

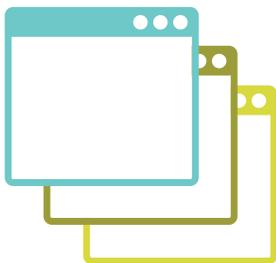
# ACCOMPLISH DAILY FINANCIAL-SERVICES DEMANDS WITH THE RIGHT DEVICE

## Executive Summary

The financial-services industry can be fast-paced and intense. For the industry's professionals, there's additional pressure that comes with transacting large sums of money, managing corporate-sized private investments, or shouting over your peers on the trading room floor. Financial-services professionals, including financial analysts, private investment bankers, and retail bankers, need to remain productive while helping keep company data safe wherever they go—especially if their organizations intend to keep up with digitally-disruptive competitors and the digital transformation taking place in every industry. These needs put a greater demand on mobility, data analytics, and virtualizing hardware-based functionality.

To determine which device can keep pace with the demands of day-to-day financial-services industry workflows and performance, multitasking, and scalability requirements, Prowess Consulting ran two devices, the Microsoft® Surface® Pro 4 and the Apple® iPad Pro®, through a regimen of tests. We used the latest version of each device, a Surface Pro 4 running Windows® 10 on an Intel® Core™ i7-6650U processor and an iPad Pro running iOS® Mobile 10.2.1 on an Apple® A9X processor. This report details our most important findings.

We devised testing scenarios based on common tasks performed by financial-services workers. In most cases, we found that the Surface Pro compared to the iPad Pro enabled workers to:



**Seamlessly multitask**  
to complete multi-app  
workflows



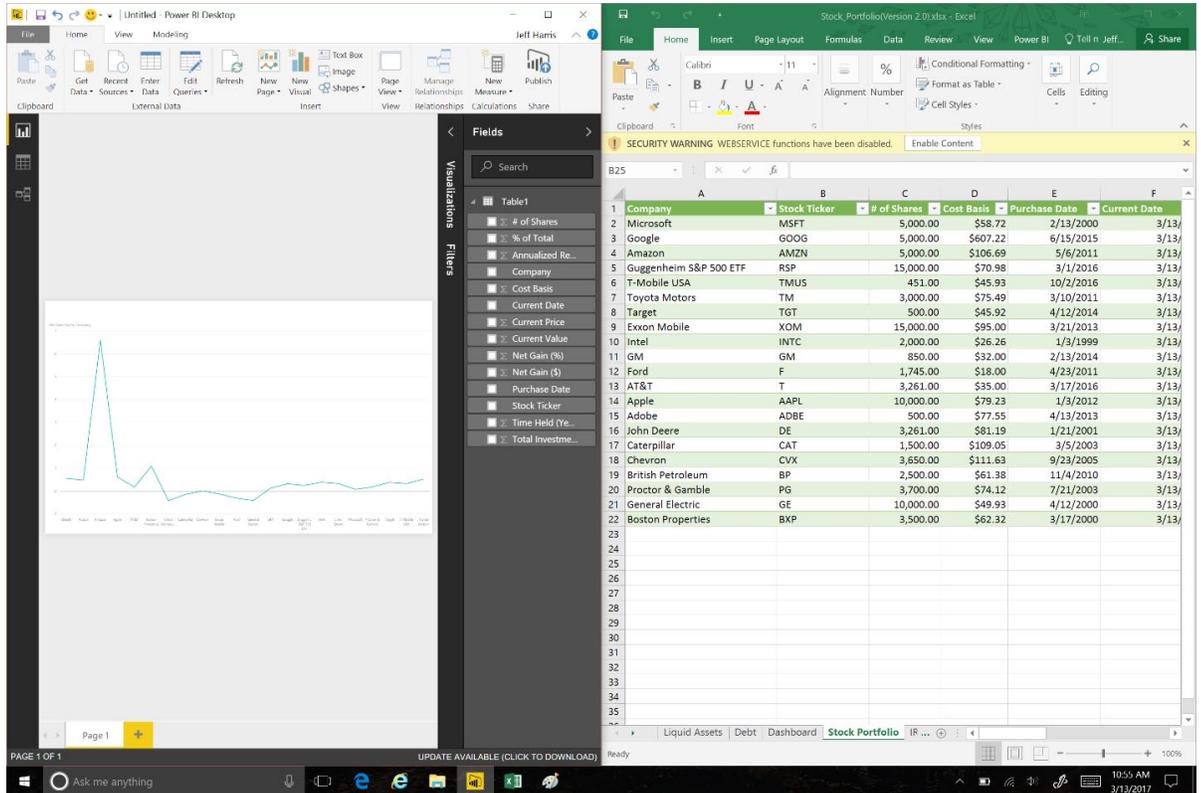
**Quickly crunch numbers**  
to make faster,  
more-informed decisions



**Access more features**  
that enable them to better  
meet customers' needs

# Which Device Best Meets the Needs of Financial-Services Professionals?

To enable greater mobility, financial-services workers are trading in their desktop computers and terminals for more mobile form factors like tablets and 2-in-1 devices. Some users gravitate toward Apple® iPad® devices, but our testing found that those devices might not be the best choice to support the job requirements of all employees. Not all devices can manage the same types of workloads; some devices are better suited for content consumption only—such as checking social media, reading emails, browsing the web, or watching videos—while others work well for content consumption *and* content creation.



**Figure 1.** Use split-screen functionality on the Microsoft® Surface® Pro to consume and create content

Financial-services professionals with compute-intensive, multi-app role requirements need devices that can:

- Perform complex operations quickly and smoothly
- Give them access to the data that's important for their jobs without chaining them to their desks
- Enable and support analysis of that data, often as visualizations
- Help them better engage with their customers

In scenarios designed to mimic day-to-day financial-services tasks, we tested a Microsoft Surface Pro and an Apple iPad Pro to find out if one device is better at helping financial-services professionals get the most done on the go.

Our findings show that the Surface Pro offers all the content-creation capabilities of a desktop PC running Windows, in addition to the content-consumption abilities of any other tablet or device, but the iPad Pro is better suited for content consumption only.

Financial-services workers need a device that can help them:

- **Seamlessly multitask** to complete multistep, multi-app workflows
- **Quickly crunch numbers** and make faster, more-informed decisions
- **Access more features** that help them meet customer needs

## Seamlessly Multitask

Whether people are actually capable of multitasking is up for debate, but it's mandatory for devices to have the power to concurrently run multiple programs in today's financial-services workplace. For financial-services professionals, their computers also need to be able to support workloads that are larger than those faced by the average office worker.

To see how the Surface Pro and the iPad Pro compare for meeting financial-services needs, we ran scenarios in which our users completed multiple tasks with multiple programs open simultaneously.

### Scenario 1: Reviewing Investments

In our first scenario, a bank has rebranded itself to have a casual, inviting atmosphere, and its financial advisors work directly with its customers in settings designed to be more intimate. Office conversation areas include tables where the advisor and customer can sit side by side and couches where multiple people can talk with advisors. To facilitate the rebrand, the bank's financial advisors use mobile devices that keep them connected at the tables or on the couches.

Two financial advisors are helping customers with their asset-allocation strategies. David, using a Surface Pro, helps one customer, while his counterpart Marielle uses an iPad Pro to help another.<sup>1</sup>

#### ON THE MICROSOFT® SURFACE® PRO

Both David and Marielle's customers want to look at their investment options across different industries. To do so, David and Marielle need to review their customers' stock portfolios and prepare to make adjustments to calculate the impact to their overall gains.

David, using a Surface Pro connected to an external monitor via Microsoft® Surface Dock, prepares for his client meeting by using Microsoft® PowerPoint® 2016, Microsoft® Excel® 2016, and Microsoft® Power BI® to create a presentation. He has all three apps open—Excel and Power BI on the external monitor and PowerPoint open on his Surface Pro. He opens the

customer's portfolio in Power BI, exports the portfolio to Excel 2016, and makes adjustments to the customer's investment allocations based on which stocks he thinks his customer should buy or sell. David can then either use an Excel 2016 plug-in to export or pin the data to his Power BI dashboard, or he can convert the Excel workbook into a table and import it manually. David opts for conversion.

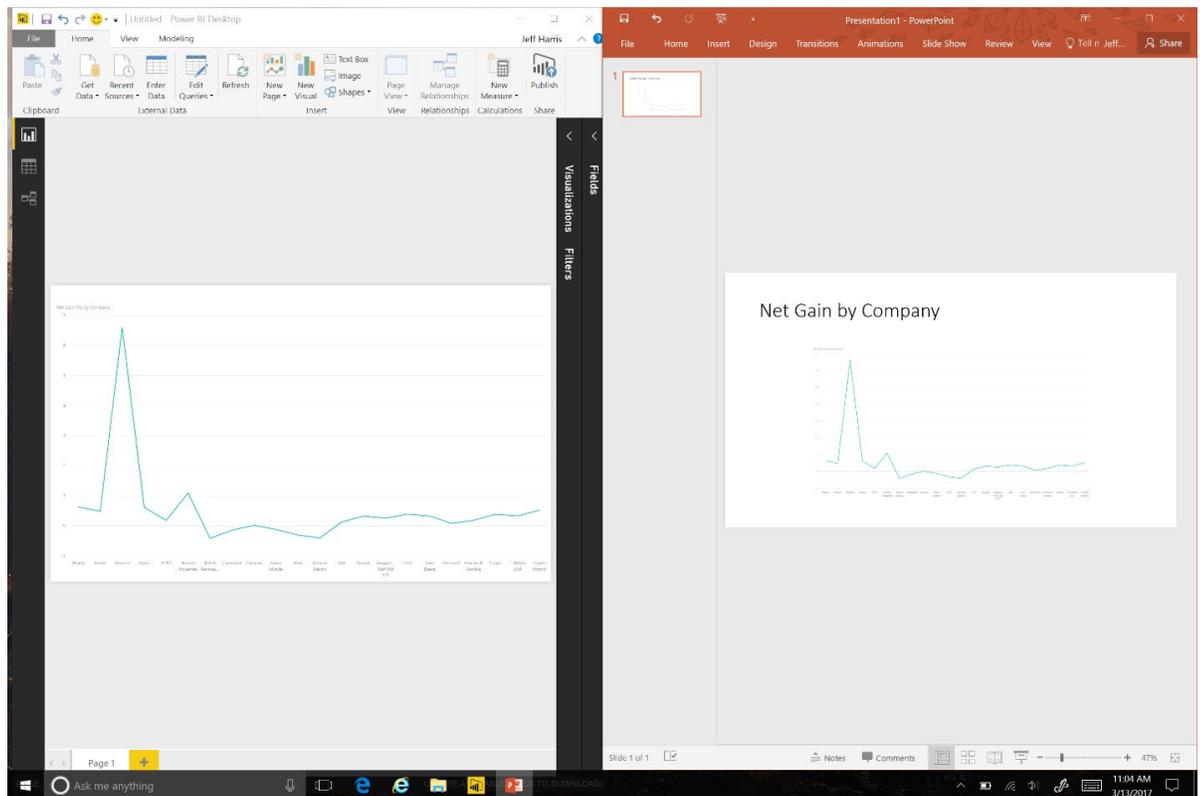
David saves and closes the workbook. He then imports the appropriate Excel workbook into Power BI so he can play with the graphs and charts. If he wanted, David could also pin the Excel workbook to his Power BI dashboard

# 57%



less time to prepare  
investment allocation forecasts  
on the Microsoft® Surface® Pro  
4 than on the Apple® iPad Pro®

as-is and work on it within Power BI (via Excel Online). David chooses an appropriate layout to visualize the portfolio data and generates a line chart. He copies the chart with a Windows hotkey, and switches over to the presentation he's been working on in PowerPoint. He creates a new slide and pastes in the chart from Power BI.



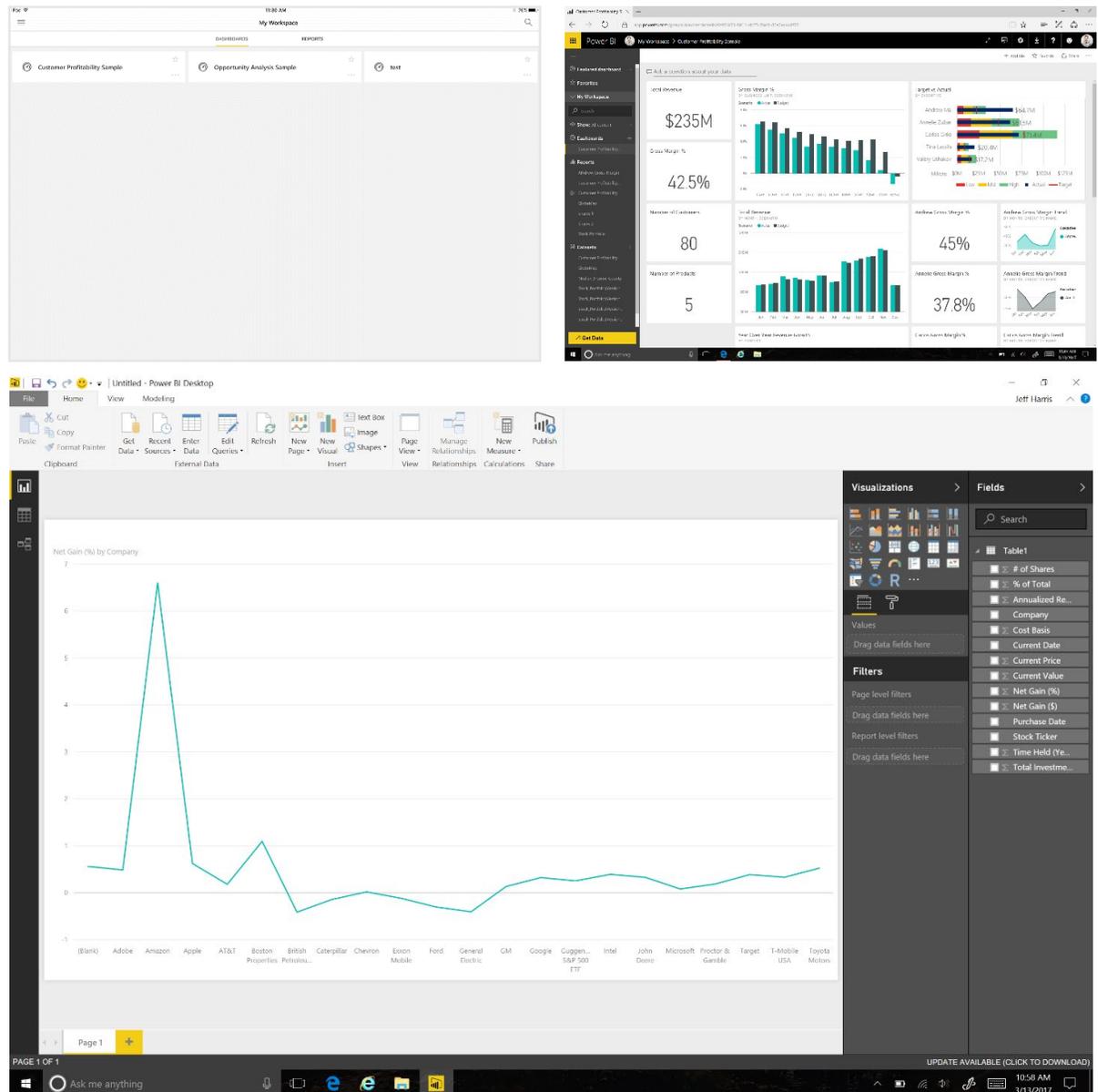
**Figure 2.** David inserts a line chart from Microsoft® Power BI® (left) into Microsoft® PowerPoint® 2016 (right) on the Microsoft® Surface® Pro

At the meeting with his client, David runs through the presentation and reviews the customer's portfolio and his recommendations for investments. He learns that just before the meeting, the customer sold a dozen shares. While sitting with his customer in real time, David is able to make edits to his customer's portfolio within Power BI, refresh the graph, and edit the PowerPoint presentation to share it with his customer live. He can do all of this on the Surface Pro quickly and easily.

### **ON THE APPLE® IPAD PRO®**

Marielle attempts to prepare a similar PowerPoint presentation for her client using her iPad Pro. Unfortunately, preparing the presentation takes her longer because switching between apps on the iPad Pro means she actually has to close and re-open each app each time she needs to transition from one to another. She can view apps side-by-side, but only one app can be active at a time. PowerPoint for iOS is essentially frozen in memory when she switches over to Excel for iOS.

Neither Power BI for iOS nor Excel for iOS are able to connect to outside data sources on the iPad Pro. The Excel workbook Marielle uses is connected to real-time data that is supposed to refresh when the data is updated, but because the data is from an outside source, the workbook can't. Marielle instead has to save a static version of the spreadsheet with data only current for the time she saves it. She then discovers that she can't import the Excel spreadsheet into Power BI for iOS anyway.

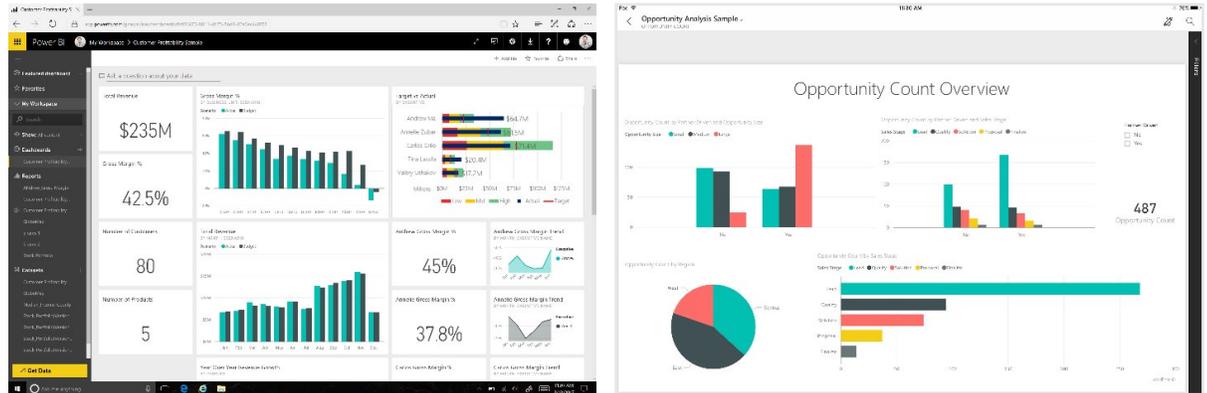


**Figure 3.** Financial-services workers have greater, more granular control with Microsoft® Power BI® on the Microsoft® Surface® Pro—either in Internet Explorer® (top right) or the desktop app (bottom): the Apple® iPad Pro® supports minimal functionality for Power BI for iOS® (top left)

Marielle opens Safari® and navigates to the Power BI web app where she is able to import data from the Excel spreadsheet. She generates a line chart of the data, but to insert the chart into her PowerPoint presentation, she has to take a screenshot of her current Power BI view and crop the screenshot in Photos for iOS, so that it only contains the line chart. Then, she re-opens PowerPoint for iOS, opens her in-progress presentation, and pastes the chart into the appropriate slide.

Later, when Marielle is presenting her recommended asset-allocation strategy to her client, the client tells her about an earlier decision to sell off a number of stocks. Marielle opens Power BI for iOS on her iPad Pro, hoping to update the information right there while sitting with her customer, but she discovers that she can't edit reports or graphics in Power BI for iOS.

She tells her client to give her a moment while she re-opens Power BI in Safari, makes adjustments to her client's portfolio, refreshes the line chart, takes another screenshot, crops the screenshot, and pastes the refreshed line chart into her presentation.



**Figure 4.** Financial-services professionals can enjoy more sophisticated controls and layouts with Microsoft® Power BI® in Internet Explorer® on the Microsoft® Surface® Pro (right) than on the Apple® iPad Pro® (left)

In the end, David spends 57 percent less time to complete the entire scenario on the Surface Pro than Marielle spends to complete it on the iPad Pro.

## Scenario 2: Live Modeling

In our next multitasking scenario, the vice president of a wealth-management firm has asked for a report that shows a variety of financial metrics for the bank's two biggest customers over the past year. To create the report, two of the bank's wealth-management relationship managers (RMs) need to export data and data-analysis visualizations, check the data and visualizations for accuracy, and compile finished reports using Power BI and Excel. Suzanne is our Surface Pro user for this scenario, and Tomás is using the iPad Pro.<sup>1</sup>

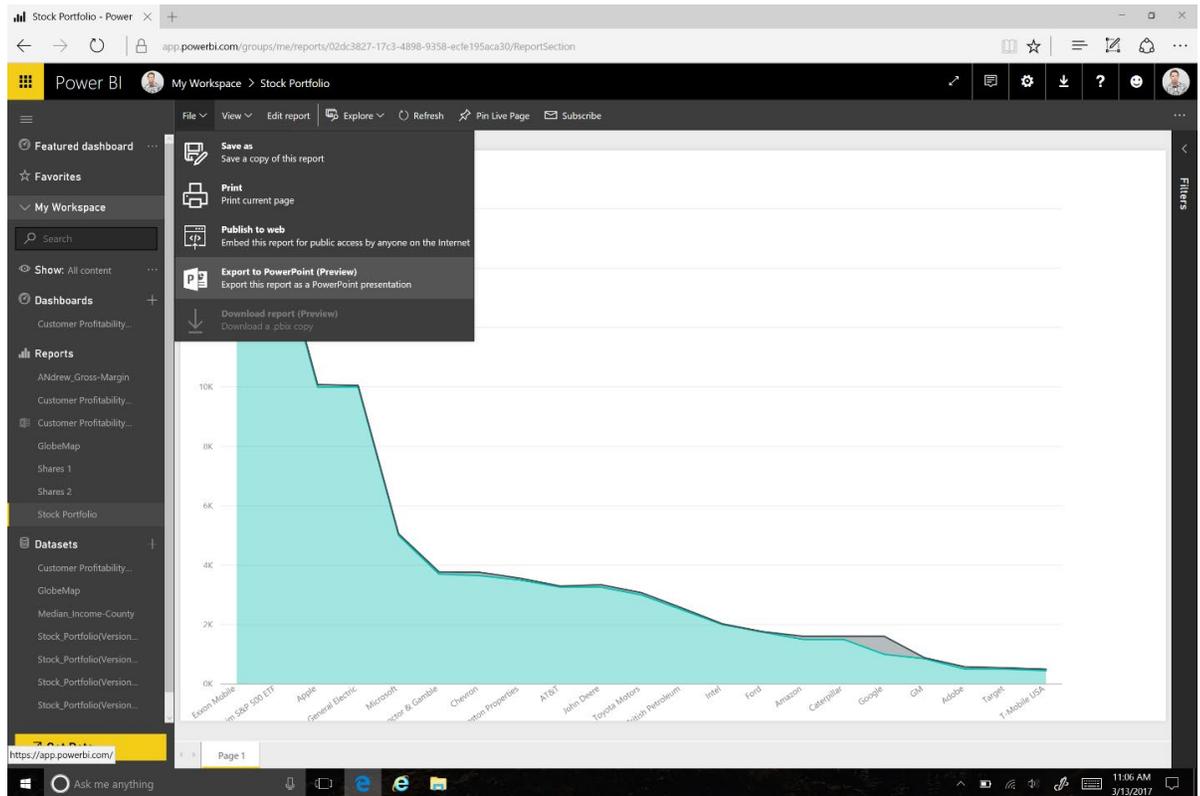
**76%** 

less time to create and update reports on the Microsoft® Surface® Pro 4 than on the Apple® iPad Pro®

### ON THE SURFACE PRO

Suzanne looks at point-in-time graphs in Power BI for both companies on her Surface Pro and notices some oddities. She exports the data sets and opens them in adjacent windows in Excel. She edits the data in Excel, and then refreshes Power BI after each edit until she's satisfied with the results.

Later, she presents her Power BI dashboard during a meeting with the CFO using a projector in his conference room. With the Surface Pro, she is able to take notes in Microsoft® OneNote® on the Surface Pro screen while projecting Power BI to extend her desktop to multiple monitors.



**Figure 5.** Financial-services workers can export Microsoft® Power BI® visualizations directly into Microsoft® PowerPoint® 2016 on the Microsoft® Surface® Pro

## ON THE IPAD PRO

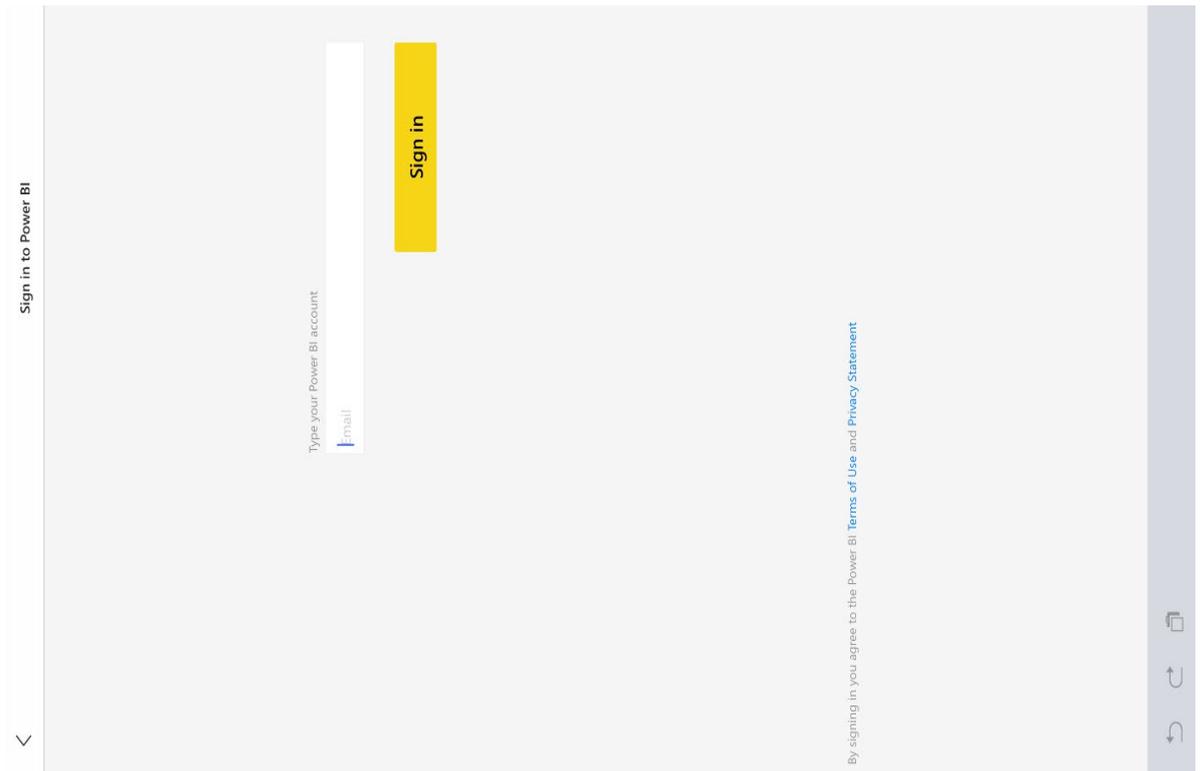
Tomás, on the iPad Pro, can't finish his presentation anywhere near as fast as Suzanne does with the Surface Pro. He encounters a roadblock as soon as Power BI loads: the login screen auto-rotates to portrait mode even though the iPad Pro is connected to the Smart Keyboard for iPad Pro and is locked in a horizontal orientation.

He tilts his head to the left as he types in his credentials, and scribbles himself a note to schedule an appointment with his chiropractor—he would make a reminder in OneNote for iOS, but that requires exiting Power BI for iOS. He tips his head to the side like this many times throughout the day because it takes less time than detaching the iPad Pro from the Smart Keyboard, flipping the iPad Pro to portrait mode, and using the touchscreen keyboard.

Tomás cannot look at the two Excel files side by side because Excel for iOS can't display multiple instances of an application simultaneously. Instead, Tomás spends a lot of time jotting notes on a physical piece of paper while looking at each sheet individually. Because Power BI for iOS won't enable him to do a live-refresh of an Excel data source, he has to import the Excel spreadsheet into Power BI for iOS. From there, he chooses a good graph with which to visualize the data.

Unfortunately, he notices an error with the graph and has to repeat the whole process—editing the information in Excel, importing the Excel data into Power BI for iOS, and regenerating the graph.

All told, Suzanne is able to execute her workflow in 76 percent less time on the Surface Pro than Tomás is able to complete his work on the iPad Pro.



**Figure 6.** The Microsoft® Power BI® for iOS® login screen is auto-oriented in portrait mode

### Multitask Faster and More Smoothly on the Surface Pro

The iPad Pro can't have more than one application open simultaneously. On the iPad Pro, apps in the background are essentially frozen in memory, so real-time information and running massive datasets through queries can't be done unless the app is currently in-use or includes a background-refresh function. While you can open certain apps side-by-side on the iPad Pro, you cannot have two Excel spreadsheets open at the same time. For multi-app workflows, iPad Pro users find themselves exiting and re-opening apps anytime they need to switch between programs or tasks.

PowerPoint comes in handy when presenting, too, and being able to have multiple apps open at once can save a financial-services worker from a lot of churn. On the iPad Pro, the churn of just closing and re-opening apps during a multi-app workflow can add up to big productivity losses over time.

Our results show how much time is spent working through financial-services tasks on the iPad Pro. Consider that the average PC refresh cycle has slowed to five or six years, and your firm/company can be looking at a lot of lost productivity over time:<sup>2</sup>

### Time Saved When Multitasking on the Surface Pro Compared to the iPad Pro

	Five times a day	Every work day	Each month	Over the next year	For the next six years
<b>Scenario 1: Reviewing investments</b>	14.7 minutes	1.2 hours	4.9 hours	7.3 business days	44.0 business days
<b>Scenario 2: Live modeling</b>	20.1 minutes	1.7 hours	6.7 hours	10.0 business days	60.3 business days

In these scenarios, we found that the Surface Pro out-tasked the iPad Pro with its ability to:

- Display multiple applications and windows at one time
- Extend its display to another monitor
- Enable smooth task completion across multiple apps

## Crunch Numbers Quickly

Financial-services workers often work with large, computationally-intensive formulas or spreadsheet models—either running the numbers or finding ways to present numbers in a consumable form. Microsoft Excel and Microsoft Power BI are two tools that make these kinds of tasks possible, but these apps need to connect to external data sources or often need to run in the background in the case of large Excel computations.

To see how this affects a financial-services worker's ability to complete common tasks, we ran the following scenarios on both devices to investigate how each handles the manipulation, analysis, and visualization of data.

### Scenario 3: Turning Data into a Graphical Analysis

Two stockbrokers working outside of their offices receive time-sensitive requests from their clients. Rodolfo uses a Surface Pro 4, and Sean uses an iPad Pro.<sup>1</sup>

#### ON THE SURFACE PRO

Rodolfo receives a phone call from his client who wants him to model the impact to her individual retirement account (IRA) if she buys additional stocks in a certain company. She wants to know by end of day. Rodolfo tells her he'll have some numbers for her much sooner—he can do most of the work right there on his Surface Pro.

	A	B	C	D	E	F	G	H	I	J	K	L
	Company	Stock Ticker	# of Shares	Cost Basis	Purchase Date	Current Date	Total Investment	Current Price	Current Value	% of Total	Net Gain (\$)	Net Gain (%)
1	Microsoft	MSFT	5,000.00	\$58.72	2/13/2000	3/13/2017	\$293,600.00	\$64.69	\$323,425.00	2.54%	\$29,825.00	10.16%
2	Google	GOOG	5,000.00	\$607.22	6/15/2015	3/13/2017	\$3,036,100.00	\$846.26	\$4,231,305.50	34.01%	\$1,195,205.50	39.37%
3	Amazon	AMZN	6,000.00	\$106.69	5/6/2011	3/13/2017	\$640,140.00	\$855.00	\$5,130,000.00	62.33%	\$4,489,860.00	701.39%
4	Guggenheim S&P 500 ETF	RSP	15,000.00	\$70.98	3/1/2016	3/13/2017	\$1,064,700.00	\$90.92	\$1,363,750.50	42.11%	\$299,050.50	28.09%
5	T-Mobile USA	TMUS	451.00	\$45.93	10/2/2016	3/13/2017	\$20,714.43	\$61.89	\$27,910.14	0.85%	\$7,195.71	34.74%
6	Toyota Motors	TM	3,000.00	\$75.49	3/10/2011	3/13/2017	\$226,470.00	\$113.36	\$340,080.00	10.31%	\$113,610.00	50.17%
7	Target	TGT	500.00	\$45.92	4/12/2014	3/13/2017	\$22,960.00	\$54.95	\$27,472.50	0.83%	\$4,512.50	19.65%
8	Exxon Mobile	XOM	15,000.00	\$95.00	3/21/2013	3/13/2017	\$1,425,000.00	\$81.18	\$1,217,700.00	35.52%	-\$207,300.00	-14.55%
9	Intel	INTC	2,000.00	\$26.26	1/3/1999	3/13/2017	\$52,520.00	\$35.16	\$70,320.00	2.69%	\$17,800.00	33.89%
10	GM	GM	850.00	\$32.00	2/13/2014	3/13/2017	\$27,200.00	\$36.89	\$31,352.25	1.19%	\$4,152.25	15.27%
11	Ford	F	1,745.00	\$18.00	4/23/2011	3/13/2017	\$31,410.00	\$12.53	\$21,864.85	0.27%	-\$9,545.15	-30.39%
12	AT&T	T	3,261.00	\$35.00	3/17/2016	3/13/2017	\$114,135.00	\$42.36	\$138,119.66	4.26%	\$23,984.66	21.01%
13	Apple	AAPL	10,000.00	\$79.23	1/3/2012	3/13/2017	\$792,300.00	\$139.25	\$1,392,500.00	42.62%	\$600,200.00	75.75%
14	Adobe	ADBE	500.00	\$77.55	4/13/2013	3/13/2017	\$38,775.00	\$121.16	\$60,580.00	1.84%	\$21,805.00	56.23%
15	John Deere	DE	3,261.00	\$81.19	1/21/2001	3/13/2017	\$264,760.59	\$109.58	\$357,340.38	10.77%	\$92,579.79	34.97%
16	Caterpillar	CAT	1,500.00	\$109.05	3/5/2003	3/13/2017	\$163,575.00	\$92.58	\$138,870.00	4.05%	-\$24,705.00	-15.10%
17	Chevron	CVX	3,650.00	\$111.63	9/23/2005	3/13/2017	\$407,449.50	\$109.57	\$399,930.50	15.32%	-\$7,519.00	-1.85%
18	British Petroleum	BP	2,500.00	\$61.38	11/4/2010	3/13/2017	\$153,450.00	\$34.04	\$85,087.50	3.24%	-\$68,362.50	-44.55%
19	Proctor & Gamble	PG	3,700.00	\$74.12	7/21/2003	3/13/2017	\$274,244.00	\$91.25	\$337,625.00	11.52%	\$63,381.00	23.11%
20	General Electric	GE	10,000.00	\$49.93	4/12/2000	3/13/2017	\$499,300.00	\$29.80	\$298,000.00	9.29%	-\$201,300.00	-40.32%
21	Boston Properties	BXP	3,500.00	\$62.32	3/17/2000	3/13/2017	\$218,120.00	\$130.15	\$455,525.00	12.92%	\$237,405.00	108.84%
22							\$9,766,923.52		#VALUE!		#VALUE!	#VALUE!

Figure 7. Rodolfo's view of his client's portfolio in Microsoft® Excel® 2016 on a Microsoft® Surface® Pro

# 58% faster



to generate a graph in Microsoft® Power BI® on the Microsoft® Surface® Pro than the Apple® iPad Pro®

This client is one of Rodolfo's oldest, so he knows she processes information better when it's visually displayed. He plans to edit her portfolio in Excel and then access Power BI to generate a graph of the portfolio changes, making it easy for his client to see how it might affect her portfolio overall.

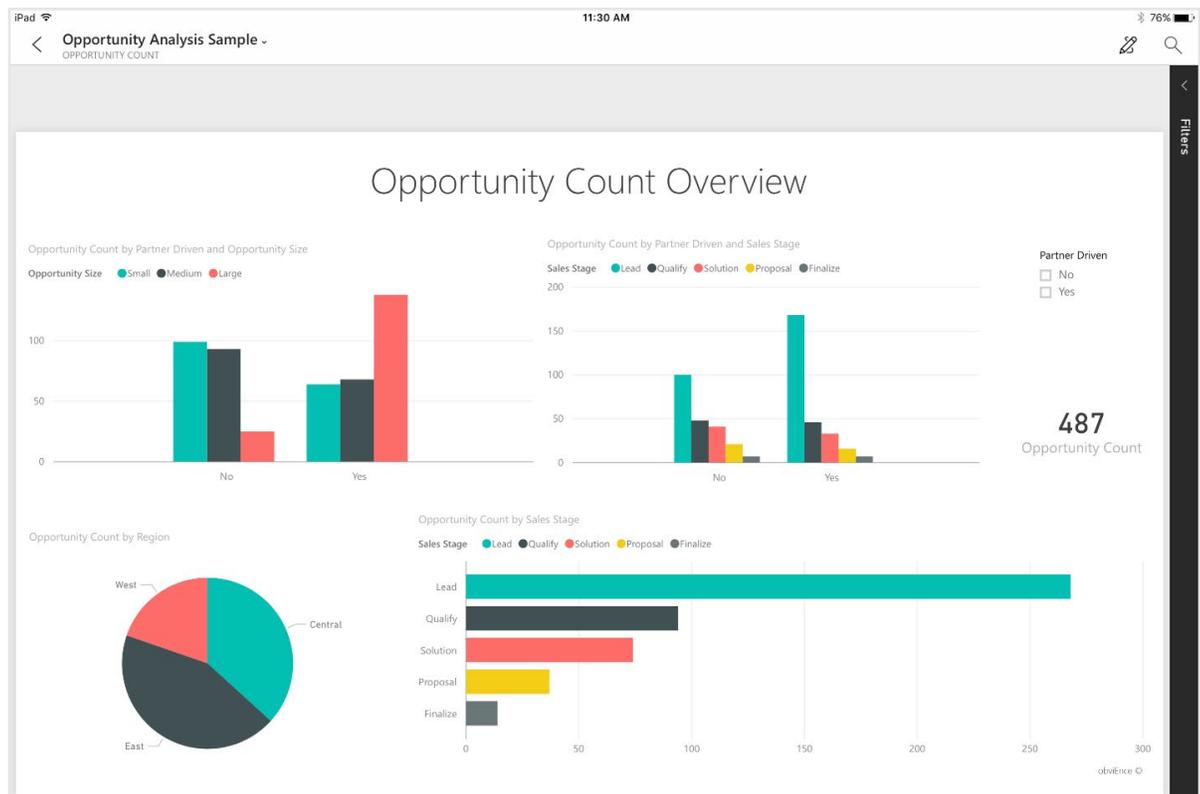
Rodolfo uses his Surface Pro to open Power BI in Internet Explorer®. He locates his customer's portfolio on his dashboard and opens it with a mouse-click. From there, he is able to open the portfolio in Excel 2016 to adjust a few numbers. He then saves and closes the spreadsheet. Next, he opens Power BI in a new Internet Explorer tab. Because Power BI is connected to Microsoft

Dynamics 365® for Financials, which is where the customer data in Excel originated, the client's portfolio is automatically updated.

Rodolfo is able to open the appropriate report on his Power BI dashboard to show his client how her portfolio will be impacted by buying additional stocks.

## ON THE IPAD PRO

Sean receives a similar request from a client who also understands visual information better than a spreadsheet of numbers. Sean recently purchased an iPad Pro after reading that it could replace the laptop he uses while commuting by train from his home to his office in a neighboring state.



**Figure 8.** Microsoft® Power BI® for iOS® includes options to annotate or search the information in a report, but it lacks the option to analyze in Microsoft® Excel®, unlike with Power BI on the Microsoft® Surface® Pro

Sean taps the Power BI for iOS icon to open the application, and he quickly finds his customer's portfolio on his dashboard—but there's no option to analyze the data in Excel. With a grumble, Sean realizes he has to wait until he gets to the office and can access his customer's information on his Windows 10–based desktop PC.

He could edit his client's portfolio by opening it in Excel for iOS, but he decides it isn't worth the hassle to switch back and forth between Excel for iOS and Power BI for iOS—especially because he knows he can do all this work from the Power BI dashboard on Windows 10.

Depending on how hot his client's potential new shares are, this delay can have big consequences for Sean's client.

Using the Surface Pro, Rodolfo is able to create a graph 58 percent faster than Sean on the iPad Pro.

## Scenario 4: Run Complex Calculations

In this scenario, financial analysts at a wealth-management firm just received an Excel spreadsheet with the latest data from S&P® Capital IQ® on several key companies that they've been monitoring. The analysts plug data from that spreadsheet into an Excel workbook designed to run the numbers through some analytical algorithms. The workbooks are computationally-heavy, with 50,000 rows, and financial analysts Chandra and Reggie rely on their devices to run the numbers for them.<sup>1</sup> Chandra uses a Surface Pro, and Reggie uses an iPad Pro.

Both Chandra and Reggie open their Excel workbooks, fill in the appropriate cells from the S&P Capital IQ data, and run the computations—but the Surface Pro runs the computations three times faster than the iPad Pro. In the fast-paced world of trading, that time difference can add up to hours—even days—of missed opportunities for Reggie, and it could lead to revenue or business loss for her organization.

## Work with Data Faster and More Easily on the Surface Pro

The iPad Pro does a good job generating and visualizing data in Microsoft Dynamics 365 for Financials, and like the Surface Pro, it can render many graphics instantly. This is useful for viewing reports and other data visualizations in Power BI, but that's about all that the Power BI for iOS app can do on the iPad Pro.

**3x**  
**faster**  
to run complex queries in  
Microsoft® Excel® on the  
Microsoft® Surface® Pro 4  
than on the Apple® iPad Pro®



In these scenarios, the Surface Pro handled data visualization and manipulation much better than the iPad Pro, which often required more steps to accomplish a task or lacked functionality altogether. In fact, the Surface Pro generated the new visualization 58 percent faster than the iPad Pro.

Power BI for iOS can visualize data that already exists in Microsoft Dynamics 365 for Financials, and users can essentially zoom in on a report and make “handwritten” annotations, but they cannot manipulate the visualizations or the data behind them. With other reports, the Power BI for iOS app auto-directs users to Safari, which opens a report in Excel Online; however, the iPad Pro simply lacks the functionality to edit spreadsheets in Excel Online.

## Time Saved When Working with Data on the Surface Pro Compared to the iPad Pro

	Five times a day	Every work day	Each month	Over the next year	For the next six years
<b>Scenario 3: Turning data into graphical analysis</b>	11.8 seconds	4.9 minutes	0.3 hours	3.9 hours	3.0 business days
<b>Scenario 4: Running complex calculations</b>	40.0 seconds	16.7 minutes	1.11 hours	13.3 hours	10.0 business days

The Surface Pro allows financial-services professionals to:

- Respond to client needs in real-time and with rich data visualizations
- Quickly run large workloads through complex calculations
- Seamlessly edit and share data

## Access More Features

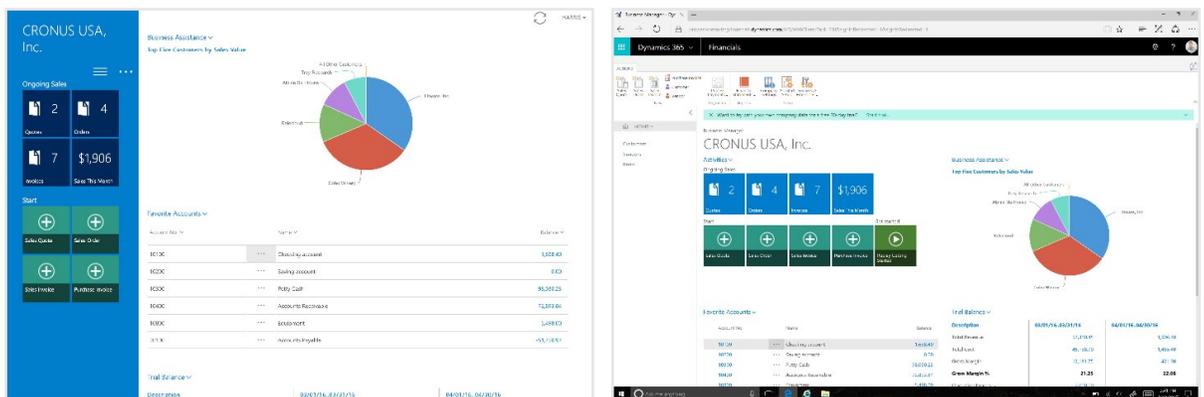
Throughout our testing, we noted where apps had more tools or more robust functionality on the Surface Pro compared to the iPad Pro. These next sections break the differences and observations down by app comparisons and device considerations.

### App Comparisons

We compared the apps for iOS with the apps for Windows, including some financial-services-specific apps, to dig in to some of the iPad Pro device's limitations. This section describes our most pertinent findings.

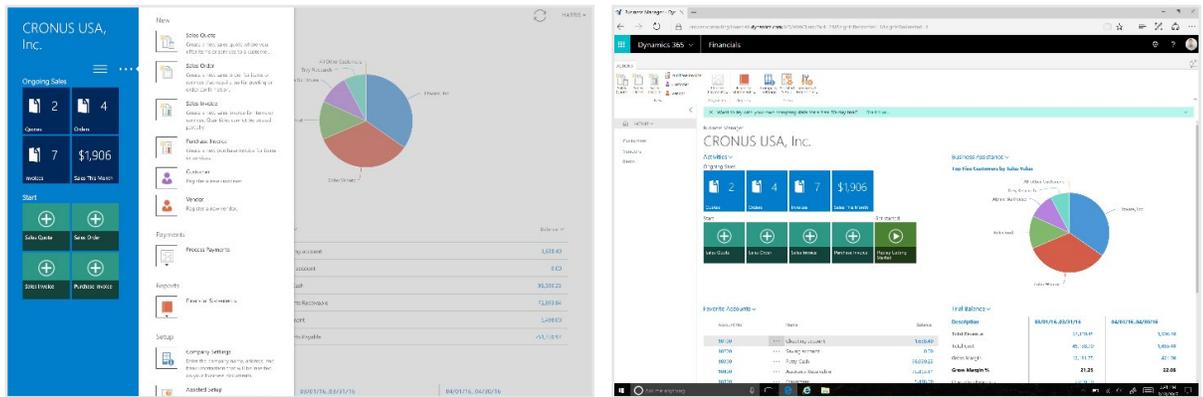
### MICROSOFT DYNAMICS 365® FOR FINANCIALS

The Microsoft Dynamics 365 for Financials dashboard appears the same on the Surface Pro and the iPad Pro, but a deeper inspection shows that the two apps are organized differently. On the Surface Pro, in Internet Explorer, Microsoft Dynamics 365 for Financials uses workspaces—Home, Finance, Sales, and Purchasing—that give users more financial tools and reports to analyze, organize, and visualize the information that matters most. (For our tests, we worked from the Finance workspace.)



**Figure 9.** The Microsoft Dynamics 365® for Financials dashboard looks similar on the Apple® iPad Pro® (left) and Microsoft® Surface® Pro (right), but financial-services workers will only get the full breadth of features when using Microsoft Dynamics 365 for Financials on the Surface Pro

The iPad Pro only provides a few tools from each workspace, including new sales quotes, orders, invoices, customer accounts, vendor information, and a few basic reports. Microsoft Dynamics 365 for Financials doesn't open in Safari, so there is no way for iPad Pro users to access the full feature set of Microsoft Dynamics 365 for Financials.



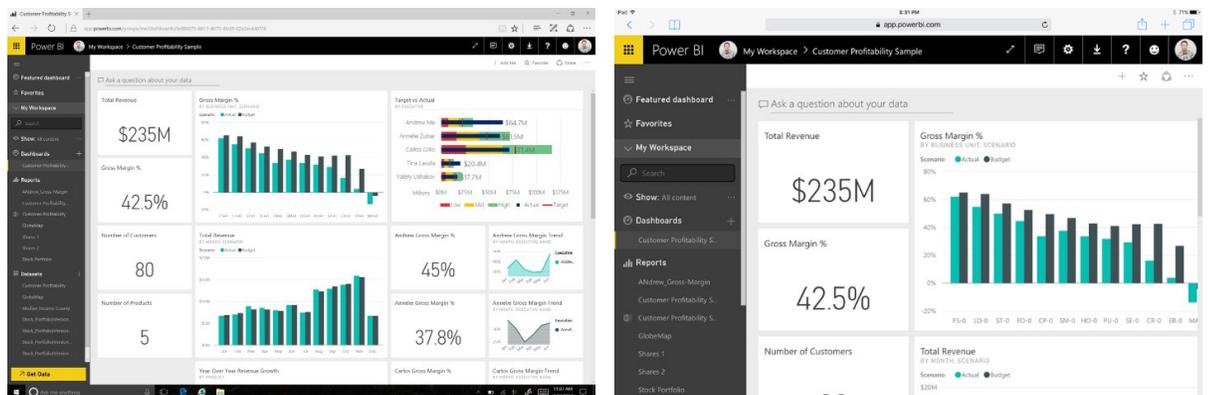
**Figure 10.** On the Microsoft® Surface® Pro, Microsoft Dynamics 365® for Financials has four workspaces, each with its own set of tools (right), where on the Apple® iPad Pro®, the app is limited to the tools shown in the screenshot (left)

With Microsoft Dynamics 365 for Financials for iOS, financial-services workers also cannot:

- Deep-dive into back-end functions
- Edit or share ledger reports
- Create or edit ledger accounts

## MICROSOFT® POWER BI®

On the Surface Pro, a user can create custom visualizations and dashboards in Power BI, in addition to switching between data-visualization methods with a tap or a mouse-click. Power BI for iOS lacks the functionality to create new dashboards and visualizations, which renders the iPad Pro a good device to view data visualizations and navigate through dashboards—but not to create or design either.



**Figure 11.** The Microsoft® Power BI® dashboard looks similar on both devices, but financial-services professionals will quickly find that Power BI for iOS® (left) has less functionality than Power BI in Internet Explorer® on the Microsoft® Surface® Pro (right)

Financial-services workers will also find that they are unable to:

- Refresh a report from within Power BI for iOS
- Export data to PowerPoint for iOS
- View certain information in the Power BI for iOS app; instead, Excel Online opens automatically in Safari

## MARKET DATA SOLUTIONS

Financial market-data apps provide a host of financial-services professionals with real-time information and analytics. We compared two of these apps, S&P Capital IQ and Money.Net®, on the Surface Pro and iPad Pro. Both apps have simplified user interfaces (UIs) for iOS and only allow users to browse company and stock financials. Financial-services professionals can do much more with these apps on the Surface Pro.

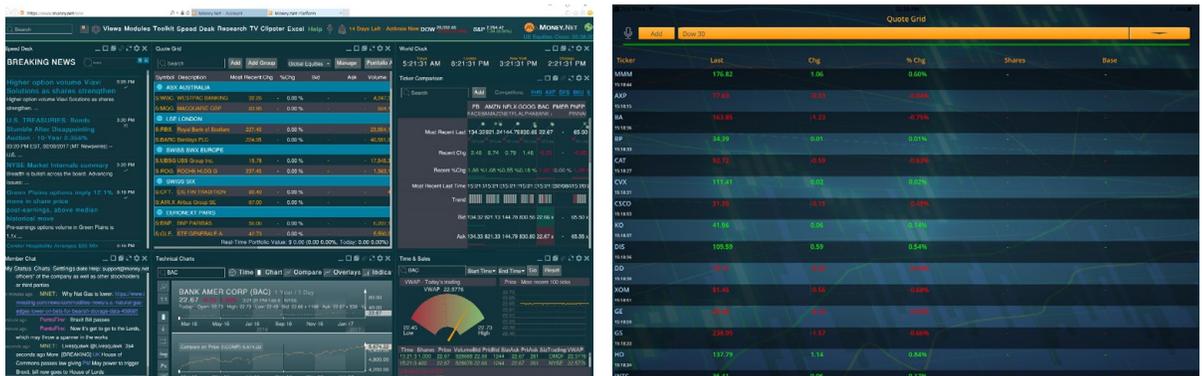
### S&P® CAPITAL IQ®

Financial-services workers using a Surface Pro can access S&P Capital IQ in any browser that supports Silverlight®. Like Money.Net, S&P Capital IQ provides financial-services workers with a bevy of financial data, news, analytics, and company information. Users access the app from a customizable dashboard, where they can accomplish a number of tasks—too many to list all of them here. In our exploration of S&P Capital IQ, we created a list of companies in the technology industry whose financial data we wanted to monitor.

Because the app is web-based, we were able to access this list of companies on the S&P Capital IQ for iOS app—but the app lacks the same customization capabilities as the web app on the Surface Pro because the iPad Pro doesn't support Silverlight®.

Financial-services workers who use S&P Capital IQ for iOS might be able to export some data into Excel for iOS, but many of the app's features don't work on an iPad Pro. In S&P Capital IQ, financial-services workers cannot:

- Manipulate data
- Use analytics features
- Export spreadsheet models



**Figure 12.** Financial-services workers can access more information more quickly with the S&P® Capital IQ® app on the Microsoft® Surface® Pro (top) than on the Apple® iPad Pro® (bottom)

## MONEY.NET®

On the Surface Pro, Money.Net is a Java-based web app and allows financial-services workers to create customized views that simultaneously display multiple information feeds, a chat window, ticker information, and charts, graphs, and gauges—all of it updating in real-time with audio notifications.

Because Safari doesn't support Java, financial-services workers use Money.Net for iOS and can only view one feed at a time. The information is only available in table form and only updates with a manual refresh.

## Security Features from Intel

Built in to Microsoft® Surface® Pro devices, the Intel® Core™ processor family provides certain data and platform protection technologies:

- **Intel® Data Protection Technology with Advanced Encryption Standard New Instructions (Intel® AES-NI)** accelerates encryption and decryption, which helps protect data end-to-end.
- **Intel® Secure Key** creates strong, randomized keys for cryptographic protocols.
- **Intel® Software Guard Extensions (Intel® SGX)** is a set of instructions that developers can use to add protective layers to specific sets of code; useful for helping protect intellectual property (IP) and personally identifiable information (PII).
- **Intel® Memory Protection Extensions (Intel® MPX)** increases software security at multiple layers by analyzing the part of the code that directs a software path to a value stored in a different location in memory.
- **Intel® OS Guard** blocks malicious attacks when the system is running in the highest privilege level.

## COMPONENT CONSIDERATIONS

The physical parts of a user's device can play a significant role in usability, productivity, and value for mobile workers.

### DEVICE CONFIGURATIONS

The Surface Pro provides options to support financial-services workers no matter how compute- or graphics-intensive their roles and workloads. For performance needs, the Surface Pro comes with one of three processors:

- Intel Core m3 processor for the most mobile users who require less power
- Intel Core i5 processor for average users
- Intel Core i7 processor to support graphics-heavy and compute-intensive financial-services needs and tasks

All of these processors include up to 4 MB of Intel® Smart Cache, which prioritizes last-level cache use based on workload size to lower latency and improve data input/output (I/O) speeds.<sup>3</sup>

The iPad Pro offers one processor option, the Apple A9X system-on-a-chip (SoC). The A9X has two cores and has no last-level cache to store frequently-used data and lower latency.

Depending on storage needs, financial-services workers can be equipped with Surface Pro devices with solid-state drive (SSD) capacities ranging between 128 GB and 1 TB. The iPad Pro has less storage space, with three size options ranging from 32 GB to 256 GB.

For memory, the Surface Pro can support between 4 GB and 16 GB of RAM. The iPad Pro only supports 4 GB of RAM.

The Surface Pro family provides the flexibility to select a device configured to the specific needs of financial-services workers.

See [Appendix C](#) for details on available storage and memory options for both devices as of April 2017.

## BRING-YOUR-OWN-DEVICE (BYOD) MANAGEMENT

Both the Surface Pro and the iPad Pro can be managed by IT policies through mobile device management (MDM), but the Surface Pro provides more options because of the domain group policy. Additionally, the Surface Pro can be imaged like any Windows OS–based desktop PC, but the iPad Pro lacks that kind of manageability.

## MULTIPLE DISPLAYS

The Surface Pro uses the Surface Dock to transform it into a desktop. As with a desktop PC, users can extend the desktop to multiple monitors and use different programs on different screens. To extend the screen with the iPad Pro, users need a monitor connected via third-party software or an Apple TV® device, and the iPad Pro and Apple TV must be on the same wireless network. Users can connect their iPad Pro devices to a screen or monitor using a dongle for Lightning® to HDMI, but they can only duplicate their screens rather than extending them for true multimonitor use.

## INPUT DEVICES

The Surface Pro has a number of options for keyboards, including an ergonomic version and compact model that is good for traveling, and protective covers. Some users might find the Microsoft® Surface® mouse useful, as well. The iPad Pro doesn't have a mouse option, and its keyboard options are limited to the Apple® Smart Keyboard and a few third-party options.

Both device keyboards have magnetic connectors, but the Surface Pro 4 Type Cover keyboard offers a simpler design compared to the Apple Smart Keyboard. The Apple Smart Keyboard folds in a particular way to allow access to the keyboard or to prop the iPad Pro in a landscape orientation. It also weighs just over a pound, which, combined with the 12.9-inch iPad Pro, can prove cumbersome to carry.



**Figure 13.** The tilt angle of the unfolded Apple® Smart Keyboard (on the left) is fixed, while the angle of the the Microsoft® Surface® Pro can be adjusted up to a 120-degree recline

The tilt angle of the unfolded Apple Smart Keyboard is fixed, which hinders an ergonomic work environment or setup. The Surface Pro includes an adjustable stand with up to a 120-degree recline, with no added accessory needed to prop it up.

The Surface Pro 4 Type Cover keys are backlit, which makes it easier to see the keys in a dim train car or airplane cabin. Our tester found that it provided good haptic (touch) feedback when typing.

On the other hand, the iPad Pro keyboard has a grainy, matte texture with minimal haptic feedback, which made it difficult to tell when a keystroke was successful.

The Surface Pro 4 Type Cover keyboard is also outfitted with a precision-pointer touchpad, so users get automatic mouse input and good cursor control. With the iPad Pro and Apple Smart Keyboard, it might become uncomfortable over time to switch between typing on a physical keyboard and touching the iPad screen.

For added security, financial-services workers can use the Surface Pro 4 Type Cover's fingerprint ID to log in to the device.

Apple Pencil®



Microsoft® Surface® Pen



And if users don't want to buy a device-specific keyboard, they can instead connect a USB-cabled keyboard with the Surface Pro device's single USB port.

For users who want the convenience of using a stylus for financial-services tasks, the Surface Pro comes with the Microsoft® Surface® Pen.

The Surface Pen is optimized to work with the Windows 10 ecosystem and provides seamless, lag-free input, in addition to a top-mounted eraser that provides a customizable “magic button” for opening OneNote, taking screenshots, or accessing Cortana®. The Apple Pencil® is a separate purchase for iPad Pro users and creates a delay between input and output.

## A Device to Meet Financial-Services Workflow Demands

In our testing, we found that the Surface Pro managed the complex, multi-app workflows of financial-services tasks with ease because common tools like Excel and Microsoft Dynamics 365 for Financials are optimized for devices with Intel® hardware running Windows 10.

We also found that the iPad Pro lacked productivity features and functionality for computational apps used by financial-services workers—either due to limitations of the operating system or the OS's ability to support non-native apps. In many instances, we found that the iPad Pro cannot support financial-services tasks on its own because of missing or stripped-down app functionality. iOS is not designed to run apps in the background; nor can it support all features or functions of common tools, such as Excel and Microsoft Dynamics 365 for Financials, needed for financial-services roles. (Though there are apps that are designed to run in the background on the iPad Pro, like Apple Music®.)

The iPad Pro did not process massive amounts of data as quickly as the Surface Pro, nor could it keep up with the Surface Pro device's data-visualization pace. Financial-services users might find themselves frustrated with the limited capabilities of the iPad Pro when accessing and manipulating data. Microsoft® Office 365®, Microsoft Dynamics 365 for Financials, Power BI, and even terminal apps lack many vital features, filters, and customization options when used with the iPad Pro.

Between the Surface Pro and iPad Pro, we recommend that financial-services organizations that want their workers to have the mobility and the financial tools required to excel in their roles demand nothing less than a Surface Pro for their laptop-replacing devices.

# Appendix A: Hardware and Test Environment

Hardware Devices		
<b>Model</b>	Microsoft® Surface® Pro 4	Apple® iPad Pro®
<b>Model number</b>	TH2-00001	A 1584
<b>OS</b>	Windows® 10 Pro	iOS® Mobile 10.2.1
<b>Processor</b>	2.2 GHz Intel® Core™ i7-6650U processor	2.2 GHz Apple® A9X chip (64-bit) with embedded M9 coprocessor
<b>Storage</b>	256 GB SSD	32 GB
<b>Memory (RAM)</b>	16 GB	4 GB
<b>Display</b>	<ul style="list-style-type: none"> <li>12.3-inch Microsoft® PixelSense® display</li> <li>10 point multi-touch</li> <li>3:2 aspect ratio</li> </ul>	<ul style="list-style-type: none"> <li>12.9-inch LED-backlit retina display</li> <li>Multi-touch</li> </ul>
<b>Resolution</b>	<ul style="list-style-type: none"> <li>2,736 x 1,824</li> <li>4K support at 60 Hz</li> </ul>	<ul style="list-style-type: none"> <li>2,732 x 2,048</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>Intel® Iris® Graphics 540</li> </ul>	<ul style="list-style-type: none"> <li>PowerVR® Series 7</li> </ul>
<b>Ports</b>	<ul style="list-style-type: none"> <li>Full-size USB 3.0</li> <li>microSD™ card reader</li> <li>Surface Connect™</li> <li>3.5 mm headset jack</li> <li>Mini DisplayPort</li> <li>Cover port</li> <li>Built-in speaker and microphone</li> </ul>	<ul style="list-style-type: none"> <li>Smart Connector</li> <li>3.5 mm headset jack</li> <li>Lightning® connector</li> <li>Built-in speaker and microphone</li> </ul>
<b>Camera</b>	<ul style="list-style-type: none"> <li>Windows Hello® face sign-in front-facing infrared camera with infrared light source</li> <li>5.0 megapixel front-facing camera with 1080p HD video</li> <li>8.0 megapixel rear-facing autofocus camera with 1080p HD video</li> </ul>	<ul style="list-style-type: none"> <li>1.2 megapixel front-facing FaceTime® HD camera with 1080p HD video</li> <li>8.0 megapixel rear-facing iSight® camera with 1080p HD video</li> </ul>
<b>Networking</b>	<ul style="list-style-type: none"> <li>802.11ac Wi-Fi® wireless networking</li> <li>802.11a/b/g/n compatible</li> <li>Bluetooth® 4.0 wireless technology</li> </ul>	<ul style="list-style-type: none"> <li>Wi-Fi (802.11a/b/g/n/ac); dual band (2.4GHz and 5GHz)</li> <li>HT80 with MIMO</li> <li>Bluetooth 4.2 technology</li> </ul>
<b>Weight</b>	<ul style="list-style-type: none"> <li>1.73 lbs (784 g without Surface Pro 4 Type Cover attached)</li> <li>2.41 lbs (1.09 kg with Type Cover attached)</li> </ul>	<ul style="list-style-type: none"> <li>1.57 lbs (712 g without Smart Keyboard attached)</li> <li>2.67 lbs (1.21 kg with Smart Keyboard attached)</li> </ul>
<b>Price at time of purchase</b>	<ul style="list-style-type: none"> <li>\$1,699</li> <li>Surface Pro 4 Type Cover \$129.99</li> <li>Microsoft® Surface® Pen included</li> </ul>	<ul style="list-style-type: none"> <li>\$799</li> <li>Apple® Smart Keyboard \$169</li> <li>Apple Pencil® for iPad Pro \$99</li> </ul>

Software	
Surface Pro 4	
<b>Windows 10</b>	v1607 14393.693
<b>Microsoft Dynamics 365® for Financials</b>	Web
<b>Microsoft® Excel® 2016</b>	v16.0.4266.1001
<b>Microsoft® Power BI® Desktop x64</b>	v2.42.4611.901
<b>Microsoft® PowerPoint® 2016</b>	v16.0.4266.1001
<b>Microsoft Edge®</b>	v38.14393.0.0
<b>Internet Explorer®</b>	v11.953.14393.0
<b>S&amp;P® Capital IQ®</b>	Web
<b>Money.Net®</b>	Web
<b>Microsoft® OneDrive®</b>	v16.0.4266.1001
iPad Pro	
<b>iOS</b>	10.2.1
<b>Microsoft Dynamics 365 for Financials for iOS</b>	2.3.13420
<b>Microsoft Excel for iOS</b>	v1.31
<b>Microsoft PowerPoint for iOS</b>	v1.31
<b>Microsoft Power BI for iOS</b>	v11.8

<b>Safari®</b>	iOS 10.2.1
<b>S&amp;P Capital IQ for iOS</b>	v2.0.2
<b>Money.Net for iOS</b>	2.9
<b>Photos for iOS</b>	iOS 10.2.1
<b>OneDrive</b>	v8.10.1

## Appendix B: Steps and Timed Test Results

### SCENARIO 1: REVIEWING INVESTMENTS

Apps used:

- PowerPoint 2016/PowerPoint for iOS
- Excel 2016/Excel for iOS
- Microsoft Power BI Desktop Application/Microsoft Power BI for iOS

Microsoft® Surface® Pro	Apple® iPad Pro®
<ol style="list-style-type: none"> <li>1. Advisor starts with a Microsoft® Excel® spreadsheet of a client's investments, exported from a software package used to track client investments (often internal or custom), and reviews the data.</li> <li>2. Select the data in the <b>Stock Portfolio</b> tab and convert the cells into a table.</li> <li>3. Save the spreadsheet.</li> <li>4. Open Microsoft® Power BI® Desktop on one screen and Microsoft® PowerPoint® in another.</li> <li>5. In Power BI Desktop, click <b>Get Data</b> from the <b>Home</b> ribbon.</li> <li>6. Leave Excel selected and click <b>Connect</b>.</li> <li>7. Browse to the folder containing the Stock Portfolio.xlsx file, select the file, and click <b>Open</b>.</li> <li>8. Check the box for <b>Table 1</b> and click <b>Load</b>.</li> <li>9. Select the <b>Line Chart</b> visualization.</li> <li>10. Check the boxes for <b>Company</b> and <b>Current Value</b>.</li> <li>11. Press the <b>Windows</b> key + <b>Shift</b> + <b>S</b> to start the screen clipping tool.</li> <li>12. Copy the visualization image.</li> <li>13. Switch to PowerPoint and paste the image into a new slide.</li> <li>14. Return to Power BI and clear the checkbox for <b>Current Value</b>; then check the box for <b>Net Gain</b>.</li> <li>15. Press the <b>Windows</b> key + <b>Shift</b> + <b>S</b> to start the screen clipping tool.</li> <li>16. Copy or clip the visualization image.</li> <li>17. Switch to PowerPoint and paste the image into a new slide.</li> </ol>	<ol style="list-style-type: none"> <li>1. Start in Excel, viewing the Excel file with the client data in it.</li> <li>2. Switch to Power BI for iOS® (because you can't import).</li> <li>3. In Safari®, open <b>powerbi.com</b>.</li> <li>4. Tap <b>Get Data</b>.</li> <li>5. Select <b>One Drive</b> and browse to location of Stock Portfolio.xlsx.</li> <li>6. Assign a unique name for this data set.</li> <li>7. Select the line chart visualization.</li> <li>8. Check the boxes for <b>Company</b> and <b>Current Value</b>.</li> <li>9. Take a screenshot.</li> <li>10. Switch to the Photos app.</li> <li>11. Open the latest screenshot taken.</li> <li>12. Tap the edit icon.</li> <li>13. Crop the photo so that it only contains the graph and commit changes.</li> <li>14. Switch to the PowerPoint application.</li> <li>15. Create a new slide and add the image to the PowerPoint presentation.</li> <li>16. Switch to Safari.</li> <li>17. Clear the checkbox for <b>Current Value</b>; then check the box for <b>Net Gain</b>.</li> <li>18. Take a screenshot.</li> <li>19. Switch to the Photos app.</li> <li>20. Open the latest screenshot taken.</li> <li>21. Tap the edit icon.</li> <li>22. Crop the photo so that it only contains the graph and commit changes.</li> <li>23. Switch to the PowerPoint application.</li> <li>24. Create a new slide and add the image to the PowerPoint.</li> </ol>
Time to execute: 134s	Time to execute: 310s

## SCENARIO 2: LIVE MODELING

Apps used:

- Power BI on Windows 10/Power BI for iOS
- Excel 2016/Excel for iOS

Microsoft® Surface® Pro	Apple® iPad Pro®
<ol style="list-style-type: none"> <li>1. Start in Microsoft® Power BI® Desktop, looking at a graph of a number of shares; then switch to Microsoft® Excel®.</li> <li>2. A financial advisor doubles the number of shares for Microsoft in the Stock Portfolio workbook on screen one and saves the file.</li> <li>3. On screen two, the financial advisor looks at the graph and clicks <b>Refresh</b>.</li> <li>4. The Power BI visualization changes accordingly.</li> <li>5. The financial advisor doubles the number of shares for Amazon in the Stock Portfolio workbook on screen one and saves the file.</li> <li>6. On screen two, the financial advisor looks at the graph and clicks <b>Refresh</b>.</li> <li>7. The Power BI visualization changes accordingly.</li> </ol>	<ol style="list-style-type: none"> <li>1. Start with Power BI loaded in Safari®, looking at a graph of a number of shares; then switch to Excel.</li> <li>2. If closed, open the Stock Portfolio.</li> <li>3. A financial advisor doubles number of shares for Microsoft in the Stock Portfolio workbook on screen one and saves the file.</li> <li>4. The advisor then switches out of Excel (effectively closing it), and switches to Power BI.</li> <li>5. To view an updated graph, the user will have to add the Excel workbook as a new data source by tapping <b>Get Data</b>.</li> <li>6. Select <b>OneDrive</b> and browse to location of Stock Portfolio.xlsx.</li> <li>7. Assign a unique name for this data set.</li> <li>8. Select the line chart visualization.</li> <li>9. Check the box for <b>Company</b> and <b># of Shares</b>.</li> <li>10. Repeat this process again to change the graph.</li> </ol>
Time to execute: 75s	Time to execute: 316s

## SCENARIO 3: TURN DATA INTO A GRAPHICAL ANALYSIS

Apps used:

- Excel 2016/Excel for iOS
- Power BI/Power BI for iOS

Microsoft® Surface® Pro	Apple® iPad Pro®
<ol style="list-style-type: none"> <li>1. Open Microsoft® Power BI®.</li> <li>2. Open a dashboard related to a customer's assets and investments.</li> <li>3. Select a portion of the dashboard. For example, retirement investments.</li> <li>4. Click <b>Analyze in Excel</b>.</li> <li>5. Update holdings and number of shares or make changes that represent trading or other investment decisions.</li> <li>6. Save and close the spreadsheet.</li> <li>7. Refresh the dashboard and the related visualizations in Power BI.</li> <li>8. If the customer is present, the updates can be shown to them in real time. Alternatively, cut and paste the visualization into Microsoft® PowerPoint®.</li> </ol>	<ol style="list-style-type: none"> <li>1. Open Power BI for iOS®.</li> <li>2. Open a customer's portfolio from the dashboard—there's no option to analyze in Microsoft® Excel®.</li> <li>3. Switch to a desktop PC.</li> <li>4. Open Power BI.</li> <li>5. Open the customer's portfolio from the dashboard.</li> <li>6. Click <b>Analyze in Excel</b>.</li> <li>7. Make the necessary changes.</li> <li>8. Save and close the spreadsheet.</li> <li>9. Verify that the visualization is correct, repeating steps 4–6 as necessary.</li> <li>10. Return to the iPad Pro, open Power BI, and open the created visualization.</li> </ol>
Time to execute: 16.2s	Time to execute: 28s

## SCENARIO 4: RUN COMPLEX CALCULATIONS

Apps used:

- Excel 2016/Excel for iOS

Microsoft® Surface® Pro	Apple® iPad Pro®
<ol style="list-style-type: none"> <li>1. Open the computationally-heavy spreadsheet.</li> <li>2. Change the values of two properties involved in calculations.</li> <li>3. Allow the calculations to complete.</li> </ol>	<ol style="list-style-type: none"> <li>1. Open the computationally-heavy spreadsheet.</li> <li>2. Change the values of two properties involved in calculations.</li> <li>3. Allow the calculations to complete.</li> </ol>
Time to execute: 20s	Time to execute: 60s

## Appendix C: Available Storage and Memory Options as of April 2017

Processor Options	Memory Options	Disk Options	Screen Size Options	Wireless and Cellular Options
<b>Microsoft® Surface® Pro 4</b>				
Intel® Core™ M processor	4 GB	128 GB	12.3"	Wireless
Intel Core i5 processor	4 GB	128 GB	12.3"	Wireless
Intel Core i5 processor	8 GB	256 GB	12.3"	Wireless
Intel Core i5 processor	8 GB	512 GB	12.3"	Wireless
Intel Core i5 processor	16 GB	256 GB	12.3"	Wireless
Intel Core i5 processor	16 GB	512 GB	12.3"	Wireless
Intel Core i7 processor	8 GB	256 GB	12.3"	Wireless
Intel Core i7 processor	16 GB	256 GB	12.3"	Wireless
Intel Core i7 processor	16 GB	512 GB	12.3"	Wireless
Intel Core i7 processor	16 GB	1 TB	12.3"	Wireless
<b>Apple® iPad Pro®</b>				
Apple® A9X processor	2 GB	32 GB	9.7"	Wireless and cellular
Apple A9X processor	2 GB	128 GB	9.7"	Wireless and cellular
Apple A9X processor	2 GB	256 GB	9.7"	Wireless and cellular
Apple A9X processor	4 GB	32 GB	12.9"	Wireless
Apple A9X processor	4 GB	128 GB	12.9"	Wireless and cellular
Apple A9X processor	4 GB	256 GB	12.9"	Wireless and cellular

<sup>1</sup> All personas described in this paper are fictitious composites.

<sup>2</sup> Shah, Agam. "The PC update cycle slows to every five to six years, Intel's CEO says." PCWorld. June 2016.  
[www.pcworld.com/article/3078010/hardware/the-pc-upgrade-cycle-slows-to-every-five-to-six-years-intels-ceo-says.html](http://www.pcworld.com/article/3078010/hardware/the-pc-upgrade-cycle-slows-to-every-five-to-six-years-intels-ceo-says.html).

<sup>3</sup> Intel. "More Innovation More Choices with New Microarchitectures for 6th Gen Intel® Core™ Processors." 2015.  
[www.intel.com/content/dam/www/public/us/en/documents/product-briefs/6th-gen-core-family-mobile-brief.pdf](http://www.intel.com/content/dam/www/public/us/en/documents/product-briefs/6th-gen-core-family-mobile-brief.pdf).



The analysis in this document is from a U.S.-based study conducted by Prowess Consulting and commissioned by Intel.

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