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Modular Smartphone

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Abstract: Nowadays, mobile phones have become a vital part of our day to day lifestyle. All smartphone companies are trying to cast in top notch technologies into their smartphones. However, it has become increasingly difficult for smartphone companies to fulfill the user's criteria according to their whims and fancies. So people keep on changing their phones from time to time which lead to a tremendous increase in Electronic waste. Considering the unnecessary waste generated in the smart phone market, a team of three members: Dave Hakkens, Gawin Dappe and Tomas Halberstad started a design group under the name Phonebloks in 2013. Phonebloks was the first concept of a modular smartphone. [1]
Keywords: E-waste, modules, customize, frame

I. INTRODUCTION

Technology has always upgraded itself from the time of its inception. The first smartphone was made available to the public in 1994. Thereafter, the concept of smartphone skyrocketed over the whole world leading to what is now known as a modular concept of a smartphone. It is estimated by global agencies report that E-wastewill increase by 33% in 2017.A large section of E-waste mainly consist of mobile phones. Modular smartphone is one of the solutions for this global problem.As consumers, we are already used to customizing our phones, whether it's downloading apps according to our lifestyle, or picking out cases based on our sense of style. The concept of modular smartphones takes us several steps further, allowing us to essentially build your own phone, picking and choosing the hardware pieces we want. A modular smartphone is built using different components that can be independently upgraded or replaced in a modular design.



Figure 1: Pictorial representation of a modular smartphone

II. COMPONENTS

Basically to make a Modular Phone we need a Frame which will hold all parts together. Also we need different modules of camera, SIM card and memory slot, Bluetooth modules, battery, processor chip etc.



Figure 2: Project Ara modular smartphone prototype

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So a modular smartphone can be described of having following sections:

A. Spine (Frame, screen and sometimes speakers)
B. Brain (Processor)
C. Heart (Battery and other modules).[4]

The main components of Phonebloks, which was the first modular smartphone are:

1) Base
2) Bloks

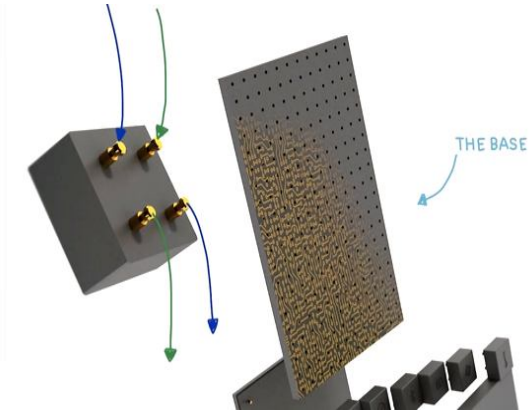


Figure 3: Base and Blok designs

Base is like a motherboard for Bloks. The base connects everything through pins. The pins will transfer signals to the base and then the phone is ready to function.[3]

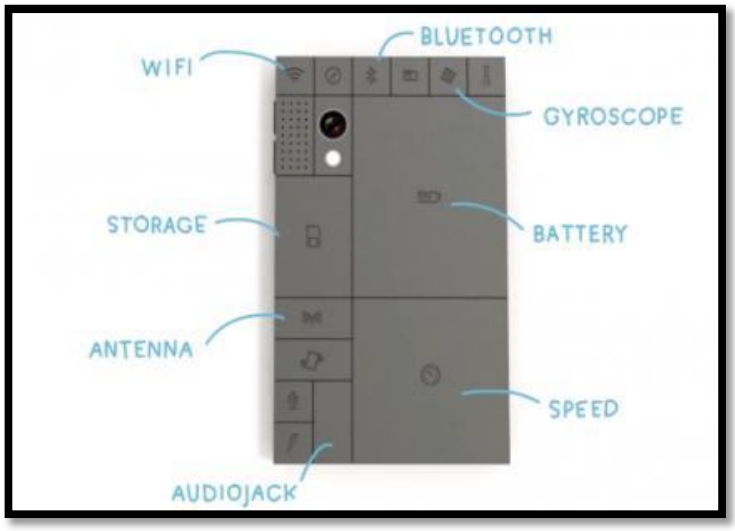


Figure 4: Sections for various modules in a modular smartphone

D. Advantages

1) It is eco-friendly: It aims to reduce worldwide e-waste by allowing you to upgrade, swap, and sell single modules which are bio-degradable in nature.
2) Customization to its fitness: It is a highly customizable smartphone where any part could be replaced according to the user's choice.
3) Mobile flexibility: The phone can be easily modified based on personal aesthetic sense of the user.

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4) *Easy to upgrade individual components:* Based on different parts manufactured by various companies, the phone can be easily upgraded.
5) *Open source platform:* Users can build their own modular phone by using the open source platforms.
6) *Consumer Empowerment:* All possible amendments can be made by the user.

E. Disadvantages

1) *Economic Issues:* Upgrading each and every part of the phone could be a financial hassle.
2) *Technical Issues:* Building modular devices with separate interconnects and magnetic locks introduce wear and tear issues that can damage these components and leave them non-functional in the long run.[5]
3) *Software compatibility:* There is a need for it to be compatible with all other phones in the market.
4) *Portability issues:* Due to various modules added to the frame of the phone, it may weigh comparatively more than normal smartphones.

III. FUTURE SCOPE

The Puzzle Phone is a modular Smartphone project by Circular Devices. Puzzle phone is in development which may become a successful modular smartphone product. In future research in the field of solar modules to add solar charging may commence. The integration of heath modules that can check the blood pressure; sugar level of the body; temperature sensing modulesetc. could be possible with a modular smartphone. The concept of a modular smartphone by Google, under the name Project Ara could further tweak their development patterns and come up with a better plan in the era to come.

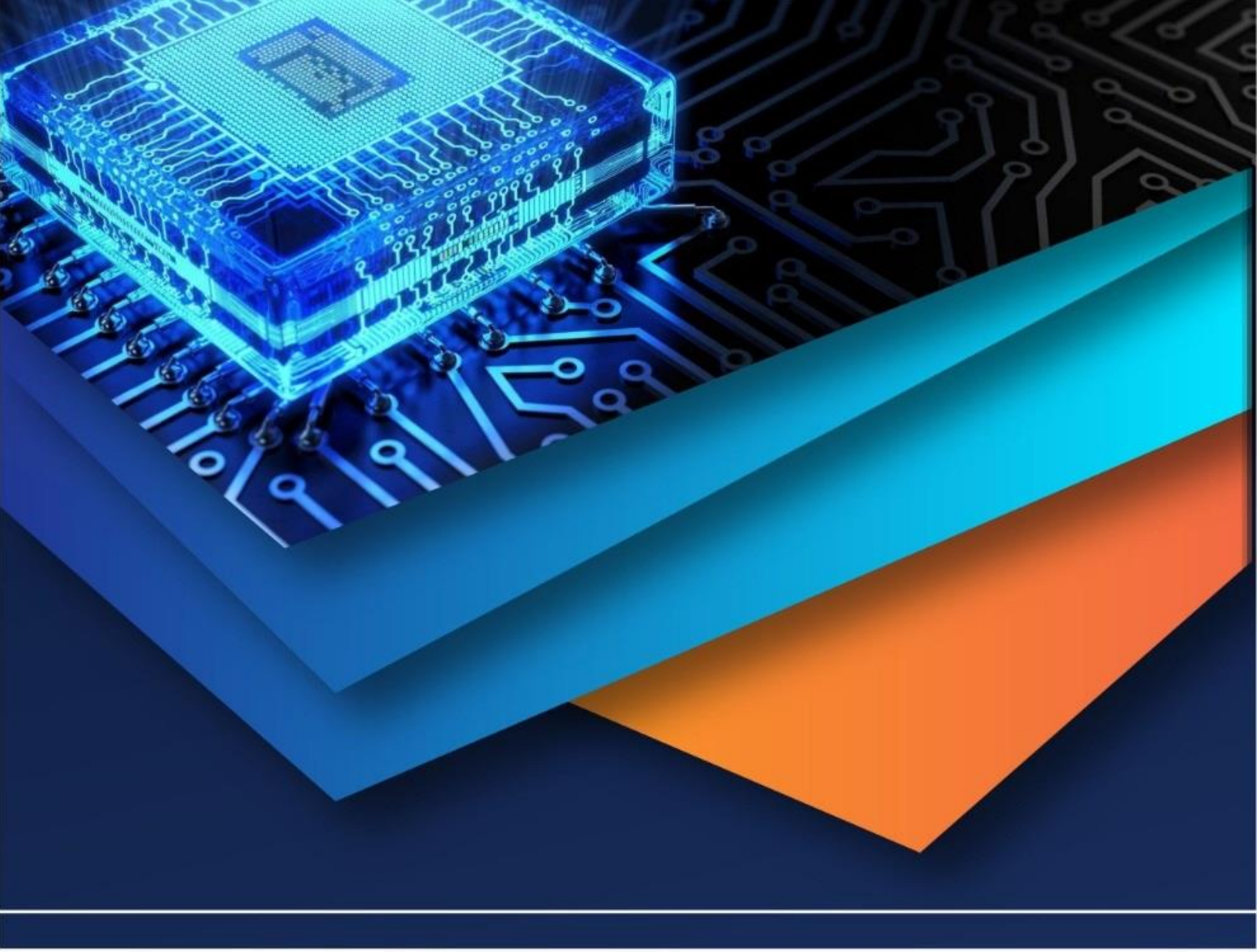
IV. CONCLUSION

Modular Smartphone is a smart and advanced concept but further research in this field is required.It is the answer to theemerging problem of E-waste. If you are person with a taste of variations in upcoming technologies,then modular smartphoneshave wide prospects in the coming decade.It provides much functionality in compact manner and is much flexible as compared to legacy phones.

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