Community App - Mobile Application

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Abstract— *while the cost of a new item is usually given, the resale value of that item is often unknown. Pricing of resale items varies tremendously, often resulting in serious losses to the seller if the item is underpriced or to the buyer if the item is overpriced. To avoid this, an accurate understanding of depreciation is necessary.*

An asset's value declines over time due to use, wear and tear, and obsolescence. Known as depreciation, this decline is systematic: the net value of an item is adjusted periodically. A used item's net value, therefore, is the original purchase price less the accumulated reduction of value. Understanding this helps individuals or companies to manage the cost of assets and accurately estimate their book value at the end of each year of their useful life.

Unfortunately, most individuals and companies lack the detailed knowledge necessary to accurately calculate depreciation. The objective of this study is to develop an application to accurately and rapidly determine the fair price of tangible assets using the sum of the year's digit depreciation method. The application will help individuals and companies to evaluate used items, whether for purchase or for sale, cost-effectively, accurately, and rapidly.

Keywords—Asset value, Depreciation, Fair price, Mobile App, Useful life.

I. INTRODUCTION

Assets are either tangible or intangible. Tangible assets, also known as fixed assets, have physical form. Intangible assets are non-monetary assets with no physical substance such as goodwill, patents, brand recognition, etc. Depreciation expense is the periodically estimated diminishment of an asset's original purchase value over the service life of that asset. Depreciation of the value of an asset that is used over a number of years must occur over the lifetime of the asset, and cannot be done in a single period. This progressive evaluation of depreciation expense helps better match asset uses with the benefits provided by an asset (Way, 2015).

Depreciation is a reduction in the value of a fixed asset with the passage of time, due in particular to use, wear and tear, or obsolescence. Only items that lose useful value over time can be depreciated. Using depreciation expense helps to report assets at their net book value, since it is a method of cost allocation. Cost allocation can be based on a number of factors, but is usually related to

the estimated period of time the product can generate any use, also known as the asset's life (Investopedia, 2012). However, depreciation can be calculated in more than one way on fixed assets. It is important to know how to calculate depreciation on fixed assets using the most popular methods, which are:

- Straight Line Depreciation
- Declining Balance Depreciation
- Units of Production Depreciation
- Sum of Year's Digit Depreciation

This project will focus on the Sum of the Year's Digit depreciation, which will help people to determine the item value based on ***price***, ***time*** and ***condition***.

1.1 Statement of problem

Pricing is a very important element of the marketing mix (Boundless Marketing, 2015). The pricing of used products for resale is difficult. Excessively high prices will generate resistance to buying, while excessively low prices will raise questions about quality and condition, and may also decrease profitability. This is the foundation of this project.

1.2 Research Objective

"Community App" is designed to help individuals by educating and providing knowledge about a realistic cost while buying or selling used products. It uses different variables across categories to arrive at a resale price for used goods. Having a software app that runs on an individual's smartphone or tablet is particularly useful for individuals who buy or sell products frequently. It reduces the need for calculation on paper, as well as errors resulting from improper knowledge. It can readily show the maximum cost or the selling value of any tangible asset.

II. LITERATURE REVIEW

Most people are familiar with the concept of Maximum Retail Price (MRP) when it comes to buying a new item. However, they are not conversant with the pricing of used goods. This usually results in used goods being priced too low or too high.

Using depreciation expense helps to report the net book value of products. It is the amount of cost allocation within an accounting period. Only items that lose useful value over time can be depreciated. Depreciation is the reduction in an asset's value caused by the passage of time due to use, abuse, wear and tear, and obsolescence.

Depreciation on fixed assets can be calculated in more than one way:

- *Straight Line Depreciation* is the default method used to gradually reduce the carrying amount of a fixed asset over its useful life. This method is designed to reflect the consumption pattern of the underlying asset and is used when there is no particular pattern to the manner in which the asset is to be used over time.

- *Declining Balance Depreciation* is an accelerated method of depreciation in which the amount of depreciation that is charged to an asset declines twice as fast as the straight line method over time. In other words, more depreciation is charged during the beginning of the life time and less is charged during the end. This is because the assets are usually more productive when they are new and their productivity declines gradually.

- *Units of Production Depreciation,* also known as Units of Activity and Units of Usage Method of Depreciation, calculates depreciation on the basis of expected output or usage. The amount of depreciation charged to an expense varies in direct proportion to the amount of asset usage. Thus, a business may charge more depreciation in periods when there is more asset usage and less depreciation in periods when there is less usage.

- *Sum of the Year's Digits Depreciation* involves calculating depreciation based on the number of years in an asset's useful life. Sum of the years' digits depreciation method, like declining balance method, is a type of accelerated depreciation technique that allocates higher depreciation expense in the earlier years of an asset's useful life. It makes sense to use an accelerated depreciation method such as the sum of the year's digits method when an asset loses most of its value toward the beginning of its useful life, as is the case with automobiles, smart phones, and electronics (Loughran, 2013).

Various mobile apps have been designed for determining the cost for resale using the concept of depreciation. Among them are Product Pricing Calculator app, e-valuator app, Real Book Value app, Gadget Value app, Maximum Selling Price (MSP) quikr, Accounting Depreciation app, and many others. These apps are designed to help the user find an appropriate price for the items for reselling or to check if a promising bargain really is one for selling and if one is really getting a good bargain for buying These apps differ in terms of features, operating systems and cost Features, operating systems and cost for these apps differ considerably.

Some apps can run only on Android platforms, some on iPhone Operating System (iOS) platforms, and some can run on both or any platform. The user just needs to download and install the version that is compatible with his/her mobile device. Some apps are free, while others charge a fee. Paid versions usually have more features and a higher level of services provided. Since the apps differ, the user should determine in advance the features desired, the operating system preferred or the affordability before making a selection.

III.   METHODOLOGY

"Community App" is designed to be used on Android mobile devices. It is a personal cost calculating software app that is designed to help individuals find an appropriate price for used items while buying or selling. "Community App" uses various steps to arrive at a resale price for used goods. It is developed using "Microsoft Visual Studio Community 2013" and "node.js", which are free software packages for application development. After completing the installation process, Microsoft creates a project that includes all the android source files related to the application.

Microsoft Visual Studio Community 2013 contains tabs such as FILE, EDIT, VIEW, WEBSITE, BUILD, DEBUG, TEAM, TOOLS, etc. which help to build an app. Once the application file is created, it is coded using Hypertext Markup Language (HTML), Extensive Schema Definition (XML) and Java Script. HTML is used to describe the structure of the app along with cues for presentation. Different HTML elements are used including embedded images and objects and to create interactive forms. It provides a structured document by denoting structural semantics for texts such as lists, pictures, blocks, and other items.   XML is used to separate content from format.   The formatting of the XML document is inside a separate style sheet.   This separation allows for easy maintenance and to update formatting as needs change.   It is easy to maintain a consistent style for all documents when the content is separate from the formatting.   JavaScript is used to create responsive interfaces that improve the user's experience and provide dynamic functionality (Berjon, Faulkner, Leithead, Navara, Connor & Pfeiffer, 2014).

Once the coding, functionality and designing are completed with different screens, the app can be debugged and the results can be viewed by clicking on "Google Chrome" tab. This will take to the webpage (for example: localhost: 51514/). On the screen, click on responsive web design tester and select a device to view the app in mobile mode as shown in the Webpage below.
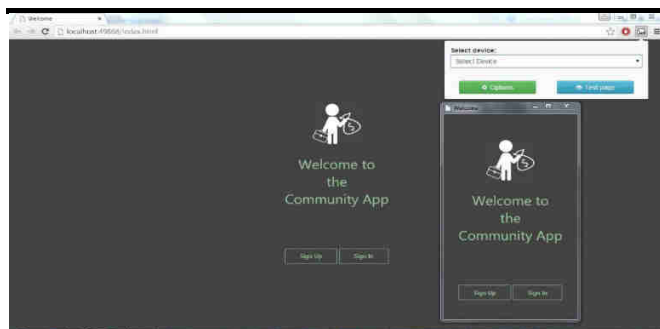
Webpage: Responsive Web Design Tester

"Community App" consists of multiple screens, in which Screen 1 represents the introduction screen. It displays the name of the app, designed with class and list, and the Sign in and Sign up option.
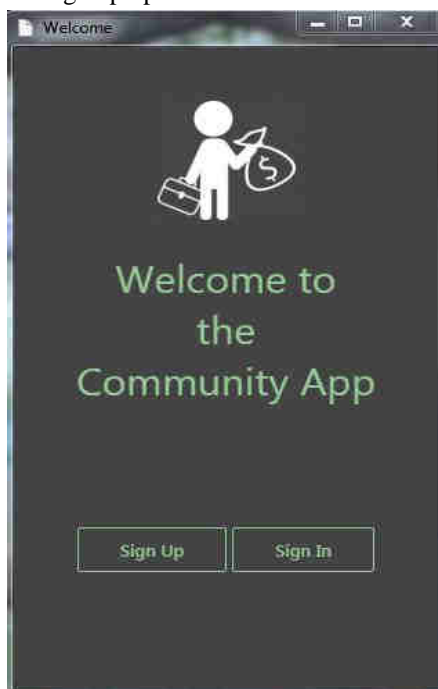

Screen 1: Welcome Screen

To access the app, one must go through the sign up process on Screen 1 by registering and providing the details of First Name, Last Name, email-id and a valid password. Once the details are entered, the user selects the "Sign Up" button to personalize the app. The user can go back to the welcome screen and restart the process by clicking on the back icon at the top left side corner of the screen. The sign up screen is designed in HTML with inputs, linking the source files, textbox and buttons. Screen 2 shows the Sign Up screen.


Screen 2: Sign Up Screen

After the sign up process is completed, the user is taken to the "Sign In" screen. Here, the user signs in with an email-id and the password which was provided during the sign up process. If the user forgets to sign up and tries to sign in, the app will pop up an alert message "Login Failed." The user can click on the "Sign Up" button or on the back icon on the top left corner of the screen and register to use the app. The sign in screen is designed in HTML with inputs, linking the source files, textbox and buttons. Screen 3 shows the Sign-In Screen.
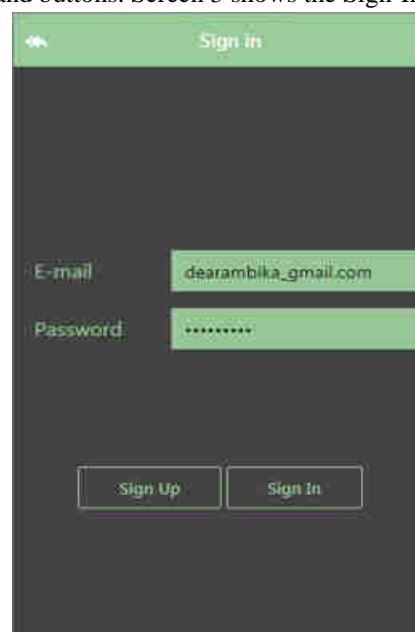
Screen 3: Sign-In Screen

After the sign in process, the app advances to Screen 4 which lists the categories of products used to calculate the costs. The categories include Books, Electronics, Mobiles and Furniture as shown in Screen 4.
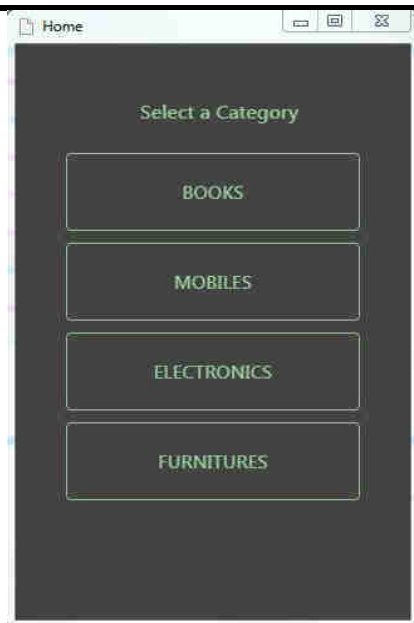
Screen 4: Category Screen

When these categories are selected it takes the user to Screen 5 as shown below for the user input based on the product selected. The categories include books, electronics with the sub category with drop down menu that includes LED/LCD TVs, desktops, laptops and cameras, mobile phones with sub category of tablets, iPads and iPods, and furniture with the sub category sofas, loveseats, tables, chairs, beds, computer desks, etc. The user input screen includes buttons with drop down menus, pictures and classes. This screen is designed with JavaScript to provide the fair value of the product selected according to the user information. The user gives the actual price of the item selected, the usage period of the product, and the life of the product; however the user must know the life of the product. The condition of the product is then entered by selecting the condition of the item from the drop down menu, which includes Excellent, Very Good, Good, Fair and Poor. A "Calculate" icon is then selected for the expected resale price. This screen also has the "Go to items" button which, if clicked, will take the user to the category screen again.

A calculated resale price of the product based on the provided information can be displayed after the "Calculate" icon is clicked.

After completing all the necessary functionality and designing, the Android Application Package (APK) file is created. The following steps create the APK file:

- Go to command prompt.
- Run the command.
- Build Cordova and release android.
- Click Install.

The above steps produce a link which helps to run on an android phone. The user can sends this link via email in

order to install it on the phone. The app is then ready to use
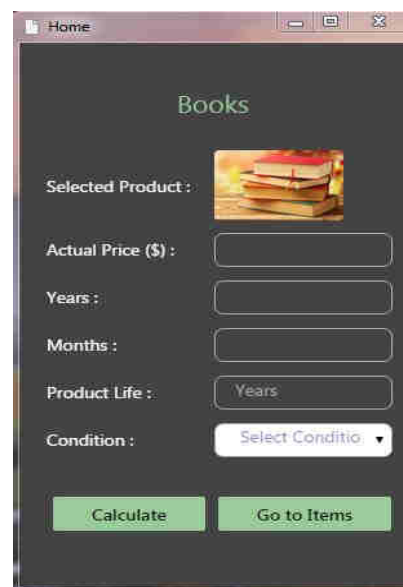
Screen 5: User Input Screen

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## IV.   RESULTS AND DISCUSSIONS

A clear understanding of the "Community App" helps avoid the malfunctions that could inconvenience the user. The "Community App" created using Microsoft Visual Studio Community 2013, was tested with some sample data. When the user has completed the sign in process the app opens "Select a Category" as shown before in Screen 4. The user selects a category and an item for which he/she wants to find the resale value. The following illustrates a description and calculation of each category.

4.1 Books Screen

The user can access the book screen to calculate the resale value of books. This screen has the heading of "Books" with an image displayed providing the necessary information. The user has to input the actual purchase price of the book, the number of years and months the book was used, the life of the book (usually the life of a book is said to be 5 years), select the condition of the book, whether it is in Excellent, Very Good, Good, Fair or Poor condition, and then click the "Calculate" icon. Once the user selects "Calculate", the app opens a new screen with the calculated resale value of the book including the data input by the user. The user can also return to the categories section by clicking "Go to Items."
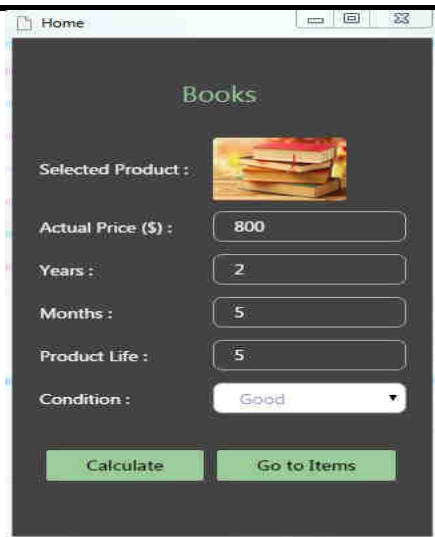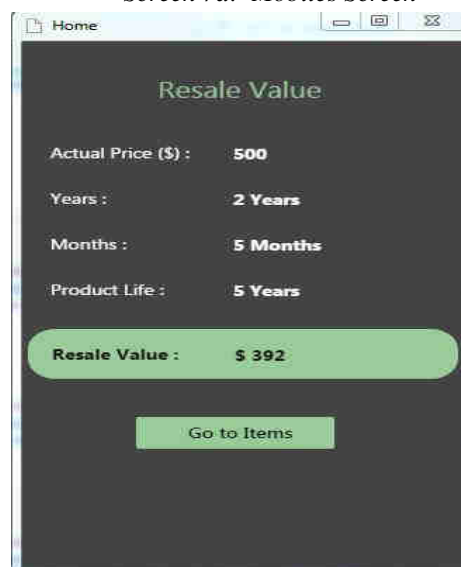
Screen 6a: Books Screen
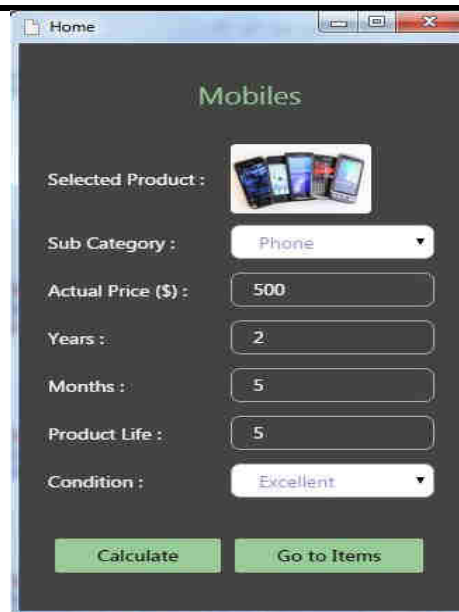
Screen 7a: Mobiles Screen

Screen 6b: Expected Resale Value

Screen 6a above displays the book screen with the data entered. The original price of the book is given as $800, it was used for 2 years and 5 months, and the product life is given as 5 years with the condition listed as "Good." Screen 6b demonstrates the calculated resale value of the book as $538.

4.2 Mobiles Screen

The user can use the "Mobiles" category if he/she wants to find the resale value of a "Phone", an "iPad" or an "iPod." These items are subcategorized in the Mobiles screen as a drop down menu. The user can select any one product at a time, enter the actual purchased price, the used time of the item in years and months, give the product life and select the condition from the drop down menu. The listed categories are Excellent, Very good, Good, Fair and Poor. The "Calculate" icon displays the resale value of the item selected.
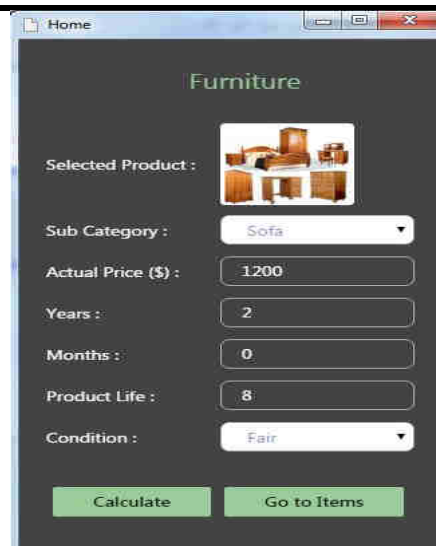

Screen 7b: Expected Resale Value

Screen 7a shows a Mobiles screen with the data entered. The subcategory selected is a "Phone". Actual price of the phone given is $500, it was used for 2 years and 5 months, and product life is given as 5 years with the selected condition "Excellent." Screen 7b displays the calculated resale value of the phone as $392**.**

4.3 Electronics Screen

The Electronics category is subcategorized into LED/LCD TV, desktop, laptop and camera. The user has to select any one item from the mentioned list, enter the actual purchased price, the used time of the item in years and months, give the product life and the product condition of Excellent, Very good, Good, Fair or Poor. The calculate icon demonstrates the resale value of the selected item.
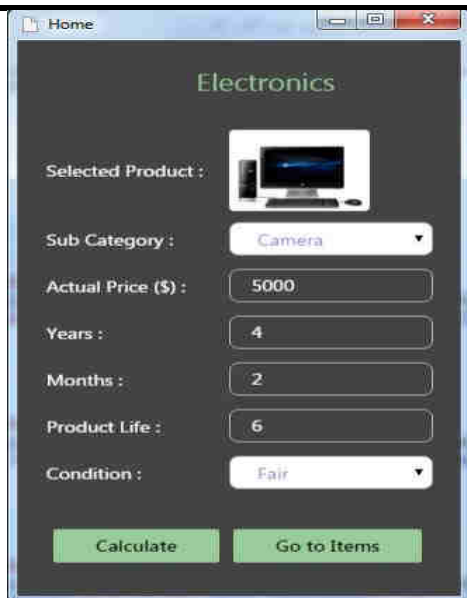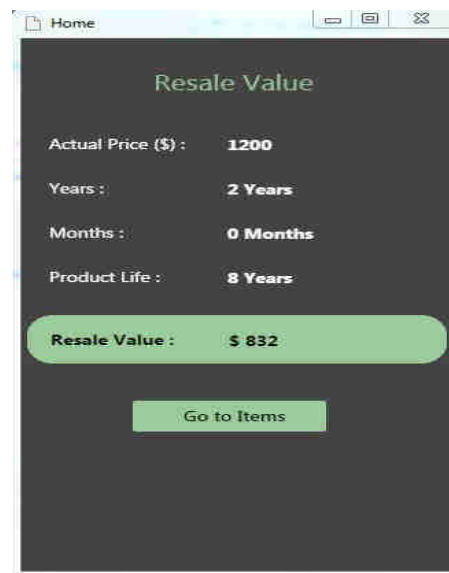
Screen 8a: Electronics Screen

Screen 9a: Furniture Page

Screen 8b: Expected Resale Value

Screen 9b: Expected Resale Value

Screen 8a shows an example of the Electronics screen with the data entered. The subcategory selected in this example is a "Camera." The actual price of the camera given is $5000, it was used for 4 years and 2 months with a product life of 6 years and the selected condition as "Fair." Screen 8b shows the calculated resale value of the phone as $2940 based on the given conditions.

4.4 Furniture Screen

The Furniture Screen has the same functions as any other screen. The user can find the resale value of sofas, loveseats, tables, chairs, beds and a computer desk in this category. The user has to select one item from the sub categories, enter the actual purchase price, the usage time of the item in years and months, give the expected product life and select a condition from Excellent, Very good, Good, Fair or Poor. The calculate icon displays the resale value of the item selected and the criteria entered.

Screen 9a displays an example of the Furniture screen with the data entered. As seen, the subcategory selected is a "Sofa." The actual price of the sofa given is $1200, it was used for 2 years and 0 months, has an expected product life of 8 years, and the selected condition is "Fair." Screen 9b displays the resale value of the sofa as $832 for the given conditions.

In Summary, "Community App" is an innovative program, designed and developed using "Microsoft Visual Studio Community 2013" and the advanced tool "node.js." It is user-friendly, enabling individuals to easily and rapidly determine the resale value of used books, mobile devices, electronic devices, and furniture before buying or selling them. For instance, a student who wants to sell a laptop on any website (e.g., OLX) and doesn't know how much to quote, can use "Community App" to determine the resale value and then post it on the

websites. This will help decide a realistic value for the used goods before posting it on the site.

V. CONCLUSION

While the price of new items is usually given, the evaluation of used assets can vary widely. This usually results from a lack of understanding of depreciation, and can result in significant losses to the seller if the items are priced too low; or to the buyer, if the items are priced too high. In the world of after-market purchases, therefore, there is a need for a mechanism that will accurately, easily, and rapidly estimate the true value of used items. In designing and developing the "Community App", this project seeks to meet that need, and to engage the resale community in an attempt to standardize this important sector of the economy.

It is an *innovative p*rogram, designed and developed using advanced tools. It is a user-friendly app, enabling individuals to easily determine the resale value of used items (books, mobile devices, electronic devices and furniture).

The *impact* of "Community App", therefore, should be readily evident to both buyers and sellers of used items. Problems arising from the inability to accurately calculate depreciation are quickly solved by using this app, which accurately and rapidly determines a fair price for tangible assets using the sum of the year's digit method**.**

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