PROJECT ARA

The Tragedy of the Modular Phone

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ANAS AHMED

Introduction:

In 2013, Dave Hakkens, a graduate from the Design Academy, uploaded a video titled "Phonebloks" to Youtube. In his video, Hakkens described his design as a fully modular phone, meaning that any part could be replaced. Hakkens explained to VentureBeat, an internet magazine, "I thought: Isn't that weird that we throw everything away just because one part is broken?" (VentureBeat). This means if a customer wanted to upgrade their phone's camera, they would be able to remove the camera and place a newer one onto the phone. Hakkens' video went viral, currently holding over 22 million views on Youtube as of April 2021. Soon Hakkens received interested messages from companies looking to design parts for Phonebloks. However, there was one suitor for Hakkens which stood out the most: Google. Google offered the opportunity to bring the product into market in 2 years. At first, Hakkens was a little skeptical to the claim, but if there was any company that would have the resources to produce the phone, it would be Google. Hakkens agreed and Google began work on what they dubbed as Project Ara: the first fully modular smartphone. In October 2013, Motorola announced that they were partnering with Google and collaborating with Hakkens. All of a sudden in 2016, months before the expected release of the phone, Google announced that Project Ara was cancelled.

Abstract:

In the early 2010s, the smartphone market was more competitive with Android phone manufacturers such as LG, HTC, Samsung, Sony, and Motorola fighting for leftover market share from customers who did not purchase the iPhone. In this age, smartphone manufacturers were focused on creating an innovative design to differentiate themselves from other manufacturers. A Design Academy graduate named Dave Hakkens pitched his concept of a smartphone to Youtube, called Phonebloks. Phonebloks worked by having all the internals of the phone connected to a board which managed all the separate parts. Each part was its own module, allowing the user to remove certain parts and upgrade other parts. For instance, if a user does not tend to use their phone camera, they could replace it with a bigger battery. The project was soon picked up by Google who named it Project Ara. Project Ara had the potential to completely disrupt the smartphone industry as it would eliminate the need for smartphone upgrades. Rather than purchasing a new phone every 2 years, users could purchase newer parts for a less expensive price. Project Ara's first phone, Spiral 1 was scheduled to release in 2017, but Google cancelled the project in late 2016. While a revolutionary concept, Project Ara had weaknesses in hardware, support, as well as failing to garner consumer interest.

Technical / Scientific:

Project Ara was based off Hakkens' original design for Phonebloks with a few exceptions. Luke Pensworth, a journalist for DailyWireless.org, elaborates "Instead of connecting all the parts such as CPU, storage, battery, and display to the module slots, the endo now comes with components such as antenna, display, sensor, and other system-on-chip (an integrated circuit that basically integrates all the components mentioned). But you're still allowed to change secondary features or modules such as camera, microphones, batteries, and speakers." (Pensworth). While this decision eliminated the "fully modular" allure of Project Ara, it was sensible as a majority of consumers are not interested in replacing their phone antenna. The secondary features where the ones consumers were more interested in, such as being able to swap in a bigger battery, or a higher quality camera. The final product had come a long way since the initial prototyping phase.

The first Project Ara prototype was a phone connected to a circuit board, a far cry from Hakkens' Phonebloks design which was a completely separate device. Despite being the original creator of the concept, Hakkens did not work with Google on Project Ara but did come in to consult the team a few times. In an interview with VentureBeat, former Project Ara design lead Dan Makoski notes "I'll just say we left those two days of meetings with Dave suggesting a [consulting] price that was just ridiculous to us, and us offering Dave to join Motorola," (VentureBeat). Hakkens reportedly wanted to stay independent and not work for Motorola, so he declined a role with Motorola and development continued. Once the design was expanded, the Spiral 1 was very similar to Phonebloks, using modules that could be connected to the back of the device. The back of the phone consists of the endoskeleton, which TIME Magazine writer

Harry McCracken describes as "an aluminum frame that contains a bit of networking circuitry so the modules can talk to each other, a tiny back-up battery and not much else." (McCracken). Every module has capacitive connections to magnetically link to the endoskeleton. This magnet system allows for modules to be hot swapped without having to power the device before swapping modules.

Once announced, the Spiral 1 was slated to cost only $50, a very low entry price compared to most smartphones of the time. This model, however, did not even have a 3G modem for internet. The goal of this price point was to be able to introduce Project Ara for international budget markets such as India. Makoski explains "We had a philosophy that this phone was not for the iPhone-carrying, latest Samsung Galaxy-carrying smartphone owner in the U.S., […] We wanted to bring access to the internet, to the smartphone space, to those who previously didn't have it. And part of the ways to do that is to create a platform where an India telecom could put customized radios into Ara for a $50 price point or a $100 price point, or it could scale all the way up to something for Latin America or the U.S." (VentureBeat). In India, the average consumer is not willing to pay the hefty $649.99 for a Samsung Galaxy S5. The customizability of Project Ara would eliminate the need for upgrading for Indian consumers and the price point would have made it easy to enter the Project Ara ecosystem. In October 2014, Google posted a video of a working Ara prototype complete with modules from piano keyboard attachments to heart rate monitors illustrating that creating the project was viable. One module even had a biome for algae with a magnifying glass for viewing.

Analysis, Discussion, Conclusions:

There was a myriad of reasons why Project Ara failed, but one reason that is often overlooked in Google's restructuring as a result of pressure from the Securities and Exchange Commission (SEC). Google created a parent company called Alphabet, Inc and made Google into a subsidiary of Alphabet. During this restructure, Regina Dugan, lead for Project Ara, left to work for Facebook. Dugan's departure left the Project Ara team in disarray as there was no longer a representative for Ara in corporate. Nobody in corporate was able to push for the project now that Dugan was no longer at the company. This restructure of the company may have played a role in the decision to cancel Project Ara among other reasons as the company was pivoting.

A lack of support from both consumers and manufacturers was a major reason Project Ara failed. Ara was mostly thought of as a commodity for enthusiasts, not the regular consumer. Most consumers would not be interested in changing their phone's CPU or battery, despite the benefits it may have. Phone manufacturers were also not very interested in Ara as it was a threat to their industry. If successful, Project Ara would shift the phone industry, removing the need for yearly or biyearly upgrades. This would cut into the manufacturer's earnings as instead of selling phones, modules would have been significantly less profitable. In turn, many phone companies decided not to design modules for the Spiral 1.

Project Ara would require a large level of software support for the modules which was another difficult selling point for Project Ara. As an increasing amount of hardware modules would be released, the software needs to be updated to not only support the new modules, but also

support backwards compatibility as well. If Project Ara wanted to support most parts, they would be limited in the facet of requiring the software to support the older parts despite becoming outdated. This could also limit new features that would take advantage of newer hardware as older hardware would not be compatible with these features. Eventually, consumers would face the need to upgrade all their modules to support the new features.

Project Ara had the potential to disrupt the entire smartphone market but was scrapped for a lack of support and profitability. One may wonder what an alternate result could be if Project Ara had chosen to become open source. The modules were 3D printed meaning that if Google had made 3D printing blueprints, enthusiasts could be able to print their own modules. Rather than solely relying on manufacturers to create parts, Google could also have consumers create new parts for Project Ara. If Google wanted to capitalize on this, they could have designed development kits that they could sell to consumers to create their own modules. Of course, there would be a lot of overhead needed to be able to make Project Ara open source. Project Ara was a revolutionary concept that was cancelled due to a lack of consumer and manufacturer support, as well as profitability.

References:

All sources are cited in MLA format.

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