CHAPTER-1
INTRODUCTION

The commercial success of Android app markets such as Google Playand the incentive model they offer to popular apps, make them appealing targets for fraudulent and malicious behaviors. Some fraudulent developers deceptively boost the search rank and popularity of their apps (e.g., through fake reviews and bogus installation counts), while malicious developers use app markets as a launch pad for their malware. The motivation for such behaviors is impact: app popularity surges translate into financial benefits and expedited malware proliferation. Fraudulent developers frequently exploit crowdsourcing sites to hire teams of willing workers to commit fraud collectively, emulating realistic, spontaneous activities from unrelated people, see Figure 1 for an example. We call this behavior "search rank fraud". In addition, the efforts of Android markets to identify and remove malware are not always successful. For instance, Google Play uses the Bouncer system to remove malware. However, out of the 7, 756 Google Play apps we analyzed using VirusTotal, 12% (948) were flagged by at least one anti-virus tool and 2% (150) were identified as malware by at least 10 tools (see Figure 6). Previous mobile malware detection work has focused on dynamic analysis of app executables as well as static analysis of code and permissions. However, recent Android malware analysis revealed that malware evolves quickly to bypass anti-virus tools.

In this paper, we seek to identify both malware and search rank fraud subjects in Google Play. This combination

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• *A preliminary version of this article has appeared in SDM 2016.*

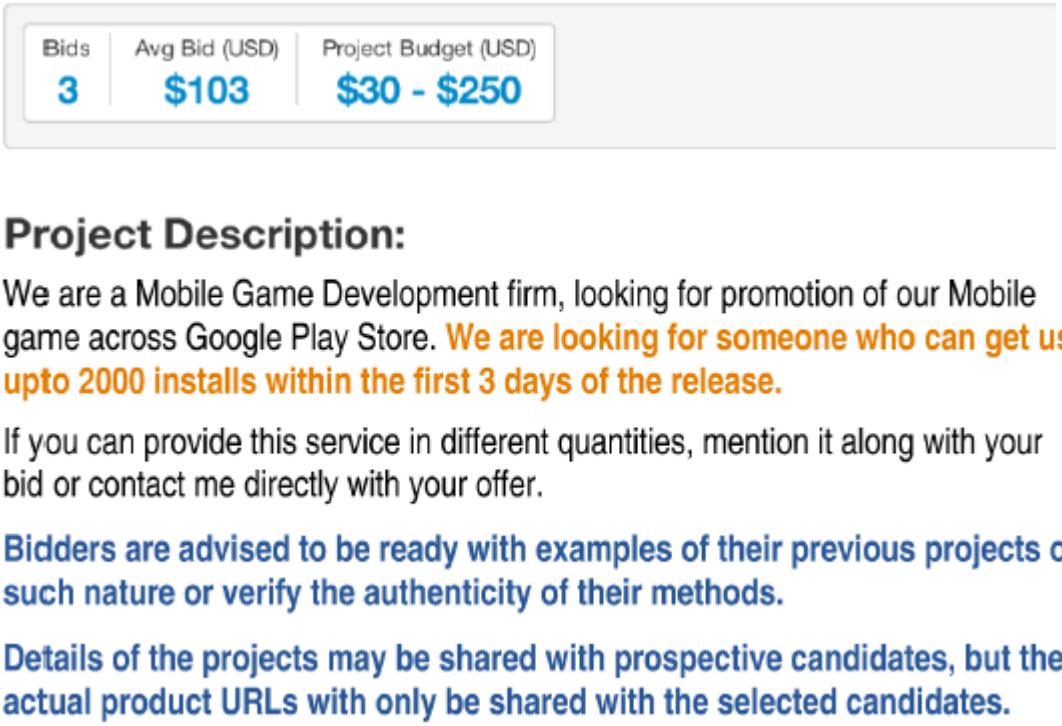


Fig. 1: An "install job" posting from Freelancer, asking for 2000 installs within 3 days (in orange), in an organized way that includes expertise verifications and provides secrecy assurances (in blue). Text enlarged for easier reading. is not arbitrary: we posit that malicious developers resort to search rank fraud to boost the impact of their malware. Unlike existing solutions, we build this work on the observation that fraudulent and malicious behaviors leave behind telltale signs on app markets. We uncover these nefarious acts by picking out such trails. For instance, the high cost of setting up valid Google Play accounts forces fraudsters to reuse their accounts across review writing jobs, making them likely to review more apps in common than regular users. Resource constraints can compel fraudsters to post reviews within short time intervals. Legitimate users affected by malware may report unpleasant experiences in their reviews. Increases in the number of requested permissions from one version to the next, which we will call "permission ramps", may indicate benign to malware (Jekyll-Hyde) transitions.

1.1 ORGANIZATION PROFILE

LETSLEARN.GURU located at NLR, has a rich background in developing academic student projects, especially in solving latest IEEE Papers, Software Development and continues its entire attention on achieving transcending excellence in the Development and Maintenance of Software Projects and Products in Many Areas.

In Today's Modern Technological Competitive Environment, Students in Computer Science Stream Want To Ensure That They Are Getting Guidance In An Organization That Can Meet Their Professional Needs. With Our Well-Equipped Team of Solid Information Systems Professionals, Who Study, Design, Develop, Enhance, Customize, Implement, Maintain and Support Various Aspects of Information Technology, Students Can Be Sure.

We Understand the Students' Needs, And Develop Their Quality Of Professional Life By Simply Making The Technology Readily Usable For Them. We Practice Exclusively in Software Development, Network Simulation, Search Engine Optimization, Customization And System Integration. Our Project Methodology Includes Techniques For Initiating A Project, Developing The Requirements, Making Clear Assignments To The Project Team, Developing A Dynamic Schedule, Reporting Status To Executives And Problem Solving.

The indispensable factors, which give the competitive advantages over others in the market, may be slated as:

- Performance
- Pioneering efforts
- Client satisfaction
- Innovative concepts
- Constant Evaluations
- Improvisation
- Cost Effectiveness

1.2 ABOUT THE PEOPLE:

As a team we have the clear vision and realize it too. As a statistical evaluation, the team has more than 15,000 hours of expertise in providing real-time solutions in the fields of Android Mobile Apps Development, Networking, Web Designing, Secure Computing, Mobile Computing, Cloud Computing, Image Processing And Implementation, Networking With OMNET++ Simulator, client Server Technologies in Java,(J2EE\J2ME\EJB), ANDROID, DOTNET (ASP.NET, VB.NET, C#.NET), MATLAB, NS2, SIMULINK, EMBEDDED, POWER ELECTRONICS, VB & VC++, Oracle and operating system concepts with LINUX.

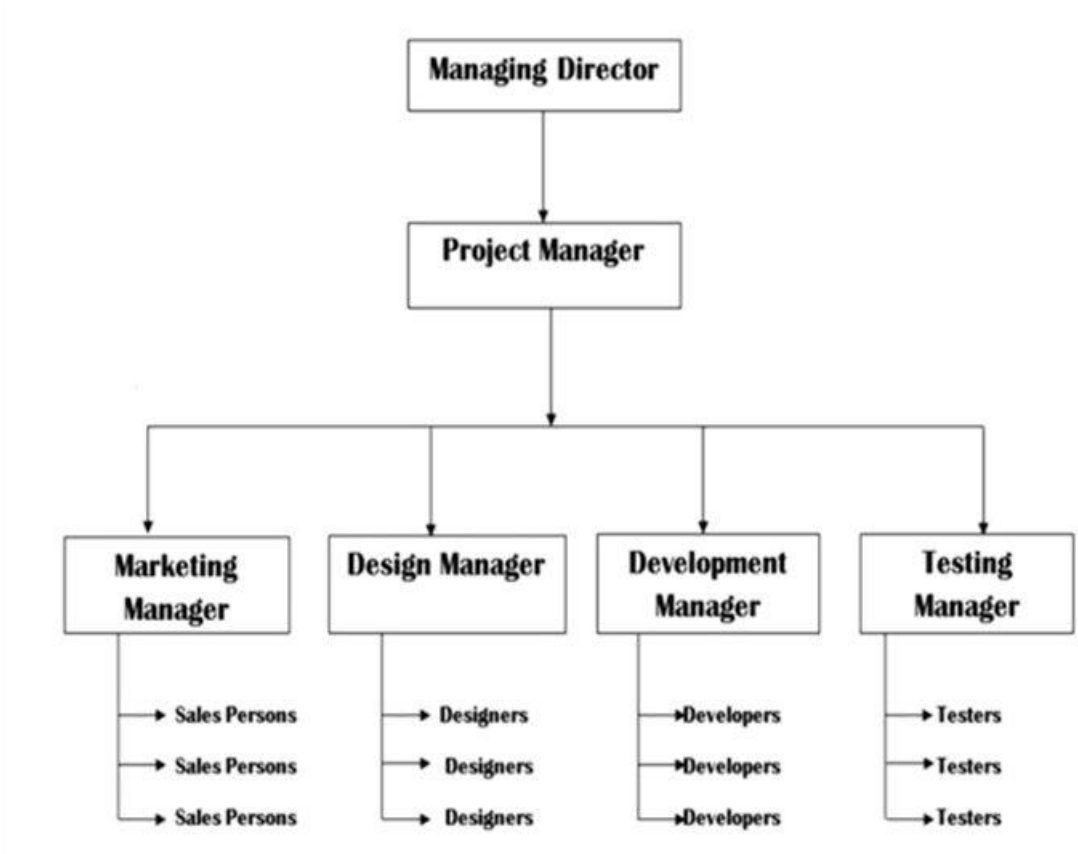
OUR VISION:

"WE CAN DEVELOP YOUR OWN IDEAS" this is our vision; we work according to our vision.

Customer Focus

We view our customer relationships as partnerships and are committed to being accountable to ensure that the development, integration and implementation of solutions are performed in a professional and timely manner. We unite this accountability with our dedication to applying the most appropriate methodologies & technologies, and we dispatch our 'best-of-breed' technology professionals to make it all happen. The result is satisfied customers who consistently give us high marks for our expansive offerings of precise engineering.

Organization Chart:



CHAPTER-2

SYSTEM STUDY AND ANALYSIS

2.1 EXISTING SYSTEM:

- In the existing system, the malware threat for mobile phones is expected to increase with the functionality enhancement of mobile phones. This threat is increased with the surge in population of smart phones instilled with stable Internet access which provides attractive targets for malware developers.
- In the existing system, in the smart phone market, Android is currently the most popular smart phone operating system. Due to this popularity and also to its open source nature, Android-based smart phones are now an ideal target for attackers. Since the number of malware designed for Android devices is increasing fast, Android users are looking for security solutions aimed at preventing malicious actions from damaging their smart phones.
- Anti-malware products promises to effectively protect against malware on mobile devices and many products are available for free or at reasonable prices. From this perspective, we propose and analyse some potential limitation-oriented techniques for effective malware detection.

Disadvantages

- There are no time related co-review behaviors.
- There is no fraudulent review filter.

PROPOSED SYSTEM

- Unlike existing solutions, the proposed system builds this work on the observation that fraudulent and malicious behaviors leave behind telltale signs on app markets. The proposed system uncovers these nefarious acts by picking out such trails.

- For instance, the high cost of setting up valid Google Play accounts forces fraudsters to reuse their accounts across review writing jobs, making them likely to review more apps in common than regular users. Resource constraints can compel fraudsters to post reviews within short time intervals. Legitimate users affected by malware may report unpleasant experiences in their reviews.

Increases in the number of requested permissions from one version to the next, which we will call “permission ramps”, may indicate benign to malware (Jekyll-Hyde) transitions.

Advantages

- Identifying both malware and search rank fraud subjects in Google Play.
- Implemented Graph Based Opinion Spam Detection.

2.3 FEASIBILITY STUDY

The feasibility of the project is analyzed in this phase and business proposal is put forth with a very general plan for the project and some cost estimates. During system analysis the feasibility study of the proposed system is to be carried out. This is to ensure that the proposed system is not a burden to the company. For feasibility analysis, some understanding of the major requirements for the system is essential.

Three key considerations involved in the feasibility analysis are

- ECONOMICAL FEASIBILITY
- TECHNICAL FEASIBILITY
- SOCIAL FEASIBILITY

2.3.1 ECONOMICAL FEASIBILITY

This study is carried out to check the economic impact that the system will have on the organization. The amount of fund that the company can pour into the research and development of the system is limited. The expenditures must be justified. Thus the developed system as well within the budget and this was achieved because most of the technologies used are freely available. Only the customized products had to be purchased.

2.3.2 TECHNICAL FEASIBILITY

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources. This will lead to high demands on the available technical resources. This will lead to high demands being placed on the client. The developed system must have a modest requirement, as only minimal or null changes are required for implementing this system.

2.3.2 SOCIAL FEASIBILITY

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel

threatened by the system, instead must accept it as a necessity. The level of acceptance by the users solely depends on the methods that are employed to educate the user about the system and to make him familiar with it. His level of confidence must be raised so that he is also able to make some constructive criticism, which is welcomed, as he is the final user of the system.

2.4 FUNCTIONAL REQUIREMENTS

Admin

It is used by the admin for activating and deactivating user request.

User

It is used to add document into database or used to download document from database.

Modular Manager

It is used to accept the document that is to be upload

2.5 NON-FUNCTIONAL REQUIREMENTS:

Non-Functional Requirements (quality attributes) ensure the delivery of an operable and manageable system which provides the required functionality reliable, uninterrupted or with minimal time of interruption even under unusual situations.

- **Security**

  Login requirements - access levels, CRUD levels

  Password requirements - length, special characters, expiry, recycling policies Inactivity timeouts – durations, actions

- **Audit**

  Audited elements – what business elements will be audited?

  Audited fields – which data fields will be audited?

  Audit file characteristics - before image, after image, user and time stamp, etc

- **Performance**

Response times - application loading, screen open and refresh times, etc Processing times – functions, calculations, imports, exports

Query and Reporting times – initial loads and subsequent loads Capacity.

- **Availability**

Hours of operation – when is it available? Consider weekends, holidays, maintenance times, etc

Locations of operation – where should it be available from, what are the connection requirements?

- **Reliability**

Mean Time Between Failures – What is the acceptable threshold for down-time? e .g. One a year, 4,000 hours

Mean Time To Recovery – if broken, how much time is available to get the system back up again?

- **Integrity**

Fault trapping (I/O) – how to handle electronic interface failures, etc

Bad data trapping - data imports, flag-and-continue or stop the import policies, etc

Data integrity – referential integrity in database tables and interfaces.Image compression and decompression standards

- **Recovery**

Recovery process – how do recoveries work, what is the process?

Recovery time scales – how quickly should a recovery take to perform?

Backup frequencies – how often is the transaction data, set-up data, and system (code) backed-up?

Backup generations - what are the requirements for restoring to previous instance(s)?

- **Compatibility**

Compatibility on different operating systems – What does it have to be able to run on?

Compatibility on different platforms – What are the hardware platforms it needs to work on?

- **Maintainability**

Conformance to architecture standards – What are the standards it needs to conform to or have exclusions from?

Conformance to design standards – What design standards must be adhered to or exclusions created?

Conformance to coding standards – What coding standards must be adhered to or exclusions created?

- **Usability**

Look and feel standards - screen element density, layout and flow, colours, UI metaphors, keyboard shortcuts

Internationalization / localization requirements – languages, spellings, keyboards, paper sizes, etc

- **Documentation**

Required documentation items and audiences for each item

CHAPTER-3

DEVELOPMENT ENVIRONMENT

3.1 SOFTWARE REQUIREMENTS:

- Programming Language : JAVA/J2EE
- Java Version : JDK 1.6 & above
- Data Base : MY SQL
- Operating System : Windows OS

3.2 HARDWARE REQUIREMENTS:

- Processor : Intel-i3
- Ram : 1GB(min)
- Hard Disk : 256 GB

ABOUT FRONT END

3.3 Java Technology

Java technology is both a programming language and a platform.

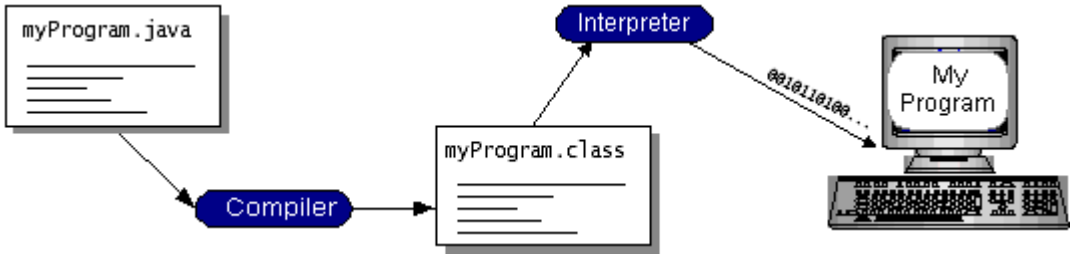
The Java Programming Language

The Java programming language is a high-level language that can be characterized by all of the following buzzwords:

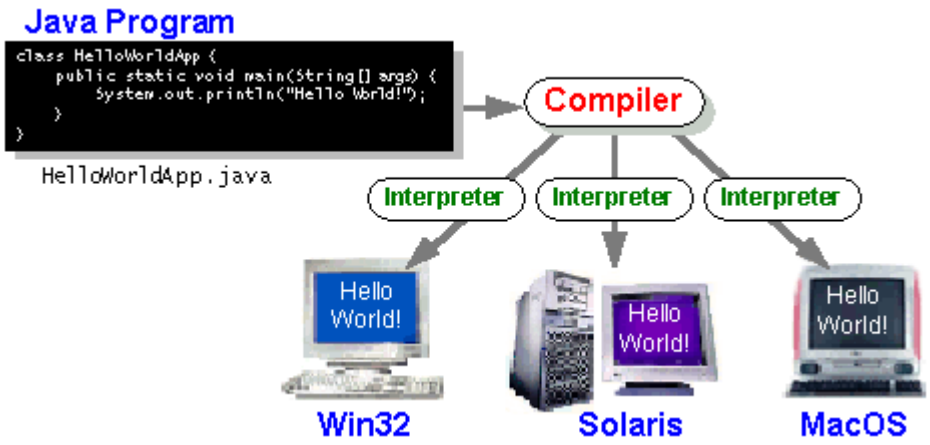
- Simple
- Architecture neutral
- Object oriented
- Portable
- Distributed
- High performance
- Interpreted
- Multithreaded
- Robust
- Dynamic
- Secure

With most programming languages, you either compile or interpret a program so that you can run it on your computer. The Java programming language is unusual in that a program is both compiled and interpreted. With the compiler, first you translate a program into an

intermediate language called *Java byte codes* —the platform-independent codes interpreted by the interpreter on the Java platform. The interpreter parses and runs each Java byte code instruction on the computer. Compilation happens just once; interpretation occurs each time the program is executed. The following figure illustrates how this works.



You can think of Java byte codes as the machine code instructions for the *Java Virtual Machine* (Java VM). Every Java interpreter, whether it's a development tool or a Web browser that can run applets, is an implementation of the Java VM. Java byte codes help make "write once, run anywhere" possible. You can compile your program into byte codes on any platform that has a Java compiler. The byte codes can then be run on any implementation of the Java VM. That means that as long as a computer has a Java VM, the same program written in the Java programming language can run on Windows 2000, a Solaris workstation, or on an iMac.



The Java Platform

A *platform* is the hardware or software environment in which a program runs. We've already mentioned some of the most popular platforms like Windows 2000, Linux, Solaris, and Mac OS. Most platforms can be described as a combination of the operating system and hardware.

The Java platform differs from most other platforms in that it's a software-only platform that runs on top of other hardware-based platforms.

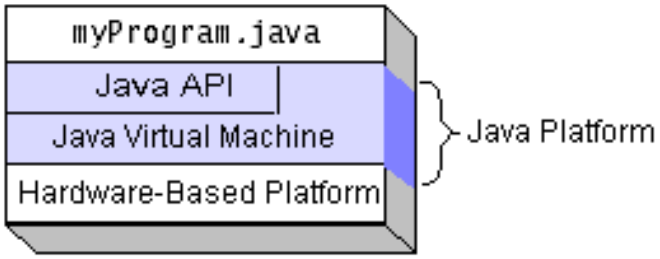
The Java platform has two components:

- The *Java Virtual Machine* (Java VM)
- The *Java Application Programming Interface* (Java API)

You've already been introduced to the Java VM. It's the base for the Java platform and is ported onto various hardware-based platforms.

The Java API is a large collection of ready-made software components that provide many useful capabilities, such as graphical user interface (GUI) widgets. The Java API is grouped into libraries of related classes and interfaces; these libraries are known as *packages*. The next section, what Can Java Technology Do? Highlights what functionality some of the packages in the Java API provide.

The following figure depicts a program that's running on the Java platform. As the figure shows, the Java API and the virtual machine insulate the program from the hardware.



Native code is code that after you compile it, the compiled code runs on a specific hardware platform. As a platform-independent environment, the Java platform can be a bit slower than native code. However, smart compilers, well-tuned interpreters, and just-in-time byte code compilers can bring performance close to that of native code without threatening portability.

What Can Java Technology Do?

The most common types of programs written in the Java programming language are *applets* and *applications*. If you've surfed the Web, you're probably already familiar with applets. An applet is a program that adheres to certain conventions that allow it to run within a Java-enabled browser.

However, the Java programming language is not just for writing cute, entertaining applets for the Web. The general-purpose, high-level Java programming language is also a powerful software platform. Using the generous API, you can write many types of programs.

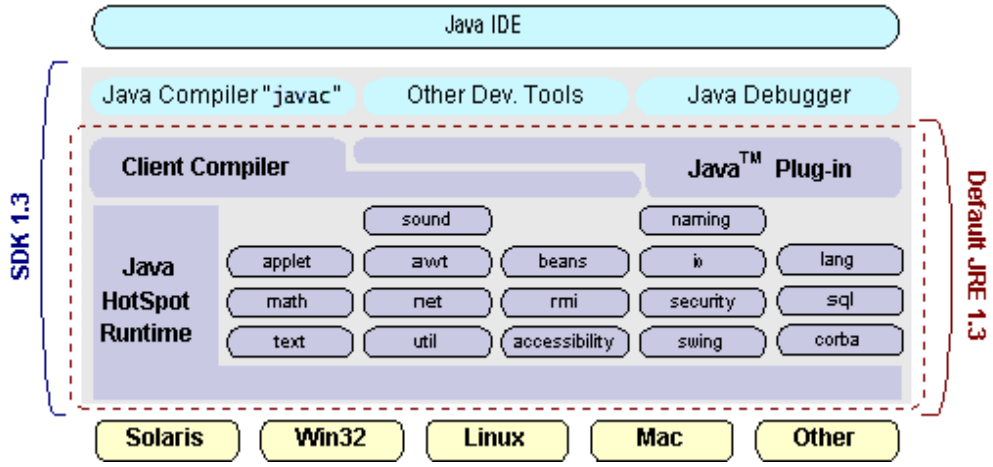
An application is a standalone program that runs directly on the Java platform. A special kind of application known as a *server* serves and supports clients on a network. Examples of

servers are Web servers, proxy servers, mail servers, and print servers. Another specialized program is a *servlet*. A servlet can almost be thought of as an applet that runs on the server side. Java Servlets are a popular choice for building interactive web applications, replacing the use of CGI scripts. Servlets are similar to applets in that they are runtime extensions of applications. Instead of working in browsers, though, servlets run within Java Web servers, configuring or tailoring the server.

How does the API support all these kinds of programs? It does so with packages of software components that provides a wide range of functionality. Every full implementation of the Java platform gives you the following features:

- **The essentials**: Objects, strings, threads, numbers, input and output, data structures, system properties, date and time, and so on.
- **Applets**: The set of conventions used by applets.
- **Networking**: URLs, TCP (Transmission Control Protocol), UDP (User Data gram Protocol) sockets, and IP (Internet Protocol) addresses.
- **Internationalization**: Help for writing programs that can be localized for users worldwide. Programs can automatically adapt to specific locales and be displayed in the appropriate language.
- **Security**: Both low level and high level, including electronic signatures, public and private key management, access control, and certificates.
- **Software components**: Known as Java Beans ™, can plug into existing component architectures.
- **Object serialization**: Allows lightweight persistence and communication via Remote Method Invocation (RMI).
- **Java Database Connectivity (JDBC™)**: Provides uniform access to a wide range of relational databases.

The Java platform also has APIs for 2D and 3D graphics, accessibility, servers, collaboration, telephony, speech, animation, and more. The following figure depicts what is included in the Java 2 SDK.



How Will Java Technology Change My Life?

We can't promise you fame, fortune, or even a job if you learn the Java programming language. Still, it is likely to make your programs better and requires less effort than other languages. We believe that Java technology will help you do the following:

- **Get started quickly**: Although the Java programming language is a powerful object-oriented language, it's easy to learn, especially for programmers already familiar with C or C++.
- **Write less code**: Comparisons of program metrics (class counts, method counts, and so on) suggest that a program written in the Java programming language can be four times smaller than the same program in C++.
- **Write better code**: The Java programming language encourages good coding practices, and its garbage collection helps you avoid memory leaks. Its object orientation, its JavaBeans component architecture, and its wide-ranging, easily extendible API let you reuse other people's tested code and introduce fewer bugs.
- **Develop programs more quickly**: Your development time may be as much as twice as fast versus writing the same program in C++. Why? You write fewer lines of code and it is a simpler programming language than C++.
- **Avoid platform dependencies with 100% Pure Java**: You can keep your program portable by avoiding the use of libraries written in other languages. The 100% Pure Java™ Product Certification Program has a repository of historical process manuals, white papers, brochures, and similar materials online.
- **Write once, run anywhere**: Because 100% Pure Java programs are compiled into machine-independent byte codes, they run consistently on any Java platform.

- **Distribute software more easily**: You can upgrade applets easily from a central server. Applets take advantage of the feature of allowing new classes to be loaded "on the fly," without recompiling the entire program.

ODBC

Microsoft Open Database Connectivity (ODBC) is a standard programming interface for application developers and database systems providers. Before ODBC became a *de facto* standard for Windows programs to interface with database systems, programmers had to use proprietary languages for each database they wanted to connect to. Now, ODBC has made the choice of the database system almost irrelevant from a coding perspective, which is as it should be. Application developers have much more important things to worry about than the syntax that is needed to port their program from one database to another when business needs suddenly change.

Through the ODBC Administrator in Control Panel, you can specify the particular database that is associated with a data source that an ODBC application program is written to use. Think of an ODBC data source as a door with a name on it. Each door will lead you to a particular database. For example, the data source named Sales Figures might be a SQL Server database, whereas the Accounts Payable data source could refer to an Access database. The physical database referred to by a data source can reside anywhere on the LAN.

The ODBC system files are not installed on your system by Windows 95. Rather, they are installed when your setup a separate database application, such as SQL Server Client or Visual Basic 4.0. When the ODBC icon is installed in Control Panel, it uses a file called ODBCINST.DLL. It is also possible to administer your ODBC data sources through a stand-alone program called ODBCADM.EXE. There is a 16-bit and a 32-bit version of this program and each maintains a separate list of ODBC data sources.

From a programming perspective, the beauty of ODBC is that the application can be written to use the same set of function calls to interface with any data source, regardless of the database vendor. The source code of the application doesn't change whether it talks to Oracle or SQL Server. We only mention these two as an example. There are ODBC drivers available for several dozen popular database systems. Even Excel spreadsheets and plain text files can be turned into data sources. The operating system uses the Registry information written by ODBC Administrator to determine which low-level ODBC drivers are needed to talk to the data source (such as the interface to Oracle or SQL Server). The loading of the ODBC drivers is transparent to the ODBC application program. In a client/server environment, the ODBC API even handles many of the network issues for the application programmer.

The advantages of this scheme are so numerous that you are probably thinking there must be some catch. The only disadvantage of ODBC is that it isn't as efficient as talking directly to the native database interface. ODBC has had many detractors make the charge that it is too slow. Microsoft has always claimed that the critical factor in performance is the quality of the driver software that is used. In our humble opinion, this is true. The availability of good ODBC drivers has improved a great deal recently. And anyway, the criticism about performance is somewhat analogous to those who said that compilers would never match the speed of pure assembly language. Maybe not, but the compiler (or ODBC) gives you the opportunity to write cleaner programs, which means you finish sooner. Meanwhile, computers get faster every year.

JDBC

In an effort to set an independent database standard API for Java; Sun Microsystems developed Java Database Connectivity, or JDBC. JDBC offers a generic SQL database access mechanism that provides a consistent interface to a variety of RDBMSs. This consistent interface is achieved through the use of "plug-in" database connectivity modules, or *drivers*. If a database vendor wishes to have JDBC support, he or she must provide the driver for each platform that the database and Java run on.

To gain a wider acceptance of JDBC, Sun based JDBC's framework on ODBC. As you discovered earlier in this chapter, ODBC has widespread support on a variety of platforms. Basing JDBC on ODBC will allow vendors to bring JDBC drivers to market much faster than developing a completely new connectivity solution.

JDBC was announced in March of 1996. It was released for a 90 day public review that ended June 8, 1996. Because of user input, the final JDBC v1.0 specification was released soon after.

The remainder of this section will cover enough information about JDBC for you to know what it is about and how to use it effectively. This is by no means a complete overview of JDBC. That would fill an entire book.

JDBC Goals

Few software packages are designed without goals in mind. JDBC is one that, because of its many goals, drove the development of the API. These goals, in conjunction with early reviewer feedback, have finalized the JDBC class library into a solid framework for building database applications in Java.

The goals that were set for JDBC are important. They will give you some insight as to why certain classes and functionalities behave the way they do. The eight design goals for JDBC are as follows:

1. **SQL Level API**

The designers felt that their main goal was to define a SQL interface for Java. Although not the lowest database interface level possible, it is at a low enough level for higher-level tools and APIs to be created. Conversely, it is at a high enough level for application programmers to use it confidently. Attaining this goal allows for future tool vendors to "generate" JDBC code and to hide many of JDBC's complexities from the end user.

2. **SQL Conformance**

SQL syntax varies as you move from database vendor to database vendor. In an effort to support a wide variety of vendors, JDBC will allow any query statement to be passed through it to the underlying database driver. This allows the connectivity module to handle non-standard functionality in a manner that is suitable for its users.

3. **JDBC must be implemental on top of common database interfaces** The JDBC SQL API must "sit" on top of other common SQL level APIs. This goal allows JDBC to use existing ODBC level drivers by the use of a software interface. This interface would translate JDBC calls to ODBC and vice versa.
4. **Provide a Java interface that is consistent with the rest of the Java system**

Because of Java's acceptance in the user community thus far, the designers feel that they should not stray from the current design of the core Java system.

5. **Keep it simple**

This goal probably appears in all software design goal listings. JDBC is no exception. Sun felt that the design of JDBC should be very simple, allowing for only one method of completing a task per mechanism. Allowing duplicate functionality only serves to confuse the users of the API.

6. **Use strong, static typing wherever possible**

Strong typing allows for more error checking to be done at compile time; also, less error appear at runtime.

7. **Keep the common cases simple**

Because more often than not, the usual SQL calls used by the programmer are simple SELECT's, INSERT's, DELETE's and UPDATE's, these queries should be simple to perform with JDBC. However, more complex SQL statements should also be possible.

Finally we decided to proceed the implementation using Java Networking.

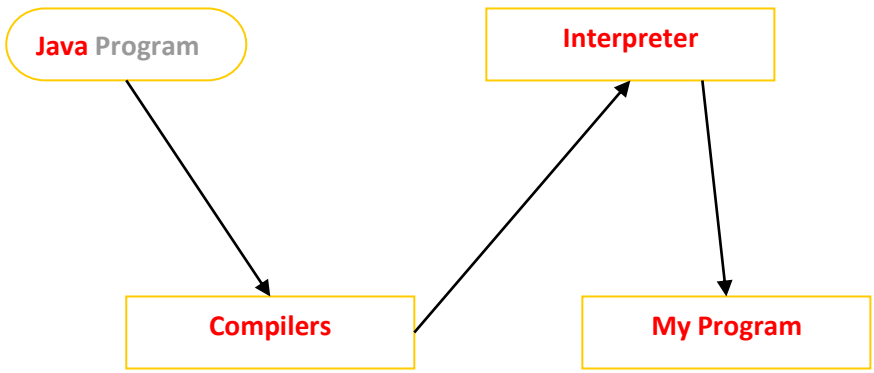
And for dynamically updating the cache table we go for MS Access database.

Java ha two things: a programming language and a platform.

Java is a high-level programming language that is all of the following

Simple	Architecture-neutral
Object-oriented	Portable
Distributed	High-performance
Interpreted	multithreaded
Robust	Dynamic
Secure	

Java is also unusual in that each Java program is both compiled and interpreted. With a compile you translate a Java program into an intermediate language called Java byte codes the platform-independent code instruction is passed and run on the computer. Compilation happens just once; interpretation occurs each time the program is executed. The figure illustrates how this works.



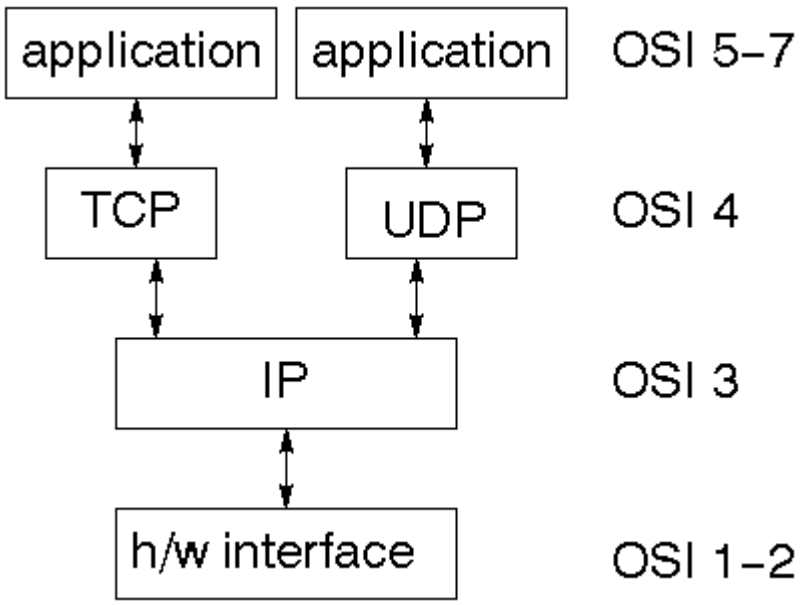
You can think of Java byte codes as the machine code instructions for the Java Virtual Machine (Java VM). Every Java interpreter, whether it's a Java development tool or a Web browser that can run Java applets, is an implementation of the Java VM. The Java VM can also be implemented in hardware.

Java byte codes help make "write once, run anywhere" possible. You can compile your Java program into byte codes on my platform that has a Java compiler. The byte codes can then be run any implementation of the Java VM. For example, the same Java program can run Windows NT, Solaris, and Macintosh

Networking

TCP/IP stack

The TCP/IP stack is shorter than the OSI one:



TCP is a connection-oriented protocol; UDP (User Datagram Protocol) is a connectionless protocol.

IP datagram's

The IP layer provides a connectionless and unreliable delivery system. It considers each datagram independently of the others. Any association between datagram must be supplied by the higher layers. The IP layer supplies a checksum that includes its own header. The header includes the source and destination addresses. The IP layer handles routing through an

Internet. It is also responsible for breaking up large datagram into smaller ones for transmission and reassembling them at the other end.

UDP

UDP is also connectionless and unreliable. What it adds to IP is a checksum for the contents of the datagram and port numbers. These are used to give a client/server model - see later.

TCP

TCP supplies logic to give a reliable connection-oriented protocol above IP. It provides a virtual circuit that two processes can use to communicate.

Internet addresses

In order to use a service, you must be able to find it. The Internet uses an address scheme for machines so that they can be located. The address is a 32 bit integer which gives the IP address. This encodes a network ID and more addressing. The network ID falls into various classes according to the size of the network address.

Network address

Class A uses 8 bits for the network address with 24 bits left over for other addressing. Class B uses 16 bit network addressing. Class C uses 24 bit network addressing and class D uses all 32.

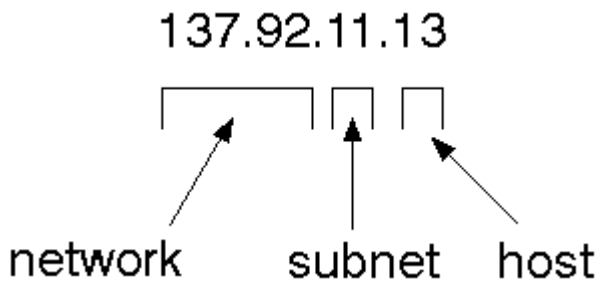
Subnet address

Internally, the UNIX network is divided into sub networks. Building 11 is currently on one sub network and uses 10-bit addressing, allowing 1024 different hosts.

Host address

8 bits are finally used for host addresses within our subnet. This places a limit of 256 machines that can be on the subnet.

Total address



The 32-bit address is usually written as 4 integers separated by dots.

Port addresses

A service exists on a host, and is identified by its port. This is a 16 bit number. To send a message to a server, you send it to the port for that service of the host that it is running on. This is not location transparency! Certain of these ports are "well known".

Sockets

A socket is a data structure maintained by the system to handle network connections. A socket is created using the call socket. It returns an integer that is like a file descriptor. In fact, under Windows, this handle can be used with Read File and Write File functions.

```
#include <sys/types.h>
#include <sys/socket.h>
int socket(int family, int type, int protocol);
```

Here "family" will be AF_INET for IP communications, protocol will be zero, and type will depend on whether TCP or UDP is used. Two processes wishing to communicate over a network create a socket each. These are similar to two ends of a pipe - but the actual pipe does not yet exist.

J Free Chart

J Free Chart is a free 100% Java chart library that makes it easy for developers to display professional quality charts in their applications. Fréchet's extensive feature set includes:

- A consistent and well-documented API, supporting a wide range of chart types;

- A flexible design that is easy to extend, and targets both server-side and client-side applications;
- Support for many output types, including Swing components, image files (including PNG and JPEG), and vector graphics file formats (including PDF, EPS and SVG);
- J Free Chart is "open source" or, more specifically, free software. It is distributed under the terms of the GNU Lesser General Public License (LGPL), which permits use in proprietary applications.

1. Map Visualizations

- Charts showing values that relate to geographical areas. Some examples include: (a) population density in each state of the United States, (b) income per capita for each country in Europe, (c) life expectancy in each country of the world. The tasks in this project include:
- Sourcing freely redistributable vector outlines for the countries of the world, states/provinces in particular countries (USA in particular, but also other areas);
- Creating an appropriate dataset interface (plus default implementation), a rendered, and integrating this with the existing XY Plot class in J Free Chart;
- Testing, documenting, testing some more, documenting some more.

2. Time Series Chart Interactivity

Implement a new (to J Free Chart) feature for interactive time series charts --- to display a separate control that shows a small version of ALL the time series data, with a sliding "view" rectangle that allows you to select the subset of the time series data to display in the main chart.

3. Dashboards

There is currently a lot of interest in dashboard displays. Create a flexible dashboard mechanism that supports a subset of J Free Chart chart types (dials, pies, thermometers, bars, and lines/time series) that can be delivered easily via both Java Web Start and an applet.

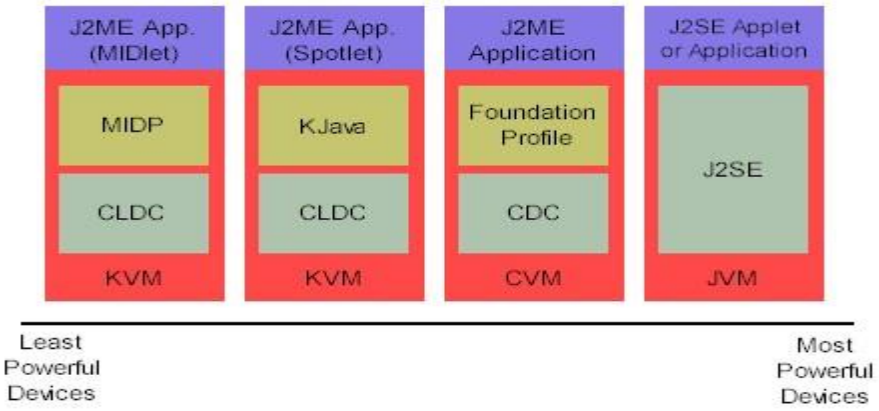
4. Property Editors

The property editor mechanism in J Free Chart only handles a small subset of the properties that can be set for charts. Extend (or re implement) this mechanism to provide greater end-user control over the appearance of the charts.

J2ME (Java 2 Micro edition): -

Sun Microsystems defines J2ME as "a highly optimized Java run-time environment targeting a wide range of consumer products, including pagers, cellular phones, screen-phones, digital set-top boxes and car navigation systems." Announced in June 1999 at the Java One Developer Conference, J2ME brings the cross-platform functionality of the Java language to smaller devices, allowing mobile wireless devices to share applications. With J2ME, Sun has adapted the Java platform for consumer products that incorporate or are based on small computing devices.

1. General J2ME architecture



J2ME uses configurations and profiles to customize the Java Runtime Environment (JRE). As a complete JRE, J2ME is comprised of a configuration, which determines the JVM used, and a profile, which defines the application by adding domain-specific classes. The configuration defines the basic run-time environment as a set of core classes and a specific JVM that run on specific types of devices. We'll discuss configurations in detail. The profile defines the application; specifically, it adds domain-specific classes to the J2ME configuration to define certain uses for devices. We'll cover profiles in depth. The following graphic depicts the relationship between the different virtual machines, configurations, and profiles. It also draws a parallel with the J2SE API and its Java virtual machine. While the J2SE virtual machine is generally referred to as a JVM, the J2ME virtual machines, KVM and CVM, are subsets of JVM. Both KVM and CVM can be thought of as a kind of Java virtual machine -- it's just that they are shrunken versions of the J2SE JVM and are specific to J2ME.

2. Developing J2ME applications

Introduction In this section, we will go over some considerations you need to keep in mind when developing applications for smaller devices. We'll take a look at the way the

compiler is invoked when using J2SE to compile J2ME applications. Finally, we'll explore packaging and deployment and the role preverification plays in this process.

3. Design considerations for small devices

Developing applications for small devices requires you to keep certain strategies in mind during the design phase. It is best to strategically design an application for a small device before you begin coding. Correcting the code because you failed to consider all of the "got chas" before developing the application can be a painful process. Here are some design strategies to consider:

* Keep it simple. Remove unnecessary features, possibly making those features a separate, secondary application.

* Smaller is better. This consideration should be a "no brainer" for all developers. Smaller applications use less memory on the device and require shorter installation times. Consider packaging your Java applications as compressed Java Archive (jar) files.

* Minimize run-time memory use. To minimize the amount of memory used at run time, use scalar types in place of object types. Also, do not depend on the garbage collector. You should manage the memory efficiently yourself by setting object references to null when you are finished with them. Another way to reduce run-time memory is to use lazy instantiation, only allocating objects on an as-needed basis. Other ways of reducing overall and peak memory use on small devices are to release resources quickly, reuse objects, and avoid exceptions.

4. Configurations overview

The configuration defines the basic run-time environment as a set of core classes and a specific JVM that run on specific types of devices. Currently, two configurations exist for J2ME, though others may be defined in the future:

* **Connected Limited Device Configuration (CLDC)**

It is used specifically with the KVM for 16-bit or 32-bit devices with limited amounts of memory. This is the configuration (and the virtual machine) used for developing small J2ME applications. Its size limitations make CLDC more interesting and challenging (from a development point of view) than CDC. CLDC is also the configuration that we will use for developing our drawing tool application. An example of a small wireless device running small applications is a Palm hand-held computer.

* **Connected Device Configuration (CDC)**

It is used with the C virtual machine (CVM) and is used for 32-bit architectures requiring more than 2 MB of memory. An example of such a device is a Net TV box.

5. J2ME profiles

What is a J2ME profile?

As we mentioned earlier in this tutorial, a profile defines the type of device supported. The Mobile Information Device Profile (MIDP), for example, defines classes for cellular phones. It adds domain-specific classes to the J2ME configuration to define uses for similar devices. Two profiles have been defined for J2ME and are built upon CLDC: K Java and MIDP. Both KJava and MIDP are associated with CLDC and smaller devices. Profiles are built on top of configurations. Because profiles are specific to the size of the device (amount of memory) on which an application runs, certain profiles are associated with certain configurations.

A skeleton profile upon which you can create your own profile, the Foundation Profile, is available for CDC.

Profile 1: K Java

K Java is Sun's proprietary profile and contains the K Java API. The K Java profile is built on top of the CLDC configuration. The K Java virtual machine, KVM, accepts the same byte codes and class file format as the classic J2SE virtual machine. K Java contains a Sun-specific API that runs on the Palm OS. The K Java API has a great deal in common with the J2SE Abstract Windowing Toolkit (AWT). However, because it is not a standard J2ME package, its main package is com. sun. kjava. We'll learn more about the K Java API later in this tutorial when we develop some sample applications.

Profile 2: MIDP

MIDP is geared toward mobile devices such as cellular phones and pagers. The MIDP, like KJava, is built upon CLDC and provides a standard run-time environment that allows new applications and services to be deployed dynamically on end user devices. MIDP is a common, industry-standard profile for mobile devices that is not dependent on a specific vendor. It is a complete and supported foundation for mobile application development. MIDP contains the following packages, the first three of which are core CLDC packages, plus three MIDP-specific packages.

* java.lang

* java.io

* java.util

* javax.microedition.io

* javax.microedition.lcdui

* javax.microedition.midlet

* javax.microedition.rms

CHAPTER-4

SYSTEM DESIGN

4.1 UML DIAGRAMS

UML stands for Unified Modeling Language. UML is a standardized general-purpose modeling language in the field of object-oriented software engineering. The standard is managed, and was created by, the Object Management Group.

The goal is for UML to become a common language for creating models of object oriented computer software. In its current form UML is comprised of two major components: a Meta-model and a notation. In the future, some form of method or process may also be added to; or associated with, UML.

The Unified Modeling Language is a standard language for specifying, Visualization, Constructing and documenting the artifacts of software system, as well as for business modeling and other non-software systems.

The UML represents a collection of best engineering practices that have proven successful in the modeling of large and complex systems.

The UML is a very important part of developing objects oriented software and the software development process. The UML uses mostly graphical notations to express the design of software projects.

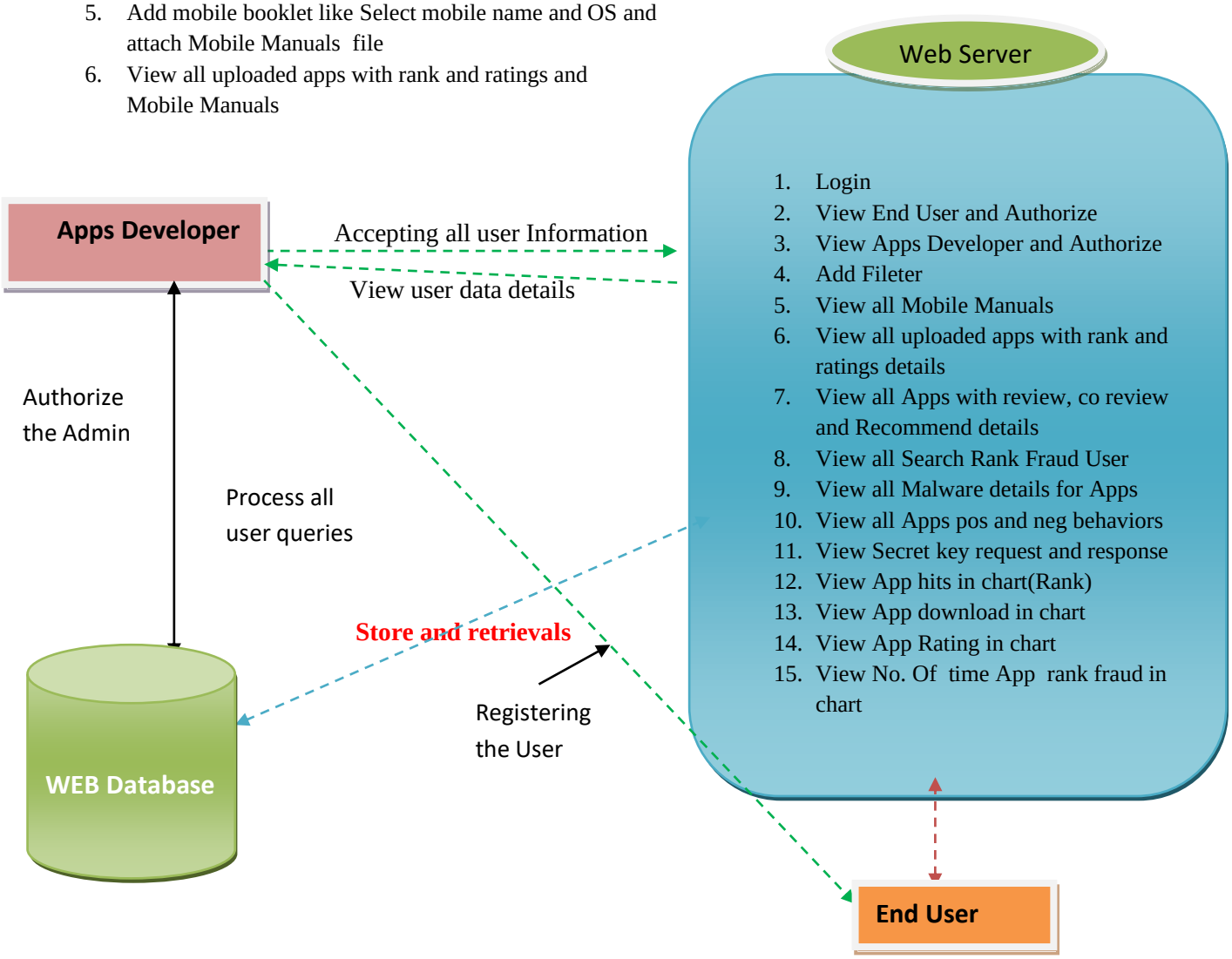
GOALS:

The Primary goals in the design of the UML are as follows:

1. Provide users a ready-to-use, expressive visual modeling Language so that they can develop and exchange meaningful models.
2. Provide extendibility and specialization mechanisms to extend the core concepts.
3. Be independent of particular programming languages and development process.
4. Provide a formal basis for understanding the modeling language.
5. Encourage the growth of OO tools market.
6. Support higher level development concepts such as collaborations, frameworks, patterns and components.
7. Integrate best practices.

Architecture Diagram

1. Register and Login
2. View Profile
3. Add Mobile name and Os
4. Select mobile name and OS and Upload apps with Appname,App uses,App desc(enc),App logo image,attach app
5. Add mobile booklet like Select mobile name and OS and attach Mobile Manuals file
6. View all uploaded apps with rank and ratings and Mobile Manuals

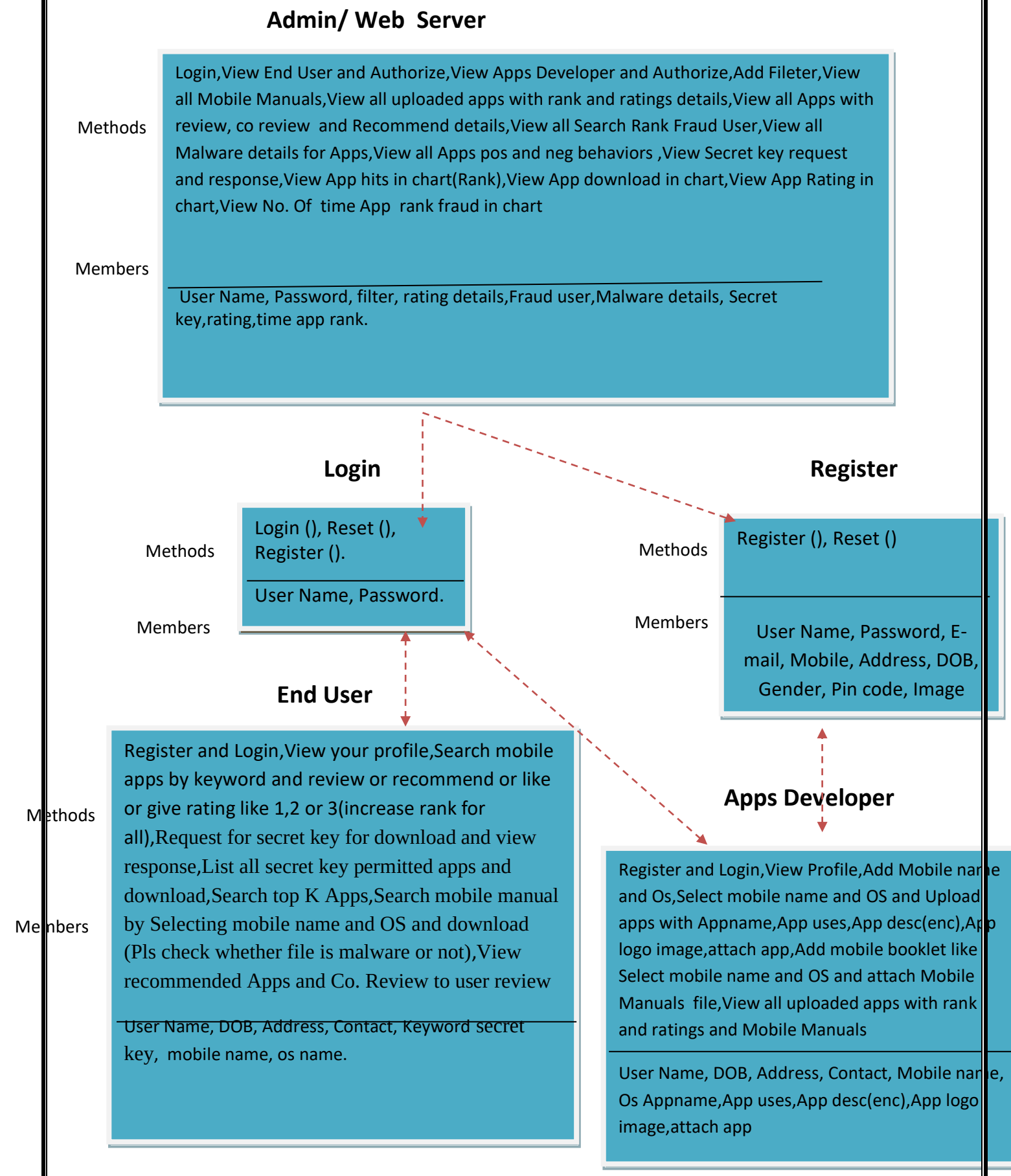


Note::

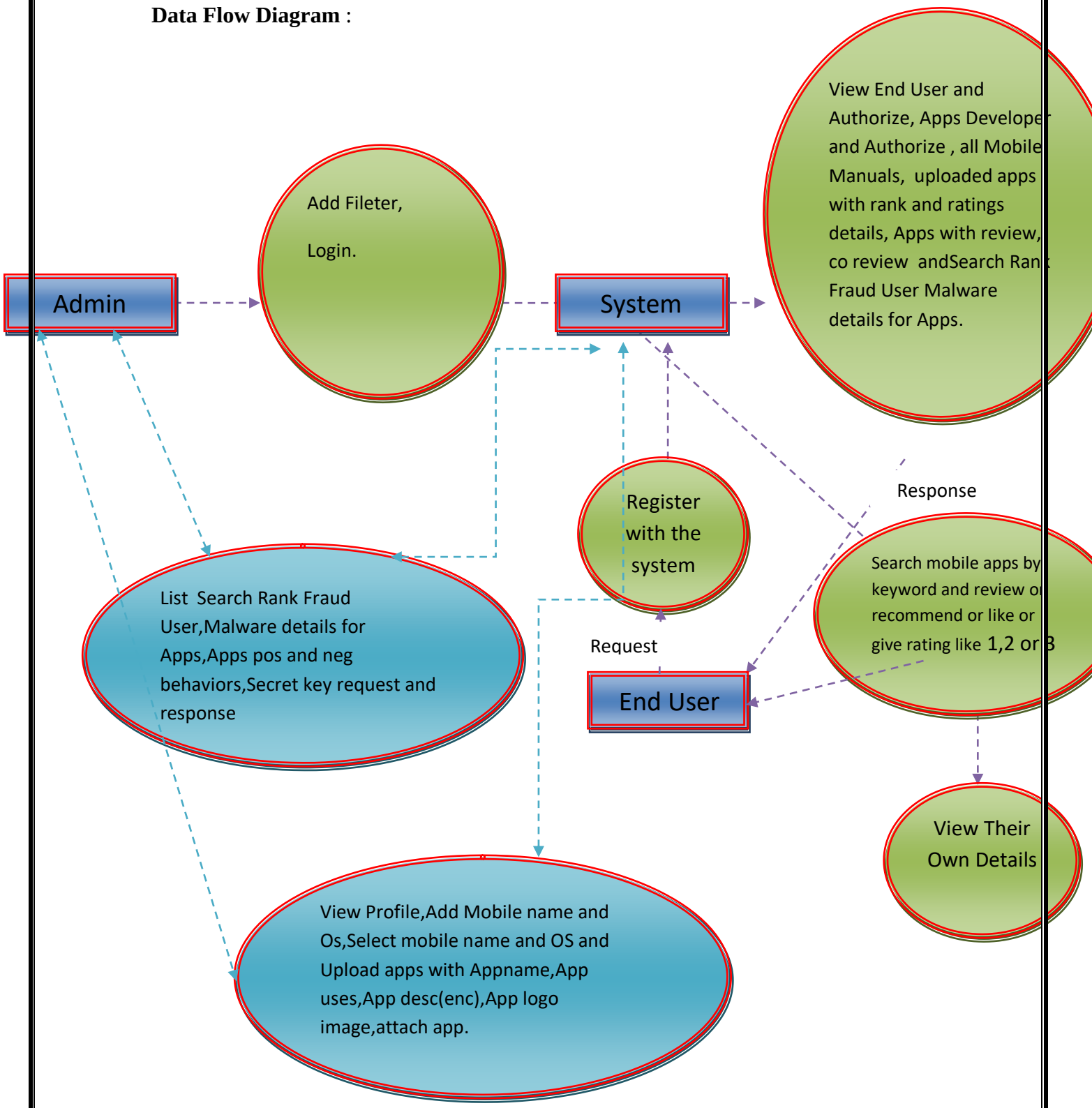
Consider User as a Fraud user If he downloads or reviews or recommend more than 3 times a day.

1. Register and Login
2. View your profile
3. Search mobile apps by keyword and review or recommend or like or give rating like 1,2 or 3(increase rank for all)
4. Request for secret key for download and view response
5. List all secret key permitted apps and download
6. Search top K Apps
7. Search mobile manual by Selecting mobile name and OS and download (Pls check whether file is malware or not)
8. View recommended Apps and Co. Review to user review

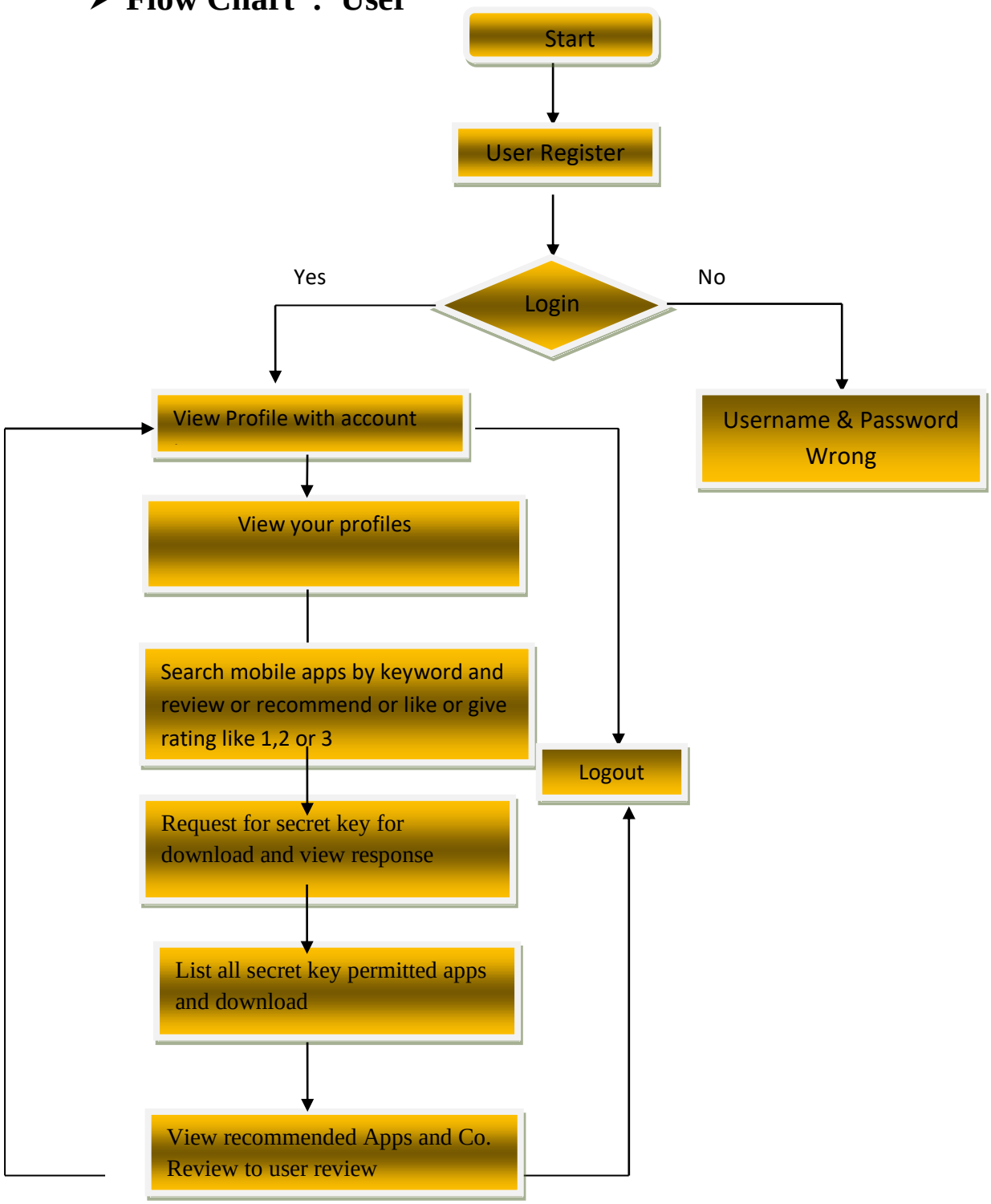
Class Diagram :



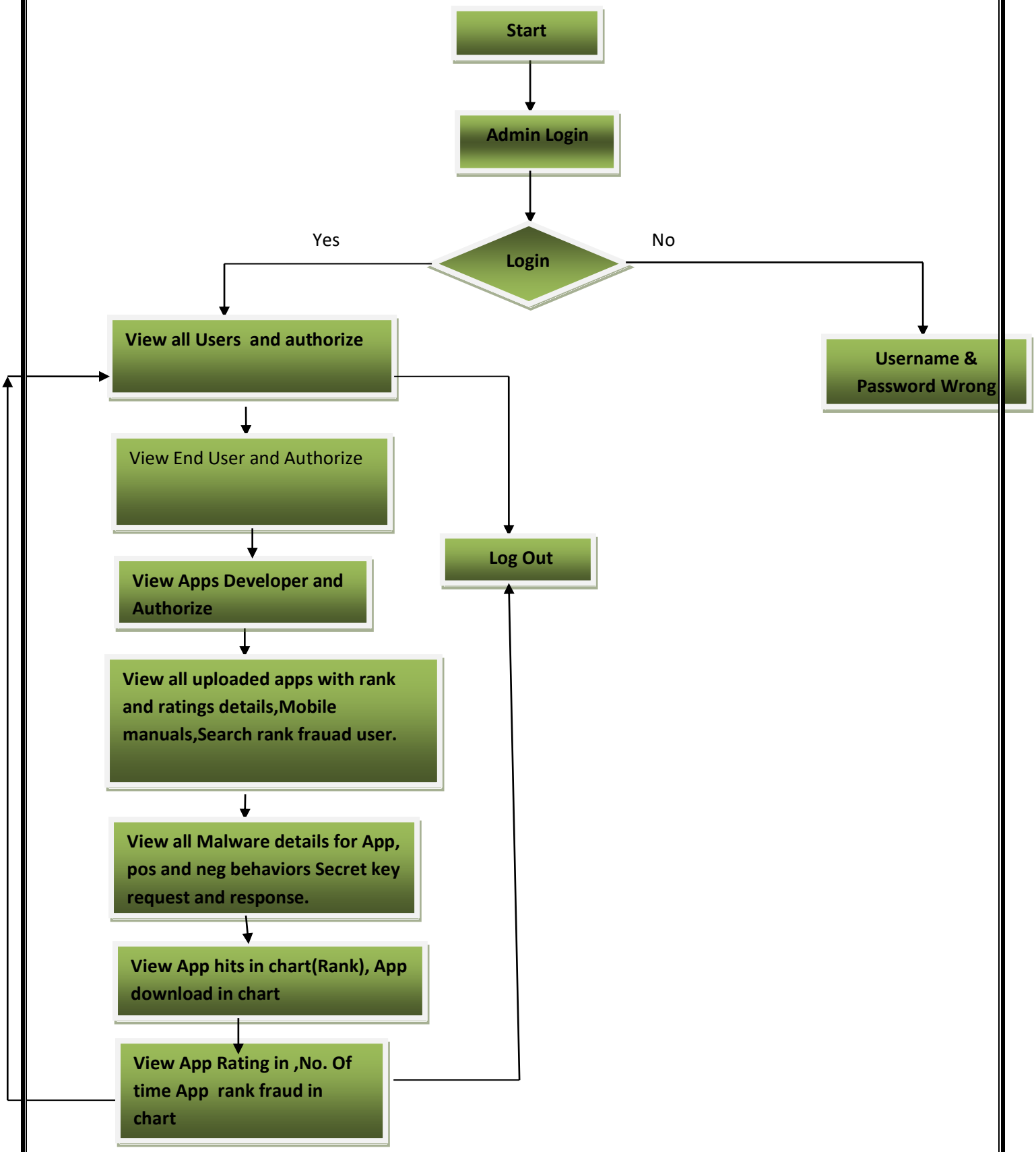
Data Flow Diagram :



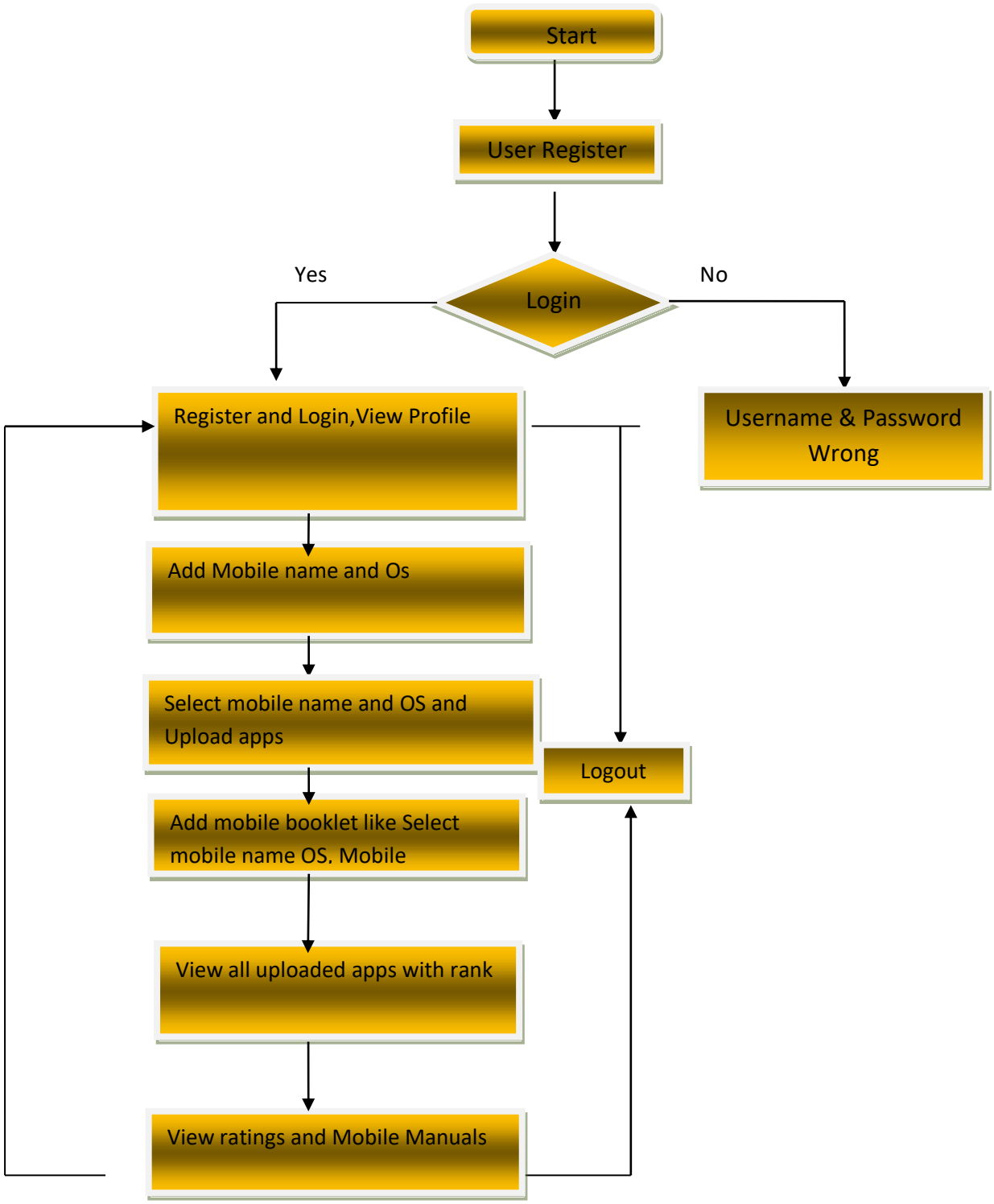
➢ Flow Chart : User



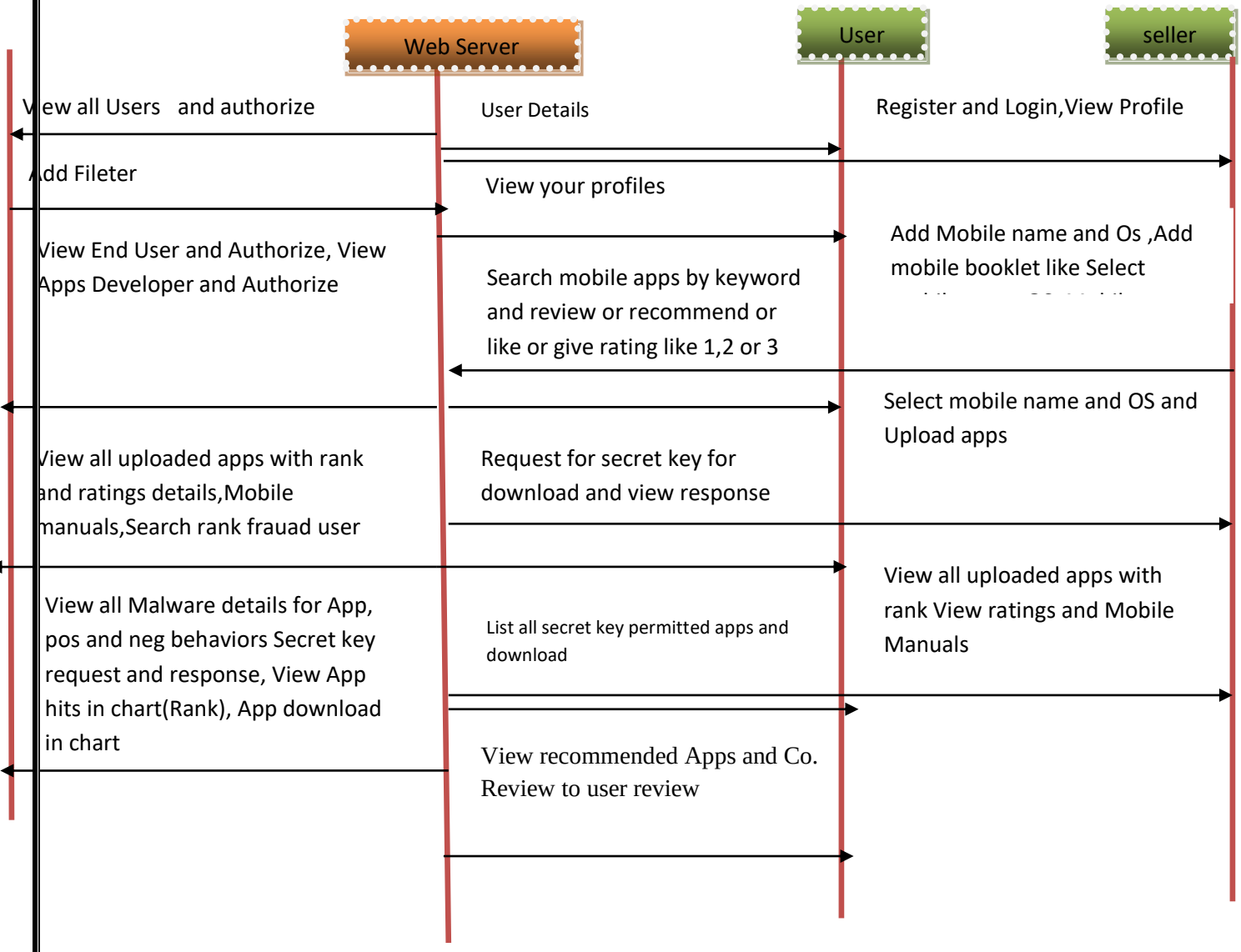
Flow Chart : Admin



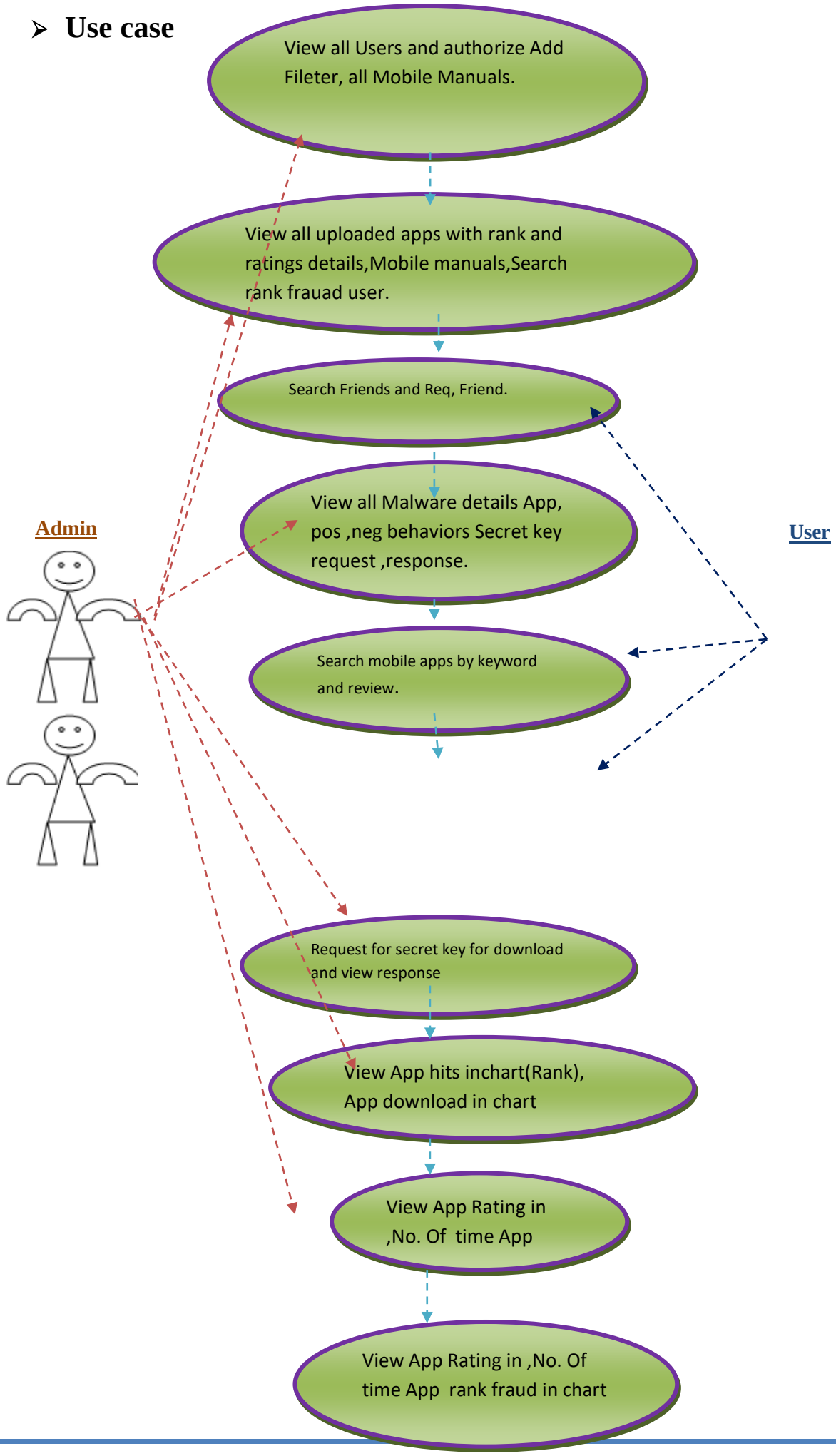
➢ Flow Chart : App Developer



Sequence Diagram



➢ Use case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View all uploaded apps with rank and ratings details,Mobile manuals,Search rank frauad user.
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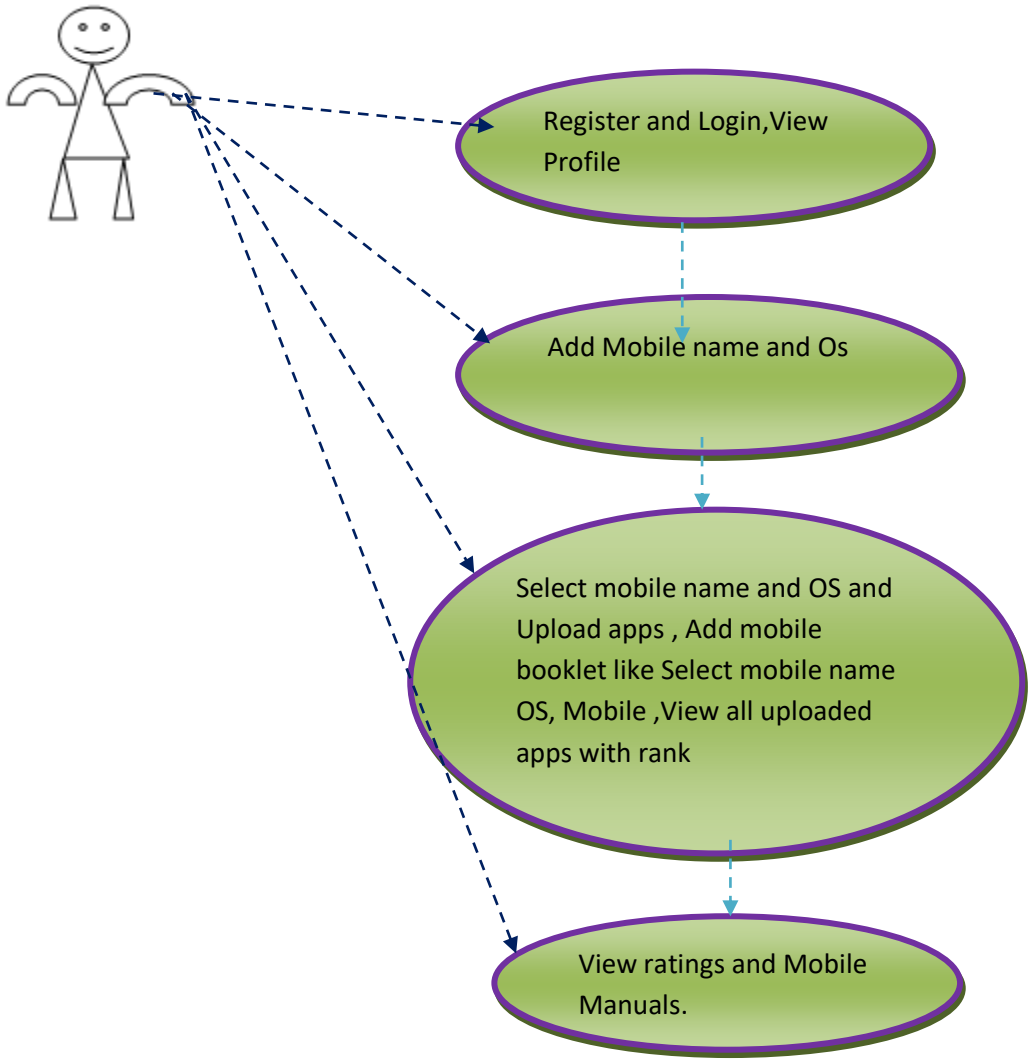
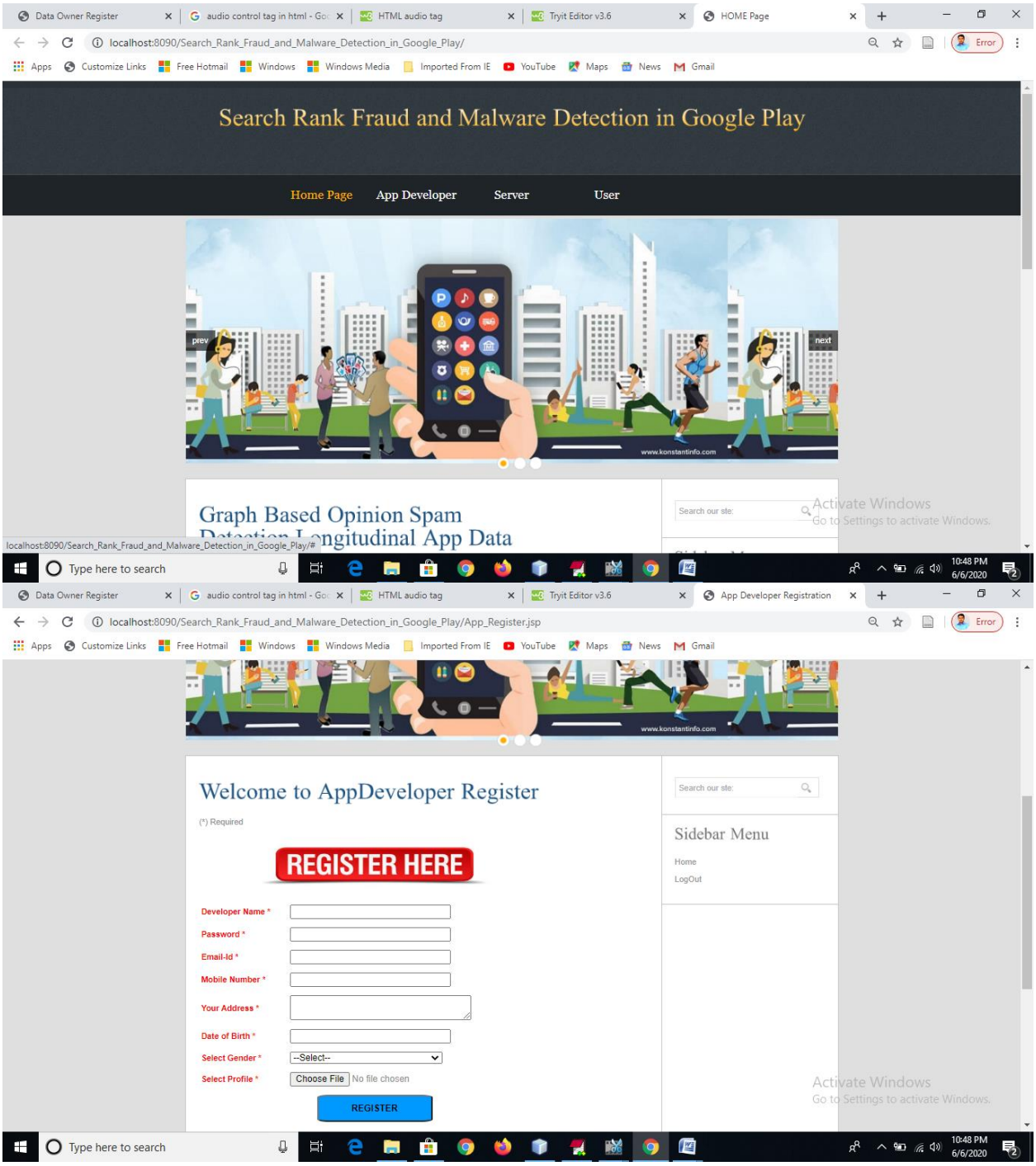
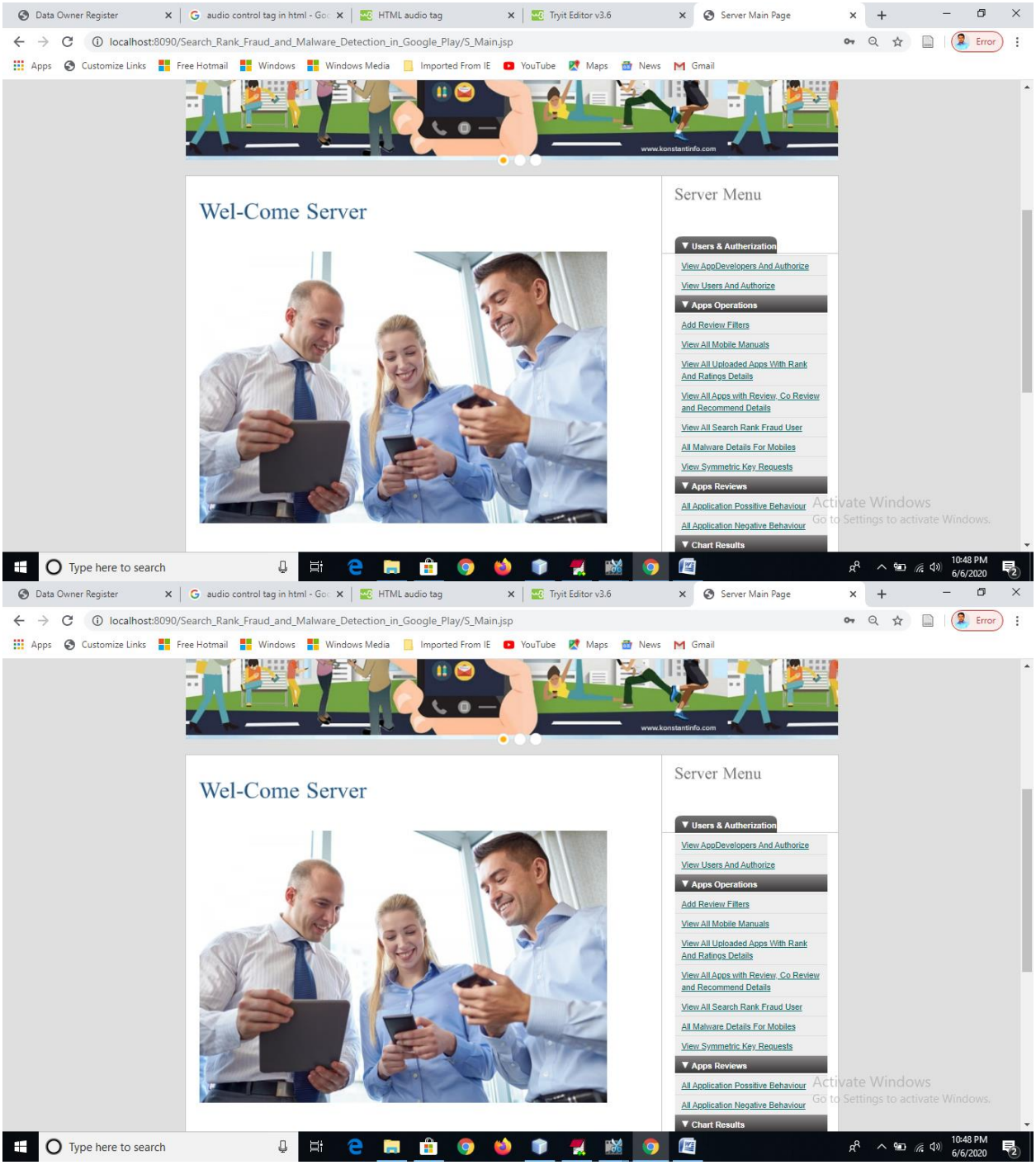
App developer



4.2 USER INTERFACE DESIGN

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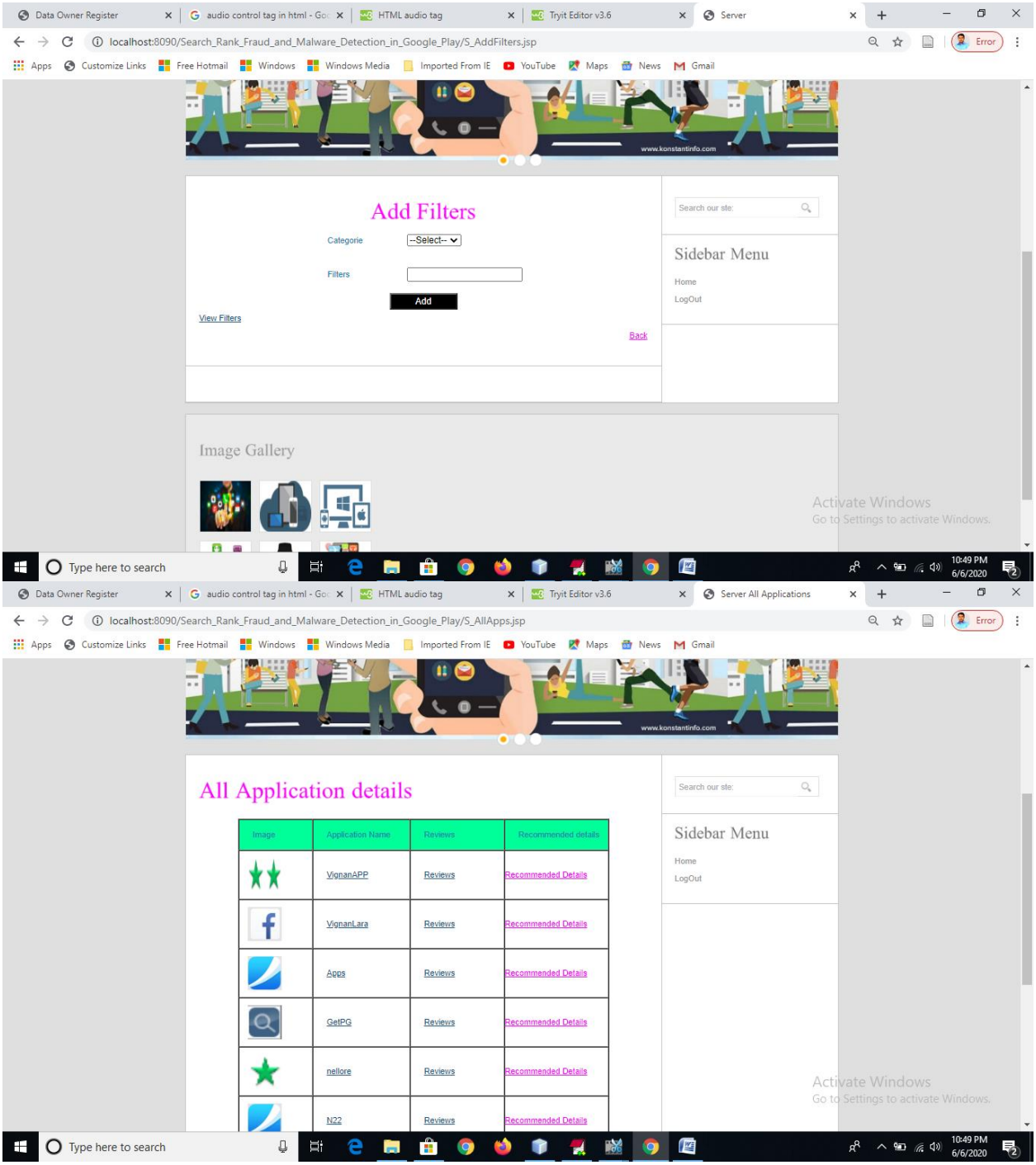
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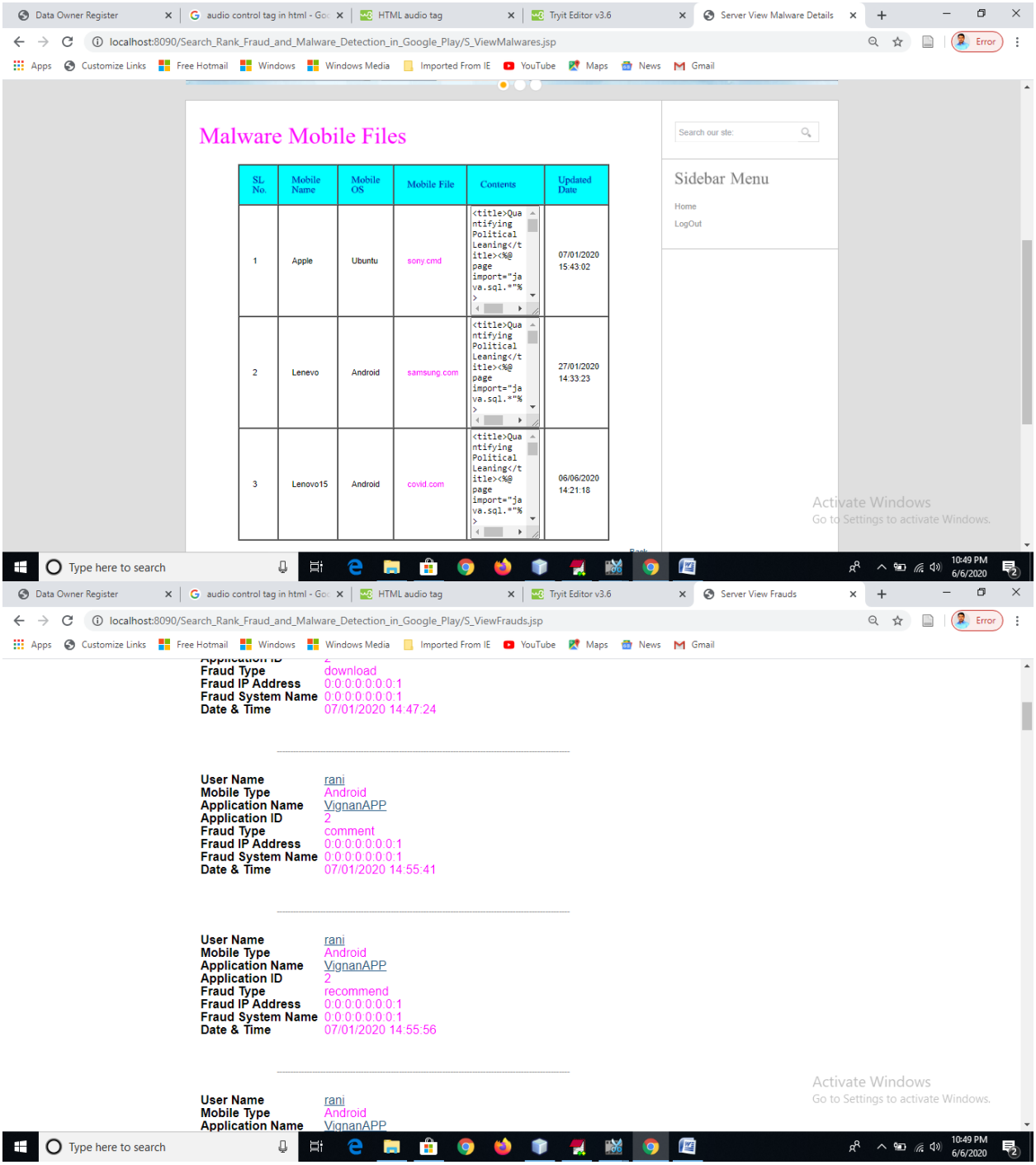
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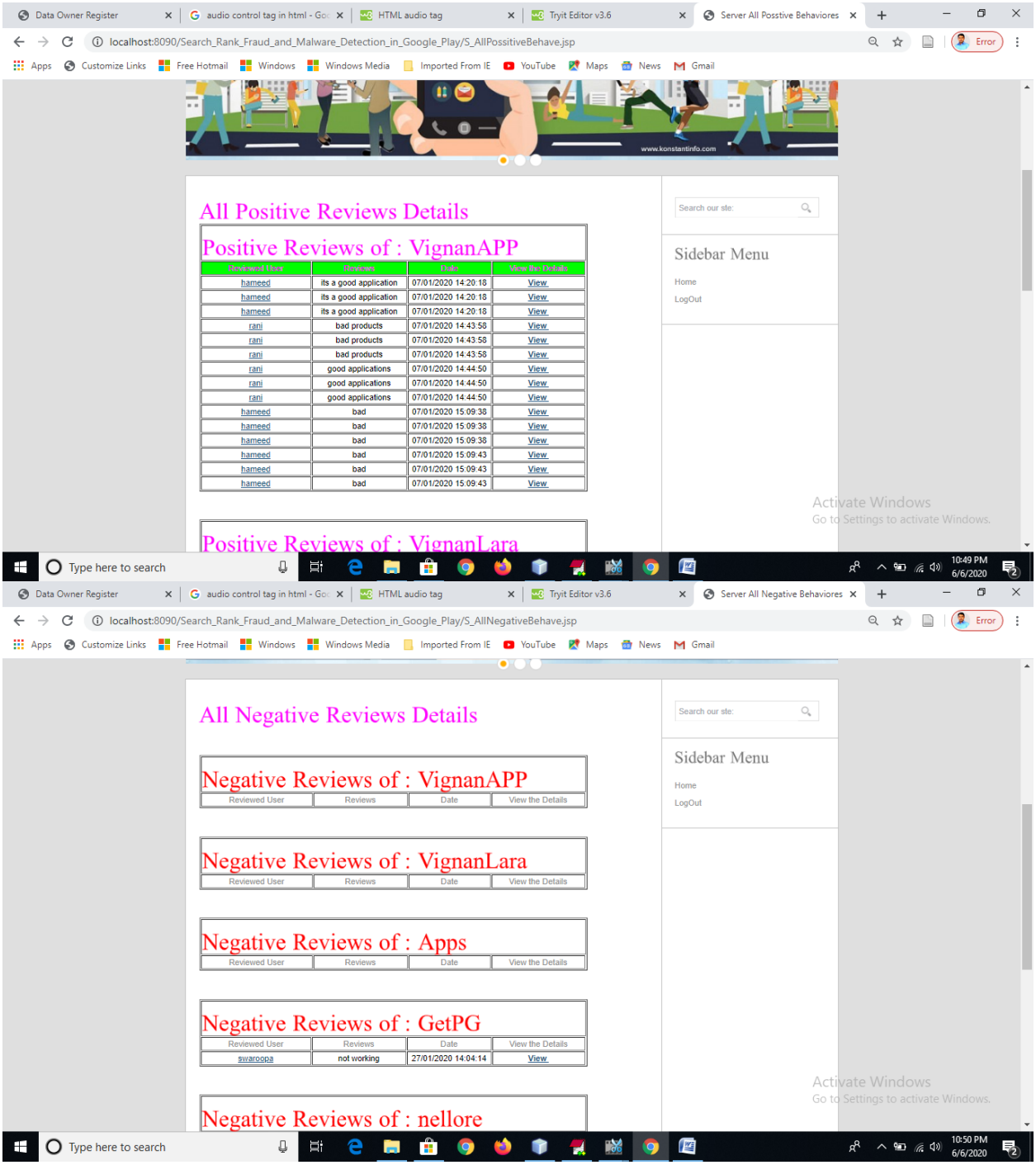
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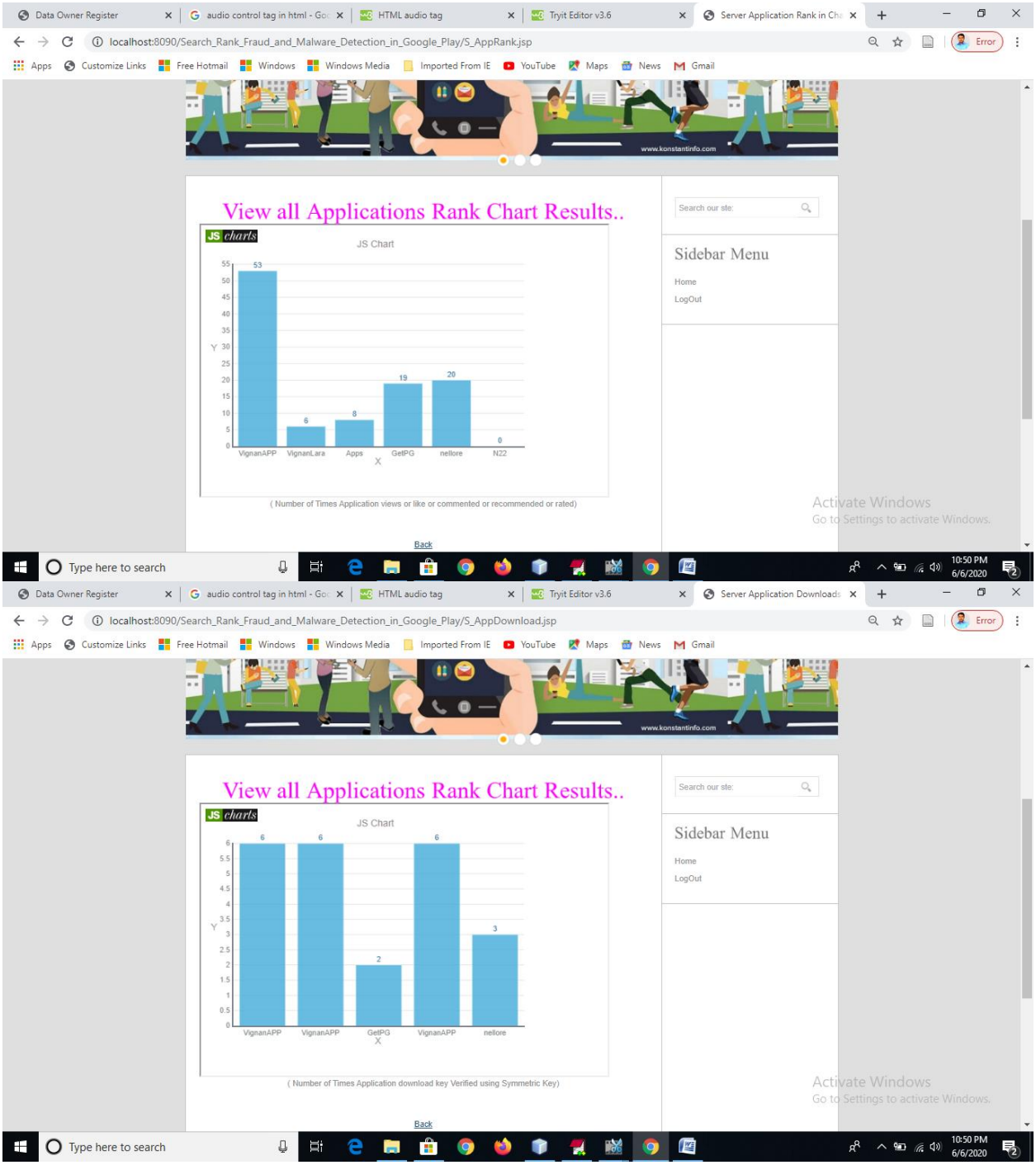
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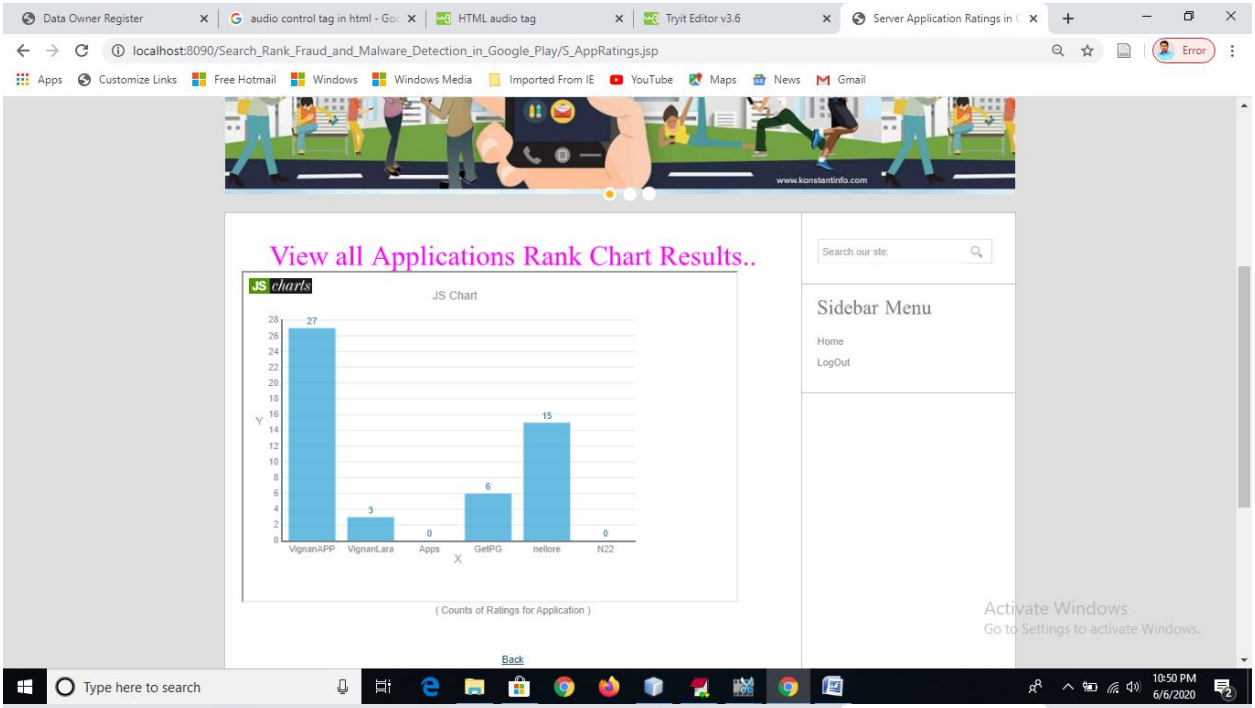
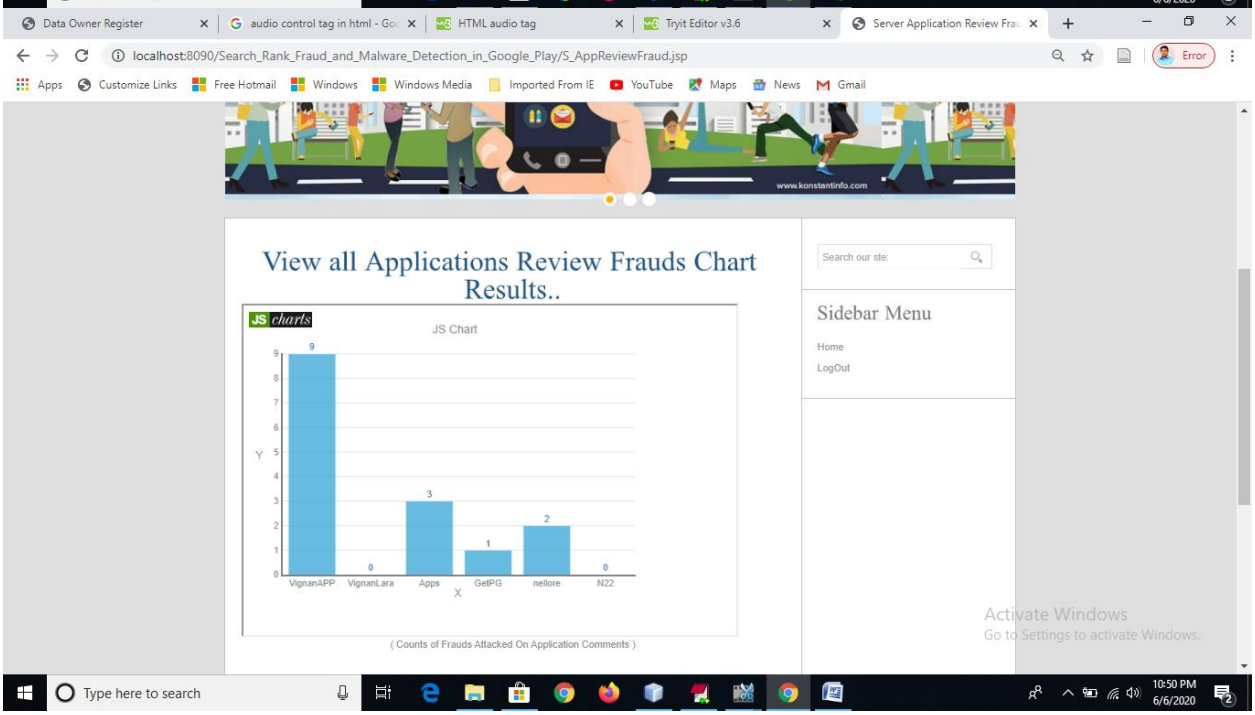

Data Owner Register
audio control tag in html - Go
HTML audio tag
Tryit Editor v3.6
Server Application Ratings in
localhost:8090/Search_Rank_Fraud_and_Malware_Detection_in_Google_Play/S_AppRatings.jsp
Apps
Customize Links
Free Hotmail
Windows
Windows Media
Imported From IE
YouTube
Maps
News
Gmail
www.konstantinfo.com
View all Applications Rank Chart Results..
JS charts
JS Chart
27
3
0
6
15
0
VignanAPP
VignanLara
Apps
GetPG
nellore
N22
X
Y
(Counts of Ratings for Application)
Back
Search our ste:
Sidebar Menu
Home
LogOut
Activate Windows
Go to Settings to activate Windows.
Type here to search
10:50 PM
6/6/2020


Data Owner Register
audio control tag in html - Go
HTML audio tag
Tryit Editor v3.6
Server Application Review Fra
localhost:8090/Search_Rank_Fraud_and_Malware_Detection_in_Google_Play/S_AppReviewFraud.jsp
Apps
Customize Links
Free Hotmail
Windows
Windows Media
Imported From IE
YouTube
Maps
News
Gmail
www.konstantinfo.com
View all Applications Review Frauds Chart Results..
JS charts
JS Chart
9
0
3
1
2
0
VignanAPP
VignanLara
Apps
GetPG
nellore
N22
X
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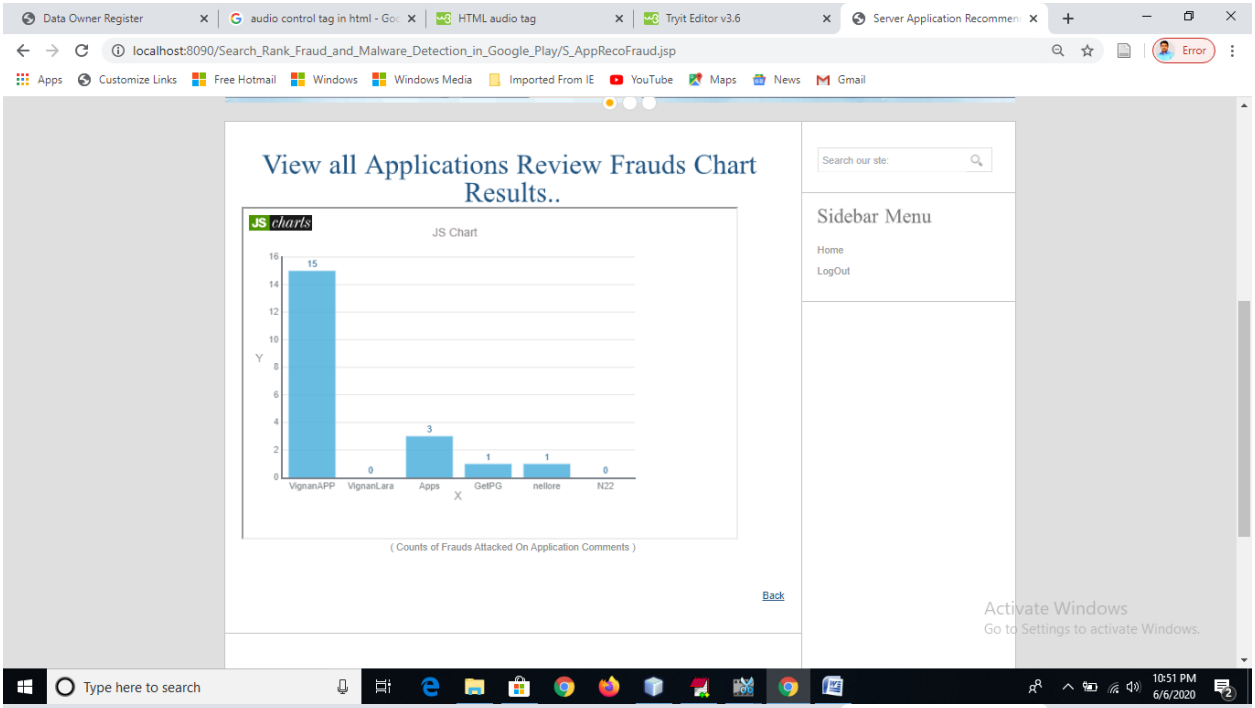
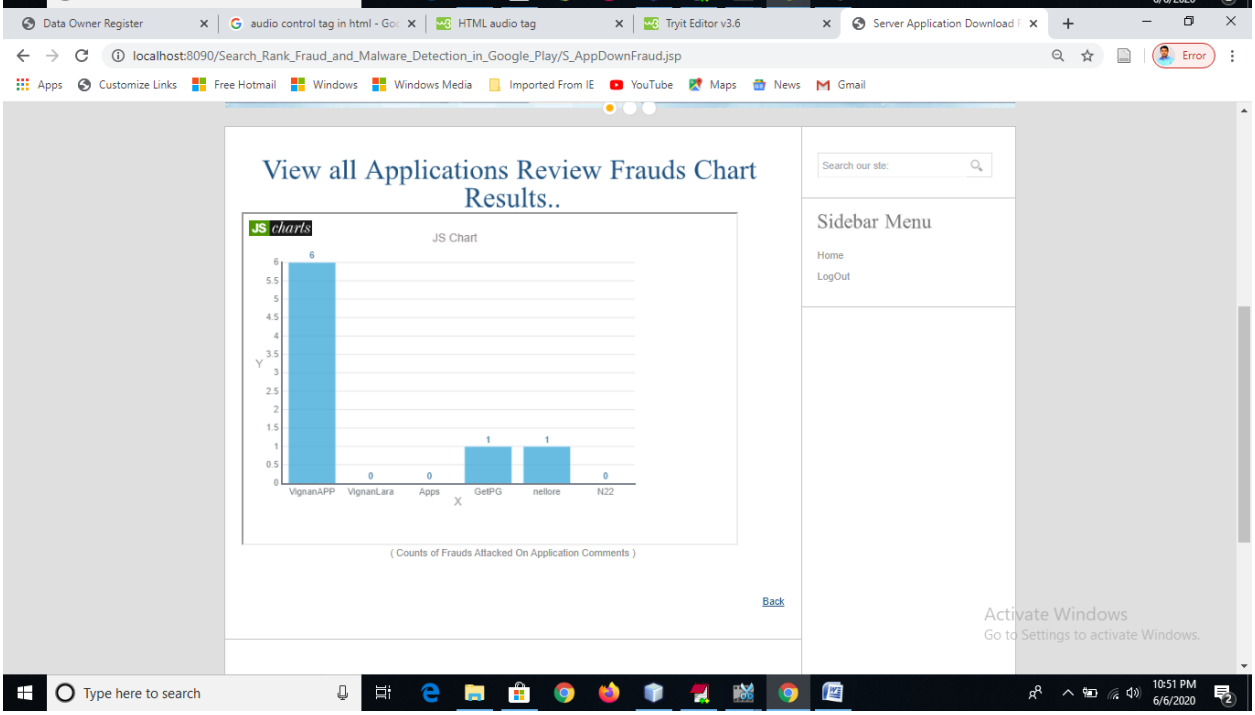
(Counts of Frauds Attacked On Application Comments)
Search our ste:
Sidebar Menu
Home
LogOut
Activate Windows
Go to Settings to activate Windows.
Type here to search
10:50 PM
6/6/2020


Data Owner Register
audio control tag in html - Goo
HTML audio tag
Tryit Editor v3.6
Server Application Recommen
localhost:8090/Search_Rank_Fraud_and_Malware_Detection_in_Google_Play/S_AppRecoFraud.jsp
Apps
Customize Links
Free Hotmail
Windows
Windows Media
Imported From IE
YouTube
Maps
News
Gmail
Error
View all Applications Review Frauds Chart Results..
JS charts
JS Chart
15
0
3
1
1
0
VignanAPP
VignanLara
Apps
GetPG
nellore
N22
X
Y
(Counts of Frauds Attacked On Application Comments)
Back
Search our ste:
Sidebar Menu
Home
LogOut
Activate Windows
Go to Settings to activate Windows.
Type here to search
10:51 PM
6/6/2020


Data Owner Register
audio control tag in html - Goo
HTML audio tag
Tryit Editor v3.6
Server Application Download F
localhost:8090/Search_Rank_Fraud_and_Malware_Detection_in_Google_Play/S_AppDownFraud.jsp
Apps
Customize Links
Free Hotmail
Windows
Windows Media
Imported From IE
YouTube
Maps
News
Gmail
Error
View all Applications Review Frauds Chart Results..
JS charts
JS Chart
6
0
0
1
1
0
VignanAPP
VignanLara
Apps
GetPG
nellore
N22
X
Y
(Counts of Frauds Attacked On Application Comments)
Back
Search our ste:
Sidebar Menu
Home
LogOut
Activate Windows
Go to Settings to activate Windows.
Type here to search
10:51 PM
6/6/2020

CHAPTER-5

SYSTEM TESTING

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies and/or a finished product It is the process of exercising software with the intent of ensuring that the

Software system meets its requirements and user expectations and does not fail in an unacceptable manner. There are various types of test. Each test type addresses a specific testing requirement.

TYPES OF TESTS

UNIT TESTING

Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration. This is a structural testing, that relies on knowledge of its construction and is invasive. Unit tests perform basic tests at component level and test a specific business process, application, and/or system configuration. Unit tests ensure that each unique path of a business process performs accurately to the documented specifications and contains clearly defined inputs and expected results.

INTEGRATION TESTING

Integration tests are designed to test integrated software components to determine if they actually run as one program. Testing is event driven and is more concerned with the basic outcome of screens or fields. Integration tests demonstrate that although the components were individually satisfaction, as shown by successfully unit testing, the combination of components is correct and consistent. Integration testing is specifically aimed at exposing the problems that arise from the combination of components.

FUNCTIONAL TEST

Functional tests provide systematic demonstrations that functions tested are available as specified by the business and technical requirements, system documentation, and user manuals.

Functional testing is centered on the following items:

Valid Input : identified classes of valid input must be accepted.

Invalid Input : identified classes of invalid input must be rejected.

Functions : identified functions must be exercised.

Output : identified classes of application outputs must be exercised.

Systems/Procedures: interfacing systems or procedures must be invoked.

Organization and preparation of functional tests is focused on requirements, key functions, or special test cases. In addition, systematic coverage pertaining to identify Business process flows; data fields, predefined processes, and successive processes must be considered for testing. Before functional testing is complete, additional tests are identified and the effective value of current tests is determined.

SYSTEM TEST

System testing ensures that the entire integrated software system meets requirements. It tests a configuration to ensure known and predictable results. An example of system testing is the configuration-oriented system integration test. System testing is based on process descriptions and flows, emphasizing pre-driven process links and integration points.

WHITE BOX TESTING

White Box Testing is a testing in which in which the software tester has knowledge of the inner workings, structure and language of the software, or at least its purpose. It is purpose. It is used to test areas that cannot be reached from a black box level.

BLACK BOX TESTING

Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box .you cannot “see” into it. The test provides inputs and responds to outputs without considering how the software works.

UNIT TESTING:

Unit testing is usually conducted as part of a combined code and unit test phase of the software lifecycle, although it is not uncommon for coding and unit testing to be conducted as two distinct phases.

Test strategy and approach

Field testing will be performed manually and functional tests will be written in detail.

Test objectives

- All field entries must work properly.
- Pages must be activated from the identified link.
- The entry screen, messages and responses must not be delayed.

Features to be tested

- Verify that the entries are of the correct format
- No duplicate entries should be allowed
- All links should take the user to the correct page.

INTEGRATION TESTING

Software integration testing is the incremental integration testing of two or more integrated software components on a single platform to produce failures caused by interface defects.

The task of the integration test is to check that components or software applications, e.g. components in a software system or – one step up – software applications at the company level – interact without error.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

ACCEPTANCE TESTING

User Acceptance Testing is a critical phase of any project and requires significant participation by the end user. It also ensures that the system meets the functional requirements.

Test Results: All the test cases mentioned above passed successfully. No defects encountered.

CHAPTER-6

CONCLUSION

We have introduced FairPlay, a system to detect both fraudulent and malware Google Play apps. Our experiments on a newly contributed longitudinal app dataset, have shown that a high percentage of malware is involved in search rank fraud; both are accurately identified by FairPlay. In addition, we showed FairPlay's ability to discover hundreds of apps that evade Google Play's detection technology, including a new type of coercive fraud attack.

CHAPTER-7

REFERENCES

7.1 REFERENCE BOOKS:

[1] "Thinking in Java", Bruce Eckel, Second Edition, Prentice Hall, mid-June 2000.

[2] "Oracle Database 10*g* Sets for TPC-H Three TB Benchmark". Retrieved 2008-01-31.

[3] "Java2 The Complete Reference", Herbert Scheldt , McGraw Hill September 2001.

[4] "Java Server Pages", Hans Bergsten, O'reilly, Third Edition December 2003.

[5] "Oracle Database" Reference 10g Release 1 (10.1). Oracle. Retrieved 2008-11-17.

[6] "IEEE, IEEE Software Standards", IEEE Press, 2009

[7] "Software Engineering- A Practioners Approach", Roger S.Pressman, McGraw-Hill

[8] "JDBC, Servlets, and JSP", Santosh Kumar K and Cogent Solutions Inc. Edition 6.

7.2 WEB RESOURCES:

[1] www.java2share.com

[2] www.way2java.com

[3] www.java2s.com

[4] www.roseindia.net

[5] www.javatpoint.com

[6] www.ajava2all.com

[7] www.booksboon.com

SAMPLE CODE

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">

<html xmlns="http://www.w3.org/1999/xhtml">

<head>

<title>App Developer Add Mobile and Os</title>

<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />

<link href="css/style.css" rel="stylesheet" type="text/css" />

<link rel="stylesheet" type="text/css" href="css/coin-slider.css" />

<script type="text/javascript" src="js/cufon-yui.js"></script>

<script type="text/javascript" src="js/cufon-times.js"></script>

<script type="text/javascript" src="js/jquery-1.4.2.min.js"></script>

<script type="text/javascript" src="js/script.js"></script>

<script type="text/javascript" src="js/coin-slider.min.js"></script>

<style type="text/css">

<!--

.style1 {

        color: #FF00FF;

        font-size: 36px;

}

.style2 {color: #FF00FF}

-->

</style>

<script language="javascript" type="text/javascript">        <!--Start Reg Validation Jai Siddalinga-->
```

```
function valid()

{

var na1=document.s.mobile.value;

if(na1=="")



{

alert("Please Enter mobile name");

document.s.mobile.focus();

return false;

}

else

{



}

var na2=document.s.os.value;

if(na2=="")



{

alert("Please Enter Os");

document.s.os.focus();

return false;

}

else

{
```

```
}

}

</script>

</head>

<body>

<div class="main">

  <div class="header">

    <div class="header_resize">

      <div class="logo">

        <h1><a href="index.html"><span class="style1">Search Rank Fraud and Malware Detection in Google Play</span></a></h1>

      </div>

      <div class="menu_nav">

        <ul>

          <li><a href="index.html"><span>Home Page</span></a></li>

          <li class="active"><a href="App_Login.jsp"><span>App Developer</span></a></li>

          <li><a href="S_Login.jsp"><span>Server</span></a></li>

          <li><a href="U_Login.jsp"><span>User</span></a></li>

        </ul>

      </div>

      <div class="clr"></div>

      <div class="slider">
```

```
<div id="coin-slider"> <a href="#"><img src="images/slide1.jpg" width="960" height="360" alt="" /></a> <a href="#"><img src="images/slide2.jpg" width="960" height="360" alt="" /></a> <a href="#"><img src="images/slide3.jpg" width="960" height="360" alt="" /></a> </div>

<div class="clr"></div>

</div>

<div class="clr"></div>

</div>

</div>

<div class="content">

<div class="content_resize">

<div class="mainbar">

<div class="article">

<h2><span class="style2">Add Mobile And Os</span> </h2>

<form name="s" action="App_AddMobileOsIns.jsp" method="post" enctype="multipart/form-data" onSubmit="return valid()" ons target="_top">

<table width="323" border="0" align="center" cellpadding="0" cellspacing="0" >

<tr>

<td width="117" valign="middle" height="50" style="color: #2c83b0;"><div align="left" class="style7 style15 style18 style21 style4" style="margin-left:20px;">Mobile Name</div></td>

<td width="206" valign="middle" height="50" style="color:#000000;"><div align="left" style="margin-left:20px;"><input type="text" name="mobile"></div></td>

</tr>

<td width="117" valign="middle" height="50" style="color: #2c83b0;"><div align="left" class="style7 style15 style18 style21 style4" style="margin-left:20px;">Mobile Os</div></td>
```

```
<td width="206" valign="middle" height="50" style="color:#000000;"><div align="left" style="margin-left:20px;"><input type="text" name="os"></div></td>

</tr>


<div >

<tr>

<td height="30" colspan="2" id="learn_more" align="center" style="color:#FFFFFF;"><input type="submit" value="Add" style="width:100px; height:25px; background-color:#000000; color:#FFFFFF;"/></td>

</tr></div>

                    </table>

                </form>

                <p align="right"><a href="App_Main.jsp">Back</a></p>


      <p class="infopost"> </p>

      <div class="clr"></div>

      <div class="clr"></div>

    </div>

    <div class="article">

      <div class="clr"></div>

      <div class="clr"></div>

    </div>

    </div>

  <div class="sidebar">

    <div class="searchform">
```

```
        <form id="formsearch" name="formsearch" method="post" action="#">
          <span>
          <input name="editbox_search" class="editbox_search" id="editbox_search" maxlength="80" value="Search our ste:" type="text" />
          </span>
          <input name="button_search" src="images/search.gif" class="button_search" type="image" />
        </form>
      </div>
      <div class="clr"></div>
      <div class="gadget">
        <h2 class="star"><span>Sidebar</span> Menu</h2>
        <div class="clr"></div>
        <ul class="sb_menu">
          <li><a href="App_Main.jsp">Home</a></li>
          <li><a href="App_Login.jsp">LogOut</a></li>
        </ul>
      </div>
    </div>
    <div class="clr"></div>
  </div>
 </div>
 <div class="fbg">
  <div class="fbg_resize">
```

```
      <div class="col c1">

        <h2><span>Image</span> Gallery</h2>

        <a href="#"><img src="images/gal1.jpg" width="75" height="75" alt="" class="gal"
/></a> <a href="#"><img src="images/gal2.jpg" width="75" height="75" alt="" class="gal"
/></a> <a href="#"><img src="images/gal3.jpg" width="75" height="75" alt="" class="gal"
/></a> <a href="#"><img src="images/gal4.jpg" width="75" height="75" alt="" class="gal"
/></a> <a href="#"><img src="images/gal5.jpg" width="75" height="75" alt="" class="gal"
/></a> <a href="#"><img src="images/gal6.jpg" width="75" height="75" alt="" class="gal"
/></a> </div>

      <div class="clr"></div>

    </div>

  </div>

  <div class="footer">

    <div class="footer_resize">

      <div style="clear:both;"></div>

    </div>

  </div>

</div>

<div align=center></div>

</body>

</html>
```