Over the past three weeks, the major players in the mobile space, Google and Apple, have hosted their annual developer confabs and released unto the marketplace all manner of promises and halted expectations. It's now up to those developers to reap the benefits from new APIs, SDKs, and other "under the hood" benefits and tweaks that promise an amazing end user experience with the next generation of their mobile operating systems.

First up is the news from Google, which at their I/O conference held during the last week in May, found [Android M](#) officially announced, albeit without it's candy or dessert moniker. In parallel to what Apple announced this past week at the WWDC, the focus for both of them centered on mobile payments, wearables, media, and automobiles. Google rebranded Google Pay to [Android Pay](#), thus emphasizing that this is centered around mobile platforms and the experience. According to Google, switching to the new environment should be relatively seamless for merchants, but payment processors will see a change in order to enhance security. In this case, the step away from card emulation to now using tokenization removes the potentiality to perform fraud at the point of sale, and relies upon the matching of stored payment methods via the purchase tokens to that user. It is expected that this may also be enhanced with geo-location features to avoid blatant fraud (such as a POS purchase in Europe while the user's mobile device says they are using the POS system in California at a Starbucks).

This is one of the first major pushes to the 'Android Everywhere' strategy that analysts have seen out of Mountain View, the second is the push for both wearables and the "internet of things" (IoT). It seems natural that these would go hand-in-hand, as the best way to connect to an automated home or environment is through a mobile or wearable solution. For Google it is Android Wear (already at revision five [5]), but much mores given the second and third generation devices that are coming to maturity once the marketplace has adjusted to better understand what consumers are actively looking for. However, even while released to hardware developers, many are still trying to overcome performance issues with the platform that have stalled or slowed updates and new releases. Besides the wearables focus, Google also announced [Brillo](#), it's core for IoT development and automation, nestled to the side of Android Home (another nod to 'Android Everywhere'), and has a interoperability program called Weave, a new language/SDK, that is intended to make it easier for software and hardware providers to ensure compatibility between ecosystems – a smart move given the fractious environment currently in play.

All of this keys well into a provider of the silicon that Android already runs on (as well iOS), which is Samsung, themselves debuting their own hardware, [ARTIK](#), which offers low-powered SoC (system on chip) platforms to be integrated into all manners of IoT devices. Since the announcement, their initial alpha program supply of hardware has sold out and is resulting in a lengthy waiting list. Suffice it to say, with such a rapid develop uptake, the interest in this market is extremely heightened.

Conversely, Apple just wrapped up it's World Wide Developers Conference (WWDC) in which many of the major announcements mirrored those of Google, with a slight nod to their desktop/laptop side of the business with a new version of OS X and it's merging similarity to its mobile OS, iOS, and it's upcoming point of singularity in which both may become indistinguishable. However, most of the excitement among the faithful revolved around that same mobile platform, of which got a version number bump, this time version 9, and the extension of "Kits" which include HealthKit and HomeKit, both bringing the mobile and wearable platforms into synchronicity and then giving developers a jumping off point to the "land of IoT". Unlike Google, Apple is essentially always wedding their releases to their own curated hardware ecosystem, from iPads and iPhones to the new Apple Watch (thankfully ditching the "i" moniker), which also received an OS version bump. Some of where the tech announcements diverged led themselves to some more interesting, if not a little "far out there" types of consumer experiences. Google slightly cornered the market on the "wow" factor of interesting opportunities, one of which is Project Jacquard (part of Google's ATAP program), in which conductive threads are woven into cloth to allow clothing to become the interface and provide other levels of interactivity with the consumer. Project Ara, another Google technology, which intends to develop a modular and upgradeable and open hardware platform (seen in demos as a modular smartphone), was displayed with a functioning prototype, detecting missing modules upon start-up, and then allowing that module to be added while running and begin functioning with it. As with a number of real-time systems, having this device handle this swap-out gracefully is a gentle leap forward for hardware and software systems. As if not already supplying the world with some off-the-wall stuff, Project Loon, in which Internet/network access is provided by a network of weather balloons, originally targeted for developing countries, was announced that it will be also be considered for deployment within the US. Finally Google's Augmented/Virtual Reality (AR/VR) projects we're given their next shot of adrenaline with updated Google Cardboard (this time, supporting multiple sized screens as well as iPhones, and Jump, a rig for easily setting up 360 degree synchronized code capture utilizing GoPro cameras), the low-cost and simple VR system for smartphones, and the demoing of smaller versions of Project Tango (as well as a price drop on developer kits) that hopes to bring the ability of real-time 3D image capture and manipulation to mobile devices. The latter is a major project combining machine learning (ML) and computer vision into the mainstream, while pushing applications such as wayfinidng and augmented reality as options for mobile platforms.

Apple on the other hand, is doubling down on some of the more pedestrian – again following (although say "leading") into the realms of IoT with HomeKit and extending their wearables strategy with HealthKit – however, neither have demonstrated major blockbuster "wow" factors the way that Google's announcements just weeks earlier were received. While Q1 2015 proved to be a landmark revenue high-water for the company, Q2 2015 results now show a slight downward trend in sales of the iPhone and iPad that helped them reach that Q1 high. Now with a new segment, the Apple Watch, it will be a curious observation as

to who will now have the foothold in advanced wearables – Google or Apple, and how those will be used to augment the day-to-day tech utilization of the users. HomeKit, the IoT framework that Apple released, sticks with their focus on "lifestyle", with their press and documentation denoting more around devices you already own being trigged by "geo fences" to activate other Apple products and solutions in your home, and less on general integration to the hardware and and software systems already out there. Already, due to the lack of standards within the IoT space, each product offering can have it's own scheme for control an interaction, and like Google with Brillo, abstract it out into HomeKit as an extension developers (both for hardware and software alike) have to become compatible with. Just before the WWDC, there were a smattering of announcements of actual products that are compatible with the HomeKit framework, but in reality represent less than a percent of those systems in the marketplace and already integrated into homes and businesses. One of the other delays and the lack of backward compatibility for systems in the marketplace supposedly hinges on the security requirements (end-to-end) than just trying to be exclusively Apple-only solutions. That is at least some good news given the general concerns expressed about most IoT architectures and devices currently in use. While this is in a nascent state, it's relatively unclear how much "heavy lifting" end users will need to do to set up these devices – since most current installs of IoT require considering the layout of the home or office, what's in those areas, and then the types of controls wanted. However, this is also expected to be a similar challenge that Brillo-enabled/power systems will need to address as well.

Unlike Google, or at least overtly, Apple has focused more on using their wearables for the "quantified self" with HealthKit and ResearchKit in order for both users and clinicians to use metrics gathered from iOS and WatchOS powered devices and tools. This offers a new realm of data Apple can now utilize about it's customers, of which most, if not all of their platforms, are tailored towards lifestyle rather than more utilitarian needs. However, unlike shipping off the last track you played on iTunes, you are now collecting a lot more personal and unique data points and shipping them of to a company that has a slightly spotty record when it comes to protecting user data and sharing arrangements. However, ResearchKit doesn't intend to hide from that actual claim, as it is strictly sold to researchers and medical professionals as a gateway to build apps and systems to feed on just such data. This could be a boom or a bust for Apple depending on how users are taking towards how they are sharing this data (opt-in vs. opt-out) and how well Apple keeps a lid on what's collected and protects those customer data stores. Given the recent breach of government human capital records, even an entity that has a high level of trust and expectations of good handling processes can fail miserably. However the opportunity for near-real-time engagement with customers who may also happen to be patients, could provide the leaps necessary in granular data collection for diseases and other ailments could aid in the next breakthrough. It will be a heavy decision users will have to evaluate – a risk/reward option that could open the door to the great and to the awful.

Finally, last of all, to bring a greater parity to what Google and Apple announced at their respective events, Apple's upgrade and reworking of Apple Pay to not only be more functional and flexible (presumably by also gobbling up Passbook and renaming it to Wallet), but enabling the NFC components in the i-Devices to use those stored payment and memberships to interact with the world. Most notably, in the UK, becoming an supplicant to the Oyster Card used for the London Underground. Apple is also now leveraging the TouchID sensor as a multi-factor biometric component as part of the payment process with Wallet as well as apps built to support the Apple Pay API. While using a form of tokenization similar to what Android pay uses, it does it dynamically via a different cryptologic hardware platform called Secure Element, which is designed in a similar fashion to Trusted Platform Modules (TPM) seen on many PC motherboards for similar keying operations. In both cases, this is to keep to customer's account number from being transmitted, and those reduces potential theft, replay, and other forms of fraud. However, as Apple has stated, they do not store the information, only act as a payment enabler, and unlike Google, do not keep you stored cards centrally – in short, they are a front-end to the relationship between the card issuer, marching and processing bank.

So as both of these yearly events draw to a close, the shakeout of each are focused on enabling consumers to automate, instrument and eventually pay for all of it through mobile platforms, whether it be in there pocket or on their wrist. I feel 2015 will be a "wait and see" year, especially now that SDKs and some of these hardware platforms are reaching their second round of maturity, and hope that the developer community decides to embrace and go forth and develop innovative uses for all of these baked-in capabilities. Much as recent years were dominated by new hardware, apps, and games, this year will be that observational year to see what toolkits had inspire people to build – come the end of the 2015 fiscal year, we make see some really interesting solutions, or a stagnant ecosystem from both Apple and Google.