



Predictions: Tech Trends – part 2 – 2018

RFG Perspective: Mobility and the digital economy proved to be an overarching theme in 2017 and will prove somehow to be even more ingrained in the all facets of enterprise business in 2018. While desktops are still the on-site work engine, they are no longer the user device of preference for business or personal use. With market and project maturity comes awareness to the need for increased attention and analysis in product selection, stakeholder involvement, project reach and cost/value ratios. Attention to tablets will further decrease in 2018 as smartphone capabilities and ubiquity increases; and other IoT devices fill in niche markets. The end of multi-year wireless contracts coincides with the demise of subsidized phones allowing for easier carrier portability and lower pricing. Many enterprises will adopt lease-style rental models for smartphones accordingly. IoT will wreak further havoc on computing power, networks, and storage calling for increased attention in analytics, data management, and security.

PCs

2017 sales in the PC space is either slightly lower or higher than 2016 depending on how sales are counted leaving the net result for the year virtually unchanged compared with the year prior. This is not encouraging for PC manufacturers given the steady downward trend has persisted over the last six years; however, that trend is likely to move upward in 2018. Desktops were predominantly relegated to shared space and task worker functionality ages ago and little of interest is happening outside of gaming, video production, and highly-computational use cases. For enterprises, most of the growth and interest lies in the laptop space where far more activity is transpiring.

At the low-end, new Intel Core processors offer moderate speed and battery improvements – most noticeable in the Chromebook space. New Chromebooks gained access to Android apps, which have been coupled with length battery lives, ongoing and automatic security updates, improvements in manufacturer designs, and excellent and improving access to the Google ecosystem. At the higher end of the spectrum, Intel's latest 8th-generation Core processors offer seriously impressive boosts in multicore processing, particularly in the i7 processor line which now features four cores and multithreading speed improvements that are doubled that of its predecessors. While this is of particular interest for performing compute-intensive tasks such as video processing and calculation-intensive work, energy savings capabilities throughout the processor range offer battery improvements typically in the 10 percent range. Price competition is stiff throughout and 2018 will prove an excellent time for upgrade and enterprises purchases will help push the market northward for the first time since 2011.

Clamshell laptop configurations will remain the preferred choice for the majority of enterprise use, though many corporations will select touchscreen models for particular for high-end users given the typically low (sub-\$100) cost of upgrade. Elsewhere, detachable laptops offerings that offer both traditional clamshell usage in addition to detached, tablet style capabilities will increase. So-called “convertible” laptops that have offered these functionalities for several years without detaching the keyboard/base have sold moderately but with little real traction in the enterprise, and RFG expects the impact of detachable options to be similar. On operating system front, improvements in Windows 10 and Mac OS have will focus mostly around security and increasing user ease into



respective ecosystems. No major productivity or management improvements are expected though each OS will marginally improve along predictable trajectories. Expect Chromebooks to make inroads, particularly at the low-end, where funding is in short supply, in Google-friendly organizations, and in places where centralized management is a challenge.

Smartphones and Tablets

As expected, this past year did not see exponential improvements in smartphone technologies or capabilities. New flagships from the likes Apple and Samsung moved the bars forward with faster processors, more RAM, and better screens from a hardware perspective. USB-C charging and fast charging also became more commonplace; minor consolation for the lack of tangible improvements in battery longevity. Operating system improvements including improved AIs and Apple's FaceID as user identification and authorization. While vendors tried to pass these incremental improvements off as major advances, high-end phone uptake – particularly in the enterprise space – was little changed versus the prior year. RFG fully expects this innovation stagnation to continue in 2018, though there are a few upcoming highlights worth mentioning.

Vendors will follow Apple's lead into eye and/or face recognition as a means of primary identification and authentication in the Android space this year, starting first in flagship devices. Enterprises should prepare by readying applications to take use of alternative authentication (other than ids and passwords) as biometric capabilities are already becoming mainstream and preferred by a majority of users. For those organizations that have not adopted more alternative authentication strategies, the time to stop delaying is now. Also, biometrics are not a substitute for multi-factor security authentication capabilities – which should also already be in place if they are not already.

Competition in the voice recognition space is heating up and enterprises should expect to see Amazon Alexa available as a default voice assistant on a few smartphones – though certainly not from industry leaders Apple and Samsung. Google's AI is getting noticeably better and conversational capabilities, resulting in improved OS and in-app functionality within Android devices. Moreover, Apple cannot afford to sit idly by and allow for Siri to remain at the virtual standstill it has retained virtually since its introduction. Expect AI engines from Amazon, Android, and Microsoft to be increasingly available across operating systems; however, the lack of low-level integration will limit usefulness and practicality. Amazon's Alexa AI lacks some of Google's intelligence; however, it has the richest IoT/third-party integration capabilities and would be the most likely contender to build tighter OS-level integrations with Android (Apple will certainly go it alone). 2018 may see a resurgence of the "Amazon Phone," though it is unlikely to be Amazon branded. Enterprises should watch this space closely for opportunities where tighter app integration and improved customer service capabilities exist. Where substantive improvements can be made, first-mover advantages may prove quite advantageous.

First-round deployments of 5G cellular Internet connectivity have deployed in pockets around the world and offer blazing-fast speeds of 1 gigabit per second or more. While a



positive development, 5G-capable handsets are virtually non-existent and the it will likely take the next two years of carriers and handset manufacturers work before mainstream offerings and usage is available. Enterprises should continue to watch this space and work with carriers and preferred vendors to understand rollout and availability timing, but otherwise have little work to do in preparation. Internal upgrades to are already underway to build faster network and the corporations should well be ready for whatever impacts have on service delivery.

Apple iPads and Google Android-based devices will largely continue along their current trajectories in enterprises as laptop/desktop accompaniments rather than replacements. The iPad Pro is being marketed as a laptop replacement and has merits including an accessible file system and Microsoft Office apps to support such a role. However, the iPad Pro is priced similarly to traditional mainstream Microsoft-based laptop offerings and remains limited compared to the full functionality (save, perhaps, a touch screen) found on enterprise laptops. While it is a compelling solution, there remains little reason to forgo a laptop in favor of an iPad Pro save some edge cases like graphic manipulation and note taking. Enterprises are advised to stick with mainstream laptop solutions instead of touch-screen first offerings for the foreseeable future.

Phone Payment Strategies and Wireless Carrier Pricing

The free phones of yesterday have long since been relegated to the domain of slow-selling overstock or woefully outdated hardware as the traditional smartphone contracts are virtually the domain of the dinosaur. Enterprises are thus relegated to paying for new smartphones in full up front or by way of a rental or finance strategy offering, primarily offered by the wireless carrier although numerous other payment lending institutions are happy to extend credit. The most common methodology is simultaneously the most expedient and attractive strategy for the majority of enterprises and consumers – lease the phone for 18-months and upgrade to a new model or continue payments for a full 24-months and own the phone. Carrier lock-in using this model can be a concern in the U.S. (decidedly less so in standardized markets like Europe); however, phones can be unlocked for use on other networks and options to separate phone from carrier usage are commonplace through contracts though IT executives will need to ensure such provisions are specifically noted. Alternatively, carriers will frequently pay off an “acceptable amount” of remaining phone payments via trade-in to encourage a switch.

Wireless carrier pricing models have stabilized and gained a degree of equilibrium across the major carriers with additional (sometimes substantive) monies saved available to those willing to use mobile virtual network operator (MVNO). That aforementioned sweet spot tends to occur between the \$40 and \$55 price points for single users, with the lower amount aligning well for voice/text users with limited Internet access requirements and the higher price point suited for those with heavy Internet usage of 5GB or more. Virtually all options include unlimited U.S. voice and texting. Enterprises will typically opt for to either reimburse access charges or to incorporate plans under a corporate umbrella and work towards discounting of up to 40 percent on pooled plans. Phone payments themselves remain the discretion of the enterprise. Differences among carrier



capabilities and performance is becoming increasingly moot, and thus, enterprises should continue to either consolidate carriers to maximize cost reduction or select the network that best meets geographic needs. Little has changed from this perspective and the next big deciding factor will be 5G rollout availability and performance.

Wearables Down; IoT Everywhere

Wearable advancements were many in 2017 including faster processors, GPS integration, and 4G connectivity. From a consumer standpoint, these improvements offer improved experiences in health tracking, notifications, and smartphone usage; however, very little in the way of enterprise applicability arrived on the horizon. Given the current trajectory, 2018 is likely to be another year of incremental improvements. Until user experiences, processor upgrades, and long-lasting batteries can be achieved, mainstream wearable devices will remain the domain of the first adopters and the health centric. Enterprise use cases should focus on identity/authentication scenarios, applicable human resource tracking, and the augmentation of health data into applicable applications.

Conversely, Internet of Things (IoT) devices are radically on the rise in both consumer and enterprise capacities. IoT devices will become a primary source for big data and supporting analytical activities by provide insight into behaviors to better optimize processes and deliver new services during 2018. However, challenges related to data acquisition, storage, transmission, collection, analytics, and security will quickly overwhelm organizations that have not adequately prepared for the onslaught. Part of the IoT challenge will stem from initial deployments of edge computing solutions to reduce data center demands and the need for digital twins that duplicate corporate assets and processes in a decentralized manner. The effects on enterprise architecture and resource requirements cannot be understated as IoT spreads and investments in up-front planning and Agile, iterative development will pay off significantly as poorly planned and executed projects will causes massive losses in revenue and opportunity.

Security

2018 will show have increased attention in security and compliance in response to regulatory requirements and the complexity of cloud implementations. Several high-profile data breaches including Deloitte, Equifax, FAFSA (used by the IRS), Verizon, and Yahoo! (affecting more than 1 billion user accounts) have aided this renewed interest. It should be obvious that proper security requires planning, oversight, and procedures throughout all application, data, and infrastructure life cycles and that security processes and responsibilities must be the responsibility of all stakeholders. A growing trend this year and beyond will be to include the “sec” into DevSecOps and to use automated tools including that incorporate machine learning and artificial intelligence. Effective use of machine learning and artificial intelligence will be leverage multiple toolsets and, it should be noted, that hackers have already adopted intelligent software to increase the potentiality of success.

This year will also be notable for featuring some of the first, well-known penetrations leveraging IoT devices. While the definitions, use cases, and implementations of IoT are



rapidly evolving, the lack of standards in technology implementation, security, update frequency will be a boon to hackers. Enterprises adopting IoT solutions in any of their myriad forms need will need to employ careful and rigorous analyses to ensure these certain attack vectors are properly vetted. Additional steps including the use of segmented networks, firewalls, whitelisting, and application-specific gateway appliances will also help.

RFG POV: "Mobile first" initiatives (along with cloud first) are now the standard direction offered by senior executives, as businesses aim to serve users with diverse needs and device types. The servicing of these directives is rapidly evolving business models and enterprise architectures including the adoption of cloud-based services, rental-style device acquisition and refresh strategies, and IoT capabilities. Enterprises will need to develop and continuously hone data management and integration strategies, analytics tools, and security tools and practices to successfully support these efforts in 2018. Accountability and compliance to prescribed outcomes using established metrics will be essential to success, as will an enterprise-view to all aspects of development, support, security, and enforcement. IoT will take center stage along with security and compliance this year and enterprises will rapidly realize that desired initiatives are fast outstripped by available resources. The complexities ahead pose both great reward and perhaps even greater risk thus necessitating a more metered, measured, enforceable approach to technology adoption.

Additional relevant research is available at www.rfgonline.com. Interested readers should contact RFG Client Services to arrange further discussion or interview with Mr. Adam Braunstein.