Capital Gain Tax Relief Check Application on Smartphones due to One House by One Household

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Abstract: With the explosive growth of IPhone and Android smartphones, there are increasing demands and requests for application developers to support both smart platforms, simultaneously. Thus, we develop HTML5 based photo album smart application which is exchangably executable for those two platforms. Thus, we develop HTML5 based acquisition tax analysis application which is exchangably executable for Android, Iphone, Linux, and Windows. In this paper, we design and implement a HTML5 based application which is able to check whether the tax payer take the advantage of pay capital gain tax relief or not. In addition, this mobile application is convenient to access tax information during real-estate trading registration. It is quite useful for person who has to visit several sites for a day. We show the architecture and implementation detail of the application in the experimental results section.

1. Introduction

While successful for complicated mobile applications, such programming styles significantly differ from those used in smartphone application development, making it is difficult for smartphone developers to adopt them. With this trade-off, HTML5 is able to provide transparency in programming style.

Some systems support programming transparency with a unified OS abstraction or distributed runtime system, mostly based on a virtual-machine approach to hide ISA variances. This approach, however, proves to be inefficient on resource-constrained sensors. In contrast, Dandelion achieves transparency by limiting the senselet functions to data processing and by introducing an extra compilation phase to produce.

In addition, we implemented a smartphone application of capital gain tax relief checking which is based on HTML5. Before we go into more detail, we first take a look at the HTML5 based hybrid architecture for smart applications consisting of elements of both native and Web applications. Especially, there are several native applications in platform of either iPhone or Android. But, there is no HTML5 based applications that can help us checking capital gain tax relief from a smartphone. Therefore, we design and implement a working version of HTML5 based application. In this section, we design the UI of application.

The term "one house for one household" means cases where one household (hereinafter referred to as the "one household") comprised of the resident, his/her or her spouse, and family members who make their living together at the same address or domicile, possess only one house in Korea as of the transfer date, and the possessing period of relevant house is three years or longer.

When one household having one house in Korea comes to temporarily possess two houses by acquiring another house (including cases where it acquires by constructing a new one by itself) before it transfers such house, if it transfers the previous house within two years (including cases where unable to transfer within two years, and which comes to fall under the causes determined by Ordinance of the Ministry of Strategy and Finance) from the date of acquiring another house, it shall be deemed as one house for one household. In such cases, where a part of previous house and appurtenant land is purchased by consultation or expropriated, if the relevant remaining house and appurtenant land are transferred within two years from the date of such transfer or expropriation, the transfer of such remaining house and appurtenant land shall be deemed to be included in the transfer or expropriation of the previous house and appurtenant land.

In this paper, we make a HTML5 based smartphone application which is able to check whether the taxpayer take the advantage of pay capital gain tax relief or not. This is very important because we need to check if we are able to get tax relief when

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we buy or sell the assets. Usually, we depend on consulting to certified accounting agent. But, it costs a lot. To this end, we developed a platform independent application on smartphone for estimation of capital gain tax relief using HTML5 and REST open API. The reason why we make use of HTML5 is because we need a platform independent application architecture. To this end, we also make use of REST open API as a client-server communication primitive. The REST open API web service is totally platform independent in terms of programming languages, operating systems, so any type of clients can access the service through internet HTTP protocol number 8080. The acquisition tax analysis application is to provide tax information for real-estate buyer/sellers on real time. This is useful because real-estate trading registration requires many types of letters and processes. Prediction of the amount of acquisition tax before visiting bank and government office leads to reduce wasting time in the complex registration processes. Moreover, people to visit several sites during a day need to access this application at anywhere and anytime using any type of computers/smartphones. This is the reason why we make use of platform independent techniques for this project. This paper provides the experimental results of the HTML5 acquisition tax analysis application.

The rest of this paper is organized as follows: Section 2 describes background and related works on this research. Section 3 focuses on the details of overall architecture and implementation detail of the application in terms of HTML5 and REST open API. Finally, section 4 describes experimental result of the application and concludes our work and presents future research directions.

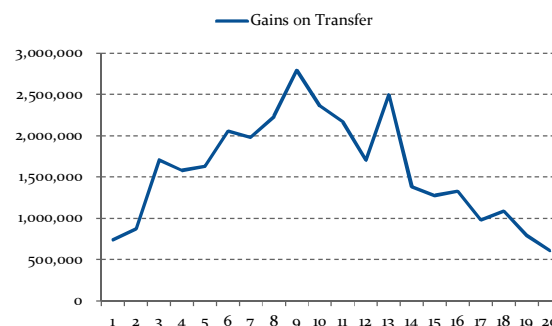## 2. Capital Gain Tax Relief System

Capital gains from the sale or transfer of land, buildings, or rights thereto, and stocks and other assets specifically listed in the pertinent Presidential Enforcement Decree, are subject to a 6 percent to 38 percent graduated capital gains tax. Taxpayers subject to forced property sales under legal or bankruptcy proceedings may obtain tax relief under certain conditions, and capital gains arising from certain transfers, exchange, and government appropriation of farmland are tax exempt. Gains from the sale of one residence per household are generally exempt from capital gains tax if the taxpayer who owns only one residence has held the residence for three years or more . Owners of luxury residences are required to pay taxes on gain related to excess space deemed luxurious under relevant law. Luxury residences are houses or apartments that have a value of at least KRW900 million. Capital gains are calculated by deducting the original purchase price, capital improvements, a basic deduction of KRW2.5 million, special deductions, and other necessary expenses from the sales price. Special deductions are available to encourage long-term holding of properties as follows:

Table 1 Capital Tax Deduction Rates

Property held	Deduction – Percentage of capital gains
3~4 years	10 to 12 (increased by 2 for each year)
5~10 years	15 to 30 (increased by 3 for each year)

Gains from the transfer of securities by a non-resident are subject to a withholding tax of 10 percent of the sales proceeds. However, where the acquisition value of securities can be confirmed obviously, the amount of tax withheld is the lower of the following two amounts: 10 percent of the sales proceeds or 20 percent of the gain on the sale. When one household having one house in Korea comes to temporarily possess two houses by acquiring another house (including cases where it acquires by constructing a new one by itself) before it transfers such house, if it transfers the previous house within two years (including cases where unable to transfer within two years, and which comes to fall under the causes determined by Ordinance of the Ministry of Strategy and Finance) from the date of acquiring another house, it shall be deemed as one house for one household. In such cases, where a part of previous house and appurtenant land is purchased by consultation or expropriated, if the relevant remaining house and appurtenant land are transferred within two years from the date of such transfer or expropriation, the transfer of such remaining house and appurtenant land shall be deemed to be included in the transfer or expropriation of the previous house and appurtenant land.

Figure 1 Gains on Transfer

Figure 1 shows the gains on transfer by the years of withholding. We can infer from Figure 1 the

fact that the gain tax on transfer(revenue) is high from 6 to 11 years, resulting in high capital gain tax. Therefore, the people at the period would be interested in to get the gain tax relief.
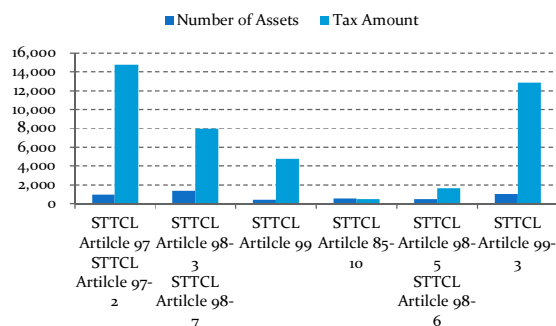

Figure 2 Credits and Exemptions of Capital Gains Tax

Figure 2 represents the credits and exemptions of capital gains tax by the cases between Article 97 to Atricle 99.

3. System Architecture and Development
3.1 Storage Persistency
In this section, we examine the local storages on HTML5 web applications. Usually, we make use of cookie and session for keeping information on desktop when network connection is not available. HTML5 provides more options than conventional web development methods. Local storage, session storage, and web database is like that. While all of these functionalities are applicable to both the mobile and desktop worlds, in the world of desktops you generally have a lower rate of adoption. However, any mobile device released in the last 2–3 years will support most of these specs. Moreover, the explosive use of mobile devices such as smartphones requires the demand of using HTML5 due to one source multi use(OSMU) developmet. So, there are big demands of persistent storage using HTML5. The persistent storage support was in demand in the world of desktops, but with the rise of the mobile web and edge connections, support for offline capability has exploded. Everything from offline data storage to the actual application startup is already available and supported on a wide range of mobile platforms. The HTML5 brings us to the three storage mediums: localStorage, sessionStorage, and WebDB. Luckily, the Sencha Touch data package offers awesome wrappers around all three. We can use these persistent storages regardless of the network connection status.

SessionStorage is not a persistent storage, meaning it gets wiped whenever the user leaves the page or closes the application. However, in case of one-page web apps where you stay on the same page the entire time, sessionStorage can be a perfect candidate for offline data access, especially in data-sensitive scenarios where you don't want the data persisted on the device after the user is done using the app. sessionStorage is generally limited to 5MB in size and when that is exceeded, depending on the platform, either a JavaScript error might be thrown, or a popup is presented to the user asking for permission to increase the available storage. The sessionStorage configuration is as follows:

Table 2 session storage example

```
new Ext.data.Store({
    proxy: {
        type: 'sessionstorage',
        id  : 'myKey'
    }
});
```

LocalStorage is essentially the same thing as sessionStorage, except it is persistent. In other words, if you close the app and return, the data will still be there. localStorage is more suited for data that you want to be available when used in combination with the offline startup techniques discussed earlier. However the localStorage still has a problem for being a perfect persistency. If you clean and delete your web cache from your browser, it will be removed from then on. So, we have to prepare a work around for compensating the cases. Sencha Touch configuration for localStorage looks almost identical to that of sessionStorage:

Table 3 local storage example

```
new Ext.data.Store({
    proxy: {
        type: 'localstorage',
        id  : 'myKey'
    }
});
```

Finally, the web database is supported by almost every browses. Though specs call for 5 MB limit per origin, iOS has been known to allow up to 50 MB after multiple user prompts. Behind the scenes it's an SQL database with a query-based language that many of us know and love. When it comes to configuring it in Sencha Touch, it is just as easy as with the other storage mediums:

Table 4 web db example

```
Ext.create("Ext.data.Store", {
    model: "User",
    proxy: {
        type: "sql"
    }
});
```

3.2 System Components

We implemented our application exploiting 3 cutting edge technologies. Figure 3 shows the system architecture of our acquisition tax analysis application. Our system architecture consists of the following components: REST Open API server, HTML5 based Platform Independent Client Appilcation, Database Server. The Figure 3 shows the system architecture of our platform independent application design and implementation for checking capital gain tax relief due to one house by one household.

✓　In-Memory Database : for the high performance of database, we make use of the in-memory database in this project. Because of too many and representative requests, we came up with a state of the art technology for processing this type of short and high frequency requests. The best way to service these requests is the in-memory database.

REST Open API Web Server (Apache Tomcat, JERSEY)

Database (MySQL + In-Memory DB Extension)

Acquisition Tax Calculation Client
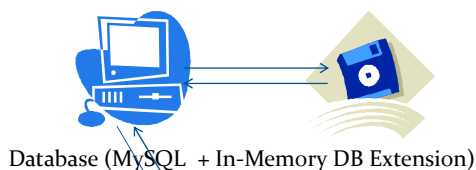
HTML5 based Platform Independent Application

Figure 3 System Architecture

✓　REST Open API Web Service : The REST is an platform independent architectural style. REST ignores the details of component implementation and protocol syntax in order to focus on the roles of components, the constraints upon their interaction with other components, and their interpretation of significant data elements

✓　Sencha Touch (HTML5) application : Sencha Touch is a representative HTML5 UI Framework in these days. Sencha Touch is a well-known user interface (UI) JavaScript library, or framework, specifically built for the Mobile Web. It can be used by Web developers to develop user interfaces for mobile web applications that look and feel like native applications on supported mobile devices. It is fully based on web standards such as HTML5, CSS3 and JavaScript. Sencha Touch aims to enable developers to quickly and easily create HTML5 based mobile apps that work on Android, iOS, Windows, Tizen and

BlackBerry devices, and produce a native-app-like experience inside a browser.

3.3 Implementation

Using these techniques, we developed the capital gain tax caluculator application which is platform independent one as shown in Figure 4. The application just sends AJAX request to the REST Open API web server as shown in Table 5.

Table 5 REST Open API URI

localhost:8080/RestAPI/apis/example/calculate/
userid=5&username=BILL&userDate=20140302&
userEtc=etc&HouseHolds=2&AreaofExcsSpace=5
AcquisitionPrice=250000&userContact=01099695
699

Table 6 shows a portion of our AJAX implementation for invoking a REST open API using the URL which is shown above.

Table 6 Implemetation codes

```
var button = new Ext.Toolbar({
        cls: "calculator_button",
        height: 35,
        items: [this.text,
            {xtype: 'spacer'},
            {html:  new  Ext.XTemplate('<img
style="width..5em;height:.5em;"
src="resources/imgs/button.png"  />').apply({name:
'button'}),
            handler: function () {
                Ext.Ajax.request({
                url:'/
    localhost:8080/RestExample/apis/example/
,
                    params:{
                    action:' calculate ',
                    userid: '15',
                    username: ' BILL',
                    username: ' BILL',
                    userDate: ' 20140302',
                    userEtc: 'etc'
                    HouseHolds: '2'
                    AreaofExcsSpace: '5'
                    AcquisitionPrice: '25000'
                    userContact: '01099695699'
                    },
                success: function(xhr) {
                    var response =
Ext.decode(xhr.responseText);
                }
            });
        }}
    ]
    });
```

Our application supports WebOS, Android, iOS, Window Phone, and BlackBerry. The application requires the only information of acquisition tax, the area of exclusive space, household numbers, and the location.   Then, the application provides the capital gain tax result which is automatically calculated.

Figure 4 Developed Application

4. Discussions

Current smart application development approach is tightly dependent on each mobile framework such as android or iphone. Once a smart application is developed, it only runs onto the platform. This limitation results in wasting the development cost because one source multi use is not allowed. We have to develop or compile the same applications for each platforms. However, future trend for smart application developments is platform independent. This is because device fragmentations exits even within an android platform. For example, there are numerous number of android devices in the markets.

In this section, we show an overall architecture of our photo album application. First we take a look at the HTML5 based hybrid architecture for smart applications. A hybrid application (hybrid app) is one that combines elements of both native and Web applications. Native applications are developed for a specific platform and installed on a computing device. Web applications are generalized for multiple platforms and not installed locally but made available over the Internet through a browser. Hybrid apps are often mentioned in the context of mobile computing. Hybrid application has the following features: 1) Can function whether or not the device is connected, 2) Integration with a device's file system, 3) Integration with Web-based services, 4) An embedded browser to improve access to dynamic online content. Most applications could be considered hybrid apps. Web apps, such as online banking services, typically store some content locally; locally stored native apps, such as Microsoft Word, also interface to the Internet.

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5/26/2017