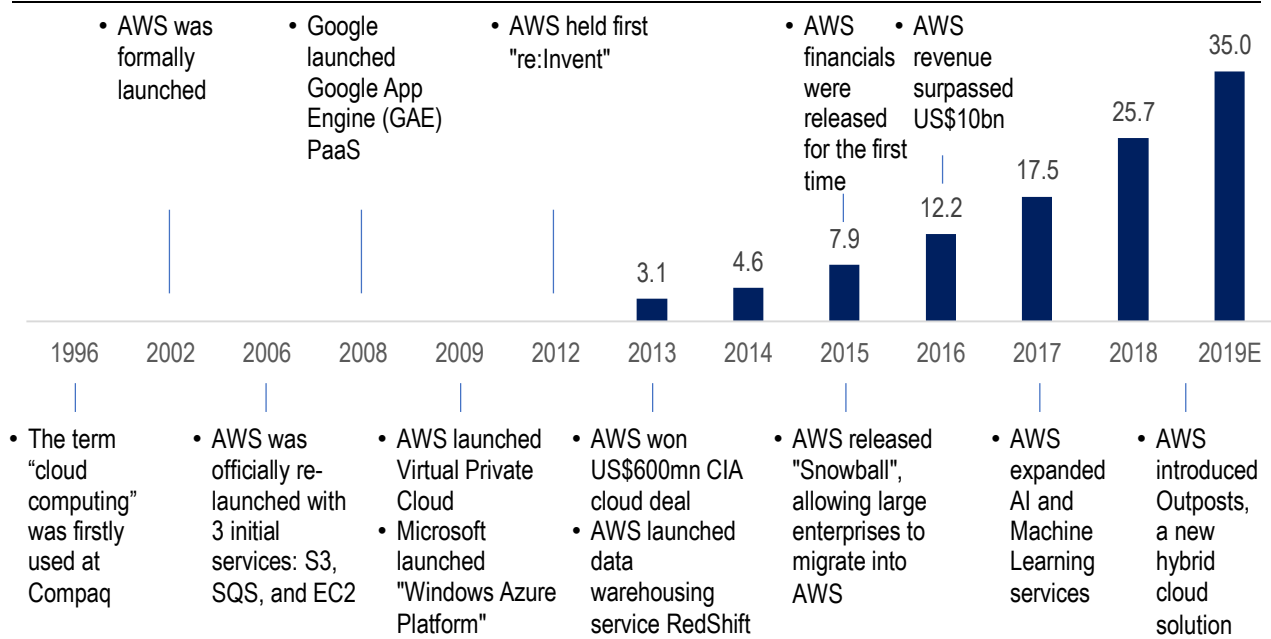




**AWS – re:Invent 2019 key takeaways**

**Figure 1: Timeline of key events of AWS and its revenue trend (bn US\$)**



Source: computerworld.com, AMTD Research estimates

**AMTD views:** As continuing to compete with its major rivals in new offerings and customer solutions, AWS launched a series of new products and services at re:Invent 2019 early this month. The key releases included new chips for cloud computing, improvements for data warehouse RedShift, new features for machine-learning SageMaker, and the most notable offering in on-premises and edge solutions. In terms of breadth and depth, we believe AWS remains the industry leader in cloud computing. Regarding the revenue, we expect AWS's total revenue will grow by 36% YoY to US\$35bn in 2019.

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Cloud

AWS/Amazon

Re:Invent 2019

### **New Graviton2 chips aims to push price/performance ratio for cloud computing**

AWS launched the next generation of its ARM processors, the Graviton2. It is a AWS-designed with a 7nm architecture and based on 64-bit ARM Neoverse cores. Optimized for cloud-native applications, New Graviton2 boasts 2x faster floating-point performance per core for scientific and high-performance workloads, supports for up to 64 virtual CPUs, 25Gbps of networking, and 18Gbps of EBS Bandwidth, in the meanwhile, it promises a 40% better performance from comparable x86-based instances.

AWS plans to move its internal services to Graviton2-based infrastructure. On the other hand, AWS services like Amazon Elastic Load Balancing, Amazon ElastiCache, and Amazon Elastic Map Reduce have tested the Graviton2 instances and plan to move them into production in 2020. We believe New Graviton2 launch may improve AWS' cost structure and operating margin in the future.

### **New updates to RedShift – AQUA brings compute closer to storage**

AWS announced updates to its data warehouse RedShift. AQUA is a new distributed and hardware-accelerated cache that enables Redshift to run up to 10x better query performance than any other cloud data warehouse.

Given that since 2012 SSD storage throughput has increased 12x while the ability for CPUs to process data in memory has only scaled 2x, the ability for CPUs to process all this data is limited if network bottleneck is removed. AQUA takes a new approach to cloud data warehousing. It accelerates Redshift queries by running data intensive tasks such as filtering and aggregation closer to the storage layer. With this new architecture, it will help big enterprises save a lot on mass data migrations.

### **SageMaker Studio makes it easier to develop high quality ML models**

Artificial Intelligence (AI)/Machine learning (ML) is one of the fastest growing areas in technology and an important battlefield for cloud computing. AWS announced SageMaker Studio, which is first web-based integrated development environment (IDE) specifically for building machine learning model. It allows developers to build, train, tune, and deploy their models from a single interface. SageMaker Studio comprises several tools, including SageMaker Notebooks, SageMaker Experiments, SageMaker Debugger, SageMaker Model Monitor and SageMaker Autopilot.

### **Outposts, Local Zones and Wavelength offer different cloud deployment solutions**

AWS also announced AWS Outposts, AWS Local Zones, and AWS Wavelength to address different demand of cloud deployments: on-premises, local latency, and 5G edge computing.

- 1) AWS Outposts Preview was released last year and the formal version was officially available this year. AWS Outposts lets customers run workloads on premise with the same AWS APIs, control plane, hardware and tools that allow them to connect with all other AWS applications. For those who still want to use the VMware control plane, the VMware Cloud on AWS variant is coming in 2020.
- 2) AWS Local Zones aims to provide low latency services for customers who are not in the Region. Although AWS currently has 22 regions (Regions) and 69 Availability Zones (AZ) in the world, there are more than 10,000 cities in the world. AWS customers in many cities still have a relatively high latency. As an extension of a Region, a Local Zone provides a high-bandwidth backbone to the AWS infrastructure and is ideal for latency-sensitive applications, such as live streaming, machine learning.
- 3) AWS Wavelength is a platform aiming to bring compute and storage to edge compute facilities. As 5G is a big enabler to edge computing, AWS and Verizon are collaborating to bring 5G to edge computing in a service that brings more applications, such as AR/VR, IoT, machine learning, and autonomous driving, etc., on ultra-low latency networks.

- Cloud
- SaaS
- Salesforce

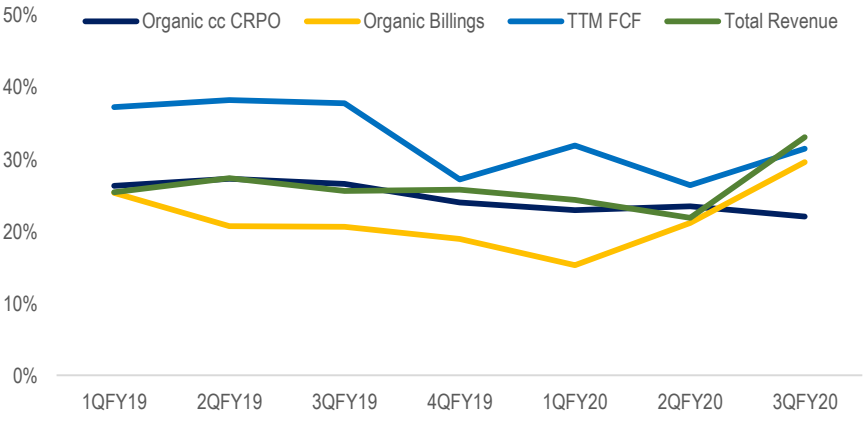
**Solid Q3 results but guidance point to slow down**

Salesforce posted solid Q3 results. Current remaining performance obligations (CRPO) bookings was US\$12.8bn, up 28% YoY in cc. Organic cc CRPO grew by 22% YoY to US\$12.2bn by excluding approximately US\$600mn contribution from M&A. Organic cc billings grew by 29% YoY. Total revenue came in at US\$4.5bn, up 33% YoY, among which newly acquired MULE's revenue grew strongly by 77% YoY in Q3.

Regarding the expenses, S&M to revenue ratio continued to decline while G&A and R&D to revenue ratio maintained and rose slightly to sustain future growth. Operating margin improved by 250bps YoY to 19.4% this quarter despite the first quarter of absorbing Tableau. We expect Salesforce can continue to improve operating margin by unleashing the acquisition synergies. The company had strong cash flow and TTM FCF was up 31.5% YoY this quarter.

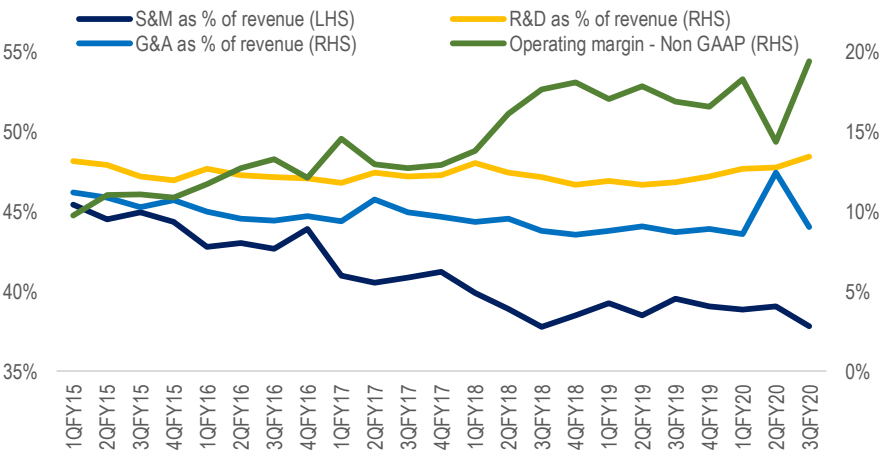
Looking ahead, decelerating CRPO bookings growth in Q3 and weak Q4 guidance of 21% YoY may raise investors' concerns over durable growth of the company. On the other hand, 28%-29% of Q1FY21 revenue company guidance compared with 22%-23% of FY21 full year revenue company guidance may indicate a tough competitive environment later next year.

**Figure 2: Salesforce's organic cc CRPO, organic billings, and TTM FCF growth, YoY**



Source: Company data, AMTD Research

**Figure 3: Salesforce's expenses as % of total revenue and operating margin (Non-GAAP)**



Source: Company data, AMTD Research

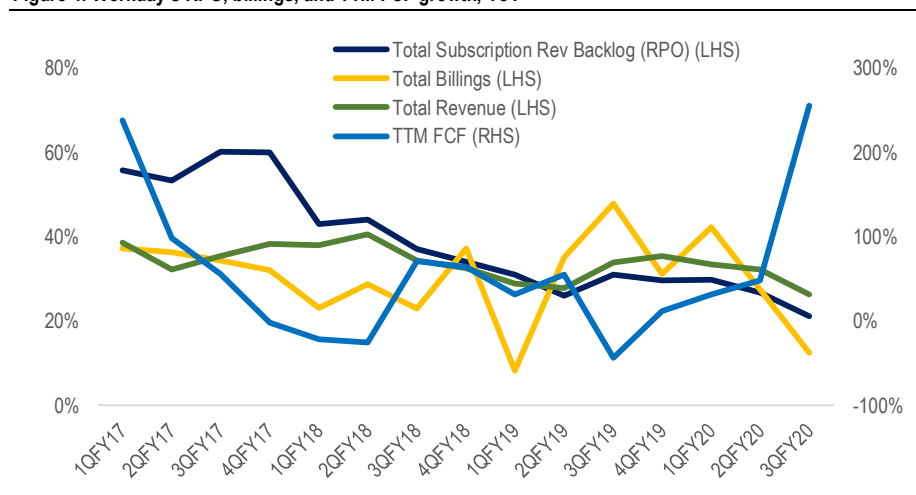
- Cloud
- SaaS
- Workday

**Positive Q3 results but sustainable growth concerns persist**

Workday reported positive Q3 results. Total revenue grew by 26.2% YoY to US\$938.1mn, among which subscription revenue was US\$798.5mn, up 27.9% YoY and ahead of market expectation. based on that, the company raised FY2020 subscription revenue outlook to US\$3.085bn - \$3.087bn. Operating margin expanded to 15.2%, up 850bps YoY, thanks to improving leverage achieved by 100%+ net retention rates. This also boosted cash flow. Operating cash flow came in at US\$258mn, and TTM FCF grew strongly by 255.6% this quarter.

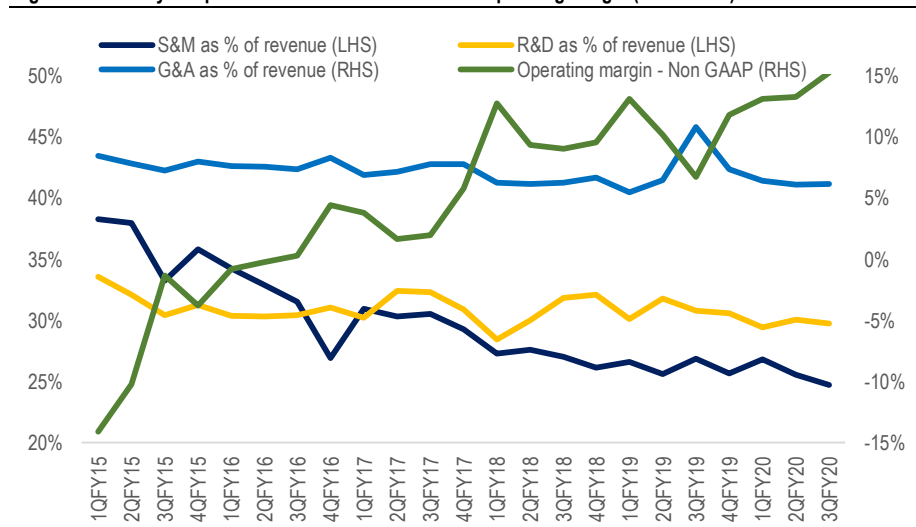
As HCM business is becoming mature, the leading indicators have shown weakness. On the backlog side, total subscription revenue backlog grew by 22% YoY, down from 27% YoY in 2QFY20; for total billings, its YoY growth decelerated from 35.6% in 2QFY20 to 26.8% this quarter. However, we believe FINS business and international expansion could be another growth drivers for Workday going forward.

**Figure 4: Workday's RPO, billings, and TTM FCF growth, YoY**



Source: Company data, AMTD Research

**Figure 5: Workday's expenses as % of total revenue and operating margin (Non-GAAP)**



Source: Company data, AMTD Research

## News updates

10 Dec 2019

Smartphone

Xiaomi

### The most affordable 5G smartphone – Redmi K30 5G launched

The Redmi K30 was officially launched in China and came in both a 4G and 5G variants. The Redmi K30 5G is the first smartphone powered by the Snapdragon 765G SoC, which is built on a 7nm+ EUV process and has an integrated Snapdragon X52 modem that supports dual-mode 5G (SA and NSA) with MultiLink. The Redmi K30 5G is built around a 6.67" LCD with 120Hz refresh rate. The display also has a pill-shaped punch hole in the top-right corner for the 20MP selfie camera joined by a 2MP depth sensor. Coming to the back camera, it's a combination of 64MP main (Sony IMX686), 8MP ultrawide (120 degrees FOV), 5MP macro, and 2MP depth sensor modules. The Redmi K30 5G offers a 12-antenna design and includes dual-frequency GPS support. The Redmi K30 5G starts at a very attractive price of RMB1,999 (US\$284) for the 6GB/64GB model, making it the cheapest 5G phone around. (Source: [Gizmochina](#))

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9 Dec 2019

Wearables

Realme

### Realme to launch its first wireless earbuds Realme Buds Air

Realme will launch its first wireless earbuds Realme Buds Air on 17 Dec. The earbuds' design is similar to AirPods, with three color options – white, yellow and black. It will sport a 12nm Bass boost driver, Bluetooth v5.0 support and an instant auto-connection feature. The earbuds will come with smart touch controls to manage music and calls, and support Google Assistant. Realme offers an INR400 coupon for existing customers or interested users participating in a promotion activity. (Source: [Gadget](#))

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9 Dec 2019

Smartphone

Oppo

### Oppo Reno 3 Pro will launch soon with dual-mode 5G support

Oppo announced that Oppo Reno 3 Pro would debut with a Snapdragon 765G SoC, and come with dual-mode 5G support. According to press, the phone will come with a quad rear camera setup. It would include a 48-megapixel primary sensor -- along with a 13-megapixel secondary sensor, 8-megapixel tertiary sensor, and a 2-megapixel depth sensor. Moreover, the phone is also said to have 30W fast charging support. (Source: [Gizmochina](#))

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6 Dec 2019

Semiconductor

TSMC

### TSMC's 5nm process to start mass production in 2Q20

TSMC will start mass production of its 5nm process in 2Q20, and it is said that TSMC may double the 5nm production capacity. The company is also planning mass production of its 3nm process in 2022. The 2020 capex will be at US\$14-15bn, similar to that of this year. Its new R&D center in Hsinchu is expected to start construction in 1Q20, and complete and open in 2021, which will incubate more advanced technologies in the next 20 years. (Source: [Gizchina](#))

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6 Dec 2019

### Huawei to release Kirin 1020 and Kirin 820

Semiconductor

Huawei

Huawei is expected to launch the flagship Kirin 1020 and the performance-grade Kirin 820 in Sept 2020. It is reported that Kirin 1020 will adopt 5nm process and feature ARM A77 CPU. This flagship chip is equipped with a built-in 5G modem; it has a 50% speed improvement over Kirin 990, and will first come with Huawei Mate 40. Kirin 820 will use 7nm technology, integrating 5G baseband, and will first be used in Huawei nova 7 or Honor 10X. (Source: [Sina](#))

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6 Dec 2019

### Apple to launch low-cost iPhone 9 in March 2020

Smartphone

Apple

Apple is expected to launch iPhone 9 in March 2020. The new iPhone will have a similar design as the iPhone 8, including a 4.7 inch display and a Touch ID home button. It will probably feature an A13 Bionic chip. The phone is expected to start from US\$399, and the projected shipment in 2020 will reach 30mn units. (Source: [MacRumors](#))

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6 Dec 2019

### Samsung's Galaxy Fold 2 vertical foldable phone will launch soon

Smartphone

Samsung

Samsung already confirmed it's making a vertical foldable handset that will compete against the US\$1,500 Motorola Razer handset. Recently, some media reported that the price might be a lot cheaper than anticipated. The price might be around US\$845. The Galaxy Fold 2 is also expected to include the 5x zoom camera and it's expected to be publicly unveiled alongside the launch of the Galaxy S11 series in February 2020. The devices might include support for 5G and 25W fast charging. (Source: [Tomsguide](#))

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6 Dec 2019

### Qualcomm launched the XR2 platform for 5G-connected AR and VR devices

Semiconductor

Qualcomm

At its Snapdragon Boondoggle, Qualcomm announced the launch of its XR2 platform. This platform was described as the "world's first 5G-supported extended reality (XR) platform." The XR2 supports display panels with a 3K by 3K resolution at 90 frames per second and supports up to 8K 360-degree videos at 60 frames per second. The Snapdragon XR2 platform is packed with significant performance improvements compared to Qualcomm's current XR platform in terms of CPU and GPU performance, video bandwidth, resolution and AI. (Source: [Techcrunch](#))

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5 Dec 2019

### Murata developed the world's smallest MLCC

Component

Murata

Murata developed the world's smallest multilayer ceramic capacitor – the GRM011R60J104M. It has a mounting surface area 50% smaller and a volume 80% smaller than the conventional product with same capacity, but its capacity is 10 times that of Murata's same-sized product. This meets the rising demand for smaller and higher density electronic circuitry since 5G's rollout. The product could be used in smartphones and wearable devices. Mass production will start in 2020. (Source: [Murata](#))

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4 Dec 2019

Semiconductor

Qualcomm

### Qualcomm detailed Snapdragon 865/765/765G, expected for sale in 1Q20

Qualcomm has announced the detail information for its upcoming Snapdragon 865 and 765/765G mobile platforms.

1) Snapdragon 865: The Snapdragon 865 is designed for flagship-class devices. the Snapdragon 865 includes all of Qualcomm's latest wireless and processor components, including a new 2.84GHz Kryo 585 CPU, Adreno 650 GPU, fifth-generation AI engine, and Spectra 480 CV-ISP.

2) The Snapdragon 765/765G: Both the Snapdragon 765 and Snapdragon 765G SoCs use Qualcomm's new generation AI engine and low-power Sensing Hub to give devices contextual awareness of voice commands, without excessive battery drain. The integrated ISP also supports multi-camera capture, allowing users to shoot from the primary, tele and wide-angle cameras simultaneously. It's also capable of capturing 4K HDR video too. Snapdragon 765/765G uses the new Kryo 475 CPU cores, with speeds of up to 2.3GHz. There's also an Adreno 620 GPU, which promises up to 20 percent improvement over last generation.

The Snapdragon 765 is made for mainstream smartphones. The Snapdragon 765G is made for gaming. The main difference between the Snapdragon 765 SoC and the Snapdragon 765G SoC is the improved graphics performance of 765G, by around 10 percent. (Source: [Anandtech](#))

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3 Dec 2019

Cloud

Kingsoft/Xiaomi

### Kingsoft and Xiaomi signed a three-year framework agreement

Kingsoft and Xiaomi signed a three-year framework agreement. Kingsoft will provide comprehensive services to Xiaomi, covering cloud services, promotion services, mailbox customized development services and advertisement agency services; jointly operate games with Xiaomi provided by Kingsoft; offer hardware products to Xiaomi, including servers manufactured by independent third party, storage devices and load balancer. Xiaomi will also provide Kingsoft promotion, software development, restaurant services, etc., and supply Xiaomi's own products. (Source: [Sina](#))

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3 Dec 2019

Smartphone

Xiaomi

### Xiaomi Mi 10 will be one of the first Snapdragon 865 phones

Mi 10 is the company's upcoming flagship and will be launched in February 2020. Mi 10 will come with the next-gen Snapdragon 865 octa-core processor. The chipset includes Qualcomm's X55 5G modem. It will feature a 6.2inch AMOLED display. Mi 10 will pack a 5,000mAh battery with 40W fast-charging. Some media claimed it will have a triple-lens set, featuring 45Mp + 12Mp + 12Mp lenses. Specific information about Mi 10 will be announced later. (Source: [Notebookcheck](#))

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As of the date the report is published, Brian Li holds financial interest in the securities of Amazon mentioned in the report.

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