The Value Derived from Data Analytics: Examining Context

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Vernon Richardson

University of Arkansas

Lessons from the IT Productivity Paradox

Stock Market Increase around AIS Investment Announcements

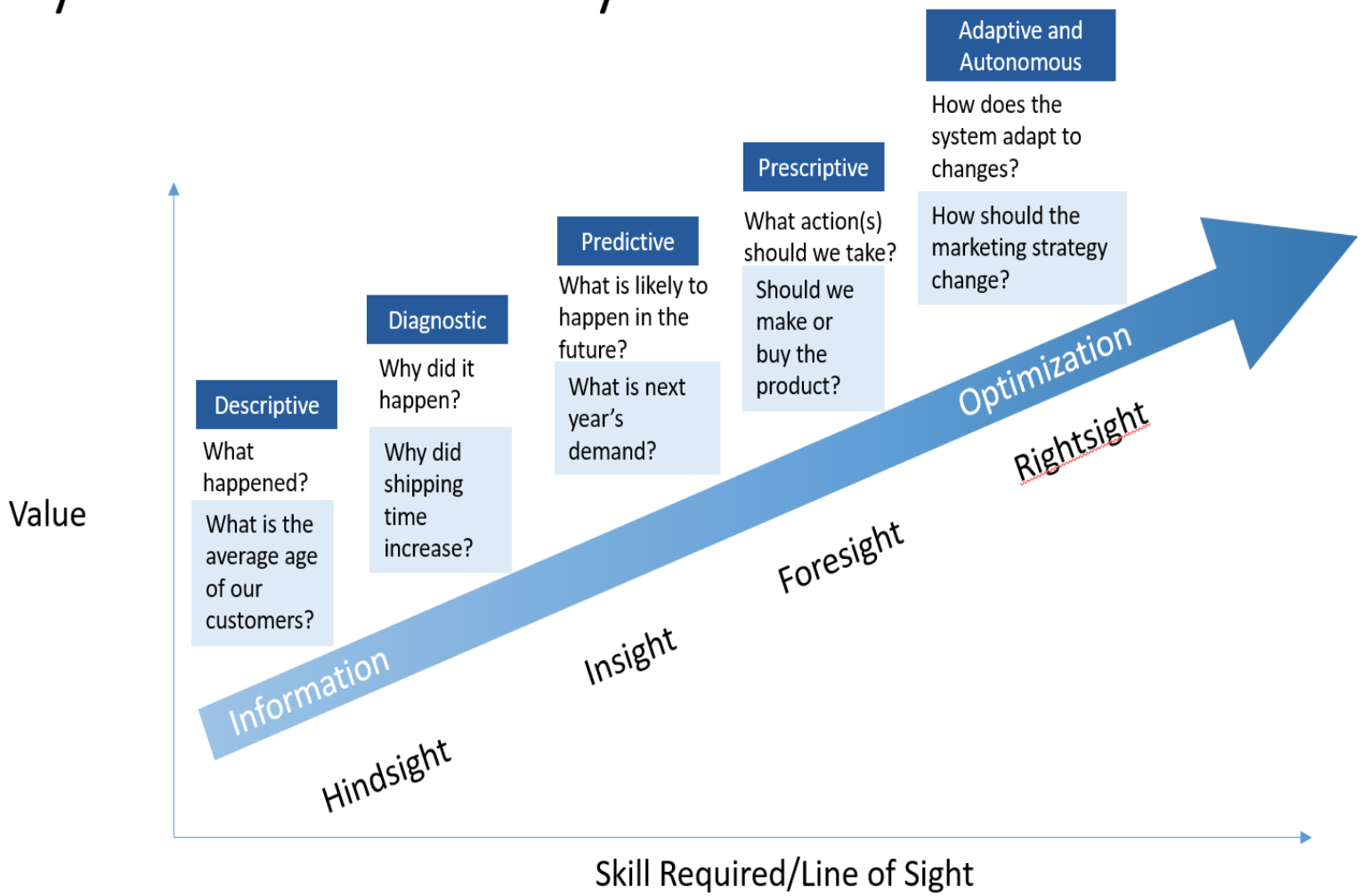
by AIS Investment Strategic Role

Automate	Informate*	Transform
0.05%	0.40%	1.51%**

*Informate-up and Informate-down are consolidated in a single strategic role: Informate.
**This return was statistically greater than zero.

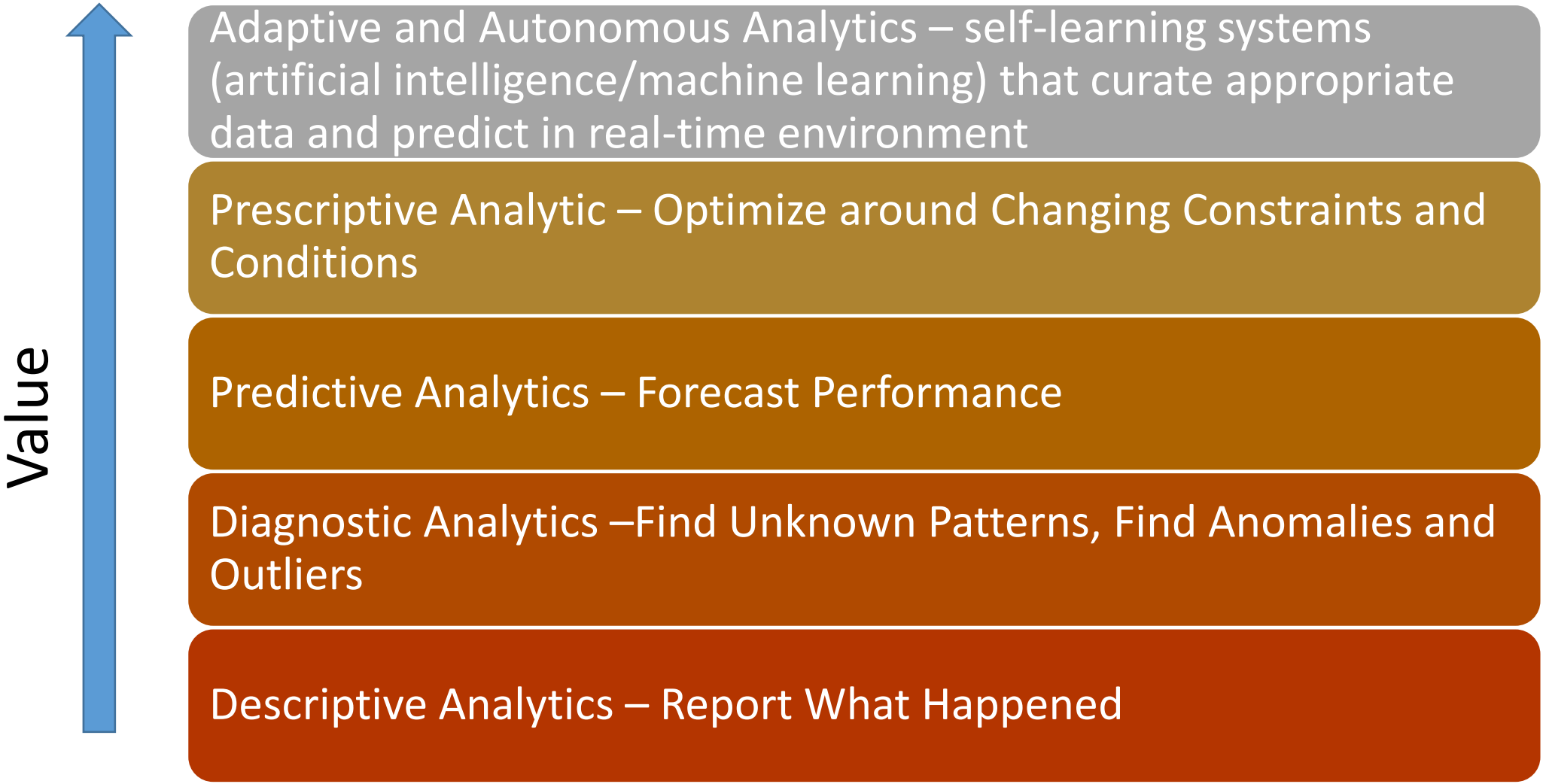
Cite: Dehning, B., Richardson, V. J., & Zmud, R. W. (2003). The value relevance of announcements of transformational information technology investments. *MIS Quarterly*, 637-656.

Analytics Ascendency Model



Adapted from:
Information Builders, 2018
Raef Lawson, "New Competencies for Management Accounts," *Strategic Finance*, March 2019, at: https://sfmagazine.com/post-entry/march-2019-new-competencies-for-management-accountants/

Expectation of Value from Data/Data Analytics



Context Specific Application:

Examining the Potential Audit Benefits of Audit Data Analytics

- **Audit Data Analytics Technology Adoption by Internal Audit Function**

- **Changes in Audit Environment Outcomes**
  - Reductions in (External) Audit Fees
  - Reductions in (External) Audit Delays

- **Validation Tests**
  - Financial Reporting Environment Outcomes
    - Material Weaknesses, Restatements, and Discretionary Accruals

Context: Audit Data Analytics

AICPA - the analysis of accounting data, together with other related financial or non-financial information, for the purpose of identifying potential misstatements or risks of material misstatement.

Enhanced Statistical Analysis, Visualization, Unstructured and Big Data Capabilities…..

IIA - faster, more efficient, and more effective audit processes; more timely risk and control assurance

Our Study

- **Audit Analytics Observations = 133 Press Releases**
  - 2006-2017 Time Period
  - Keyword Search and Action Verbs
  - Cross-Validation and Interrater Reliability

- **Control Sample Approaches**
  - Population-Based
  - Industry-Matched Control Groups
  - Industry/Auditor/Size Match

Cite: Lim, J-H, J. Park, G. Peters, and V. J. Richardson, Examining the Potential Audit Benefits of Audit Data Analytics, Working Paper, University of Arkansas, 2020.

Panel B. *ADA type*

Dependent variable:	$\Delta LogAuditFees_{i,t+1}$				$\Delta LogAuditReportLag_{i,t+1}$			
Sample:	One-to-one matched	PSM	Entropy balancing	Placebo test	One-to-one matched	PSM	Entropy balancing	Placebo test
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ADA - Descriptive$_{i,t}$	-0.010	0.015	0.010	-0.004	0.002	0.006	0.009	0.013
	(-0.19)	(0.26)	(0.23)	(-0.08)	(0.04)	(0.07)	(0.14)	(0.53)
ADA - Diagnostic$_{i,t}$	-0.086**	-0.128***	-0.086***	-0.013	-0.044**	-0.058**	-0.046***	0.017
	(-2.31)	(-2.97)	(-3.03)	(-0.33)	(-2.31)	(-2.45)	(-3.30)	(0.72)
ADA - Predictive/Prescriptive$_{i,t}$	-0.012	-0.028	-0.001	-0.031	-0.052	-0.076**	-0.059**	-0.055
	(-0.26)	(-0.53)	(-0.02)	(-0.64)	(-1.63)	(-2.25)	(-2.21)	(-1.51)
Controls	Identical to Tables 4 and 5							
Time trend effects	yes	yes	yes	yes	yes	yes	yes	yes
Industry fixed effects	yes	yes	yes	yes	yes	yes	yes	yes
Number of observations	266	266	823	67,868	266	266	823	67,868
Adjusted R^2	0.124	0.139	0.173	0.105	0.116	0.057	0.145	0.020

TABLE 6—ADA Type and Changes in Audit Outcomes

Panel A. *Change in audit fees*

Dependent variable:	$\Delta LogAuditFees_{i,t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
ADA - Descriptive$_{i,t}$	-0.012	-0.012	0.007	-0.017	-0.025	-0.004
	(-0.29)	(-0.29)	(0.15)	(-0.35)	(-0.50)	(-0.07)
ADA - Diagnostic$_{i,t}$	-0.099***	-0.099***	-0.089***	-0.086***	-0.087***	-0.080***
	(-3.92)	(-3.84)	(-3.13)	(-3.37)	(-3.33)	(-2.65)
ADA - Predictive/Prescriptive$_{i,t}$	-0.025	-0.031	-0.007	-0.035	-0.044	-0.020
	(-0.65)	(-0.83)	(-0.18)	(-0.87)	(-1.11)	(-0.47)
Controls	Identical to Tables 4 and 5					
Time trend effects	yes	yes	yes	yes	yes	yes
Industry fixed effects	yes	yes	yes	yes	yes	yes
IMR	no	no	no	yes	yes	yes
Number of observations	67,868	21,996	823	61,331	19,424	722
Adjusted R^2	0.105	0.110	0.120	0.089	0.085	0.123

Panel B. *Change in audit report lag*

Dependent variable:	$\Delta LogAuditReportLag_{i,t+1}$					
	(1)	(2)	(3)	(4)	(5)	(6)
ADA - Descriptive$_{i,t}$	0.031	0.026	0.016	0.033	0.025	0.014
	(0.50)	(0.41)	(0.24)	(0.43)	(0.33)	(0.18)
ADA - Diagnostic$_{i,t}$	-0.054***	-0.055***	-0.052***	-0.045***	-0.046***	-0.047***
	(-3.94)	(-4.00)	(-3.45)	(-3.23)	(-3.31)	(-3.05)
ADA - Predictive/Prescriptive$_{i,t}$	-0.041	-0.043*	-0.049*	-0.027	-0.029	-0.034
	(-1.63)	(-1.73)	(-1.83)	(-1.01)	(-1.11)	(-1.18)
Controls	Identical to Tables 4 and 5					
Time trend effects	yes	yes	yes	yes	yes	yes
Industry fixed effects	yes	yes	yes	yes	yes	yes
IMR	no	no	no	yes	yes	yes
Number of observations	67,868	21,996	823	61,331	19,424	722
Adjusted R^2	0.021	0.024	0.026	0.015	0.015	0.036

Panel B. *Regression results by ADA type*

Material Weaknesses | Restatements | Discretionary Accruals

Dependent variable:	*ICMW count*$_{t,t+1}$			*Restatement*$_{t,t+1}$			*Performance matched DA*$_{t,t+1}$		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
ADA - Descriptive$_{t,t}$	-0.111	-0.091	-0.100	-0.182	-0.178	-0.019	0.026	0.038	0.023
	(-0.87)	(-0.69)	(-0.72)	(-0.46)	(-0.45)	(-0.05)	(0.24)	(0.35)	(0.28)
ADA - Diagnostic$_{t,t}$	-0.172***	-0.179***	-0.080	-0.597**	-0.552**	-0.735***	-0.061***	-0.052**	-0.068**
	(-4.61)	(-4.43)	(-1.40)	(-2.21)	(-2.03)	(-2.75)	(-2.65)	(-2.24)	(-2.08)
ADA - Predictive/Prescriptive$_{t,t}$	-0.106	-0.127	-0.073	-0.038	-0.024	-0.197	-0.098***	-0.104***	-0.075**
	(-1.42)	(-1.64)	(-0.69)	(-0.14)	(-0.08)	(-0.70)	(-4.17)	(-3.93)	(-2.45)
Controls	yes	yes	yes	yes	yes	yes	yes	yes	yes
Time trend effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Industry fixed effects	yes	yes	yes	yes	yes	yes	yes	yes	yes
Number of observations	58,053	17,739	695	67,868	21,992	781	50,687	13,522	528
Adjusted R^2	0.043	0.051	0.012	0.017	0.022	0.042	0.081	0.084	0.001

Thanks!

(PR Newswire)-- Nov. 6, 2013: Descriptive
Datawatch Corporation (NASDAQ-CM: DWCH), the leading global provider of visual data discovery solutions, today announced that Vodafone has deployed Datawatch as part of a suite of tools to provide a validated, company-wide view of business transactions that will enable the Internal Audit Team to quickly spot anomalous issues and minimize risk…..The new analytic tools, which will now include data from PDFs, Excel spreadsheets and multiple diverse reports, will give the Internal Audit Department unprecedented access to huge volumes of data…….All this data, together with the unstructured and semi-structured data from operational systems across the globe, …...with real-time streaming data into visually rich analytic applications allow users to dynamically discover key factors that impact any operational aspect of their business.

(BUSINESS WIRE)--February 21, 2017: Diagnostic
Aptos, Inc., a recognized market leader in retail technology solutions, today announced Tailored Brands, Inc., (NYSE: TLRD), has selected the powerful Aptos Sales Audit Solution to improve financial visibility and decision making across its extensive omni-channel retail enterprise…… provide a unified view of our enterprise financial transactions across all channels and brands…… to easily quantify and qualify our financial performance in all areas down to the individual store-level….. The company will leverage Aptos Sales Audit to validate and relay accurate and timely transaction information throughout the enterprise, integrating data from its point of sale and legacy back end systems, for improved decision making, streamlined operations and reduced costs. Aptos Sales Audit ensures the integrity, accuracy and availability of detailed transactional data from every sales channel and touch point and streamlines audit activities. Aptos' central audit repository receives all transaction data, treats it to a consistent and robust set of business rules, and then quickly feeds all validated data directly to the entire retail enterprise. Designed for multi-channel retail chains, Aptos Sales Audit is flexible, easy to integrate, and proven by more than 250 leading fashion, department, discount, and specialty retailers in North America, Europe, Asia and Australia.

(BUSINESS WIRE)-- May 20, 2013: Predictive
Today, Verafin announced a partnership with Fundtech, to integrate Fundtech's PAYplus payment platforms: PAYplus Connect & PAYplus USA with Verafin's enterprise FRAML solution. This integration of the leading funds transfer solution in the US and North America's most advanced behavior-based fraud detection and Anti-Money Laundering (AML) analytics gives financial institutions the power to prevent wire fraud in real time… proactively protect our subsidiary banks from even the latest criminal advances. We did not want a point solution that gave us only one piece of the fraud puzzle. We needed technology with the flexibility to integrate with our existing systems; a solution that gave us breadth of functionality and a better view of customer activity across our enterprise.