BATTERY SAVING APP USING ANDROID STUDIO

FINAL REPORT

Submitted By

Sunny Raj(22BCS10173)

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IN

COMPUTER SCIENCE

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BONAFIDE CERTIFICATE

This is to certify that this project **"ANDROID BATTERY SAVING APP USING ANDROID STUDIO"** is the bonafide work of Mr. SUNNY RAJ bearing UID no 22BCS10173 he is the student of year 2022-2026 who carried out the project work under my/our supervision. He is the bonafide student of CHANDIGARH UNIVERSITY.

19-05-2023

DATE **UNIVERSITY STAMP** **SIGNATURE**

(GARIMA THAKUR)

ACKNOWLEDGEMENT

It gives us the privilege to complete this mid semester project. This is the only page where we have the opportunity to express my emotions and gratitude. It is a great pleasure in expressing sincere and deep gratitude towards my supervisor and guide Mrs. Garima thakur for her valuable suggestions, guidance, and constant support throughout the completion of this project named “Android Battery Saving app using android studio". This project, though done by us, wouldn't be possible without the support of varied people, who by their cooperation have helped us in bringing out this project successfully. And am really very thankful to Chandigarh University for providing me such a great opportunity to make such a wonderful project which can solve real-life problems and extremely valuable handson experience along with crucial soft skills such as working in a team, communication skills, and much more. I also offer my most sincere thanks to every team member of our group who was working rigorously on this project and staff members of the Computer Department, University Institute of Engineering, Chandigarh University for copperation provided by them in every possible way. We thank all the faculty members and other supporting staff for the help they provided.

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CHAPTER 1

PROJECT SCOPE PLANNING AND TASK IDENTIFICATION

1.1. Identification of client

70 percent people or even more than that use Android Operating System in the world. Android Operating System has ground breaking features like Mobile Hotspot, Calling, Texting, Gaming, WIFI, Bluetooth etc in such small devices that fits in the palm of the hand. In between these revolutionary features, we are going to talk about the main feature which is its battery. Because of Battery, it is portable meaning, it can be carried anywhere and it to be charged at least once a day. Android Operating System uses a lot of resources which in turn reduces the battery charge too quickly. To tackle this situation many research has been done to optimize the Battery quality of android device but with limited supply of energy, the battery can't withstand the android applications for long time. There are various ways to enhance power management. One of them is a battery saver application. This application can help the user to reduce power consumption slightly.

I. BRIEF

- In Present as well as future, Android Operating System is essential for any person in any stream. Let it be a student, worker, employee, manager, trustee etc. To satisfy their needs Mobile phones should be charged and operational 24/7. Because the revolutionary features of Android Device can come in handy if any emergency situation occurs. But the portable battery has a limitation because of which it needs to be recharged at least once a day. Some Android Device has capacity more than one day.

- As time went, more and more android developers developed sophisticated applications that used a lot of RAM and Battery charge. Even hardware got new upgrades such as extra sim slot, SD card, Camera, Flashlights, etc. The developers and researchers estimated that Wi-Fi, Location, Third Party Ads and other Third Party applications eats up very high usage of power.

- Therefore, we studied different type's battery applications from Google Play store and tried to run it on Virtual Android Device. Results will be shown in main paper. We will pick only one android battery saver application which is the most efficient and easy to use and understand.

II. Project Scope

- Saving power of Android enabled devices have become a significant issue with 400,000 such devices being activated daily. Android Smartphone and tablets offer several power hungry hardware components and the app developers are exploiting these components at disposal to provide revolutionary user experience. But the battery life has not increased at the same pace to support the power demand. Thus many researches have been carried out to investigate how to minimize the power consumption in Smartphone.

- This battery saver is useful only for reading or texting purposes. You cannot watch movie, play games etc because it requires full screen and sometimes even full power of RAM, processors, network, location, etc based on what you are using. Other things like location, cache memory etc can be optimized from settings application.

- We won't be showing how to do it in this paper. Point to be noted "THIS APPLICATION CAN REDUCE THE BATTERY CONSUMPTION SLIGHTLY". This information will help people understand the efficient way to use our application as well as Battery Saver Mode in Settings.

1.2 Identification of problem

Power consumption is one of the most important issues of smartphones. Android OS, a popular smartphone operating system, has a function with which an application can be invoked in screen-off state without user's operation. Some applications frequently work in screen-off state, and consume battery. In this paper, we propose a method for identifying applications that largely drain battery in Screen-off state in Android devices. We introduce the standard method of Android for estimating power consumption of each application, and show that it cannot always estimate consumption correctly. Then, we propose a method for identifying heavily battery-draining application by monitoring setting and invoking alarm, which is a common method for executing an application in screen off state. Our experimental results demonstrate that our method can identify battery-draining applications more correctly than the standard method of Android operating system.

1.3 Identification of task

In this project, we will build an application which saves the battery by shutting down the pixels on the unwanted side of the screen black. In other battery saver apps there are many functions like cooling the temperature of the battery, cleaning the memory, cleaning cache, junk files etc. Our app doesn’t contain such features, because most of these functions are available in Android Settings App. This application will reduce the battery usage by turning off the pixels of half screen in its initial opening. If Battery Saver Mode is used during playing games, watching movies etc, it affects the accessibility of the mobile and sometimes might use more battery then when the battery saver mode is off. So when using Battery Saver Mode, we can use it only when we don’t use our mobile for high end tasks which requires most of its RAM, Memory ,CPU cores, Brightness, Location etc.

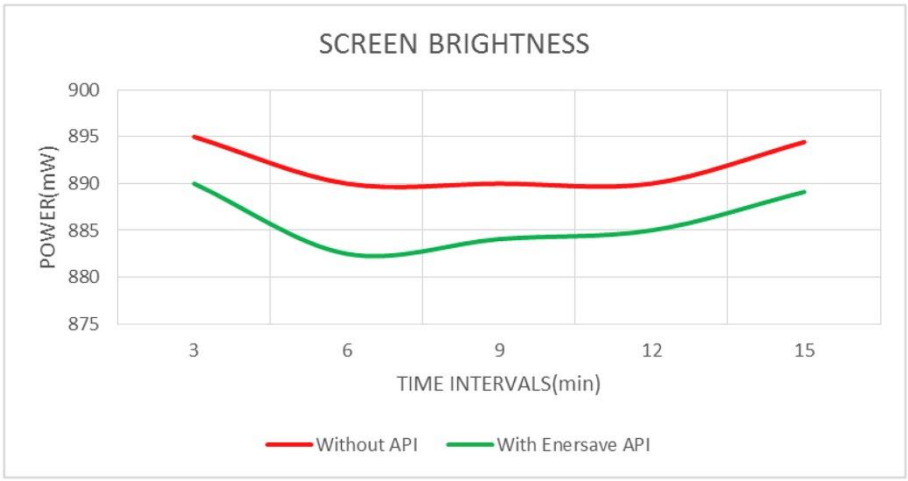

Table 1.1 (Eg: Screen Brightness Api)

CHAPTER 2

LITERATURE REVIEW/BACKGROUND STUDY

2.1. Timeline of the reported problem

The rapid development of technology has led to a shift in how we communicate with the world. Computers themselves have also changed significantly since their inception, from analogue machines, to large electromechanical computers and transistor computers. Nowadays, many people own personal computers, varying from desktops to laptops. In addition, they are also using smaller, portable computers such as tablets and smartphones. Each iteration of devices enabled us to accomplish tasks that were previously not possible. The rise of smartphones has enabled us to remain connected with everything, regardless of our location. They are capable of accessing the internet, with applications ranging from social media networks to banking services. With over 3 billion users as of June 2014, this technology has affected a significant portion of the world. However, the smartphone itself was also developed through a series of iterations.

I. BRIEF

- Initially, smartphones were large, bulky, expensive, and only used in enterprise settings. One of the first multipurpose phones was the IBM Simon, released in 1993. The purpose of this device was to create a “Swiss Army Knife” phone that combined many features. It functioned as a mobile phone, a PDA and a fax machine. The device was much larger than the modern-day smartphone and costed $899 USD, the equivalent of approximately $1500 USD in 2017

- Development of smartphones continued, with devices such as the Nokia 9110, Blackberry 5810, and the Palm Treo 600. Each device introduced functions that would become standard features on modern smartphones, such as keyboards, e-mail, web browsing, and coloured screens. Another notable inclusion is the Palm Pilot, a personal digital assistance device.

- While the Palm Pilot was not a phone, it offered many smartphone features such as calendars, contact lists, e-mail and web browsing. These devices were then used in conjunction with the cellphones of that time.

2.2 Existing solutions

- The major shift into modern smartphones came from Apple in 2007, when the iPhone was released. The Apple Smartphone featured a 3.5-inch capacitive touch screen, and combined the aspects of a phone, an iPod, and internet access. It also removed features such as keyboards and stylus' in favour of touchscreen interaction. The following year, the Android operating system was released on the HTC Dream. Android is an open source mobile operating system. While the initial adoption of Android was slow, as of 2016 it represents 81.7% of the smartphone market.

- The smartphone can be viewed as an extension of the computer, allowing us to perform the same tasks on a pocket-sized device. Developers have embraced this medium and created accessible mobile equivalents of the online services that we use. In addition, they are also creating new, unique applications by leveraging the variety of sensors on the device. However, they must compensate for the lack of resources in comparison to traditional computers.

Methods

1. Limit your push notificatons
2. Adjust your location services settings
3. Lower background activity
4. Adjust your screen brightness
5. Adjust your screen timeout settings
6. Protect your phone from extreme temperatures
7. Turn on battery saver mode

2.3 Bibilometric Analysis

- The waterfall model is a classical model used in the system development life cycle to create a system with a linear and sequential approach. It is termed a waterfall because the model develops systematically from one phase to another in a downward fashion. The waterfall approach does not define the process to go back to the previous phase to handle changes in requirements. The waterfall approach is the earliest approach that was used for software development.

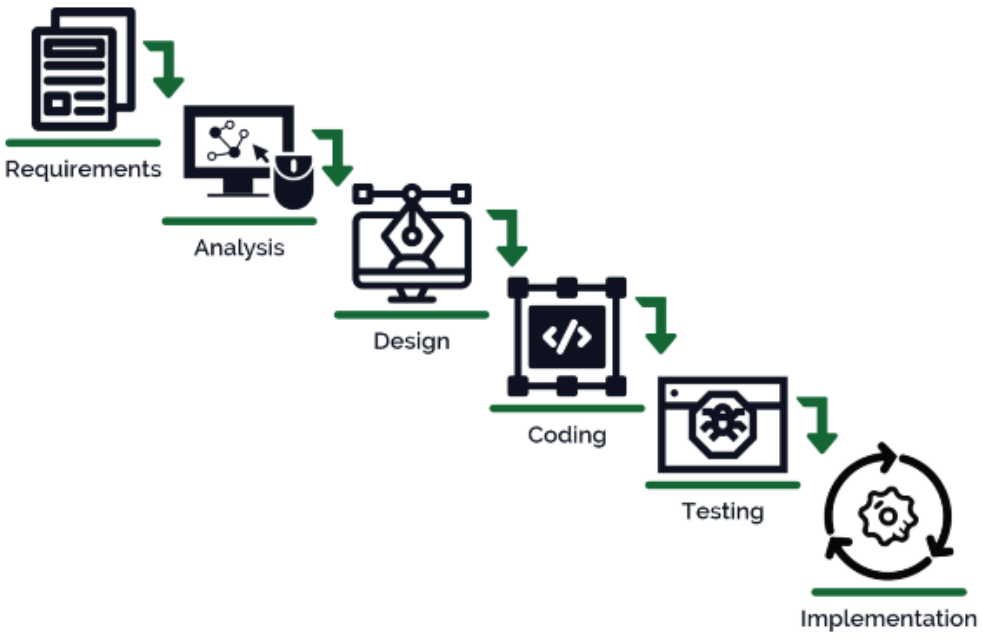

Figure 1 (Project Waterfall Model)

Measuing application performance

- To estimate the performance of this application we used two different devices , one is newer; one is older, google pixel 2 and google pixel 6.

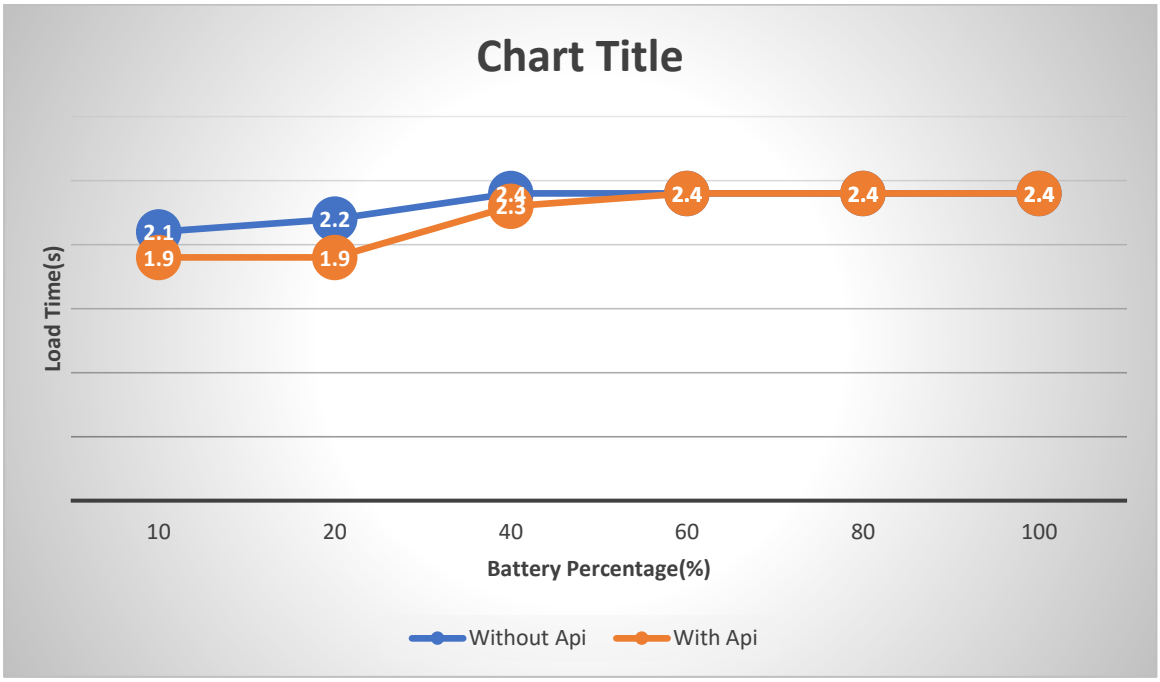

Table 2.3.1 Website Performance Testing on Google Pixel 6

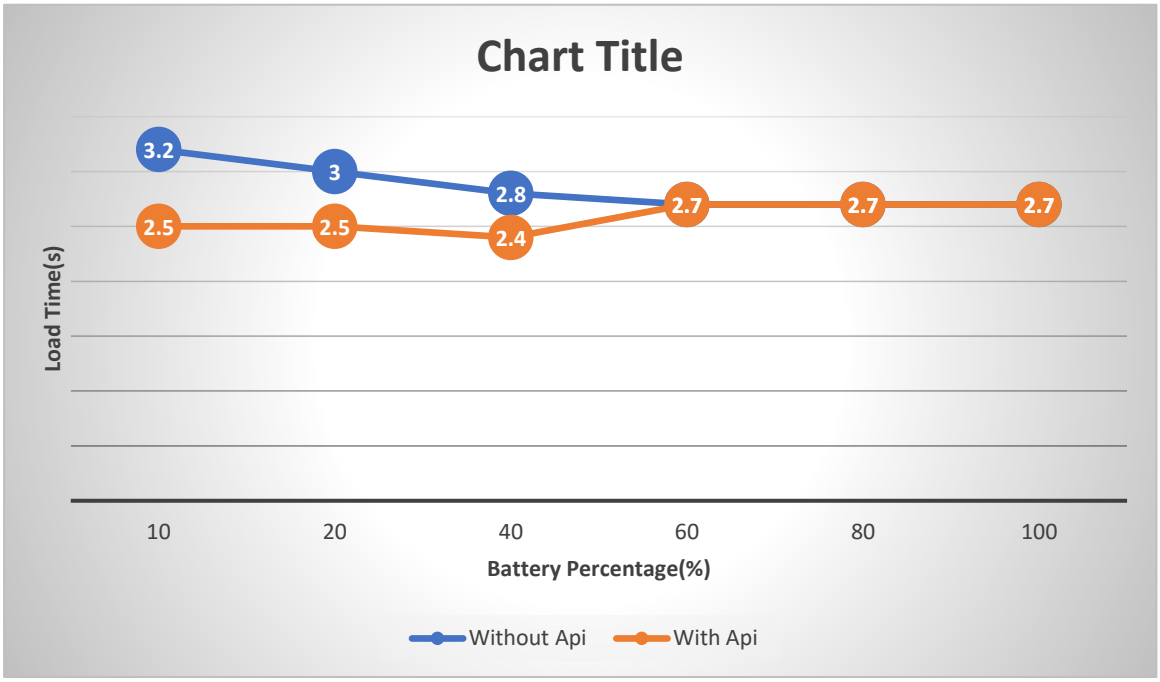

Table 2.3.2 Website Performance Testing on Google Pixel 2

CHAPTER 3

DESIGN FLOW / PROCESS

3.1 Evaluation & Selection Of Features

- This is a black screen battery saver that will help you regain privacy and save battery with the same efficiency ,this will save money. New devices are growing bigger than ever. And that's good. But that also means the screen will drain the battery faster. What if you're just reading an article or chatting with a friend? Do you really need to use the entire screen? What if you could easily turn off parts of the screen without impacting your flow? And by this, also gain more privacy while (for example) commuting: there's always someone snooping your screen.

- On AMOLED screens which equip most of today's and all of tomorrow's devices, a black pixel = no pixel. Not drawing pixels means no battery consumption because the screen is simply turned off there. Using this approach, our application can save a significant amount of battery time, thus increasing the interval between charging. Very handy when you're often on the go or traveling! Conveniently enable the black full screen mode when your device needs to stay awake, but you're not looking at the screen.

CHAPTER 4

RESULT ANALYSIS AND VALIDATION

4.1 Review Summary

- Several tools and studies have relied on active measurements to identify Web performance bottlenecks. Unlike passive measurements via real user monitoring systems, active measurement practices inherit several limitations because pages loaded in controlled environments do not represent the characteristics of how pages load in the real world. Steiner et al. used a real user monitoring system to compare the impact of CPU processors embedded in old and new smartphones on the web performance – suggesting that page loads on new devices with fast CPUs are significantly faster than page loads on old devices with slow CPU. Like other studies, the authors observed that faster CPUs on newer smartphones load webpages faster than those on old phones. Another study reveals that about 35% of the PLT is spent performing CPU-intensive tasks on user devices.

4.2 Goals and objectives

- Slow mobile device hardware is a bottleneck to mobile Web performance. We perform a large-scale measurement study to identify the impact of Android's battery-saver (which throttles the CPU clock speed) mode on mobile Web performance. Our data suggests that under low-battery conditions, sudden rises in page load time, total LongTask time, and time to interactive metrics are observed on some devices. The average frame rate on some smartphones also declines, leading to unresponsive and

paint-blocked websites. Through this paper we hope we motivate the need for new website design goals that improve mobile Web experience for slow mobile devices. The Web performance community has developed numerous best practices for developers to deliver high-performance experiences to end users.

CHAPTER 5

CONCLUSION AND FUTURE WORK

5.1 Conclusion

- This application is focused on saving the battery by turning off the display either half or more than that by turning off the pixels in amoled screen and showing a black screen in LCD screens

- On AMOLED screens which equip most of today's and all of tomorrow's devices, a black pixel = no pixel. Not drawing pixels means no battery consumption because the screen is simply turned off there. Using this approach, our application can save a significant amount of battery time, thus increasing the interval between charging. Very handy when you're often on the go or traveling! Conveniently enable the black full screen mode when your device needs to stay awake, but you're not looking at the screen.

5.2 Future Work

We look forward to add more features to this app and fix the in-app bugs , also improve the overall working of this app and make this more user friendly as per users desrie…

THANK YOU……

Timeline

	Project Scope , Planning and Discussion	Literature Review and problem identification	Preliminary Design	Detailed System Design/Technical Details	End Term Viva	Project Report
	7th March – 14th March	28th March – 10th April	20th April – 30th April	9th May – 17th May	18th May – 22nd May	15th May – 17th May

Project Timeline Table

Organisation of report

- Timeline of the reported problem

  As investigated throughout the world, when was the problem identified, documentaryproof of the incidents.

- Existing solutions

  Brief of the earlier proposed solutions

- Bibliometric analysis

  Analysis based on (key features, effectiveness and drawback)

- Review Summary

  Link findings of literature review with the project at hand.

- Goals/Objectives

Statements setting the milestones during the course of
project work.Keeping in mind

- Narrow, specific statements about what is to be learned and performed
- Precise intentions
- Tangible
- Concrete
- Can be validated or measure

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  - Date uploaded on Aug 06, 2021