



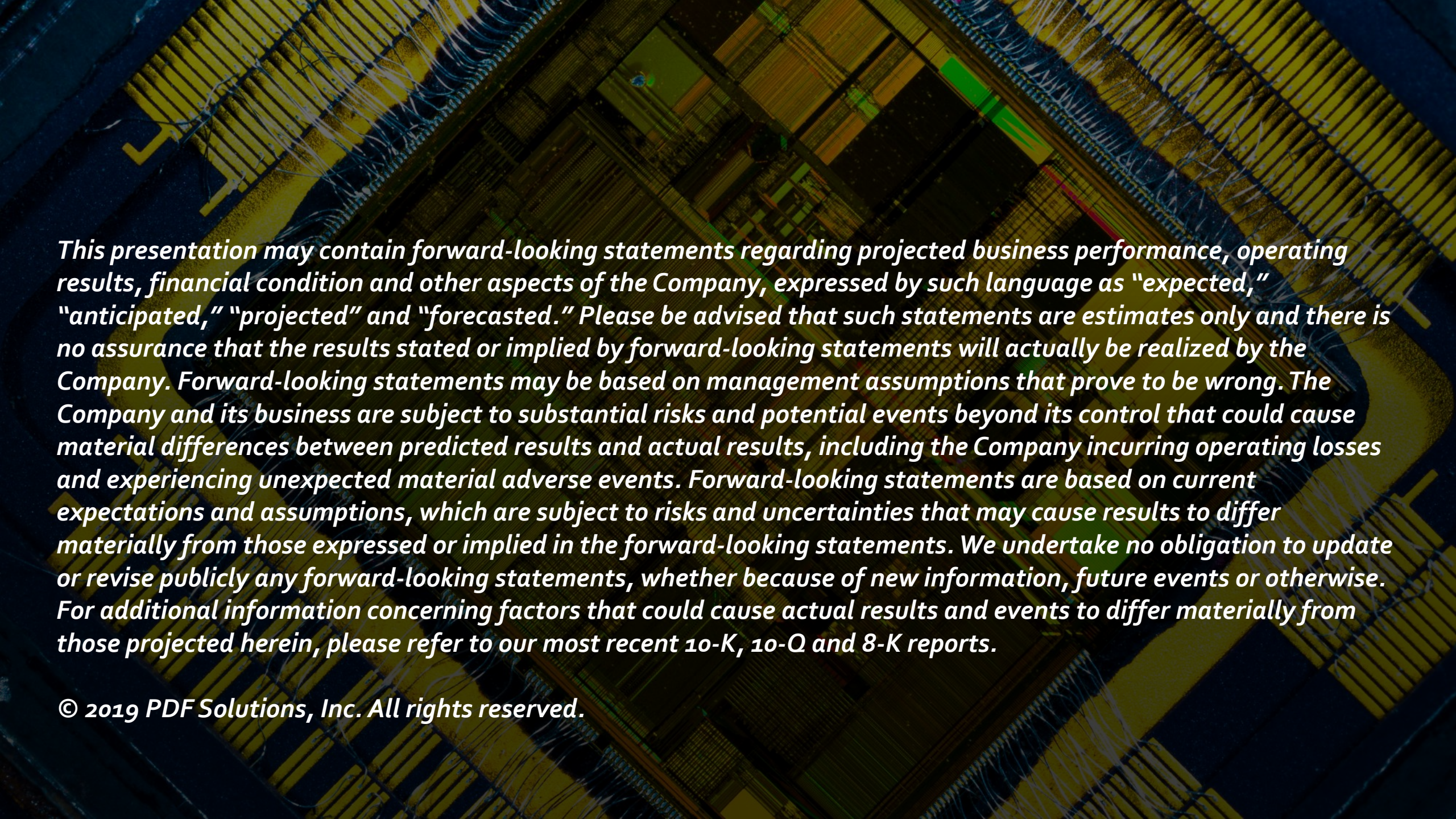
**PDF/SOLUTIONS™**

# 8<sup>th</sup> Annual NYC Investor Summit

December 17, 2019

Kimon Michaels, EVP, Director & Co-Founder



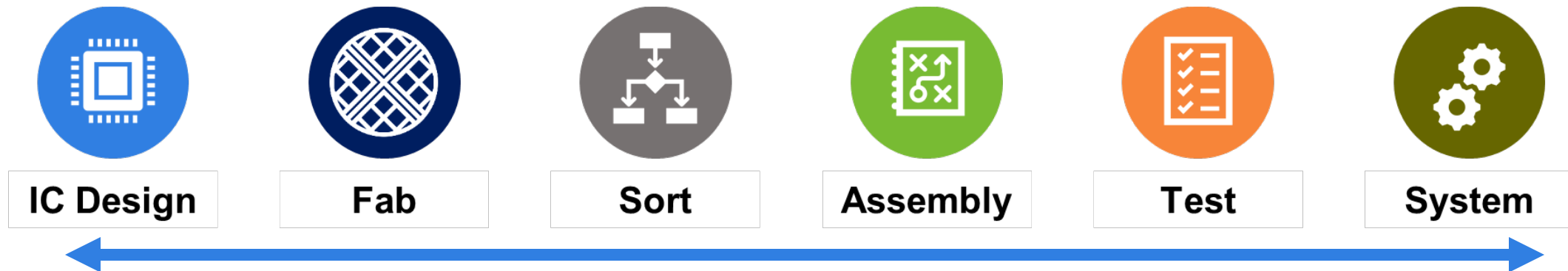


*This presentation may contain forward-looking statements regarding projected business performance, operating results, financial condition and other aspects of the Company, expressed by such language as "expected," "anticipated," "projected" and "forecasted." Please be advised that such statements are estimates only and there is no assurance that the results stated or implied by forward-looking statements will actually be realized by the Company. Forward-looking statements may be based on management assumptions that prove to be wrong. The Company and its business are subject to substantial risks and potential events beyond its control that could cause material differences between predicted results and actual results, including the Company incurring operating losses and experiencing unexpected material adverse events. Forward-looking statements are based on current expectations and assumptions, which are subject to risks and uncertainties that may cause results to differ materially from those expressed or implied in the forward-looking statements. We undertake no obligation to update or revise publicly any forward-looking statements, whether because of new information, future events or otherwise. For additional information concerning factors that could cause actual results and events to differ materially from those projected herein, please refer to our most recent 10-K, 10-Q and 8-K reports.*



# PDF Solutions

- PDF is an analytics company that improves process efficiency and product reliability for the semiconductor supply chain
- PDF uniquely provides:
  - An end-to-end big data analytics solution designed to meet the needs of the semiconductor value chain
  - Differentiated data obtained during manufacturing, test, and in-field use from IP integrated into semiconductor devices



# Building a Platform for Success

## GROWTH

- Analytics revenue CAGR of 35% since 2014
- Analytics now represents 53% of total revenues in TTM Q3 2019 vs 10% in 2014

## PROFITABILITY

- Total company gross margins expanding driven by high margin Analytics
- 66% non-GAAP Analytics gross margins YTD Q3 2019\*
- Targeting 70%+ gross margins

## VISIBILITY

- 74% annual recurring revenue (ARR) as a percent of 2018 Analytics revenue; 31% ARR CAGR since 2014
- 97% analytics customer retention rate in through Q3 2019
- Gainshare royalties expected to continue for several years

## DIVERSIFICATION

- Increased number of Analytics customers from 48 to 134 since 2014
- Customer concentration significantly reduced; largest customer 30% of revenue in YTD 2019 vs 52% in 2014
- No more than 25% of sales come from any one international market

## STRENGTH

- \$100.3 million cash balance at end of Q319; No long-term debt
- Initiatives to improve DSO's in place to manage working capital
- Non-GAAP operating profit every year since 2012

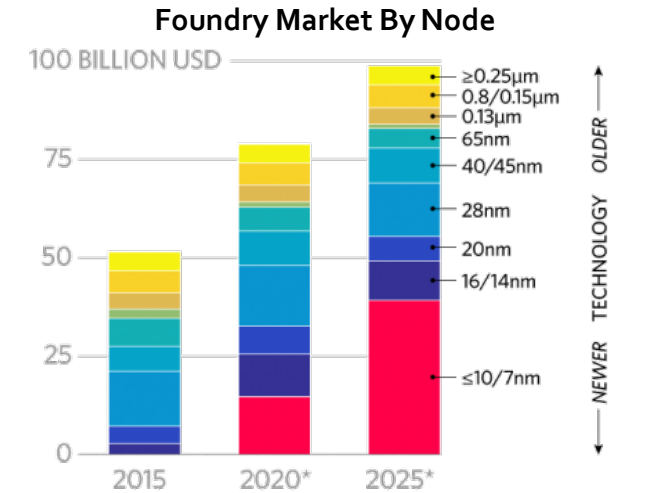
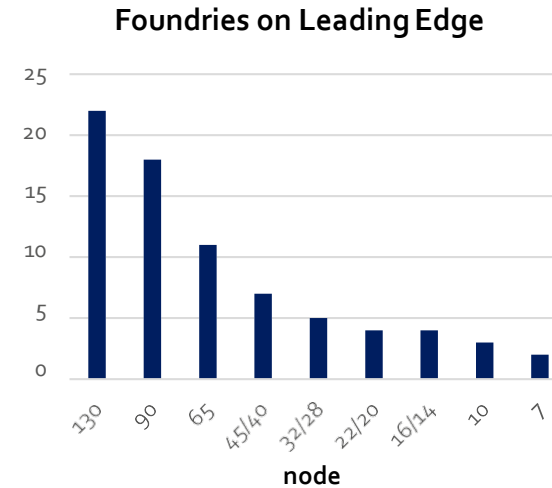
## INVESTMENT

- Ongoing commitment to invest in Engineering Technology and Sales & Marketing
- Expanded technology offerings through strategic acquisitions
- \$48.6 million in share buybacks since 2014

# Value Shifting to Mass Production



[www.techrepublic.com/article/moores-law-is-dead-three-predictions-about-the-computers-of-tomorrow](http://www.techrepublic.com/article/moores-law-is-dead-three-predictions-about-the-computers-of-tomorrow)



Copyright Stratfor 2019

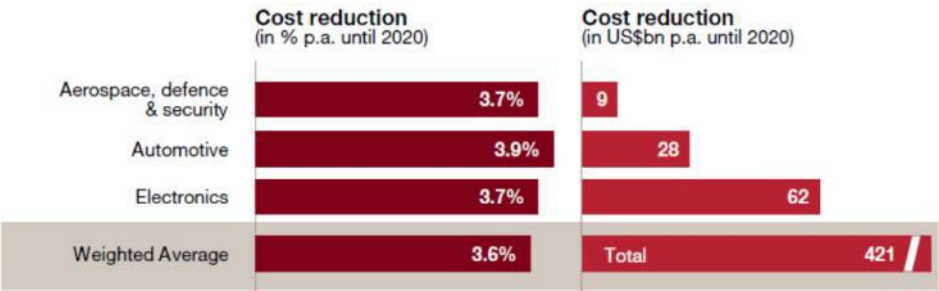
## ○ Trends:

- Moore's Law is slowing down, and foundry business is consolidating due to process complexity
- Percentage of foundry market in finFET nodes expected to continue to grow

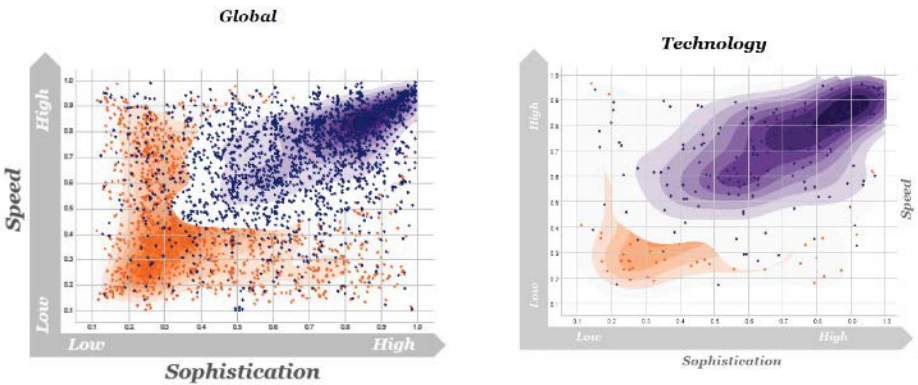
## ○ Implications:

- Increased value in mass production **continuous improvement** vs. **time to market**
- Financial risk shifting away from foundry to fabless & system companies

# Data and Analytics Growing in Importance



High-tech sectors will see a greater percentage of cost reductions than average and represent nearly a fourth of the total revenue reductions tracked.



Companies moving to **faster decision speed** with **greater sophistication**, especially in tech. sector.



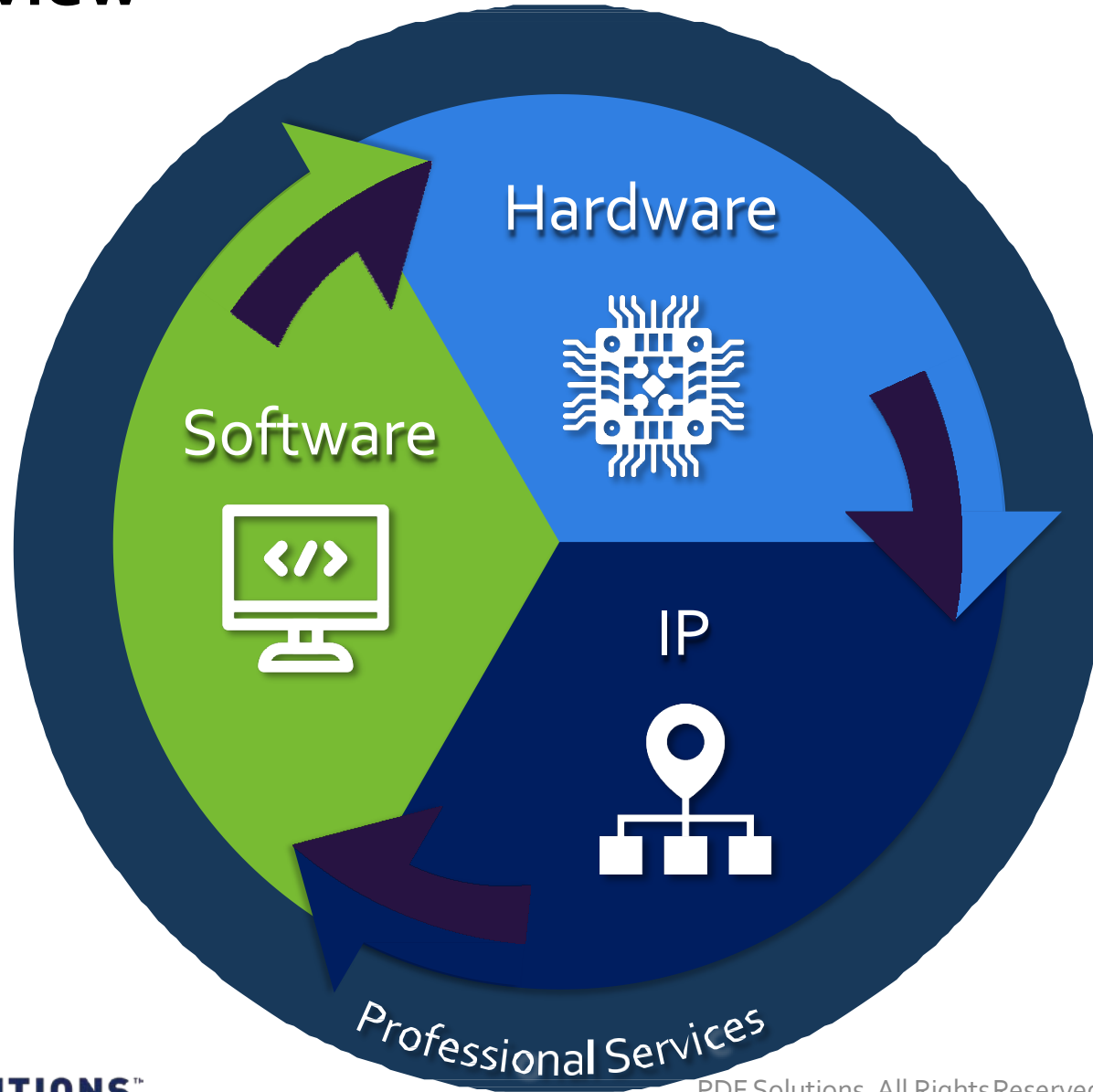
Only half of companies today place a high importance on data analytics, but 83% expect that it will be a core competence in five years.



Number of companies with “highly digitized” functional groups expected to double over next 5 years.

Source: PwC – Industry 4.0 Building your digital enterprise

# Overview



- **Exensio®**  
Analytics big-data platform with common semantic data model for integrated, aligned data from all sources
- **eProbe® & pdFasTest®**  
Electrical measurement hardware
- **CV® infrastructure, CVCore™ & DFI™**  
(Design for Inspection)  
Characterization, quality and reliability
- **Professional Services**  
Engineering, consulting, and managed data

# Exensio Platform: Big Data Analytics and Control for Semiconductors



## ■ Process Control

Detect and identify process or tool problems in manufacturing in real time

## ■ Test Operations

OEE optimization, escape prevention, and yield recovery

## ■ Manufacturing Analytics

Higher manufacturing yields via integration of all front-end and back-end data

## ■ Assembly Operations

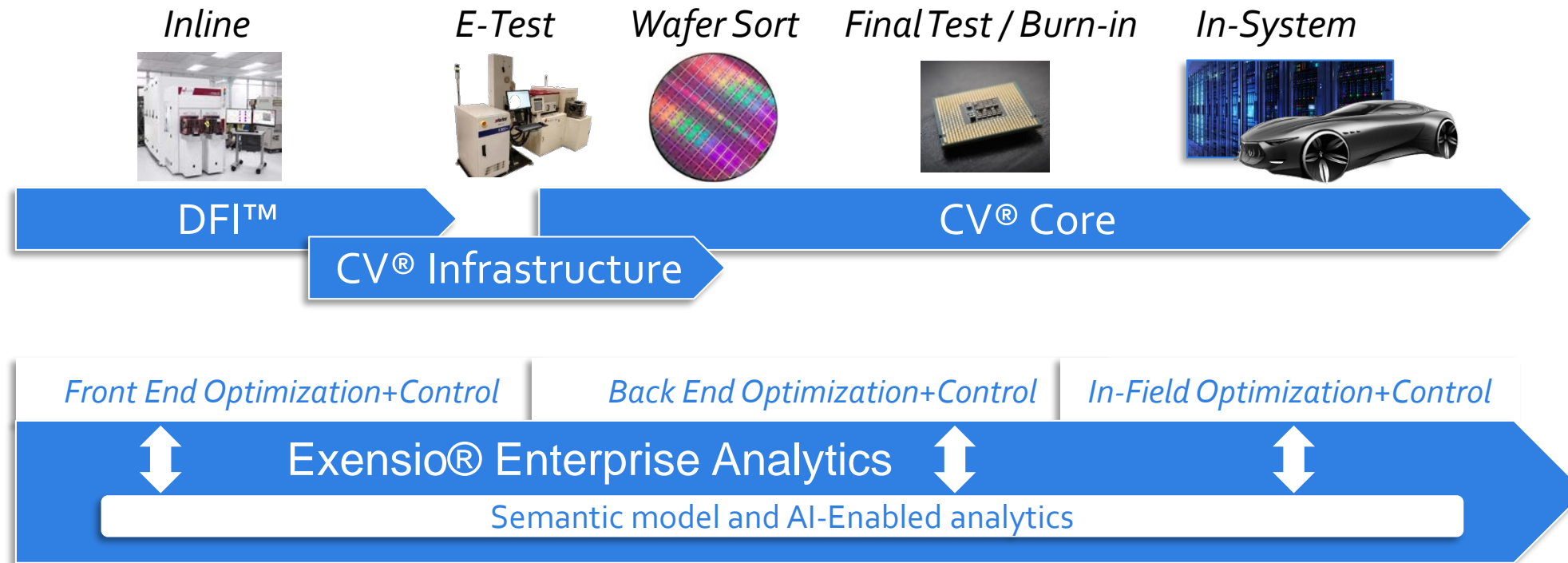
Traceability of wafers, die, and multichip modules through assembly & packaging

## ■ Process Characterization

Analytics that support the DFI System and CV Core System



# PDF Differentiated Data Leverages Exensio® End-to-end Analytics



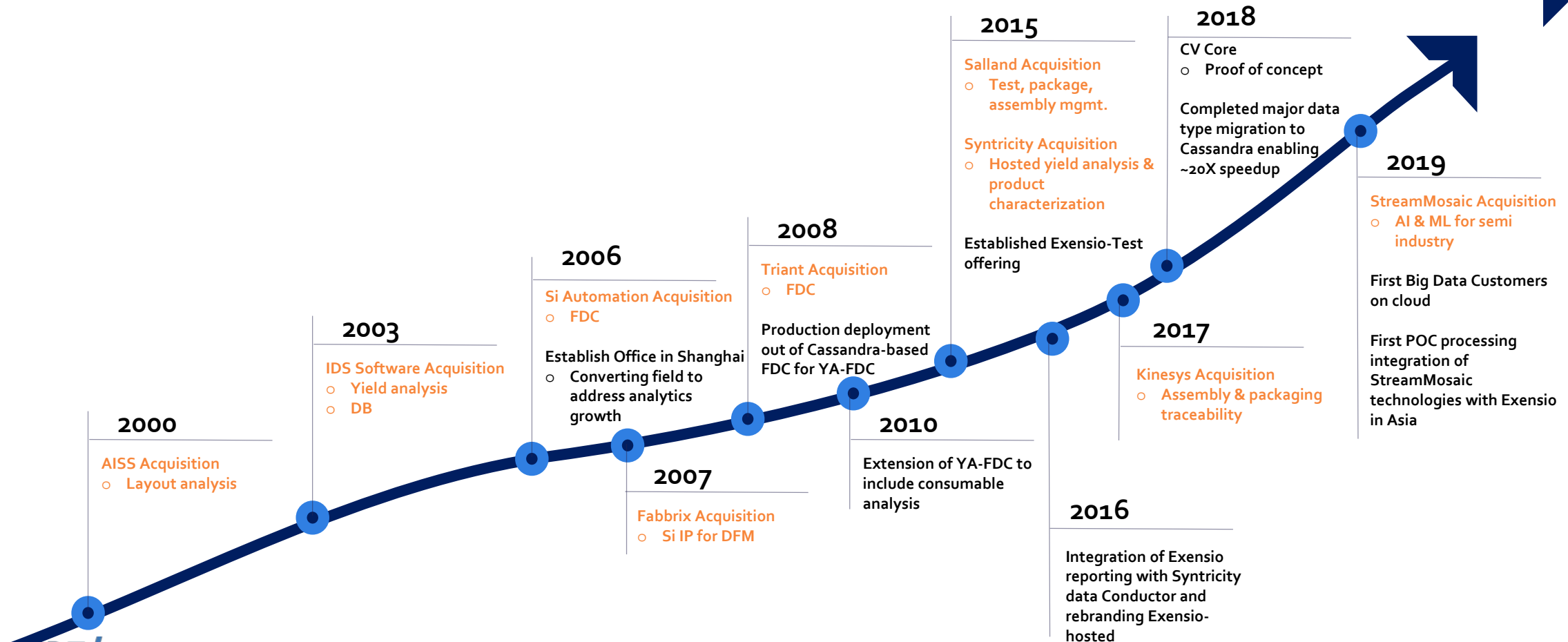
- PDF differentiated data provides product-relevant electrical fail mode coverage across the chip lifecycle
- Analytics with PDF data value proposition: Better reliability, lower cost and improved performance

# Foresight to Lead the Change

*PDF Acquisitions and Product Releases Have Expanded Our Scope and TAM*

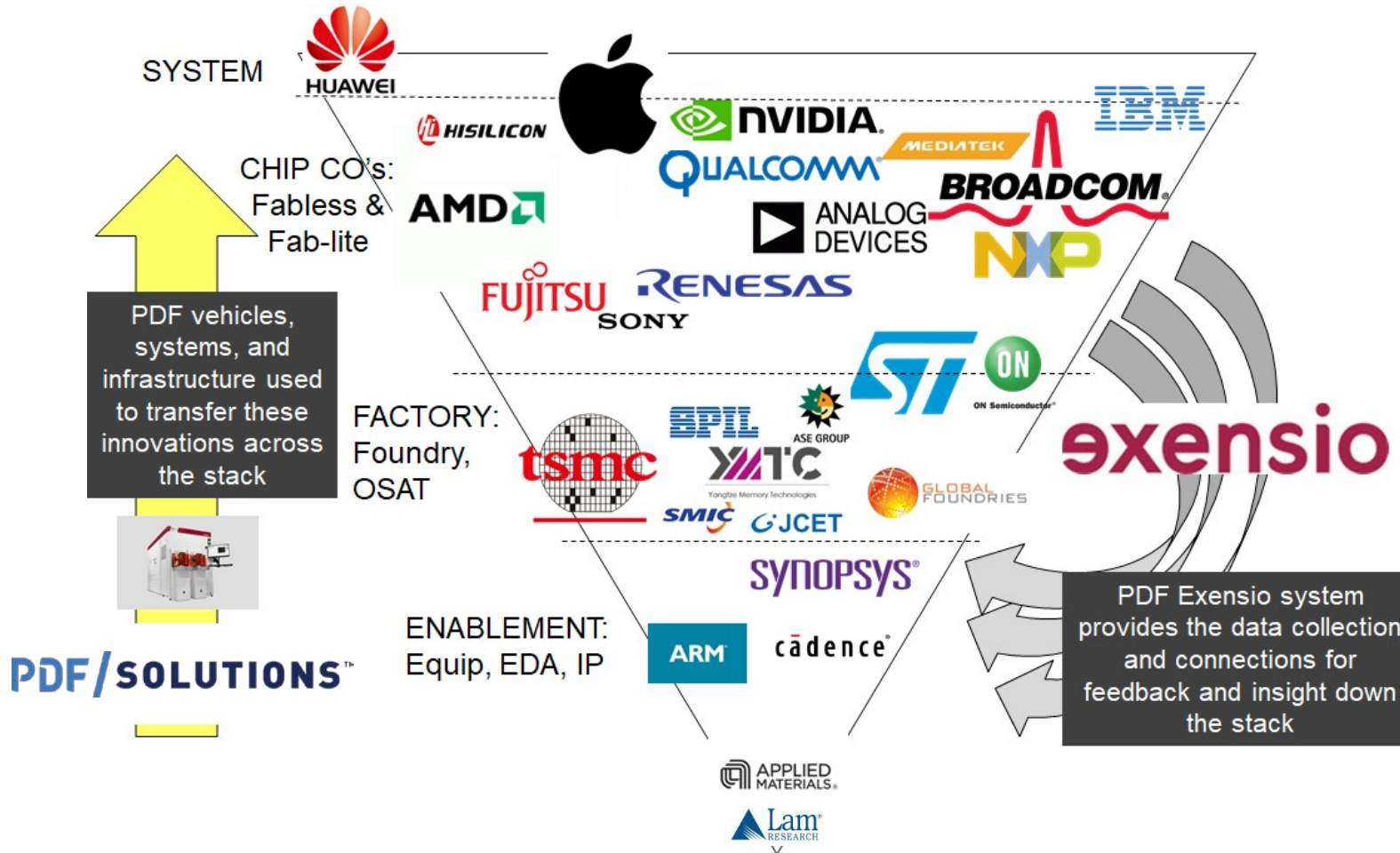
Gainshare Model "Selling Time to Volume"

Subscription Model "Selling Data"





# Today PDF Bridges the Supply Chain Stack



Representative industry participants; not indicative of actual customers.  
Logos are the property of the respective trademark owners.

- PDF analytics and data implemented broadly across the supply chain
- PDF continues to increase our established relationships with critical industry members
- PDF is the only commercial analytics-focused provider with breadth and scale required by our customers

# PDF Solutions: Customer Base



**134** customers in  
**20** countries  
spanning fabless,  
fab, OSAT, and  
system



**#1** commercial  
solution for mfg  
yield and control  
with large cloud  
customer base



**#2** and **fastest  
growing** commercial  
provider in mfg test  
operations leveraging  
DEX network



**Leading commercial  
provider** die  
traceability through  
the supply chain

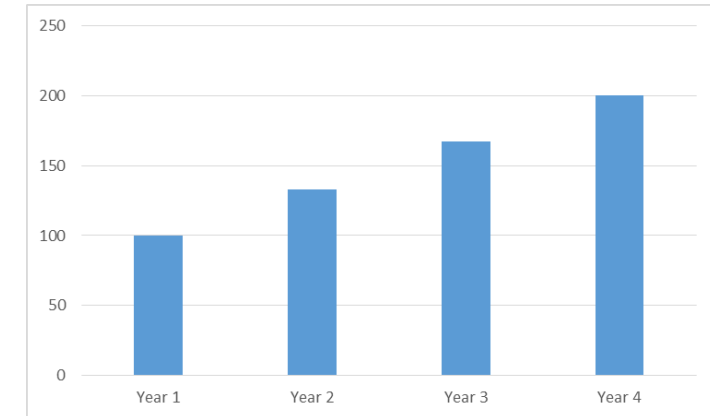




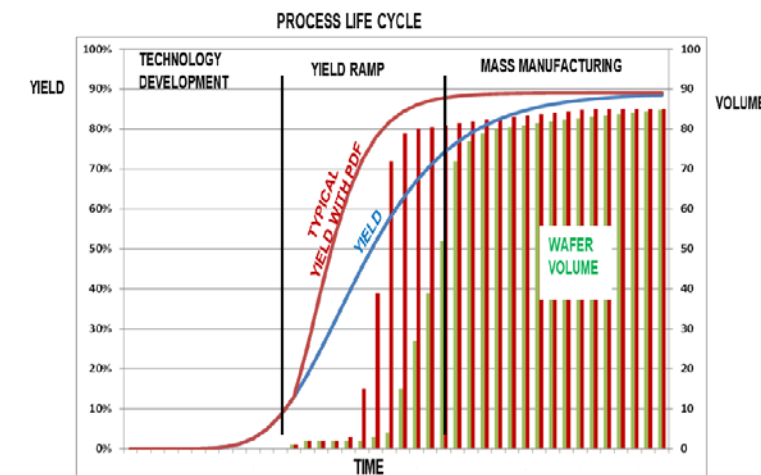
# PDF Business Models

- PDF has always provided solutions combining advanced analytics and differentiated data
- PDF has two business models to capture the value of our solutions
- Subscription model: when value is data
  - During mass production, use of our solutions by customer engineers enables continuous improvement and monitoring of yield and reliability
  - Subscription model enables PDF to be compensated based on usage
- Gainshare model: when value is time to volume
  - In competitive foundry market, time to mass production is critical.
  - The variable fee royalty model enables PDF to be compensated based on measurable value delivered

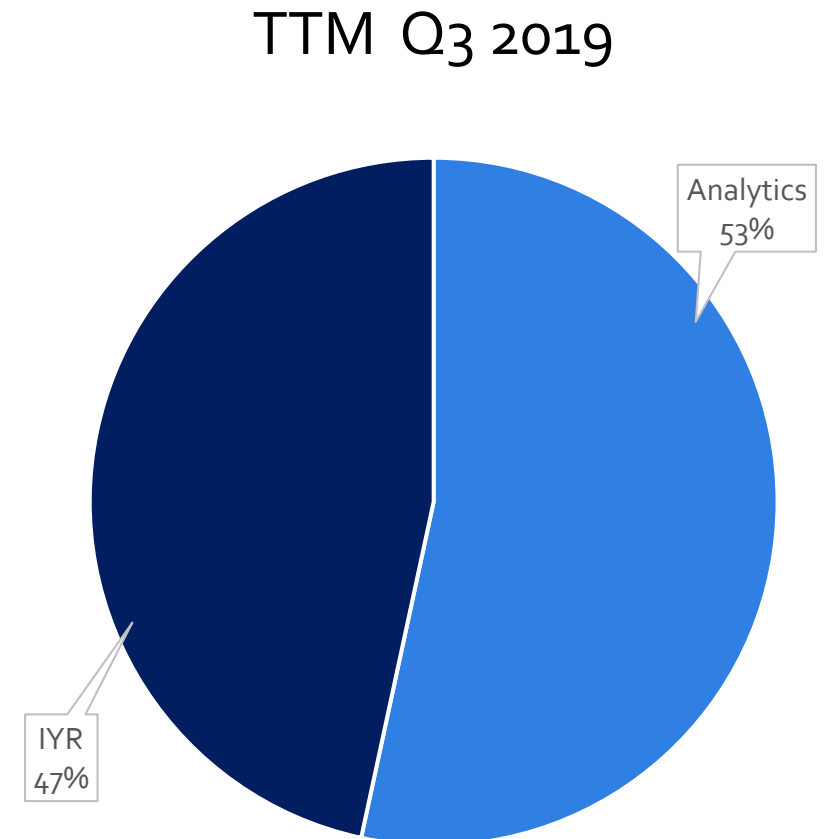
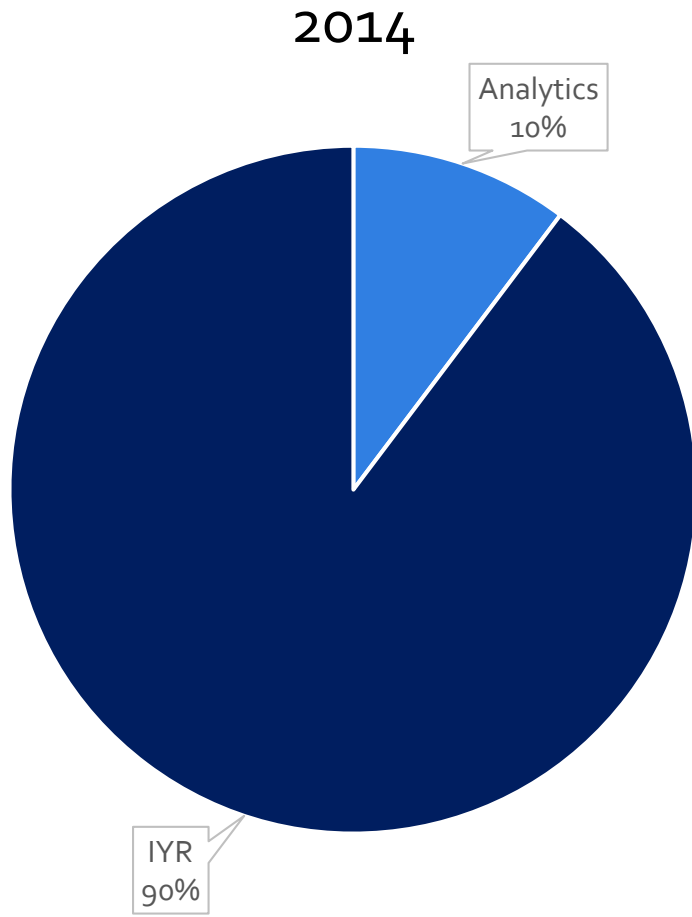
Subscriptions grow ARR overtime



Gainshare model value



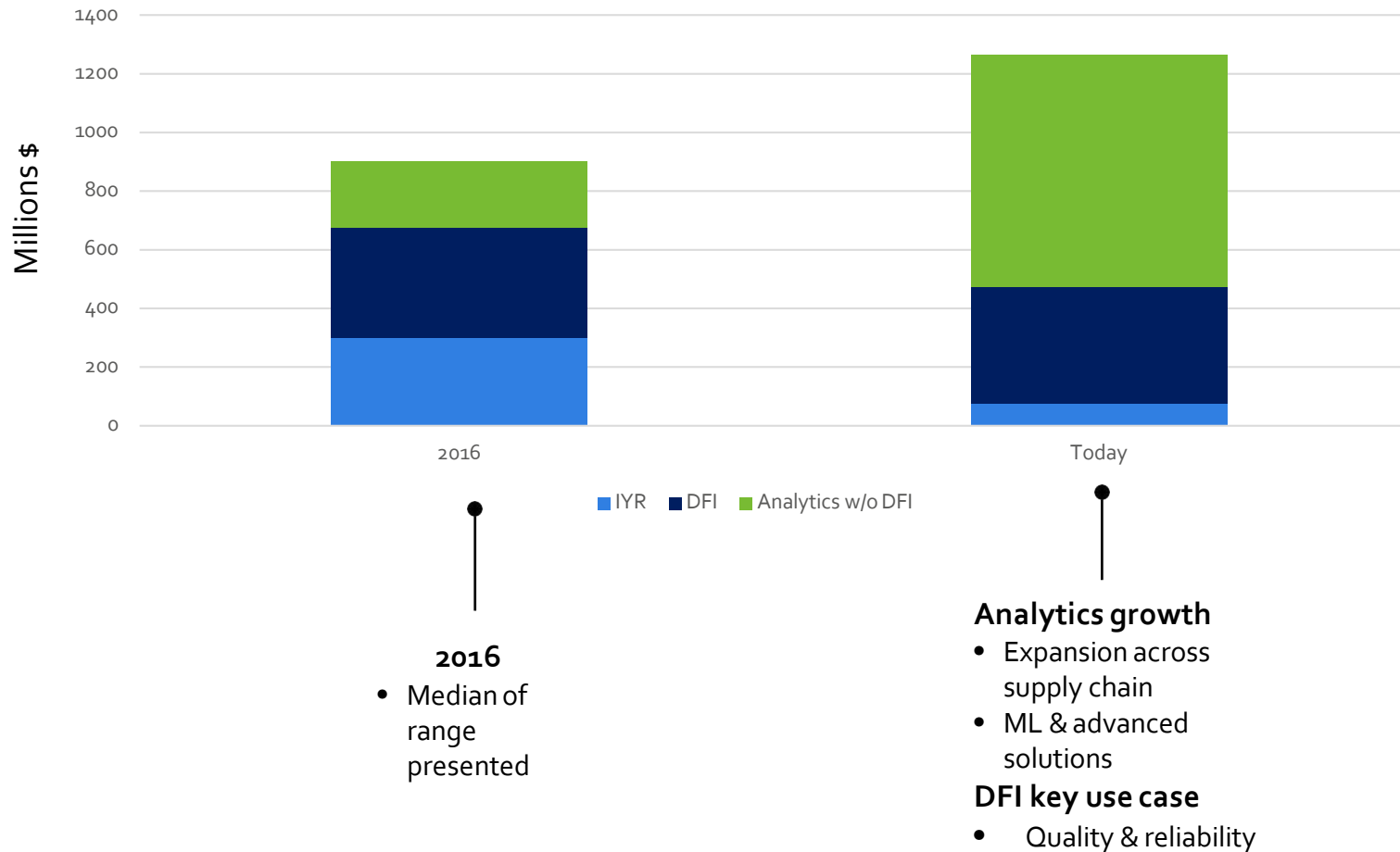
# Revenue Shift by Categories





# PDF Solutions – Total Available Market

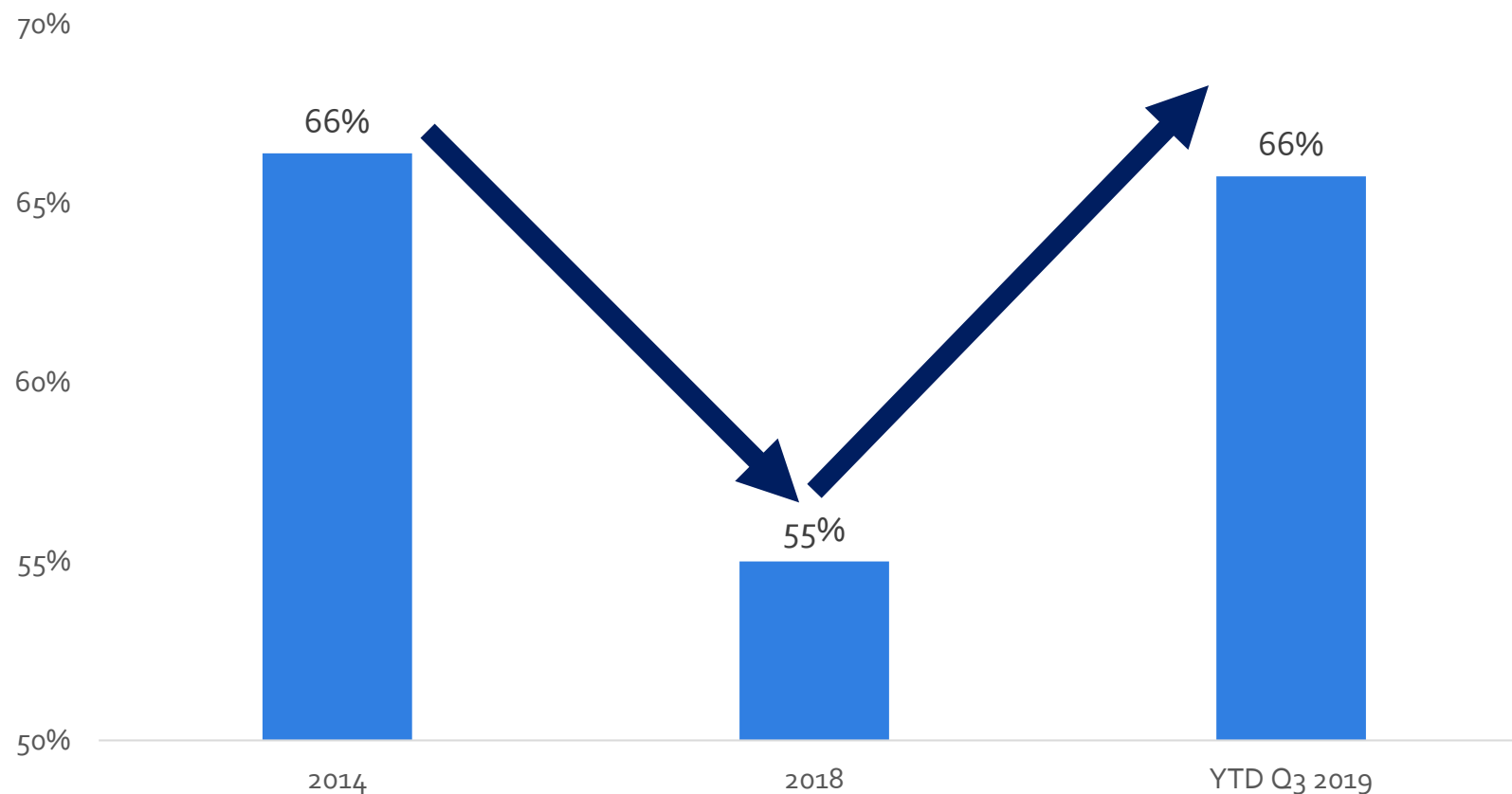
PDF Solutions TAM



- Today, PDF provides the only commercial, supply-chain-wide analytics system
- Growth in analytics TAM being driven from
  - Move to cloud and increased data volumes
  - Additional opportunities in fabless, OSAT, system analytics
- DFI™ TAM growth driven by
  - Need for electrical data for quality and reliability
  - Observability limits of conventional inspection

# Total Company Gross Margins

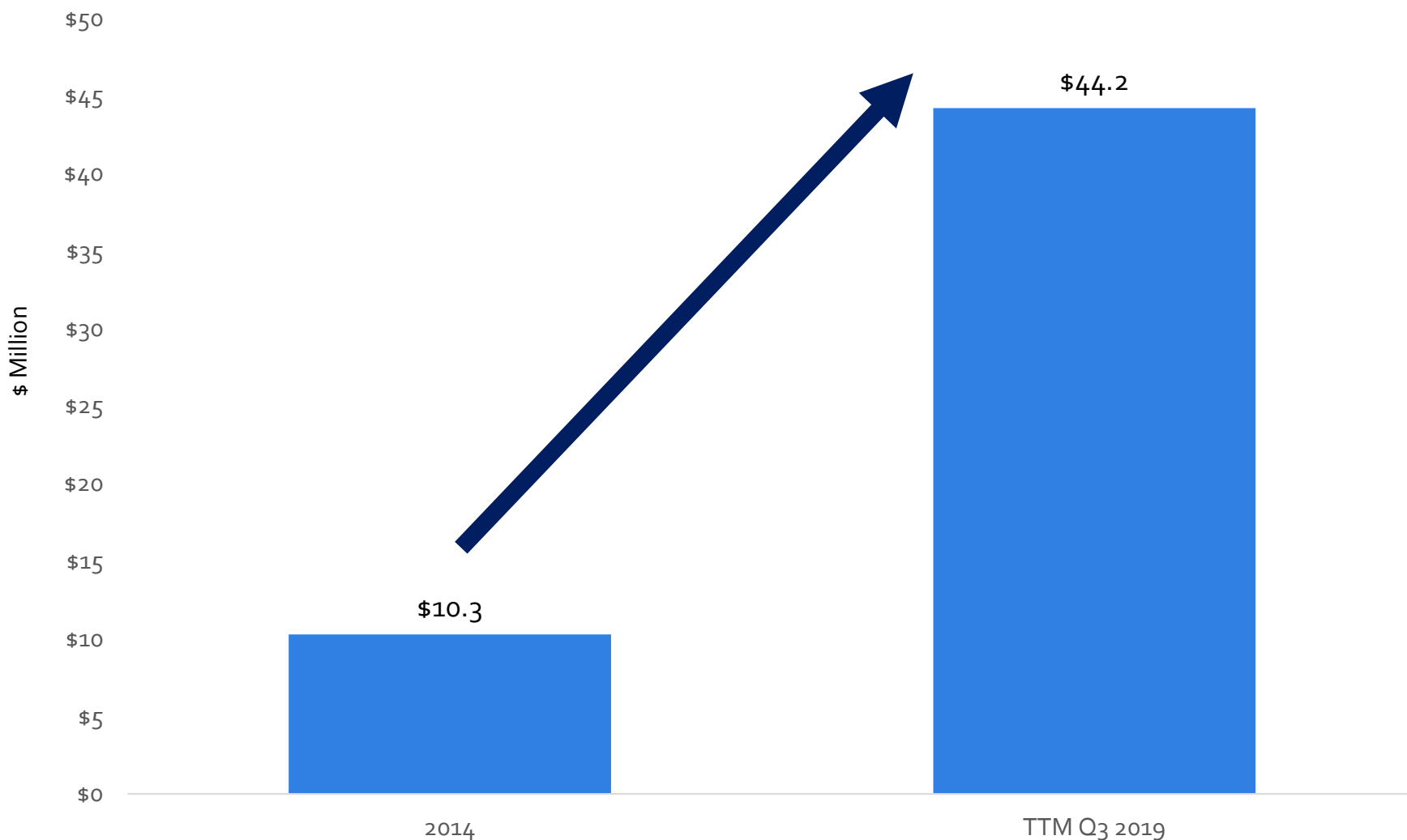
## Total Company Non-GAAP Gross Margins\*



\*See reconciliation of GAAP to non-GAAP in appendix

- First monetization of technology was IYR with associated royalties.
- IYR when combined with Gainshare created meaningful margins.
- Current gross margin expansion driven by Analytics growth.
- Progressing towards industry-leading gross margin standards. Replacing Gainshare 100% margin with Analytics margins.

# Analytics Revenue Growth



GROWTH

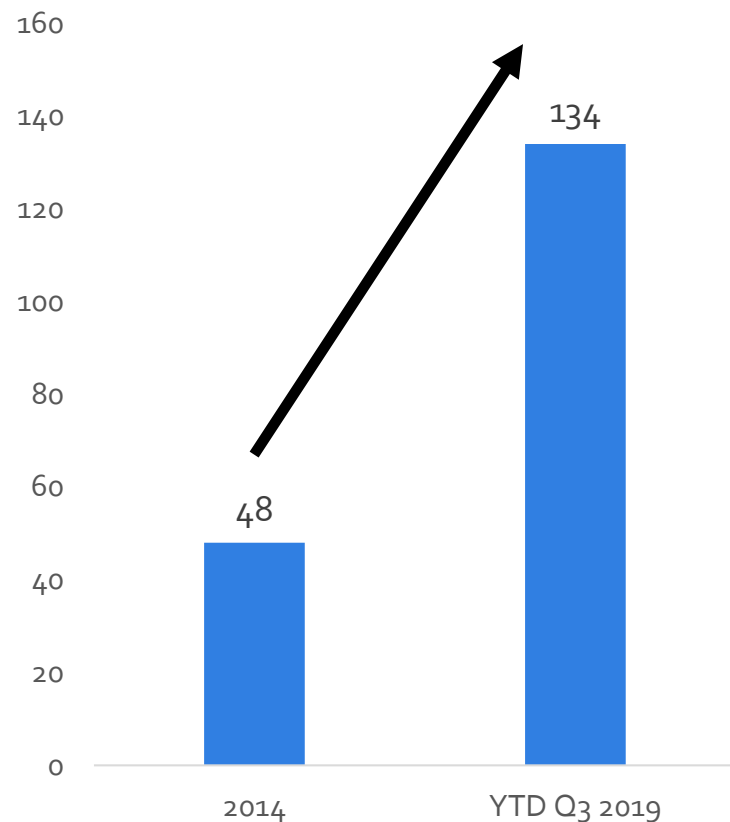
Revenue CAGR

35%

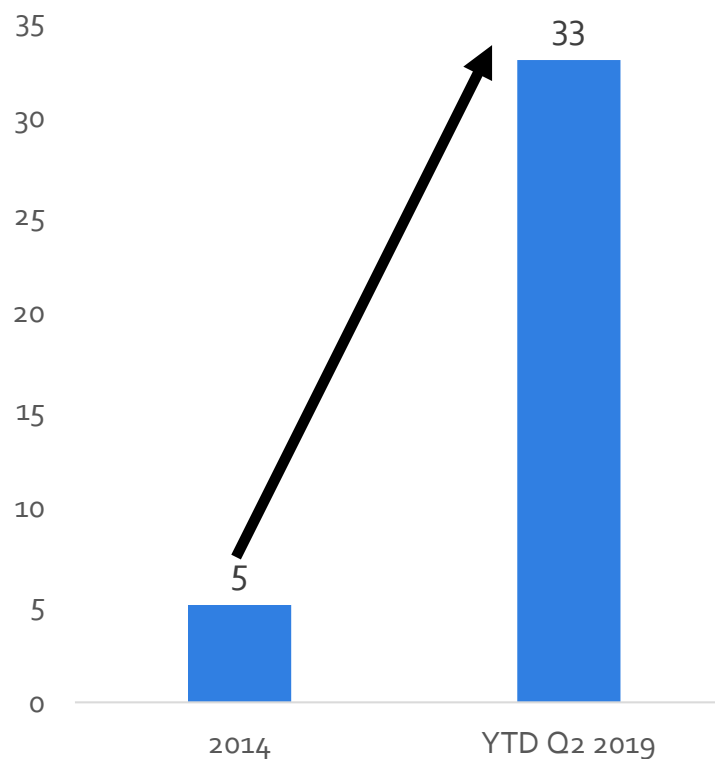


# Analytics Customer Adoption

## Total # of Customers



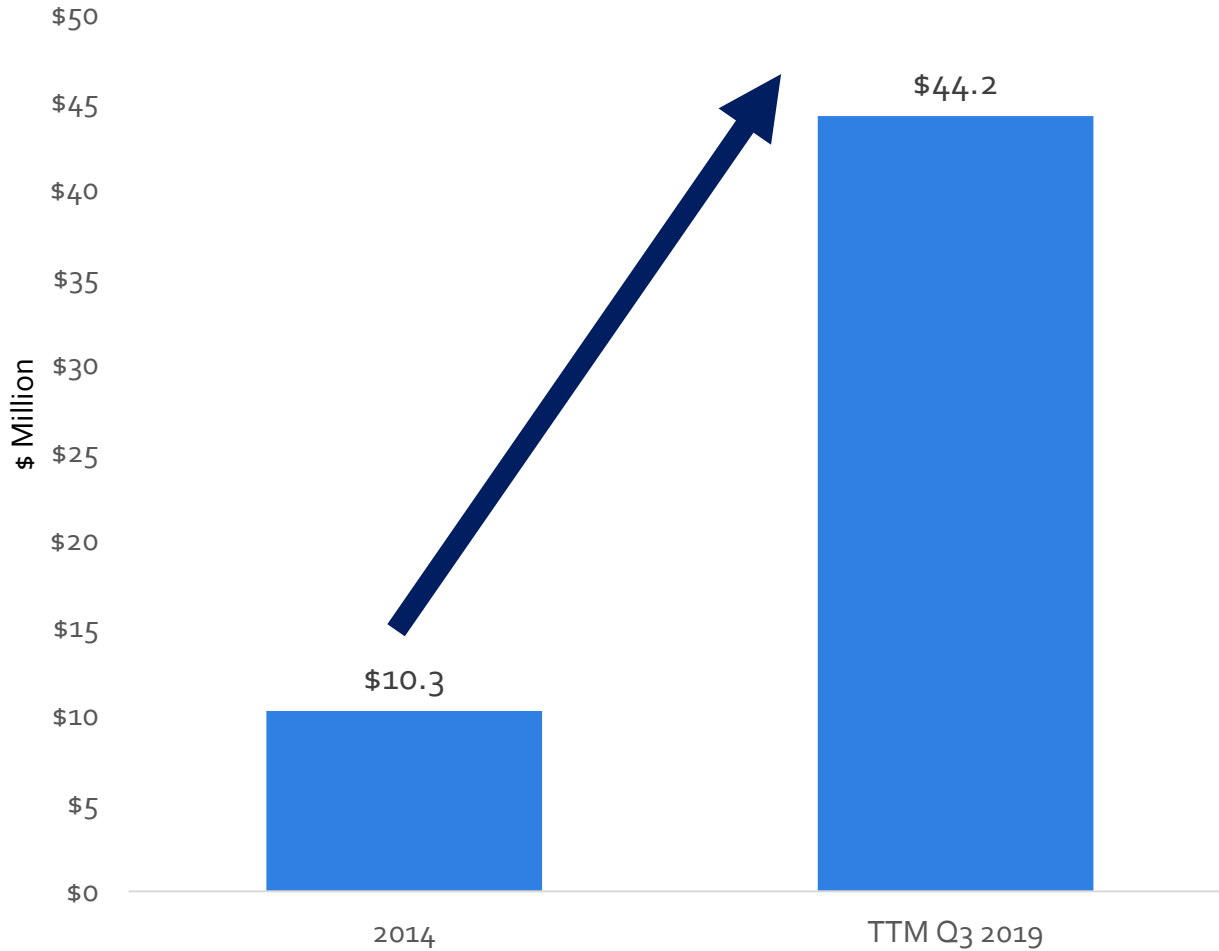
## # of Customers More than 1 Product



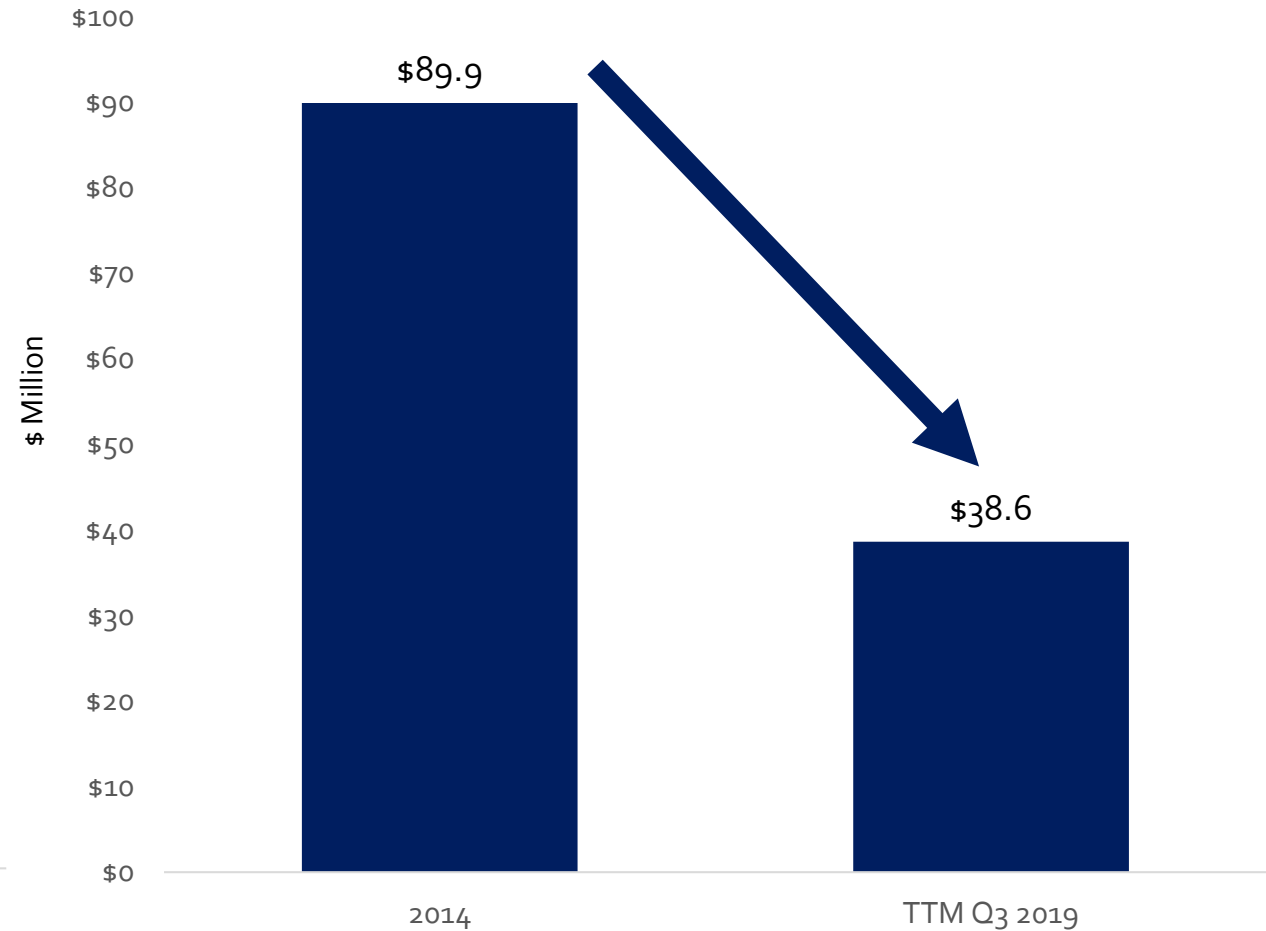
- Added more than 80 new Analytics customers since 2014, an increase of 171%
- 25% of customers utilize more than one product
- Growth in Analytics Revenue per account of 46%
- Multiple product adoption by customers continues to increase as PDF introduces additional products through product development and acquisition

# Revenue: Analytics vs. IYR

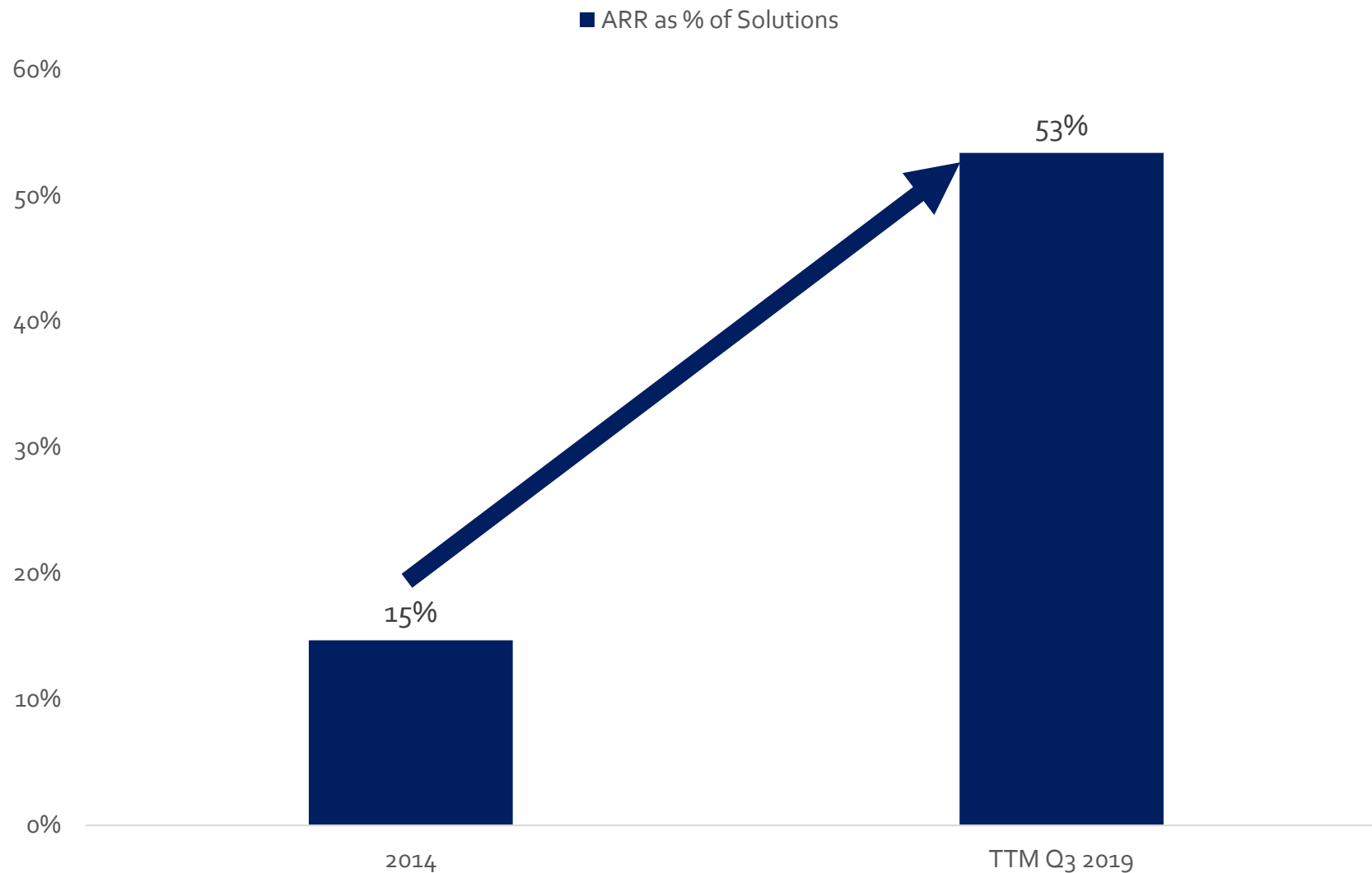
Analytics  
Revenue



IYR  
Revenue



# Annual Recurring Revenue

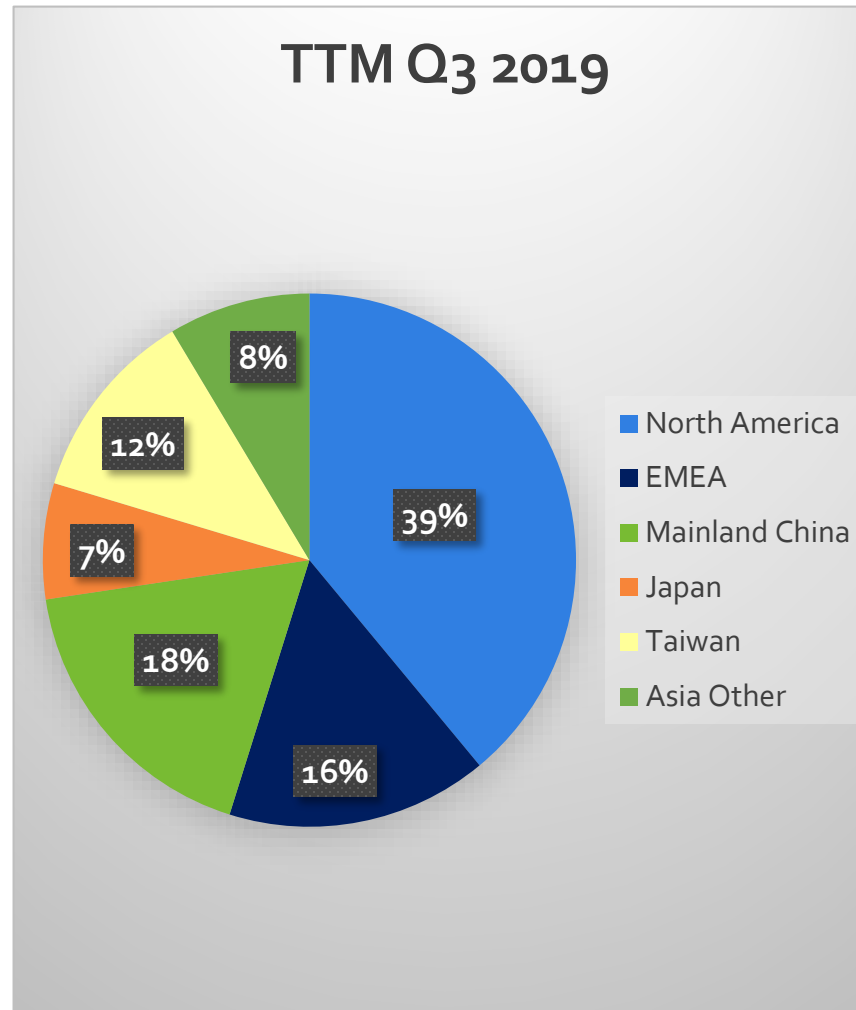


## VISIBILITY

- 31% ARR CAGR since 2014
- ARR is the value of the contracted recurring revenue components of multi-year subscriptions normalized to a one-year period
- ARR provides good level of forward revenue visibility
- Prior to 2014 the majority of our revenue was perpetual licenses. We have transitioned to time-based license by 2019.
- 2019 increased demand for paid pilot projects which are not ARR



# Global Geographic Distribution



- Globally diverse geographic distribution
- No more than 25% of sales come from any one international market

# Balance Sheet Strength

	(\$ Million)
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- Cash and cash equivalents (end of Q3 2019) \$100.3
- Debt \$0
- Gainshare royalties expected to continue for several years

- Existing balance sheet strength provides foundation for investment in growth of analytics business both organically and inorganically
- Successful initiatives taken to improve DSOs to achieve strong cash increase in Q3 2019

# Long-Term Targets

	Target	Comparables
Annual Analytics Revenue Growth	20%	14%*
Non-GAAP Gross Margins	>70%	85%**
Non-GAAP Operating Margin	20%	22%**

Comparables: Cadence, Splunk and Synopsys

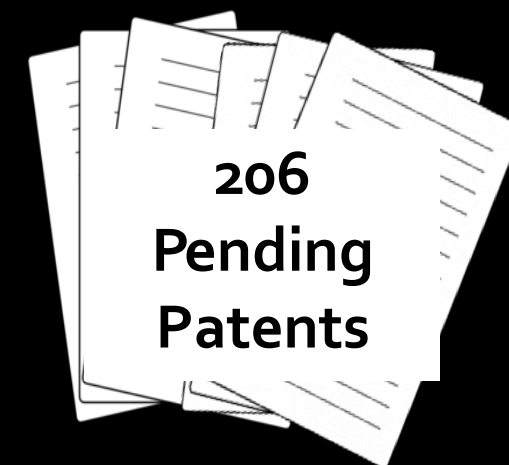
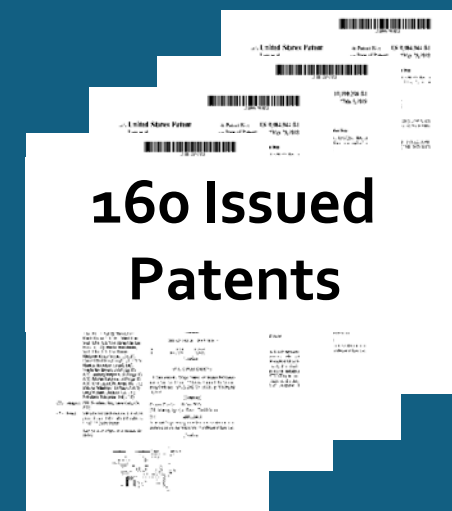
\*Based on Analyst Estimates

\*\*Comparable data supplied by Zacks Research System and based on TTM Q2 2019

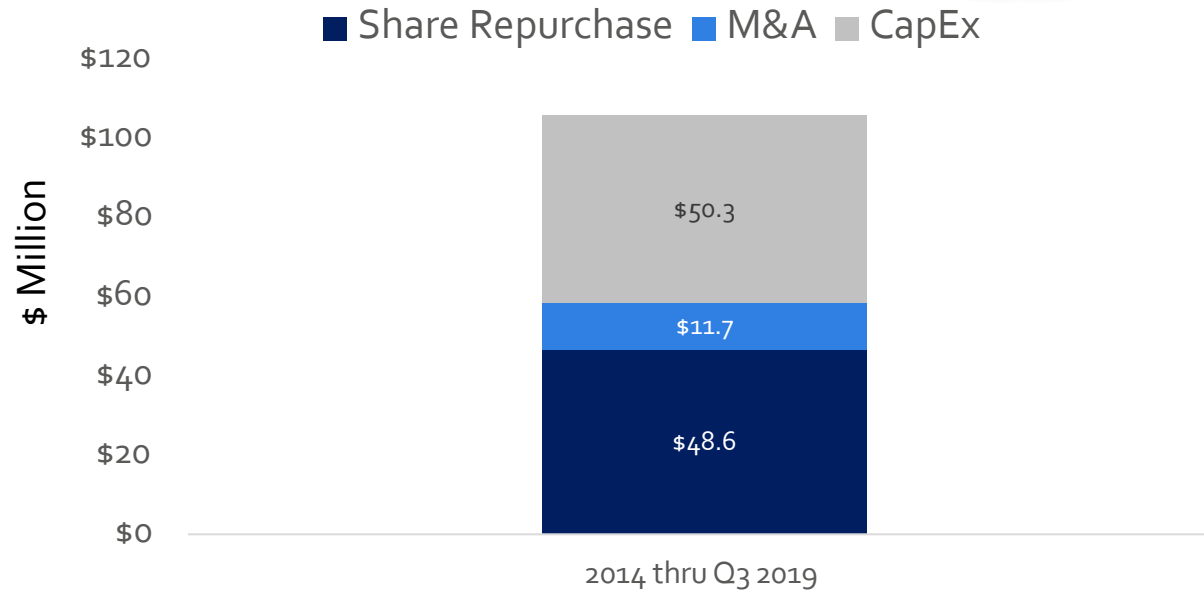
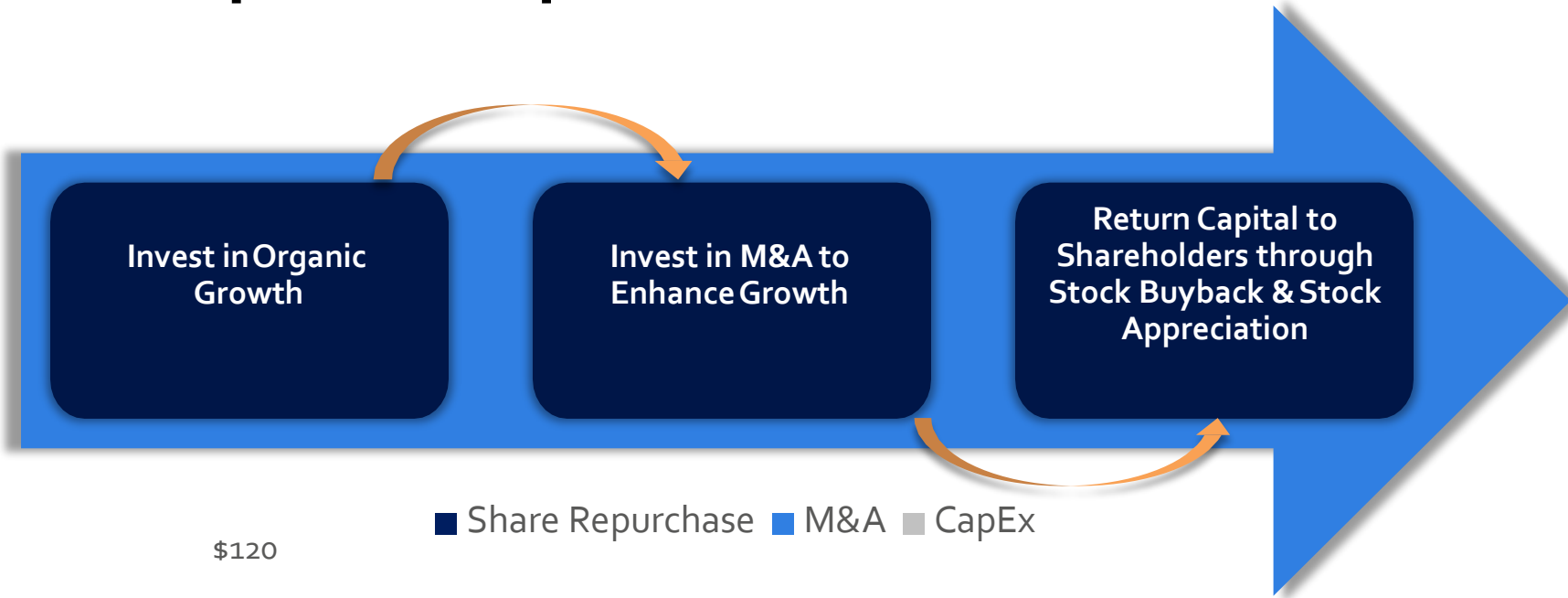


# Investment Results in Strong Patent Position

- Our investments in analytics & differentiated data result in a strong and growing patent position
- Patents based on 28 years of know-how in semiconductor development and mass production
- Key patents in areas of:
  - Design for inspection and CV structures for advanced nodes
  - Electrical characterization
  - AI/ML technology



# Disciplined Capital Allocation



- Capex investments include DFI, CVi, IP, DEX network, and infrastructure
- Cash balance has stayed relatively constant while we
  - Invest in Capex,
  - Make acquisitions
  - Return capital to shareholders through stock buyback





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## Financials - Appendix



# Non-GAAP Presentation

In addition to providing results that are determined in accordance with Generally Accepted Accounting Principles in the United States of America (GAAP), the Company also provides certain non-GAAP financial measures. Non-GAAP net income excludes the effects of non-recurring items (including severance payments), stock-based compensation expenses, amortization of acquired technology and other acquired intangible assets, and their related income tax effects, as applicable, as well as adjusts for the non-cash portion of income taxes. These non-GAAP financial measures are used by management internally to measure the Company's profitability and performance. PDF Solutions' management believes that these non-GAAP measures provide useful supplemental measures to investors regarding the Company's ongoing operations in light of the fact that none of these categories of expense has a current effect on the future uses of cash (with the exception of certain non-recurring items) nor do they impact the generation of current or future revenues. These non-GAAP results should not be considered an alternative to, or a substitute for, GAAP financial information, and may be different from similarly titled non-GAAP measures used by other companies. In particular, these non-GAAP financial measures are not a substitute for GAAP measures of income or loss as a measure of performance, or to cash flows from operating, investing and financing activities as a measure of liquidity. Management uses these non-GAAP financial measures internally to measure profitability and performance; these non-GAAP measures are presented here to give investors an opportunity to see the Company's financial results as viewed by management. A detailed reconciliation of the adjustments made to comparable GAAP measures is included herein.

# GAAP to Non-GAAP Income Reconciliation (Annual)

in thousands (except share amounts, percent of revenue, and EPS)

	2014	2015	2016	2017	2018	2019 YTD thru Q3	Trailing 12 months thru Q3-19
<b>GAAP net income (loss)</b>	<b>\$ 18,462</b>	<b>\$ 12,407</b>	<b>\$ 9,103</b>	<b>\$ (1,337)</b>	<b>\$ (7,716)</b>	<b>\$ (4,088)</b>	<b>\$ (7,202)</b>
Adjustments to reconcile GAAP net income (loss) to non-GAAP net income (loss):							
Stock-based compensation expense	8,547	9,756	11,002	11,810	10,295	8,641	11,111
Impaired deferred costs	1,892	-	-	-	-	-	-
Previously impaired deferred costs	-	(1,892)	-	-	-	-	-
Amortization of acquired technology	-	176	374	471	575	431	574
Amortization of other acquired intangible assets	31	196	432	398	435	436	544
Restructuring charges and severance payments	57	-	-	400	907	92	667
Write-down in value of property and equipment	-	-	-	-	227	-	227
Acquisition costs & adjustment to contingent consideration related to acquisition	-	1,335	-	-	90	30	120
Tax Impact of Adjustments	4,836	2,725	559	1,231	(1,992)	(2,083)	(2,951)
<b>Non-GAAP net income (loss)</b>	<b>\$ 33,825</b>	<b>\$ 24,703</b>	<b>\$ 21,469</b>	<b>\$ 12,973</b>	<b>\$ 2,821</b>	<b>\$ 3,458</b>	<b>\$ 3,091</b>
<b>GAAP net income (loss) per diluted share</b>	<b>0.58</b>	<b>0.39</b>	<b>0.28</b>	<b>(0.04)</b>	<b>(0.24)</b>	<b>(0.13)</b>	<b>(0.22)</b>
<b>Non-GAAP net income (loss) per diluted share</b>	<b>1.06</b>	<b>0.77</b>	<b>0.66</b>	<b>0.39</b>	<b>0.09</b>	<b>0.11</b>	<b>0.10</b>
<b>Shares used in diluted shares calculation (in millions)</b>	<b>31.9</b>	<b>32.2</b>	<b>32.4</b>	<b>33.2</b>	<b>32.5</b>	<b>33.0</b>	<b>32.9</b>

# GAAP to Non-GAAP Gross Margin Reconciliation

in thousands

	2014	2015	2016	2017	2018	2019 YTD thru Q3	Trailing 12 months thru Q3-19
<b>GAAP Gross Margin</b>	<b>\$ 60,449</b>	<b>\$ 58,954</b>	<b>\$ 63,013</b>	<b>\$ 54,350</b>	<b>\$ 42,992</b>	<b>\$ 38,608</b>	<b>\$ 48,613</b>
Adjustments to reconcile GAAP gross margin (loss) to non-GAAP gross margin:							
Stock-based compensation expense	3,419	3,914	4,427	4,606	3,554	2,404	3,190
Impaired deferred costs	1,892	-	-	-	-	-	-
Previously impaired deferred costs	-	(1,892)	-	-	-	-	-
Amortization of acquired technology	-	176	374	471	574	431	574
Restructuring charges and severance payments	-	-	-	151	258	-	-
<b>Non-GAAP gross margin</b>	<b>\$ 65,760</b>	<b>\$ 61,151</b>	<b>\$ 67,814</b>	<b>\$ 59,578</b>	<b>\$ 47,378</b>	<b>\$ 41,443</b>	<b>\$ 52,377</b>

# Balance Sheet

(\$ '000)	Q3'19
Cash and cash equivalents	\$100,259
Accounts receivable, net	24,359
Unbilled accounts receivable	10,197
Prepays and other current	8,026
Property, plant and equipment, net	38,969
Operating lease right-of-use assets	7,581
Other assets	39,956
<b>TOTAL ASSETS</b>	<b>\$229,347</b>
Accounts payable	\$2,203
Accrued liabilities	6,765
Operating lease liabilities - current portion	1,826
Deferred revenue and billing in excess of revenue	9,831
Non-current operating lease liabilities	7,726
Tax and other long-term liabilities	6,009
Total stockholders' equity	194,988
<b>TOTAL LIABILITIES &amp; EQUITY</b>	<b>\$229,347</b>



# Thank You

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