit kernel, and the WebKit kernel on the CSS3.

PAGE INITIALIZATION RESPONSE WEB DESIGN

In the case of the platform's visual width of not more than 768 pixels, the style of the braces in the CSS script is loaded. Since now cross platform screen size of the various types of courseware in the process of development, only for the vast majority of the device to adjust the elastic layout can be.

Using HTML 5 to Realize the Mobile Terminal Cross Platform Application and Functional Development of Multimedia Resources

This courseware by using HTML 5 custom video control script command and conversion support mobile platform browser video format, realizes the multimedia resources FLASH animation, video and other mobile terminal cross platform application development and function.

COVERT HTML5 MEDIA FORMAT THROUGH SWF ANIMATION

By technical means, the swf format will be converted to the mobile terminal can support the media format.

Scripting code, the media format embedded in the HTML5 page, the use of <video> tags to add media.

USING JQUERY AND CSS3 CUSTOM VIDEO CONTROL

Different browsers provide original browser video control is different, the courseware video controls in order not to control the default browser video control, making a custom video control, so that it can be used in operation, watch all mobile platforms in the browser.

The development of new media courseware pages, presented in the form of Web video based on HTML5, but it can help the mobile user experience to interface design quality, and smooth operation experience, can realize the automatic continuous
playback function, easy, convenient and quick, and fully meet the needs of mobile users fragmentation time.

**The Performance Optimization of Courseware Page Development**

The optimization method based on PC is also applicable to the HTML5 mobile terminal, and the courseware based on the performance of the page such as loading, image, CSS, script rendering and so on. For the mobile web page, the loading process is the most time-consuming process, may be accounted for 80% of the total time consuming, so it is the focus of the courseware page optimization.

Improper handling of the script will block the page loading, rendering. The animation special effects rendering of this courseware by using transitions GPU way, to trigger CSS3 render process.

**Release Testing to Achieve Cross Platform Compatibility**

The HTML5 courseware development environment is a cross platform mobile system, based on the result, the page `<head>` header element, add `<meta name="viewport" content= "initial-scale=1.0, user-scalable=no, maximum-scale=1, width=device-width ">` instruction, cross platform application.

![Cross platform display effect.](image)

Figure 2. Cross platform display effect.
EPILOGUE

Practice has proved that HTML5 has the semantic, device compatibility, CSS3 and other characteristics, so that it is suitable for cross platform learning system development, to provide seamless content services for different end users. Efficiency of HTML5 training system of water-saving irrigation of greenhouse tomato based on the one hand to achieve the systematic integration of various forms of media education resources, on the one hand is realized in different operating system and different mobile hardware platform on the generality and compatibility, is a kind of innovation and breakthrough way of training new type farmers' occupation.

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