CFO Analytics and the Digital Revolution

By

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Polling Question #1

What do you use as your primary reporting system?

a) Corporate Performance Management System (CPM)

b) Enterprise Resource Planning (ERP)

c) Business Intelligence (BI) tool

d) Spreadsheets

e) Other

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About Gary Cokins
Founder, Analytics-Based Performance Management LLC

B.S. Industrial Engineering & Operations Research;
Cornell University, 1971

M.B.A. Finance & Accounting; Northwestern University,
Kellogg School of Management, 1974
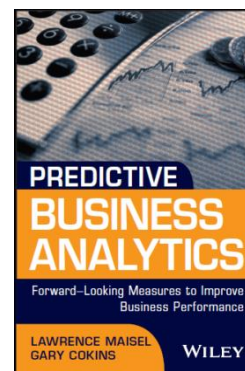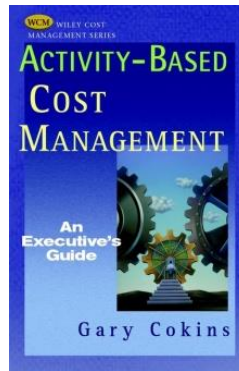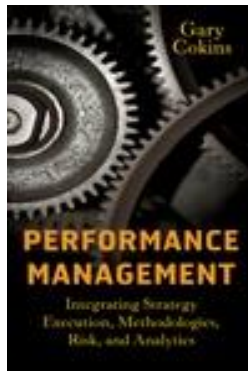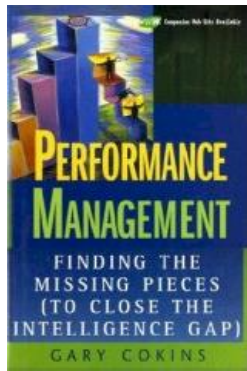
Previous Associations:
- FMC Corporation
- Consultant with: Deloitte,
    KPMG,
    Electronic Data Systems [EDS, now HP]
- SAS

Who will benefit from this presentation?

Managers who have previously struggled at promoting FP&A, enterprise performance management (EPM) and integrating business analytics (BA) into their decision support systems.

Managers who intend to "champion" any or all EPM and BA improvement techniques and need a compelling call to action.

My Co-authored Book

https://www.wiley.com/en-us/Predictive+Business+Analytics%3A+Forward+Looking+Capabilities+to+Improve+Business+Performance-p-9781118240151

This link is to chapter 1:

http://media.wiley.com/product_data/excerpt/65/11181755/1118175565-13.pdf
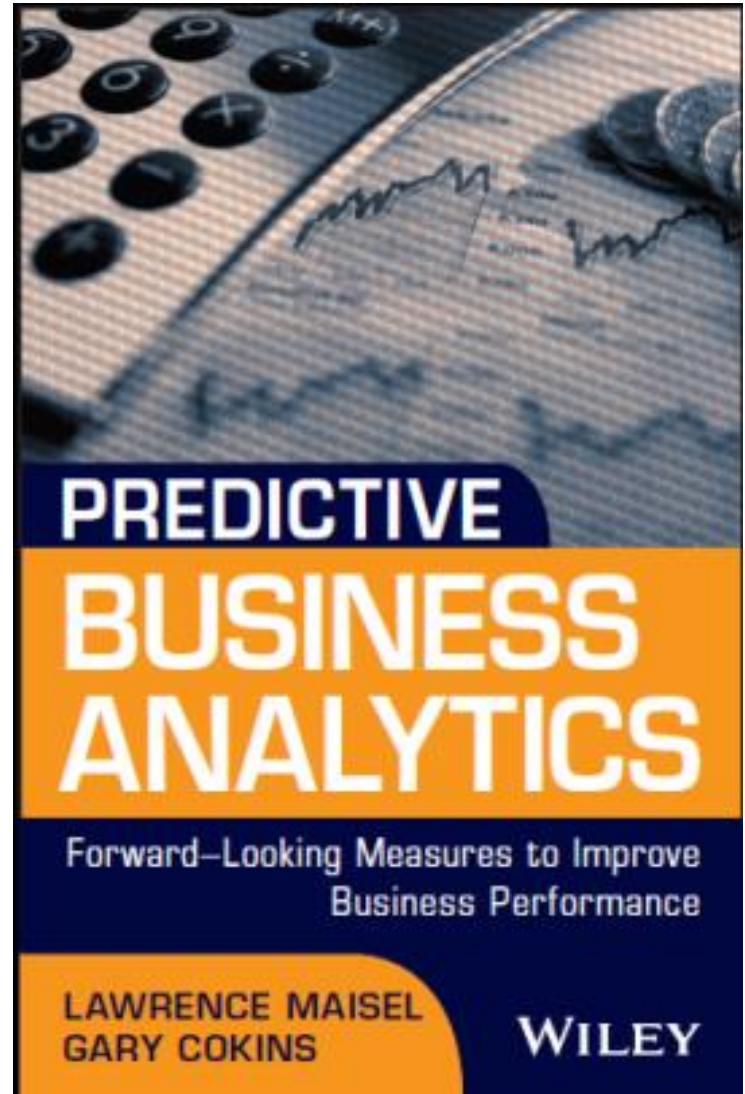
Agenda

- **Overview – Maturity Stages of Analytics**

- **Why is Business Analytics even Needed?**

- **What is Business Analytics … and Why?**

- **Examples of applying Business Analytics**

- **BI and BA for the CFO function and CPM**

- **The Disruptive Digital Revolution**
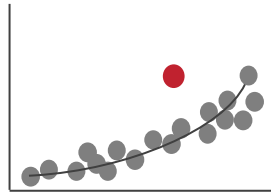
- **Benefits and Summary**

The Analytical Continuum

Historical view ← | → Future view

Descriptive   **Diagnostic** | **Predictive**   **Prescriptive**
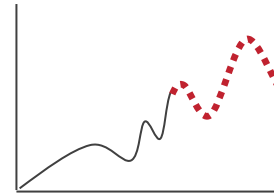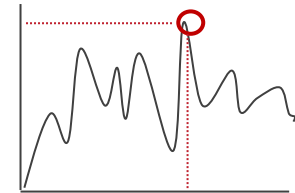
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Why is Business Analytics Needed?

How does an organization gain a competitive edge?
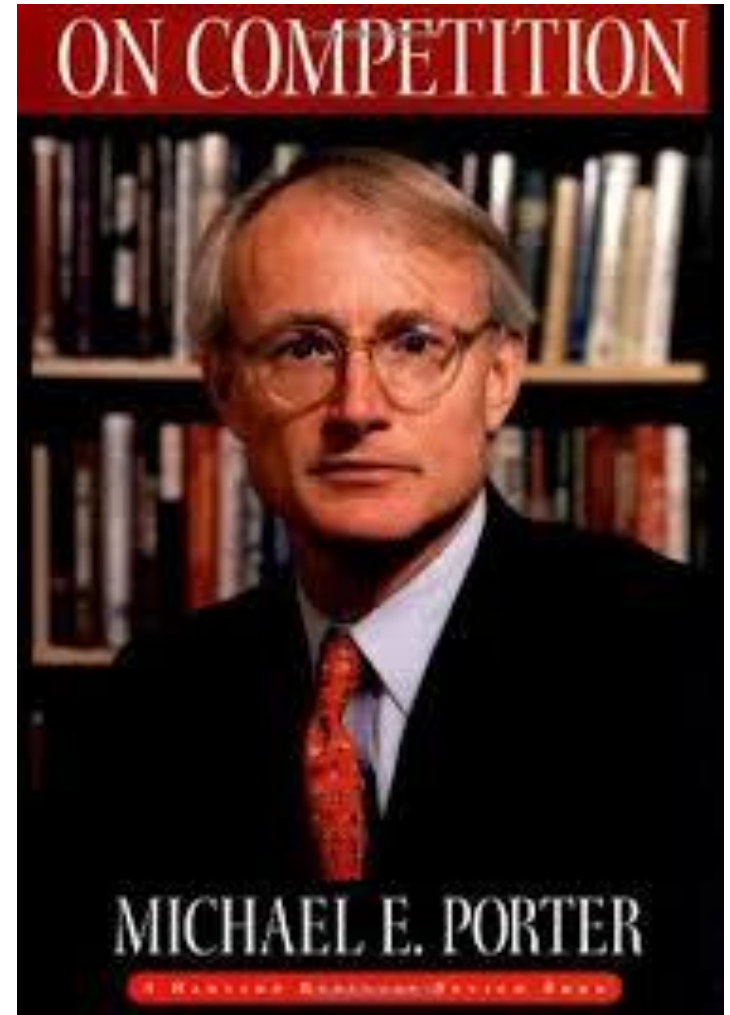
      -- by first-to-market (via innovation)?

      -- by customer loyalty?

      -- by low-cost and low-price provider?

      -- Other?

But how sustainable are these long-term?

Porter's 3 Generic Strategies

- Cost Leadership
- Differentiation
- Focus

Each has risks

Isn't Competition Ultimately About Cost Leadership, Differentiation, or Focus?*

Cost Leadership Strategy – via improving process efficiencies, unique access to low cost inputs, vertical integration, avoiding certain costs, etc.

Differentiation Strategy – via developing products and/or services with unique traits valued by customers.

Focus Strategy – via concentrating on a narrow segment with entrenched customer loyalty.

But don't each of these have risks today?

* Source: Michael E. Porter's three generic strategies.

Problem: Generic Strategies are Vulnerable !

Cost Leadership Strategy – other firms lower their costs.

Differentiation Strategy – imitation by competitors; changes in customer tastes.

Focus Strategy – broad-market cost leaders or micro-segmenters invade and erode your customers' loyalty.

The best defense is agility with quicker and smarter decision making using statistics, analytics, and operations research.

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Confusion and Lack of Consensus about BA

Is business analytics (BA) …

- A data warehouse?
- Data mining with drill-down and reporting?
- Business intelligence (BI) with enhancements?
- Data governance, management and quality?
- Probabilities and statistics, like regression and correlation analysis?
- Forecasting?
- Optimization equations?
- All of the above? And even more?

Work with the End in Mind

Regardless of how we define "analytics", its purpose is:

Better Decisions. Better Actions.

Analytics' goal should be to gain insights and foresight and to solve problems, to make better and quicker decisions with more accurate and fact-based data, and to take actions. It is the use of internal and external data to provide a competitive advantage to an organization.

Business Intelligence versus Business Analytics

Recognize that "*There is no intelligence in business intelligence (BI).*"

- <u>BI</u> is about query, drill downs, and reporting.
- In contrast, <u>business analytics</u> is about investigation and discovery.

- <u>BI</u> consumes stored information.
- ***Business analytics*** produces **new** information.
- CPM deploys analytics in the context of its method.

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Business Analytics – Insights and Actions

- Queries answer questions, BI creates questions.

- Analytics then stimulates more complex and interesting questions

- Most importantly, business analytics also has the power to ***answer*** the questions.

Common Statistical Terms

<u>Descriptive / Diagnostic statistics</u>

- Distribution curves (bell-shaped), mean, median, standard deviations.

- Correlation (dependency relationships among variables)

- Segmentation (dividing groups into subgroups)

- Cluster analysis (grouping objects that are more similar than other objects)

<u>Predictive / Inferential statistics</u>

- Hypothesis testing (yes/no)

- Regression (forecasting dependent variables from independent ones)

Polling Question #2

Correlation is not always Causation

Number of people who drowned by falling into a pool
correlates with
Films Nicolas Cage appeared in
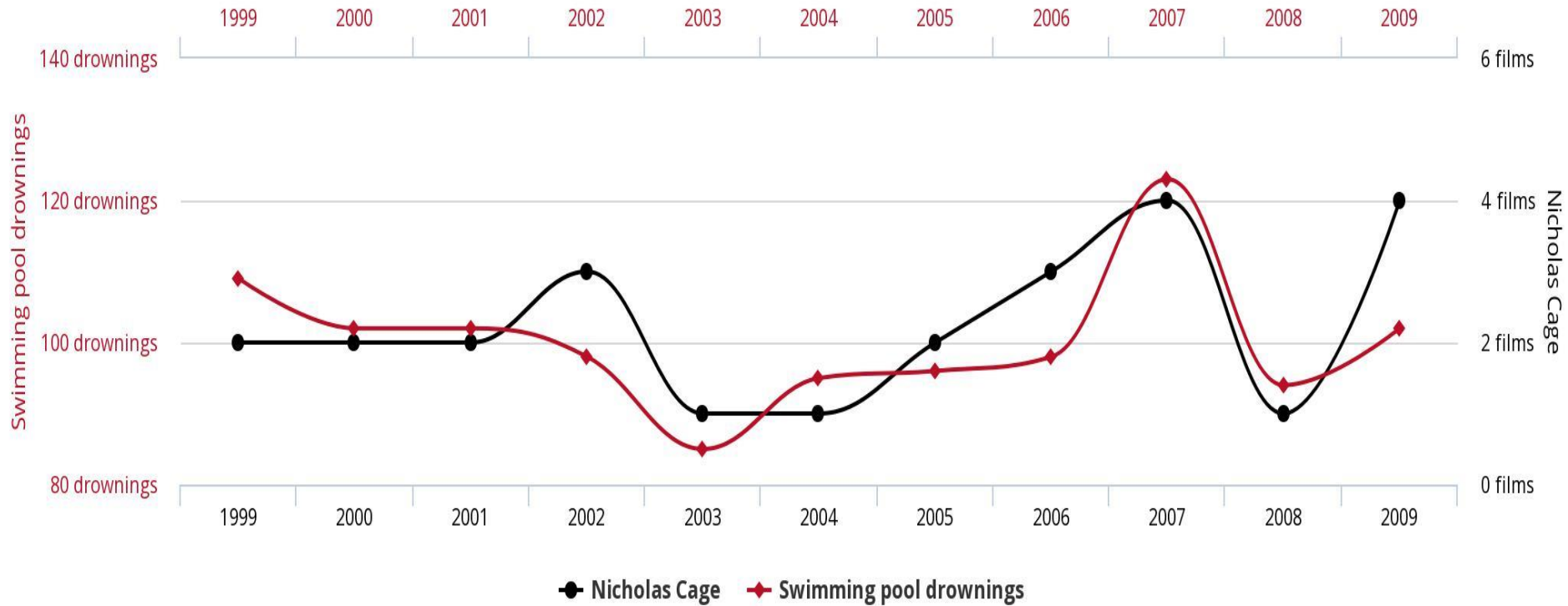
A Need For Predictive Analytics

Predictive Analytics –
Which X is most likely to Y?

Retail Merchandising
Which product in a retail store chain can generate the most profit without carrying excess inventory but also not having periods of stock outs?

Customer Profitability
Which customer will generate the most profit lift from our least effort?

Employee Retention
Which of our employees will be the next most likely to resign and take a job with another company? See this link to IBM's tool:
https://www.cnbc.com/2020/04/03/ibm-ai-can-predict-with-95-percent-accuracy-which-employees-will-quit.html

These are the types of questions asked *every* day. Business analytics fills in the X and Y.
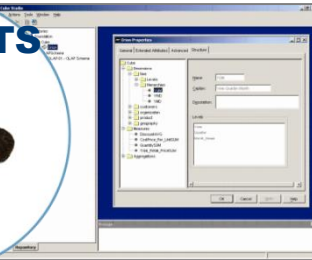
STANDARD REPORTS

1

AD HOC REPORTS

2

QUERY DRILLDOWN (OR OLAP)

3

ALERTS

4

Business Intelligence (BI) versus Business Analytics (BA)

Reactive (Descriptive)

STANDARD REPORTS

1

AD HOC REPORTS

2

QUERY DRILLDOWN (OR OLAP)

3

ALERTS

4

Proactive (Inferential)

STATISTICAL ANALYSIS

5
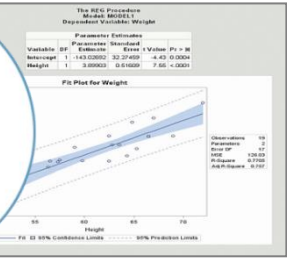
FORECASTING

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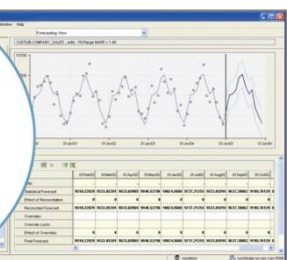
PREDICTIVE MODELING

7
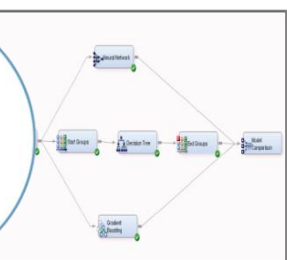
OPTIMIZATION

8
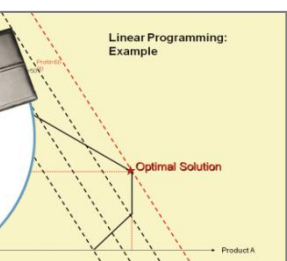
From Data → BI Reporting → Models & Predictions

<u>Weather</u> (www.accuweather.com)

<u>Data collection</u> – sensors for temperature, humidity, wind speed. [satellite photos]

<u>Current Conditions</u> – summary reporting.

<u>Future prediction capability</u> – past max/mins; weather models with partial differential equations.

<u>Business</u>

<u>Data collection</u> – "sensors" on sales, production, orders pipeline, economic conditions.

<u>Current Conditions</u> – business reports.

<u>Future prediction capability</u> – models with ~~partial differential equations~~ advanced analytics. Probabilities of sales, profits, etc.

Models help plan our week-end …

…. and our business strategy's future.

Source: Joe Czyzyk, Central Michigan Univ. Research Corporation.

Modeling is Foundational to BA

Determining the value of a home (realtors)

Available house data:

- sale price
- total square footage
- # of bedrooms
- # of bathrooms
- size of basement
- size of garage
- type of construction
- lot size
- age of house
- school district
- per capita income of neighborhood
- etc.

Sale price = f (input data)

Source: Joe Czyzyk, Central Michigan University Research Corporation.

What Pressures Cause Interest in Business Analytics?

-- Complexity and variables are replacing "gut feel"

-- Exponential growth in data, users, searches

-- Volatility, uncertainty, risk and clock-speed

-- Standardized processes (e.g. ERP, CRM systems)

-- Intuition of the potential value of unused structured and text data

-- Enormous IT processing power

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Examples of Analytics

- Celebrities and the film industry

Will Smith: *Independence Day; Men in Black; I, Robot; I am Legend; Hancock*

Examples of Analytics

- Celebrities and the film industry

  Will Smith: *Independence Day; Men in Black; I, Robot; I am Legend; Hancock*

- Sports teams
- Crime prevention
- Music score analysis

What about business analytics in mainstream businesses and government?

There are many Analytics Domains in Business

Retail sales and merchandising analytics [markdown and assortment planning]

Financial services analytics [risk and loan credit scoring]

Pharmaceutical analytics [drug development and clinical trials]

Marketing analytics [CRM, segmentation, and churn analysis]

Text analytics [sentiment analysis]

Financial control analytics [customer payment collections]

Fraud analytics [insurance and medical claims]

Pricing analytics [price sensitivity analysis]

Telecommunications analytics [customer behavior]

Supply chain and transportation analytics [route optimization]

Manufacturing analytics [warranty claims]

Hospital analytics [patient scheduling]

Human resources analytics [workforce planning]

Banking analytics [anti-money laundering]

Police analytics [crime pattern analytics]

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My Role as the IMA Executive-in-Residence (2015-2018)

IMA *Strategic Finance* magazine

http://sfmagazine.com/wp-content/uploads/sfarchive/2014/11/Mining-the-Past-to-See-the-Future.pdf

Example #1

Balanced Scorecard KPI Validation
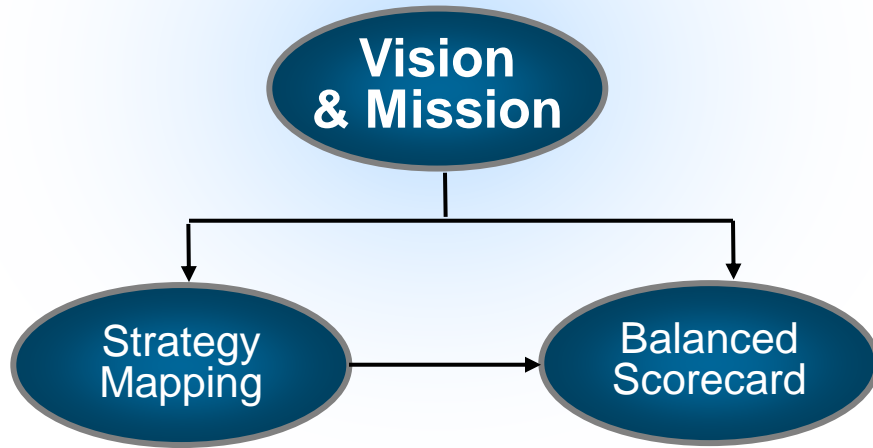
- A Vision statement answers **"where do we want to go?**

- Strategy maps and scorecards answer, **"How will we get there?"**
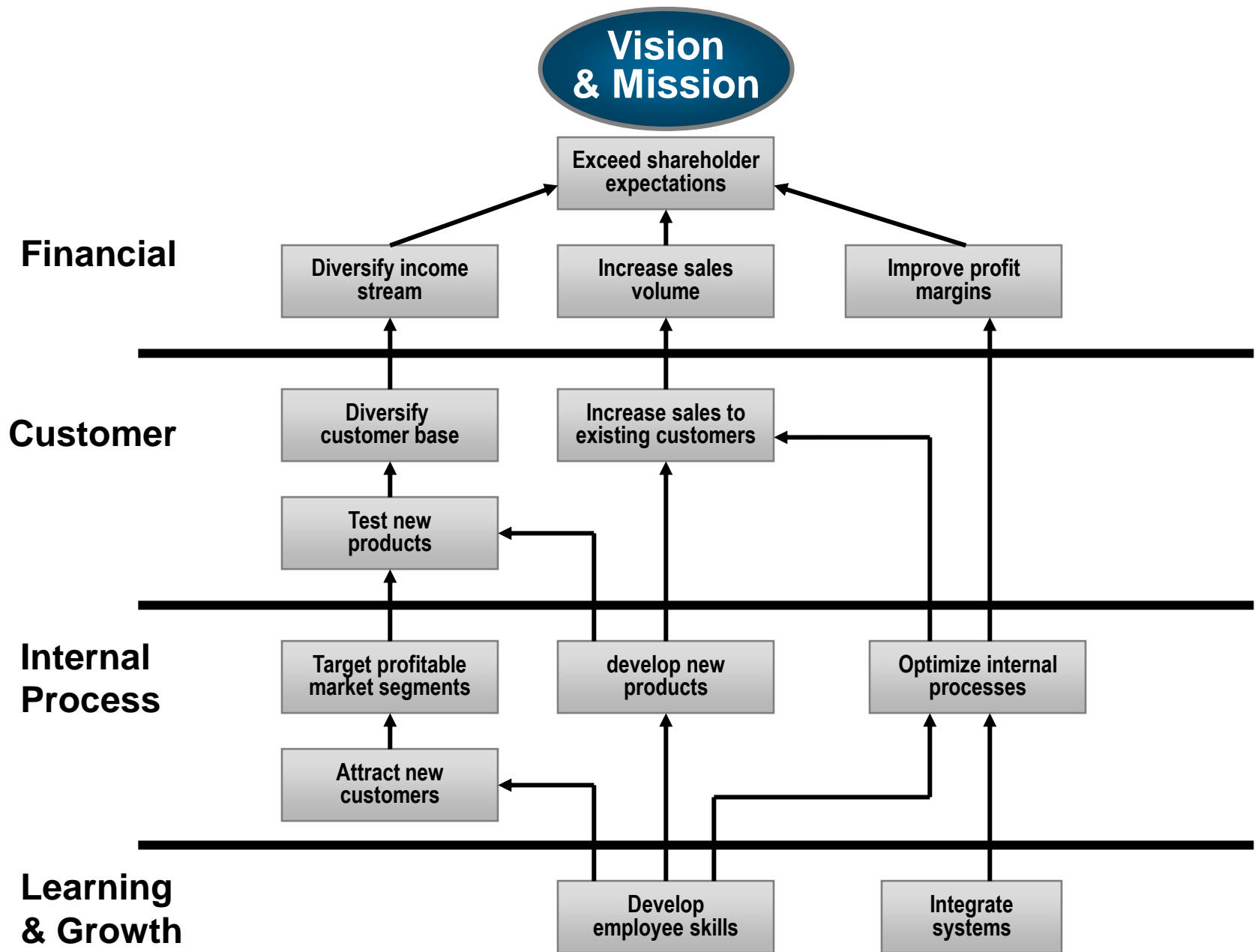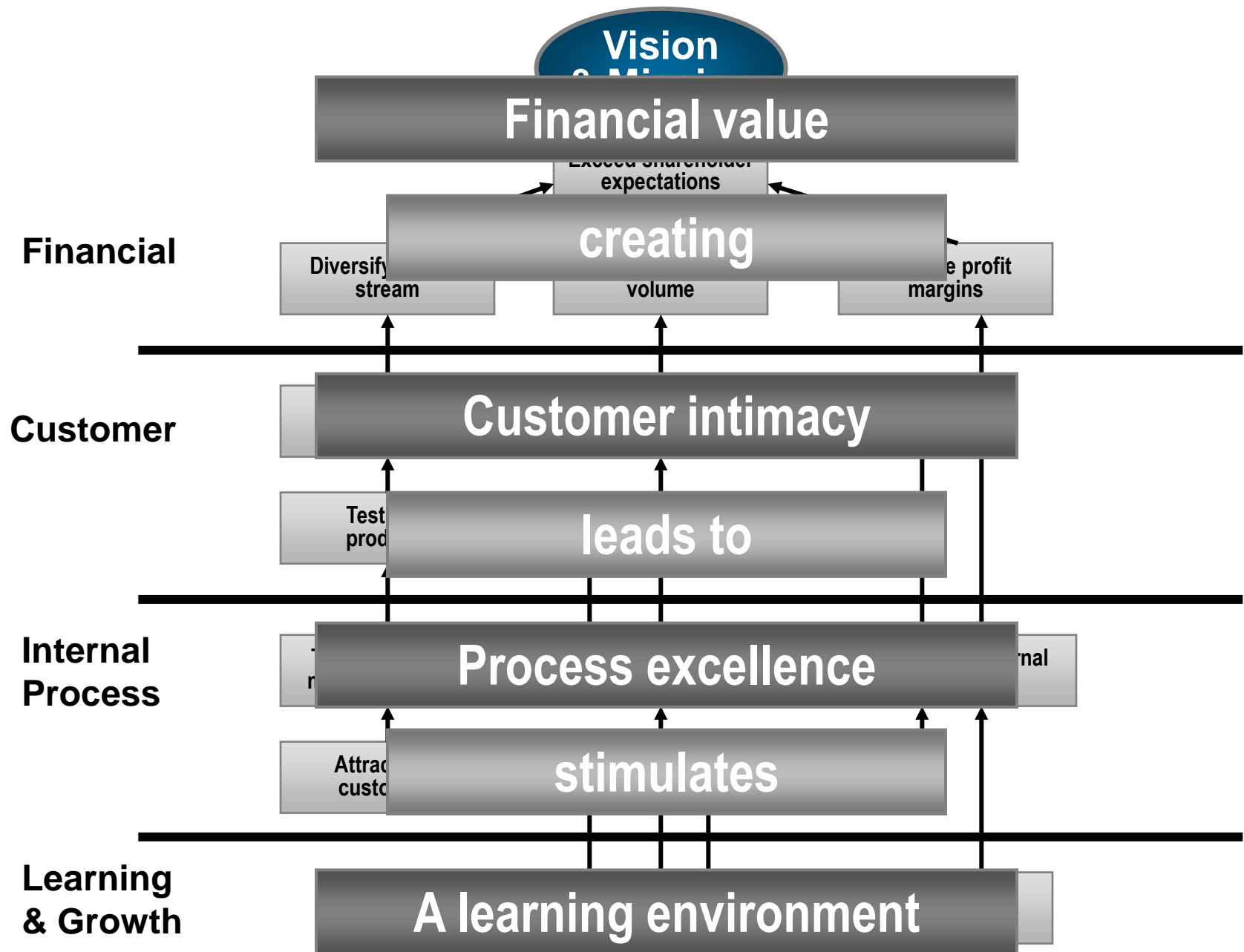
Ex. #1 What Measures Matter? KPI Correlation Analysis

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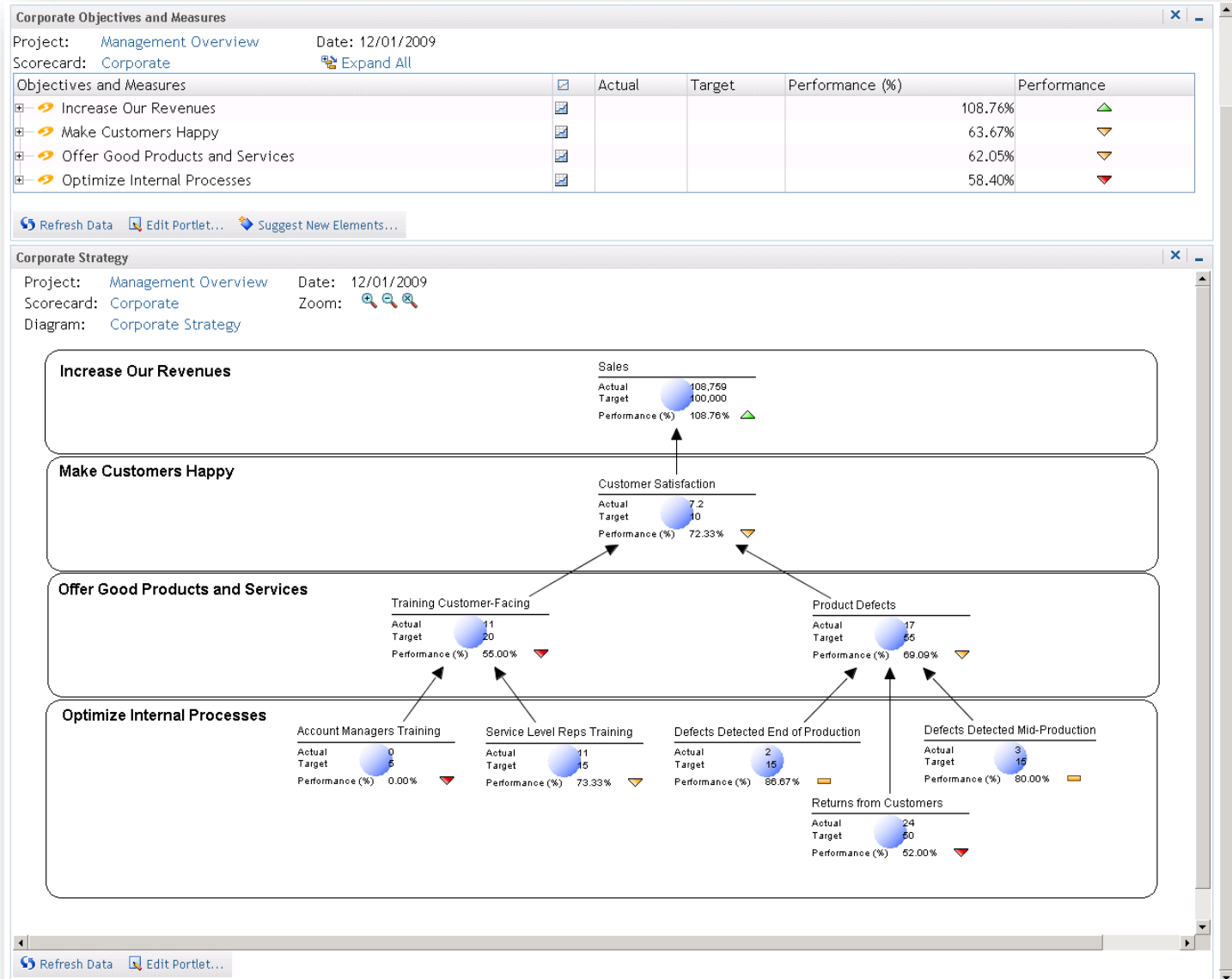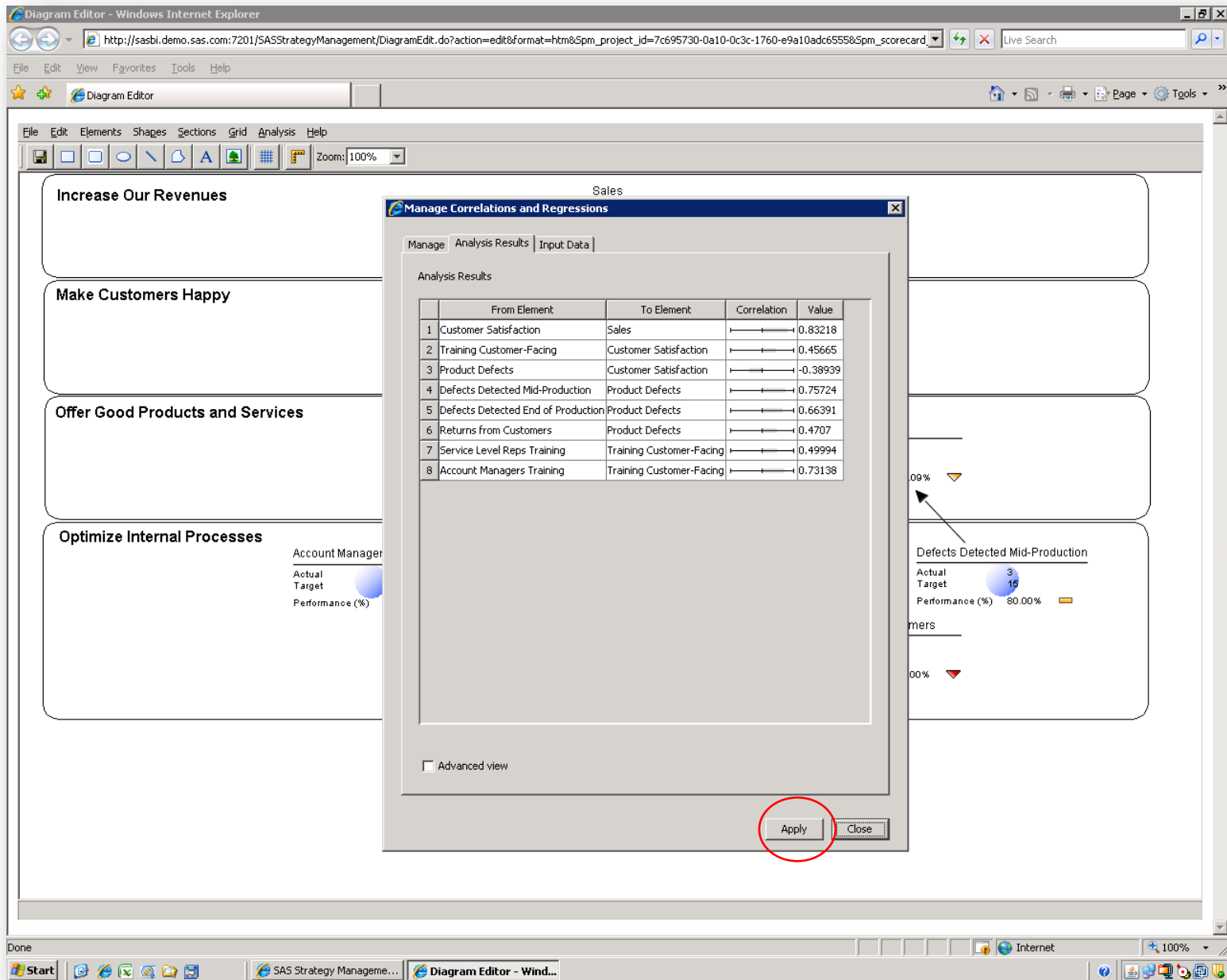
Thickness of the arrows reflects explanatory power

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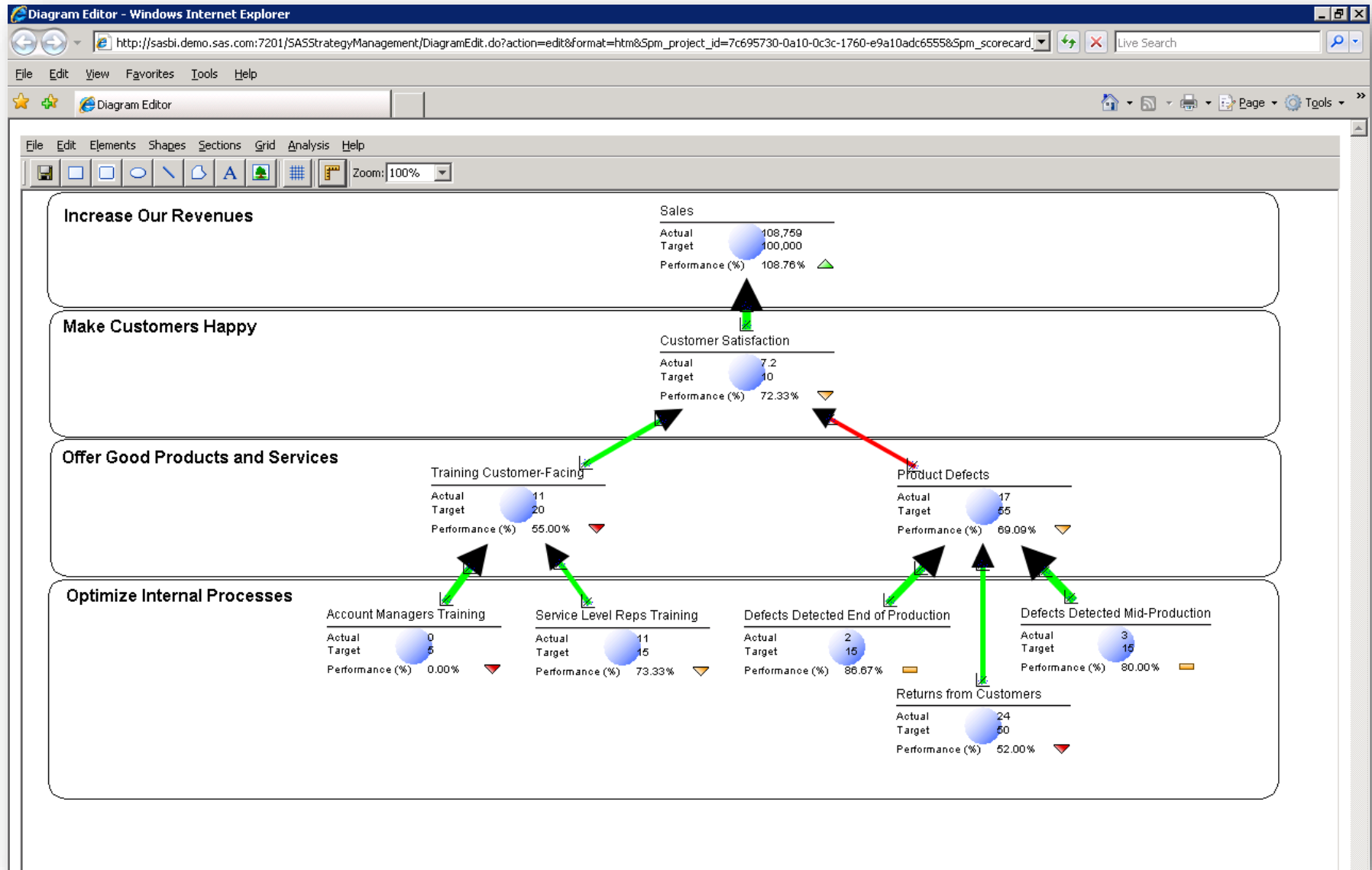
Polling Question #3

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The "Digital Revolution"

The accounting profession needs to prepare itself for substantial change and a threat to jobs in accounting.

This is because there is an accelerating and disruptive digital technology transformation in progress. It is referred to as the "digital revolution".

It can potentially adversely impact an organization's competitiveness and will be replacing some employee jobs with computers.

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The threat to one's job security

Examples of digitization disrupting traditional industries such as Uber for car passenger transportation and Airbnb for temporary residence rentals are just the tip of the iceberg.

It is another category of digitization – artificial intelligence (AI) including machine learning with algorithms, robotic process automation (RPA), and cognitive computing software – that will create the dramatic changes.

Digital transformation is not exclusively about physical robots but also about software robots that perform functions that white collar employees perform.

Digital transformation presents great potential but also raises concerns. It can provide invaluable business enhancements but also be a threat to one's job security.

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Career choices – Risk Mitigation

As one begins to more fully understand the impact of software automation and the speed at which will impact accounting jobs, accountants have two broad choices:

- One is be fearful, wonder if they chose the wrong profession, and pursue a different career.

- The other is to embrace the imminent impact from automation and prepare themselves for less tedious and more fulfilling work that will bring increasing value to their organizations as well as to themselves.

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5 Effects of Automation on Accounting

#1 - Effect on transactional accounting processes

#2 - Effect on period-end accounting closes

#3 - Effect on auditing

#4 - Effect on business process outsourcing (BPO) of accounting tasks

#5 - Effect on regulatory filings

The next several slides describe these. I will not present them, but they are provided to include in your handout.

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5 Effects of Automation - #1 Transactions

#1 - Effect on transactional accounting processes

Clerical accountants are the most vulnerable to digitalization and automation because their roles involve routine tasks like bookkeeping and data entry. These tasks are easy to replicate with software rules because they are not complex. Even if the transactions become complex, cognitive computing software can often apply increasingly more powerful algorithms to complete the work.

Digitalization also reduces transaction-related labor as machine-to-machine integration expands. For example, when network communications between two parties conducting a purchase transaction is integrated, manual data entry is eliminated on both ends and errors are reduced.

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5 Effects of Automation - #2 Period-End

#2 - Effect on period-end accounting closes

An organization's period-end accounting tasks will be impacted by digitalization and automation. Many companies use outdated systems and cumbersome manual accounting entries. The risk of digitalization for accountants is due to the increasing application of affordable commercial software that automates the workflow processes of the monthly, quarterly, and fiscal year-end accounting close (e.g., currency exchange rates, tax statement preparation).

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#3 - Effect on auditing

Software can improve the efficiency of auditing activities. The purpose of an audit is to obtain reasonable assurance about whether financial statements are free of material misstatements and irregularities due to error or fraud. Digitalization improves the quality of an audit in many different ways.

Sampling is no longer needed when a computer can access 100% transactions in near real time to detect outliers and anomalies.

(e.g., software vendor www.mindbridge.ai)

48

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5 Effects of Automation - #3 Auditing; 2 of 2

Informed Risk Assessments – Using data analytics in the audit can lead to better informed risk assessments. This can be done through understanding the business of the auditee and yielding more evidence to support professionally skeptical behavior. It can also lead to better and comprehensive sampling which allows auditors to ask more questions.

Audit Data Standards – Internal and external auditors often cite data requests as one of the primary obstacles in completing an auditing task or client engagement. Professional accounting institutes are increasingly developing audit data standards (ADS) to address this issue. ADS creates a common data base that replicates existing enterprise data and makes it accessible to auditors, either on a continuous or periodic basis. ADS is already being applied to straightforward workflow processes such as order-to-cash, procure-to-pay, and record-to-report. Standardization enables digitalization and automation with rigorous validation checks.

Comprehensive Auditing – Computer-assisted audit tools and techniques (CATTS) are also increasingly applied to improve auditing. Traditional audits build conclusions based upon a limited sample of a population, rather than an examination of all available or a large sample of data. CATTS analyzes all the data searching for anomalies, such as post-dated transactions, and hidden patterns. Eventually sampling will be replaced with 100% data access to detect anomalies.

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5 Effects of Automation - #4 Outsourcing

#4 - Effect on business process outsourcing (BPO) of accounting tasks

The general term for third parties who perform outsourced accounting tasks is business process outsourcing (BPO). The BPO business model is typically based on fee-for-service pricing.

With centralization and economies of scale from having multiple customers, a BPO provider can perform both front and back office accounting tasks more efficiently than an individual organization can. A BPO provider also treats its service as a core competency. By comparison, the core competencies of most organizations are elsewhere.

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5 Effects of Automation - #5 Regulatory Filings

#5 - Effect on regulatory filings

Automation and technology has already begun to revolutionize regulatory compliance reporting. The implications are that rather than accountants requiring only mathematical acumen, mastery of tax laws, or bookkeeping proficiency, accountants can devote more time with increased skills interpreting and analyzing financial information.

For example, eXtensible Business Reporting Language (XBRL) is based on a standardized programming language designed to communicate and exchange business information between business systems of different organizations. Using XBRL, a company can now digitally transmit its financial statement filings to government regulatory agencies.

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A You Tube Video –
"Humans Need Not Apply"

- https://www.youtube.com/watch?v=7Pq-S557XQU

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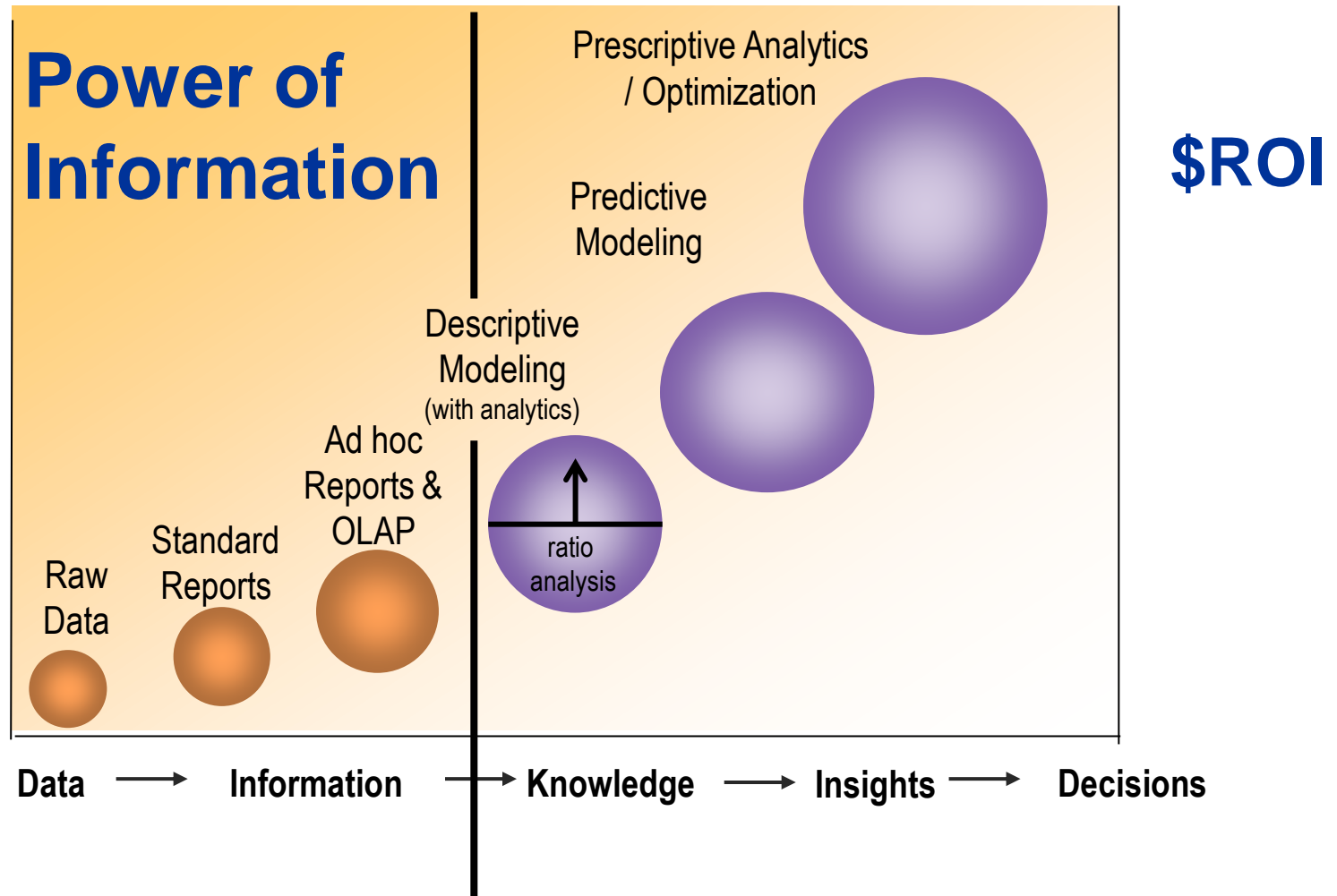
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Benefits from applying Business Analytics?

-- Higher ROI from leveraging automation

-- Deeper actionable insights and understanding

-- Reducing uncertainty and managing risk

-- More intelligent and systematically tested decisions

-- A bridge to a culture of optimization

The Intelligence Hierarchy

Power of Information

$ROI

Prescriptive Analytics / Optimization

Predictive Modeling

Descriptive Modeling (with analytics)

Ad hoc Reports & OLAP

Standard Reports

Raw Data

ratio analysis

Data → Information → Knowledge → Insights → Decisions

Polling Question # 4

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Integration of Data, Data Science, and Technology

Accounting professionals should fully embrace the integration of data, data science, and technology. They should partner with the experts because it will have a transformational impact on future business and operating models.

The limits or barriers on information flow are beginning to crumble. Those who prepare for this change will be at the forefront of accelerating value creation across an enterprise, and accountants are well-positioned to drive this evolution as thought leaders.

Getting Started Actions and Resources

Action steps

- **Get educated. Get buy-in.**
- **Rapid prototyping. Start small; think big.**

Resources:

This link is to chapter 1 of my co-authored book *Predictive Business Analytics*. It is free. Below it is a link to the book.

http://media.wiley.com/product_data/excerpt/65/11181755/1118175565-13.pdf

http://www.amazon.com/Predictive-Business-Analytics-Capabilities-Performance/dp/1118175565/ref=sr_1_1?s=books&ie=UTF8&qid=1371659458&sr=1-1&keywords=predictive+business+analytics

https://icrunchdata.com/blog/594/the-disruptive-impact-of-the-digital-revolution-on-accounting/

A suggestion: Have your management team read either or both of these educational pieces. Then schedule a meeting for discussion. Have each manager answer, "What did I learn? What issues and concerns do I have about analytic?" This will stimulate needed conversations.

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From Theory to Practice

Success depends on how well and how fast the right information gets to the right people.
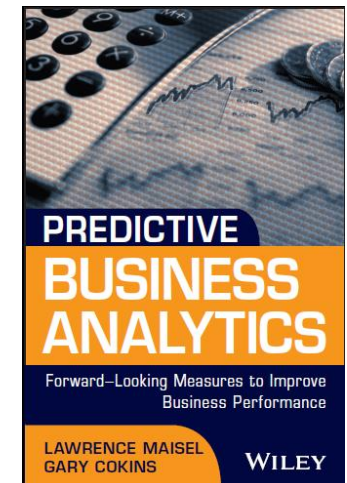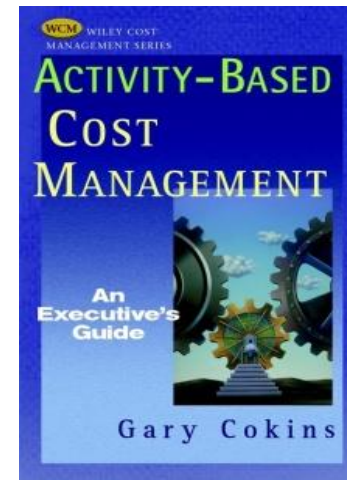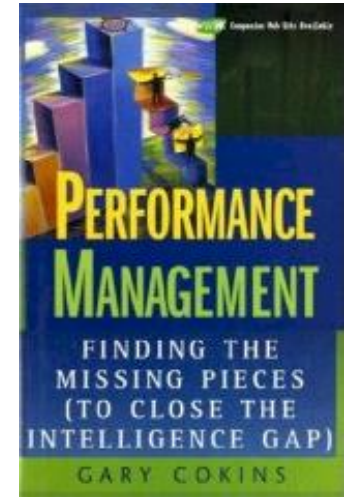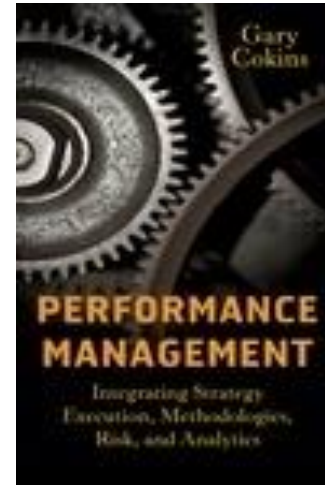
Thank You

Questions?

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