INFONOMICS

THE NEW ECONOMICS OF INFORMATION

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Control Room

Our notions of information predate the Information Age

Information is not the “new oil”

Information is:

- ✓ Non-rivalrous
- ✓ Non-depleting
- ✓ Regenerative
- ✓ Nearly limitless
- ✓ Easily transported
- ✓ Cheaper to store
- ✓ Easier to steal
- ✓ Doesn’t degrade
- ✓ More ecological
- ✓ Has no alternative

And, it’s impossible to clean-up if you spill it.

Caserta Background

Established in 2001

- Award-Winning Consultancy
- Foundation Built on Data
- Strategists, Architects, Engineers, Analysts, Scientists

Strategic Consulting

- Analytics & Data Science
- Data & Analytics Strategy
- Data Monetization & Valuation
- Chief Data Officer Advisory

Data Ecosystem Reengineering

- Data Lake Architecture
- Data Warehousing
- Data Orchestration & Migration

Advanced Technical Implementation

- Data Architecture
- Data Engineering
- Artificial Intelligence

Helping Clients Treat and Deploy Information as an Actual Asset

Is Information an Asset?

An item of property owned by a person or company, regarded as having value and available to meet debts, commitments, or legacies.

OED
Oxford English Dictionary
The definitive record of the English language

A single item of ownership having exchange value or convertible into cash. Or the total resources of a person or business such as cash, notes, and goodwill.

Merriam-Webster

An asset is a resource with economic value that an individual, corporation or country owns or controls with the expectation that it will provide a future benefit.

INVESTOPEDIA

Asset is a resource controlled by the entity as a result of past events and from which future economic benefits are expected to flow to the entity.

IFRS®

Assets are probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events.

FASB

Any economic resources (tangible/intangible) that can be owned or produce value. Assets have a positive economic value.

AICPA®

Investors are impressed by information-centric companies

Average Company

2X market-to-book value*

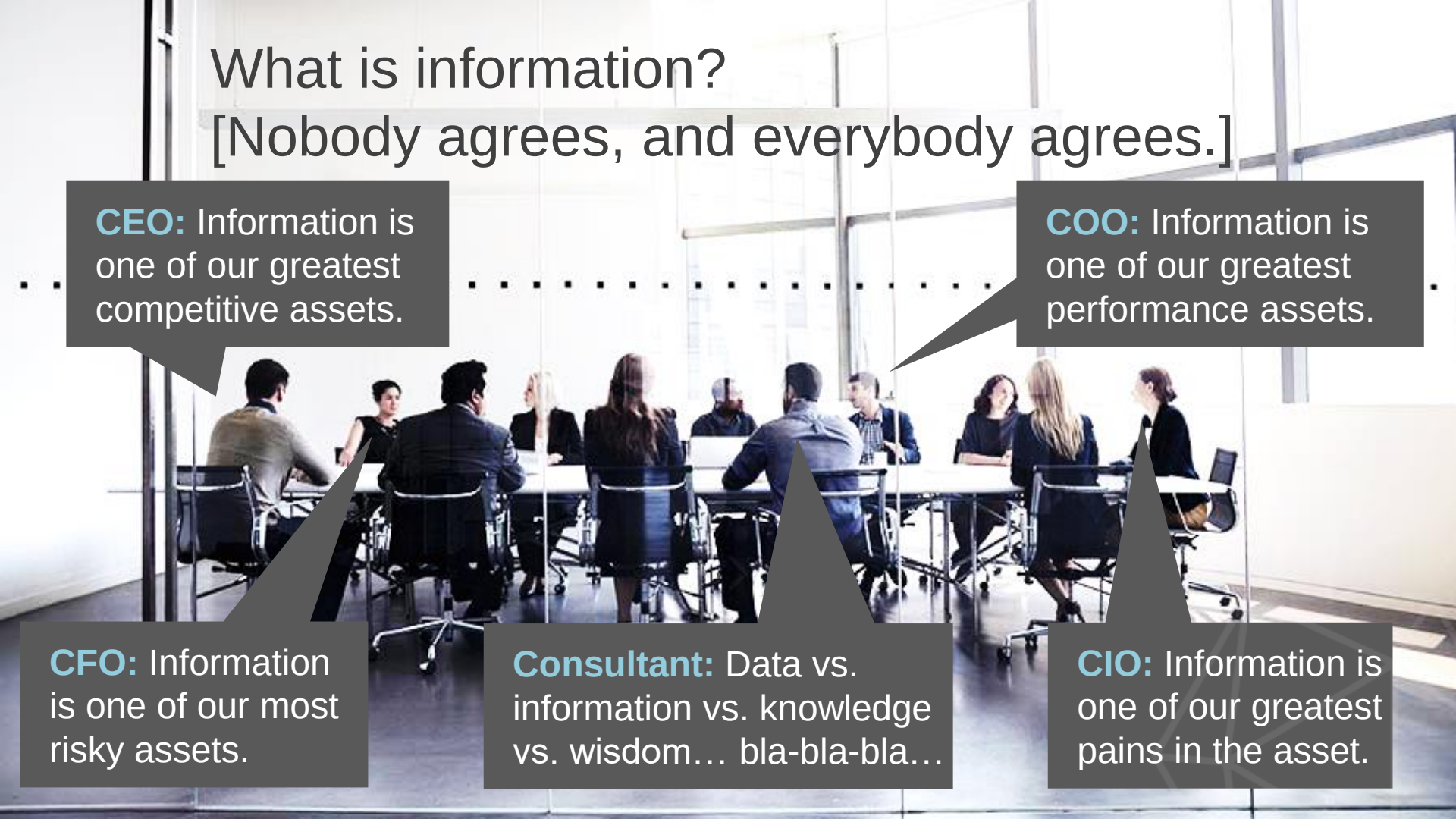
Infosavvy Companies

3X market-to-book value*

Infoproduct Companies

* Tobin's “q" ratio

What is information?
[Nobody agrees, and everybody agrees.]



The Caserta Strategy Approach: Helping Clients Treat Information as an Actual Economic Asset

"It is the groundbreaking work that firmly put data and data leadership in the middle of the business arena."

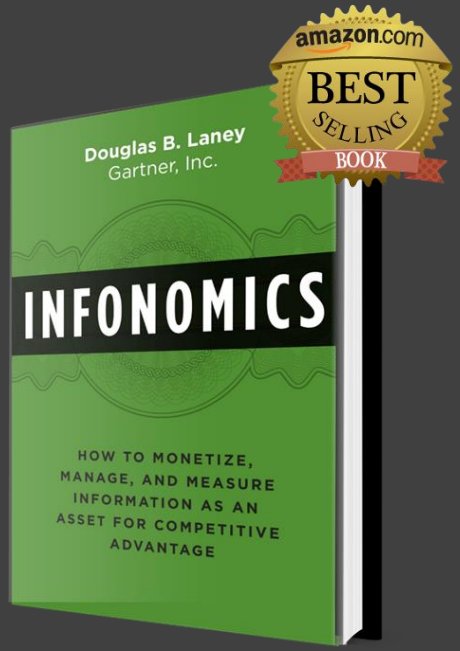
— Althea Davis, Chief Data Officer, ABN AMRO Insurance

"Closing the 'knowing-doing' gap when it comes to treating information as an asset."

– Jonathan Copulsky, Senior Partner, Deloitte

"Doug quite literally wrote the book on what our team is trying to achieve day to day."

— Ryan den Rooijen, Global Director of Data Services, Dyson



★★★★★

CIO BUSINESS TECHNOLOGY LEADERSHIP

Must-Read Book of the Year.

Introducing Infonomics: Treating information as an actual asset

MONETIZING INFORMATION

Generating economic benefits from available information assets

MANAGING INFORMATION

Applying asset management principles and practices to information

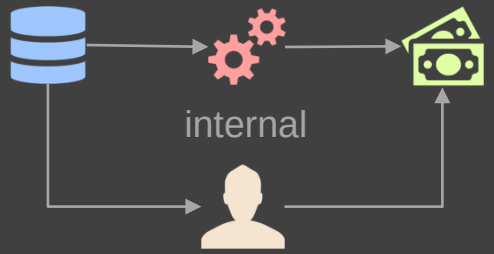
MEASURING INFORMATION

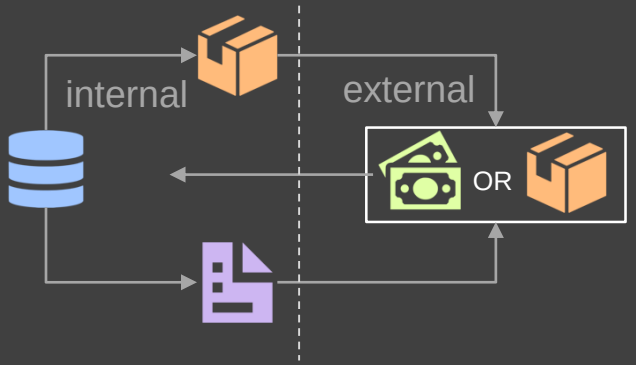
Gauging and improving information’s economic characteristics

INFORMATION AS AN ASSET

MONETIZING | MANAGING | MEASURING

Generating Myriad Economic Benefits from Information





INDIRECT DATA MONETIZATION

- Improving process performance or effectiveness
- Reducing risk / improving compliance
- Developing new products or markets
- Building and solidifying partner relationships
- Publishing branded indices

DIRECT MONETIZATION

- Bartering/trading with information
- Enhancing products or services with information
- Selling raw data through brokers or data markets
- Offering insights, analyses and reports
- “Inverted” data monetization

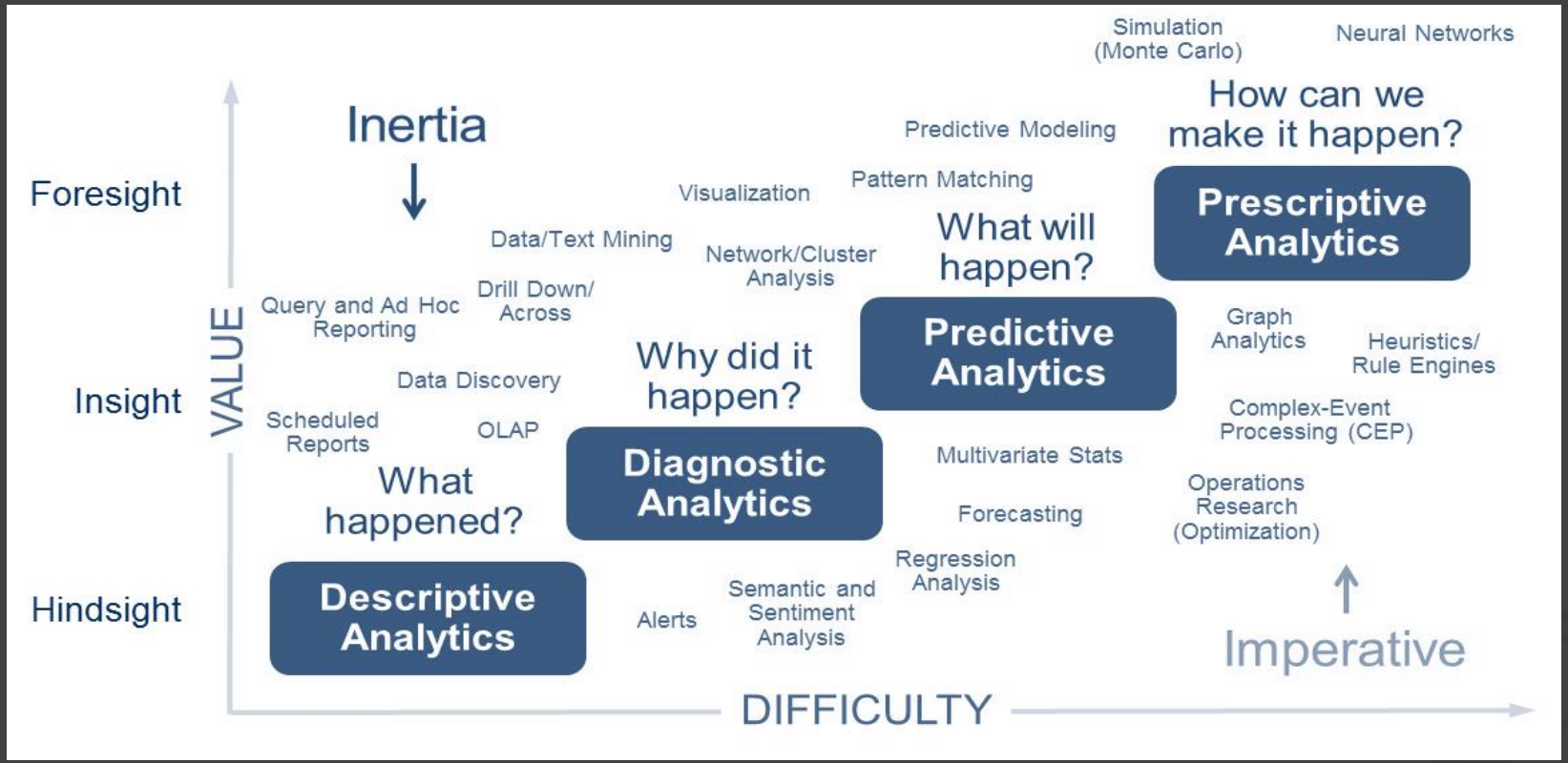
Methods to Monetizing Information

1. Establish an information strategy or information product function
2. Inventory your available information assets
3. Draw inspiration from and adapt how others have monetized data
4. Identify ways to generate direct and indirect economic benefits from each information asset
5. Test monetization ideas for feasibility
6. Prepare data and establish market
7. Gauge success and alter strategy/tactics as necessary

THE SEVEN SOURCES OF DATA

Your largest sources of data aren't those you own, they are those you don't.

Scale the Analytics Continuum



Source: Gartner

Information Monetization Examples

Social Media

Project Content

Sales and Inventory Data

Customer Data

Genealogy Data

IoT

Location Data

Multimedia Content

Infonomics Study Eye-Opener:

Organizations with a C-level CDO, are 3x more likely to generate non-monetary commercial value and 7x more likely to generate monetary value from their data externally

INFORMATION AS AN ASSET

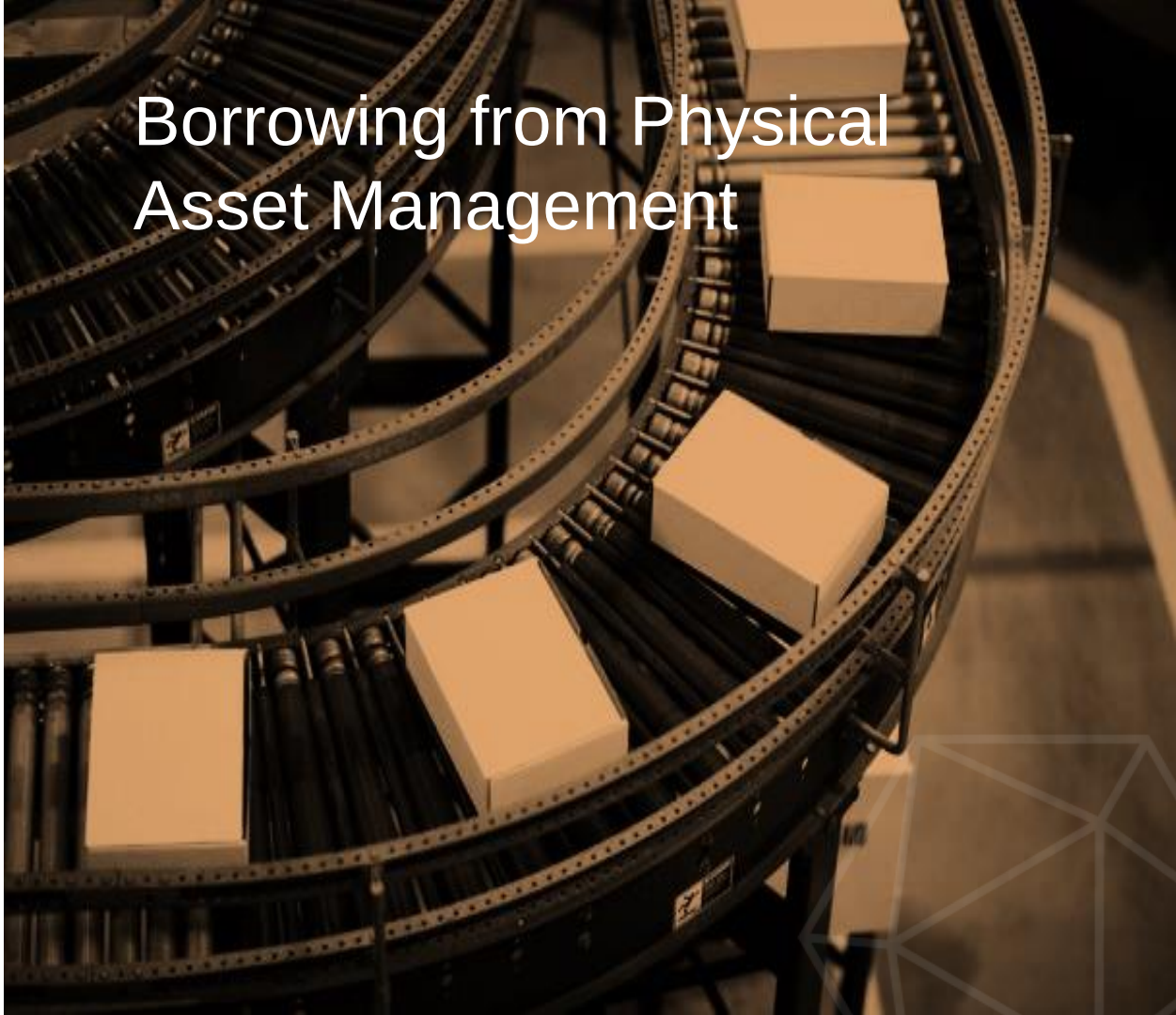
MONETIZING | MANAGING | MEASURING

caserta

When data strategy and reality diverge…

Borrowing from Physical Asset Management

- Raw materials
- Unfinished inventory
- Finished goods
- Storage
- Maintenance (planned and unplanned)
- Replacement
- Standardization
- Disposal
- Transportation
- Resource training
- Safe handling
- Security



Borrowing from Financial Asset Management

- Accounting
- Investment
- Acquisition
- Leverage
- Credit
- Valuation
- Portfolio
- Factoring
- Liquidity
- Volatility

Borrowing from Human Capital Management

- Recruiting
- Hiring
- Training
- Staffing
- Roles
- Teams
- Performance reviews
- Reduction in force
- Termination
- Outsourcing
- Temporary workers

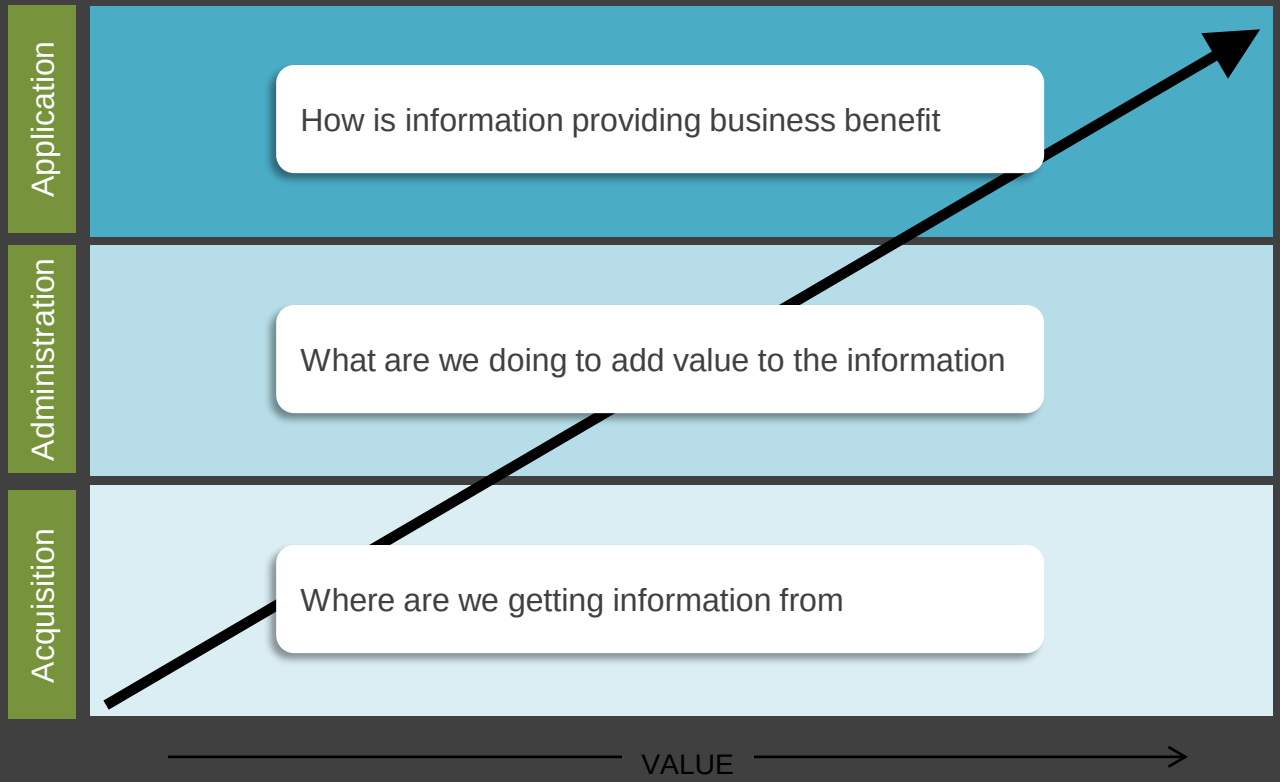
Sources of Asset Management Inspiration

Physical Asset Management (PAS-55)
Supply Chain Management (SCOR)
Financial Asset Management
ITAM / SAM (ISO 19770)
IT Service Management (ITIL)
Knowledge Management (KCS)
Human Capital Management (P-CMM)
Library Science (IFLA)
Records Management (ISO 15489)
Intellectual Property Management

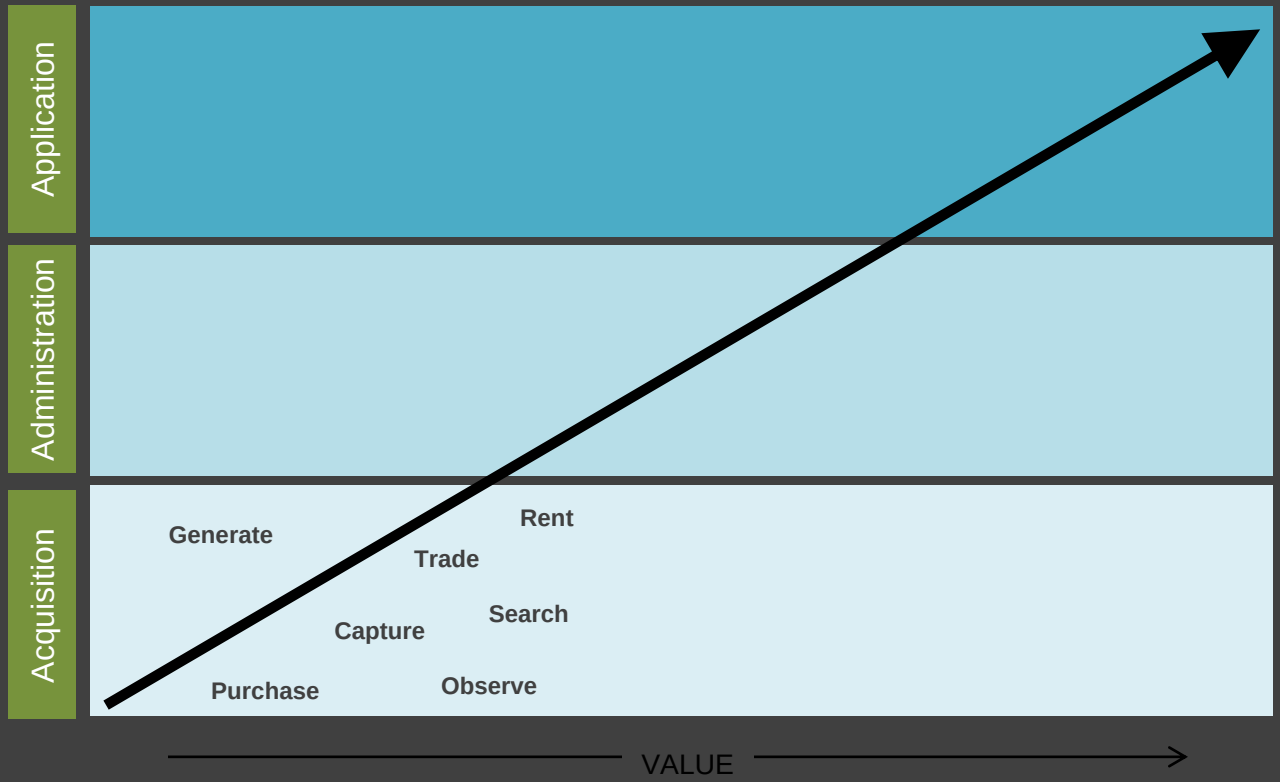
Understanding and applying information asset primitives

The Information Value Chain

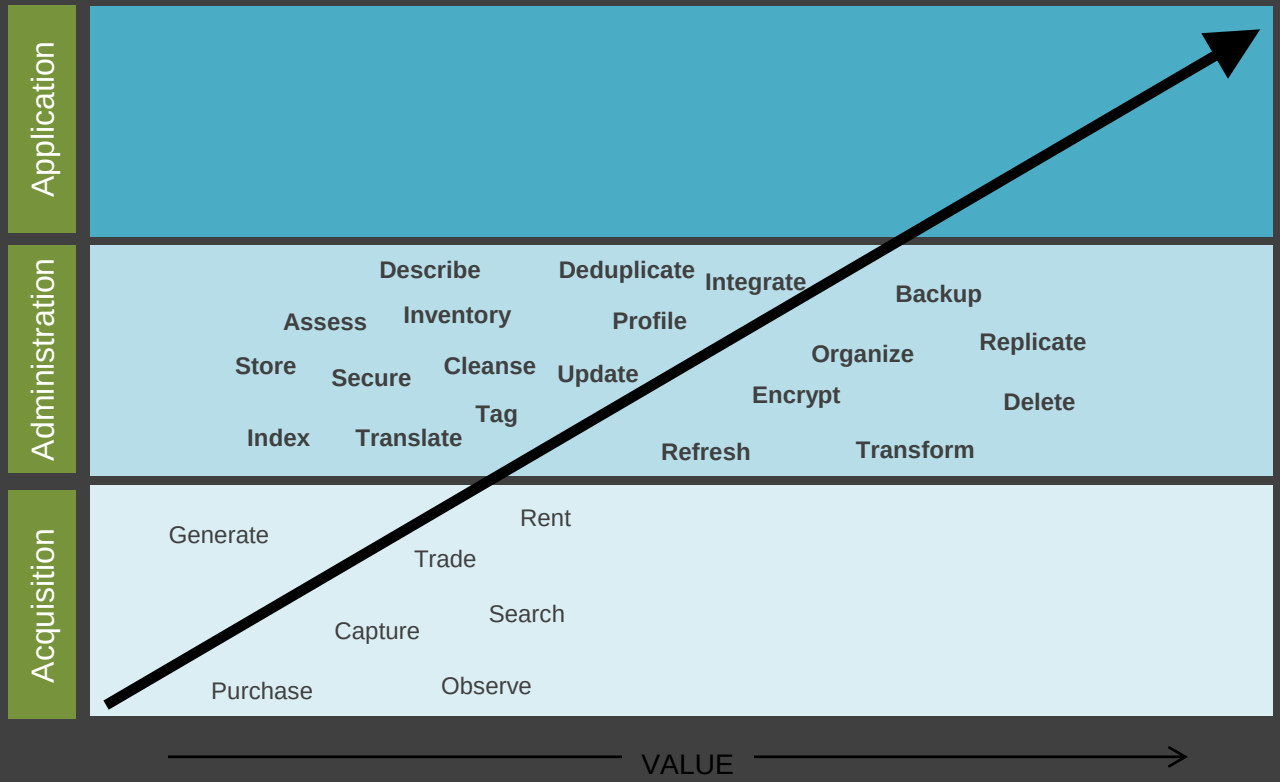
The Information Value Chain



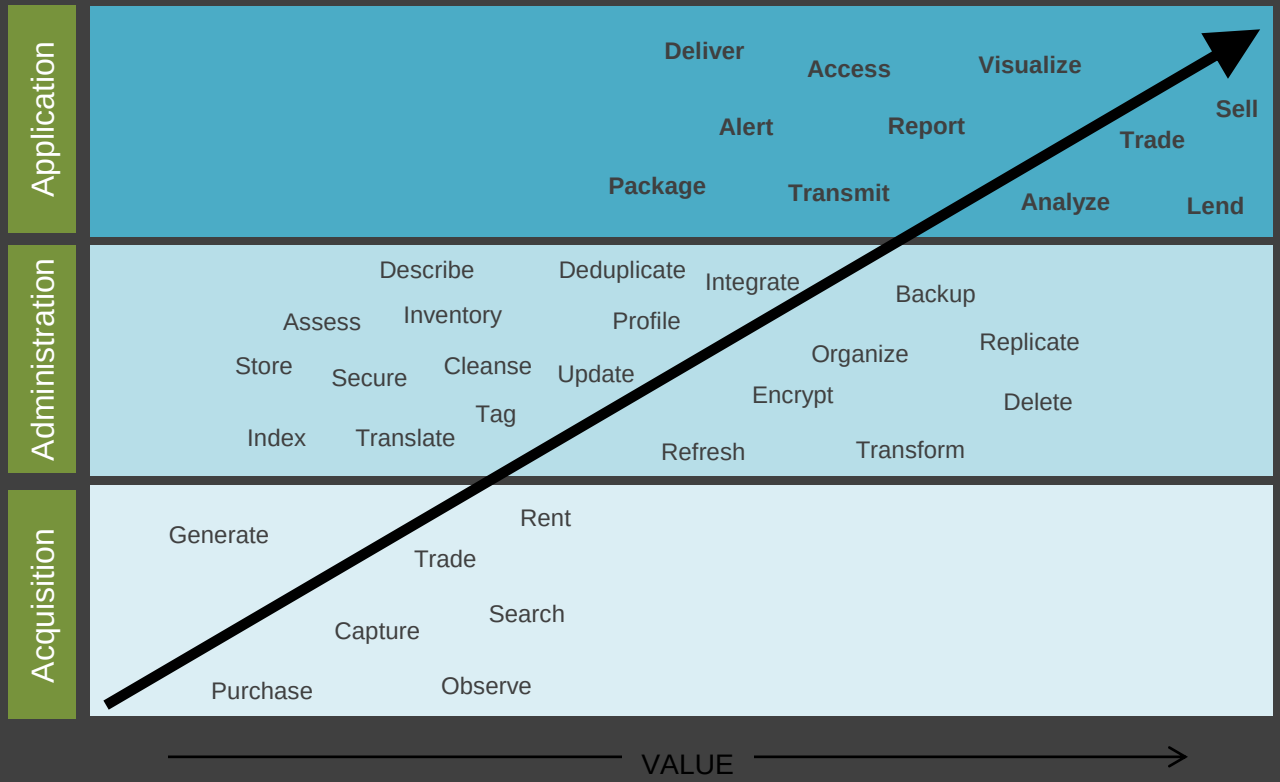
Information Asset Primitives



Information Asset Primitives



Information Asset Primitives



The basis of every great data strategy

Generally Accepted Information Principles

Generally Accepted Information Principles

Assumptions

Constraints

Tenets

Generally Accepted Information Principles

Assumptions

Assumptions are agreed-upon basic beliefs about information. They guide our understanding about how information assets can and should be perceived, managed, and deployed.

Generally Accepted Information Principles

Information should be considered and treated as an asset, because it meets each of the asset criterion

Assumptions

- **Asset Assumption**
- Proprietorship Assumption
- Appraisal Assumption
- Dominion Assumption
- Benefit Assumption

Constraints

- Specificity Constraint
- Recognition Constraint
- Jurisdiction Constraint
- Valuation Constraint
- Resource Constraint

Tenets

- Relevance Principle
- Inventory Principle
- Ownership Principle
- Authorization Principle
- Assessment Principle
- Possession Principle
- Replicability Principle
- Optimization Principle

Generally Accepted Information Principles

An organization's information assets include all forms of data and content of discernible identifiability for which it can claim ownership and/or exclusive control.

Assumptions

- Asset Assumption
- **Proprietorship Assumption**
- Appraisal Assumption
- Dominion Assumption
- Benefit Assumption

Constraints

- Specificity Constraint
- Recognition Constraint
- Jurisdiction Constraint
- Valuation Constraint
- Resource Constraint

Tenets

- Relevance Principle
- Inventory Principle
- Ownership Principle
- Authorization Principle
- Assessment Principle
- Possession Principle
- Replicability Principle
- Optimization Principle

Generally Accepted Information Principles

Information has uses well beyond its original purpose, does not deplete when used, and can be used simultaneously for different purposes.

Assumptions

- Asset Assumption
- Proprietorship Assumption
- Appraisal Assumption
- Dominion Assumption
- **Benefit Assumption**

Constraints

- Specificity Constraint
- Recognition Constraint
- Jurisdiction Constraint
- Valuation Constraint
- Resource Constraint

Tenets

- Relevance Principle
- Inventory Principle
- Ownership Principle
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- Possession Principle
- Replicability Principle
- Optimization Principle

Generally Accepted Information Principles

Constraints

Constraints are general information regulations, confinements, or bounds. They acknowledge the limits of how well information assets can be monetized, managed, and measured, and therefore restricts how absolutely the tenets can be applied.

Generally Accepted Information Principles

The groupings of data or content that comprise an “information asset” will vary from one use case or organization to another.

Assumptions

- Asset Assumption
- Proprietorship Assumption
- Appraisal Assumption
- Dominion Assumption
- Benefit Assumption

Constraints

- **Specificity Constraint**
- Recognition Constraint
- Jurisdiction Constraint
- Valuation Constraint
- Resource Constraint

Tenets

- Relevance Principle
- Inventory Principle
- Ownership Principle
- Authorization Principle
- Assessment Principle
- Possession Principle
- Replicability Principle
- Optimization Principle

Generally Accepted Information Principles

Tradeoffs among information asset quality, availability, and accessibility are inevitable.

Assumptions

Asset Assumption

Proprietorship Assumption

Appraisal Assumption

Dominion Assumption

Benefit Assumption

Constraints

Specificity Constraint

Recognition Constraint

Jurisdiction Constraint

Valuation Constraint

➡ **Resource Constraint**

Tenets

Relevance Principle

Inventory Principle

Ownership Principle

Authorization Principle

Assessment Principle

Possession Principle

Replicability Principle

Optimization Principle

Generally Accepted Information Principles

Tenets

Tenets are generally agreed-upon axioms that dictate how information assets should be managed, and lead to more detailed guidelines, policies, procedures, and standards specific to the organization.

Generally Accepted Information Principles

Information assets should be managed with at least the same discipline as other recognized assets.

Assumptions

- Asset Assumption
- Proprietorship Assumption
- Appraisal Assumption
- Dominion Assumption
- Benefit Assumption

Constraints

- Specificity Constraint
- Recognition Constraint
- Jurisdiction Constraint
- Valuation Constraint
- Resource Constraint

Tenets

- **Relevance Principle**
- Inventory Principle
- Ownership Principle
- Authorization Principle
- Assessment Principle
- Possession Principle
- Replicability Principle
- Optimization Principle

Generally Accepted Information Principles

Information assets should be cataloged, described, classified, related, and tracked.

Assumptions

Asset Assumption

Proprietorship Assumption

Appraisal Assumption

Dominion Assumption

Benefit Assumption

Constraints

Specificity Constraint

Recognition Constraint

Jurisdiction Constraint

Valuation Constraint

Resource Constraint

Tenets

Relevance Principle

Inventory Principle

Ownership Principle

Authorization Principle

Assessment Principle

Possession Principle

Replicability Principle

Optimization Principle

Generally Accepted Information Principles

The quality characteristics, cost, value, and risks of any information asset should be knowable at any point in time, and used for prioritizing and budgeting information-related initiatives.

Assumptions

Asset Assumption

Proprietorship Assumption

Appraisal Assumption

Dominion Assumption

Benefit Assumption

Constraints

Specificity Constraint

Recognition Constraint

Jurisdiction Constraint

Valuation Constraint

Resource Constraint

Tenets

Relevance Principle

Inventory Principle

Ownership Principle

Authorization Principle

Assessment Principle

Possession Principle

Replicability Principle

Optimization Principle

Generally Accepted Information Principles

An information asset should be acquired or retained only if its actual or planned value is greater than its cumulative cost, or as required by laws or other regulations.

Assumptions

- Asset Assumption
- Proprietorship Assumption
- Appraisal Assumption
- Dominion Assumption
- Benefit Assumption

Constraints

- Specificity Constraint
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- Resource Constraint

Tenets

- Relevance Principle
- Inventory Principle
- Ownership Principle
- Authorization Principle
- Assessment Principle
- **Possession Principle**
- Replicability Principle
- Optimization Principle

Generally Accepted Information Principles

An information asset should be duplicated only to improve its utility or availability, and only if doing so also increases its net value

Assumptions

Asset Assumption

Proprietorship Assumption

Appraisal Assumption

Dominion Assumption

Benefit Assumption

Constraints

Specificity Constraint

Recognition Constraint

Jurisdiction Constraint

Valuation Constraint

Resource Constraint

Tenets

Relevance Principle

Inventory Principle

Ownership Principle

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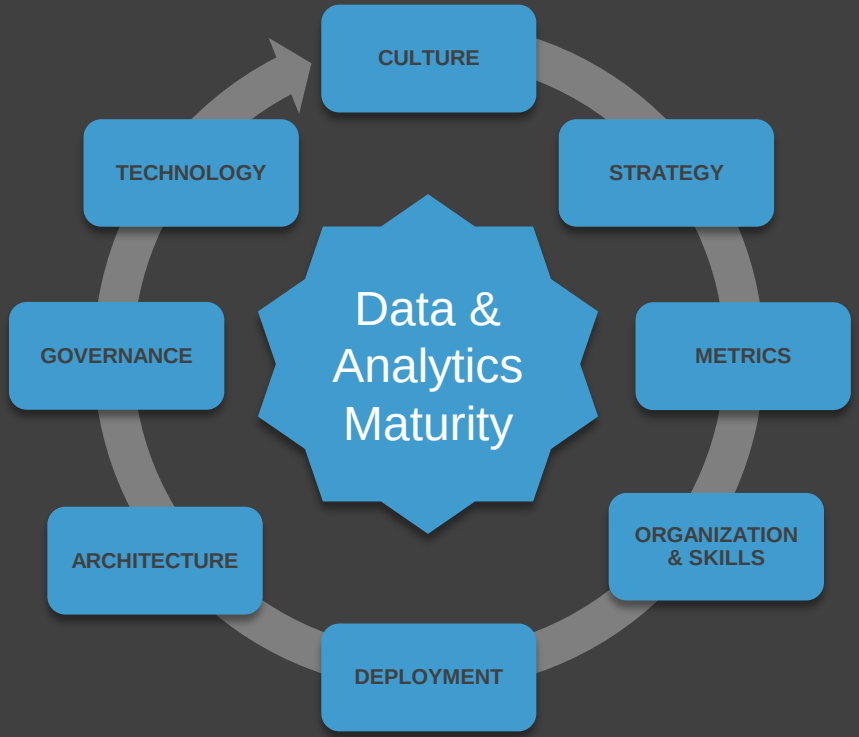
Assessment Principle

Possession Principle

Replicability Principle

Optimization Principle

Assess and mature your data & analytics capabilities



Over 200 distinct best-practice indicators.

5	Optimized
4	Managed
3	Proactive
2	Reactive
1	Aware

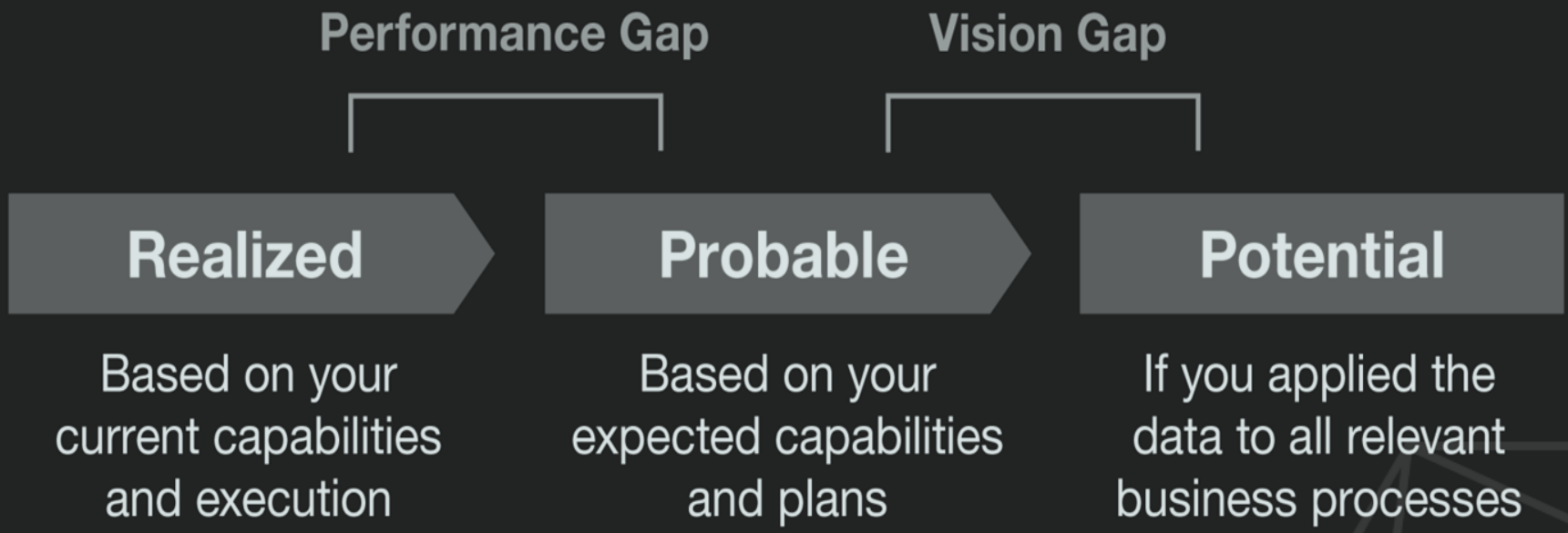
Infonomics Study Eye-Opener:

Organizations with CDOs are 3x more likely to share data freely across business units.

INFORMATION AS AN ASSET

MONETIZING | MANAGING | MEASURING

Three Degrees of Information Value



Source: “Infonomics: How to Monetize, Manage, and Measure Information for Competitive Advantage”

Dr. George E. P. Box

“All models are wrong, but some are useful.”

Information Valuation Models

Foundational Measures

How correct, complete and scarce is this data?

Intrinsic Value
of Information
(IVI)

How good and relevant is this data for specific purposes?

Business Value
of Information
(BVI)

How does this data affect key business drivers?

Performance Value
of Information
(PVI)

Leading Indicators
(Potential Value)

Improve information management discipline

Improve information's economic benefits

Lagging Indicators
(Realized Value)

Financial Measures

What did it cost to collect this data, or if we were to lose it?

Cost Value
of Information
(CVI)

What could we get from selling or trading this data?

Market Value
of Information
(MVI)

How does this data contribute to revenue / expenses savings?

Economic Value
of Information
(EVI)

Source: “Infonomics: How to Monetize, Manage, and Measure Information for Competitive Advantage”

Foundational Value of Information

Foundational Measures
How correct, complete and exclusive is this data? **Intrinsic Value** of Information (IVI)
How good and relevant is this data for specific purposes? **Business Value** of Information (BVI)
How does this data affect key business drivers? **Performance Value** of Information (PVI)

$$\mathbf{IVI} = \mathbf{Validity} * \mathbf{Completeness} * (1 - \mathbf{Scarcity}) * \mathbf{Life\ Cycle}$$

$$\mathbf{BVI} = \sum_{\mathbf{p}=1}^{\mathbf{n}} (\mathbf{Relevance_p}) * \mathbf{Validity} * \mathbf{Completeness} * \mathbf{Timeliness}$$

$$\mathbf{PVI} = \left[\left(\frac{\mathbf{KPI_i}}{\mathbf{KPI_c}}\right) - \mathbf{1}\right] * T/t$$

Source: “Infonomics: How to Monetize, Manage, and Measure Information for Competitive Advantage”

Financial Value of Information

$$\mathbf{CVI} = \frac{\mathbf{ProcExp} * \mathbf{Attrib} * \mathbf{T}}{t} \left\{ + \sum_{p=0}^{n} \mathbf{Lost\ Revenue}_p \right\}$$

$$\mathbf{MVI} = \frac{\mathbf{Exclusive\ Price} * \mathbf{Number\ of\ Partners}}{\mathbf{Premium}}$$

$$\boldsymbol{EVI} = \left[\mathbf{Revenue}_i - \mathbf{Revenue}_c - (\boldsymbol{AcqExp} + \boldsymbol{AdmExp} + \boldsymbol{AppExp}) \right] * \mathbf{T/t}$$

Financial Measures

What would it cost us if we lost this data?

Cost Value of Information (CVI)

What could we get from selling or trading this data?

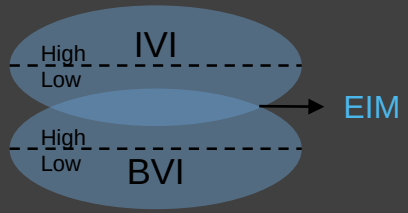
Market Value of Information (MVI)

How does this data contribute to our bottom line?

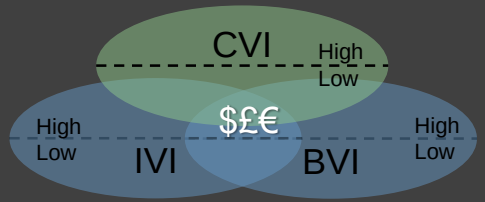
Economic Value of Information (EVI)

Source: “Infonomics: How to Monetize, Manage, and Measure Information for Competitive Advantage”

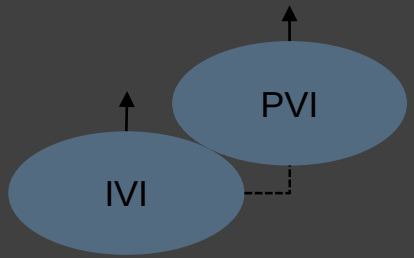
Applying the Information Valuation Models



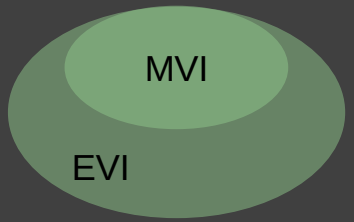
INVESTMENT:
Prioritize and fund information management initiatives for information assets with low intrinsic value and high business value.



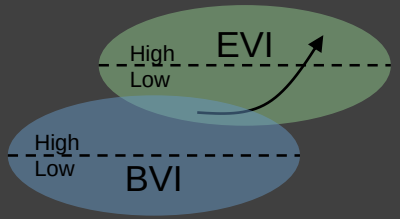
MONETIZE/ANALYTICS:
Determine the market ability of information assets, i.e., those with high quality, low cost and high external business relevancy.



GOVERNANCE:
Gauge how improving data quality metrics (intrinsic value) affects key performance indicators.



ENHANCED VALUE:
Determine how much additional economic value can be achieved by monetizing information assets.



INNOVATION/DIGITAL:
Identify information with high potential business relevance that could be driving more economic benefits.

LIFE CYCLE EXPENSE:
Dispose of information that costs more to capture and retain than its economic benefits.

Source: “Infonomics: How to Monetize, Manage, and Measure Information for Competitive Advantage”

Infonomics Study Eye-Opener:

Organizations with a C-level CDO are 4x more likely to be using data to transform business processes, products or services. Those with a “CDO lite” (non-exec) are 2x as likely.

INFORMATION AS AN ASSET

MONETIZING | MANAGING | MEASURING

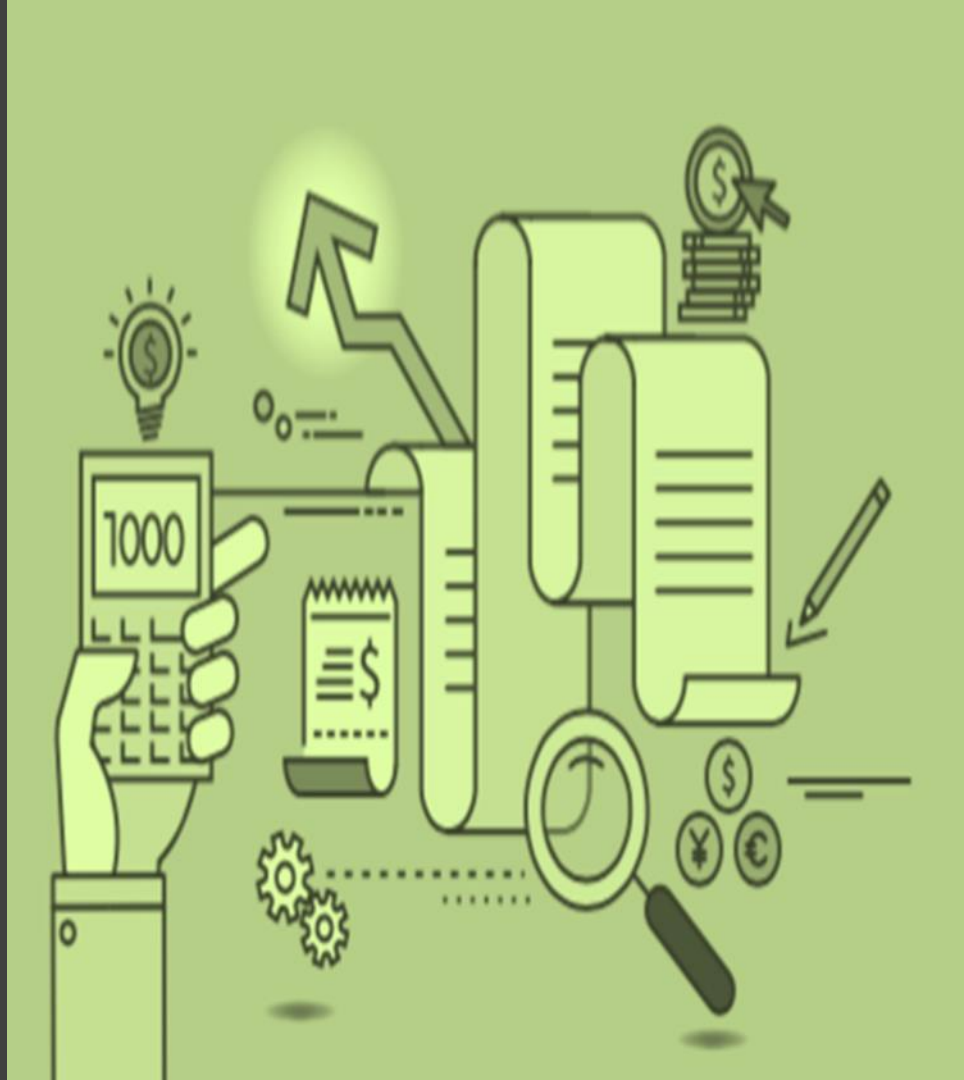
Bonus: INFORMATION ECONOMICS

Supply and Demand

- The principle of supply and demand operates differently with information than with other assets.
  - Non-rivalry means the supply is infinite.
  - A more sophisticated function of information costs and market saturation is needed. (Game theory?)

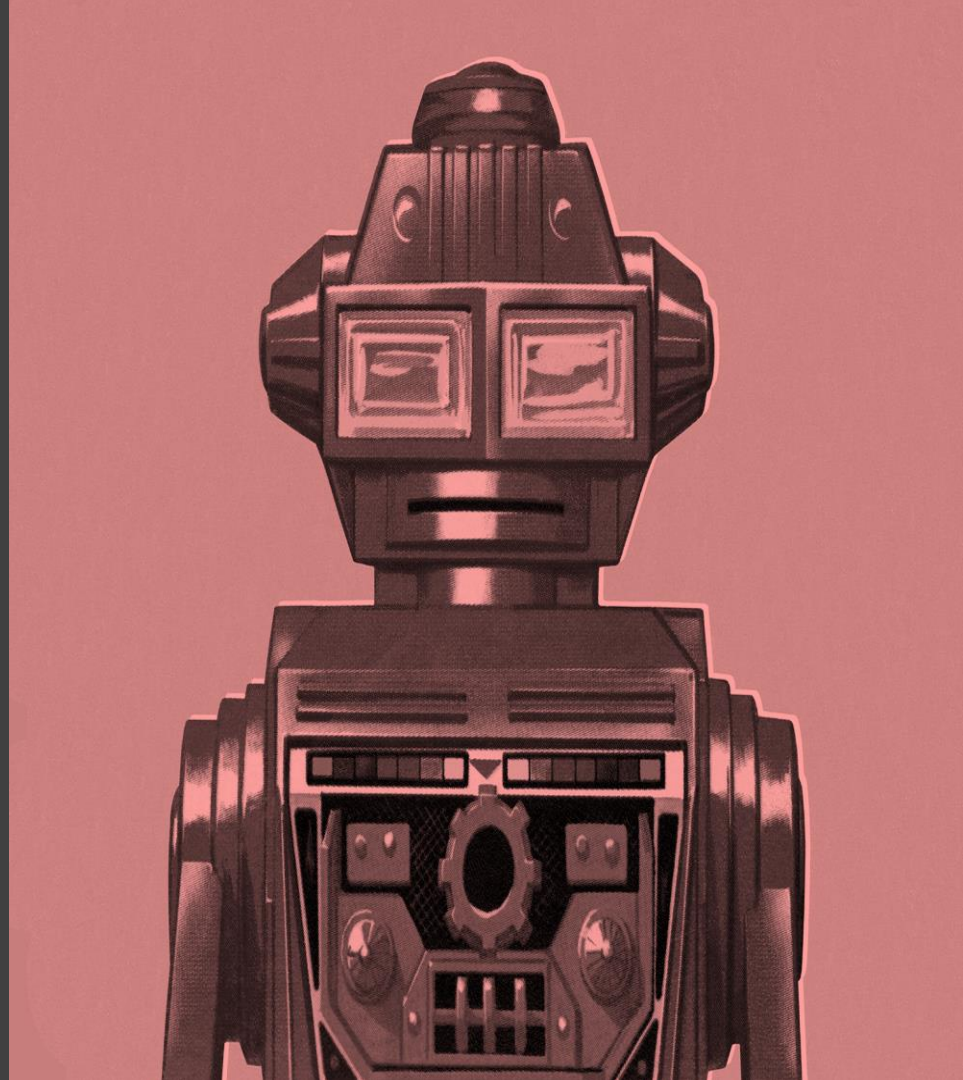
Pricing and Elasticity

- The forces of information pricing and elasticity affect everything from data markets to data security.
  - Artificial price controls are necessary
  - “Open arms-length marketplaces” are just starting to emerge
  - Data curation (alternative sources) is the key to keeping information prices low



Marginal Utility

- The marginal utility of information for both human and technology-based consumers of information should drive business and architecture decisions.
  - Increasingly most “consumers” of information are machines not human. Architect for this.

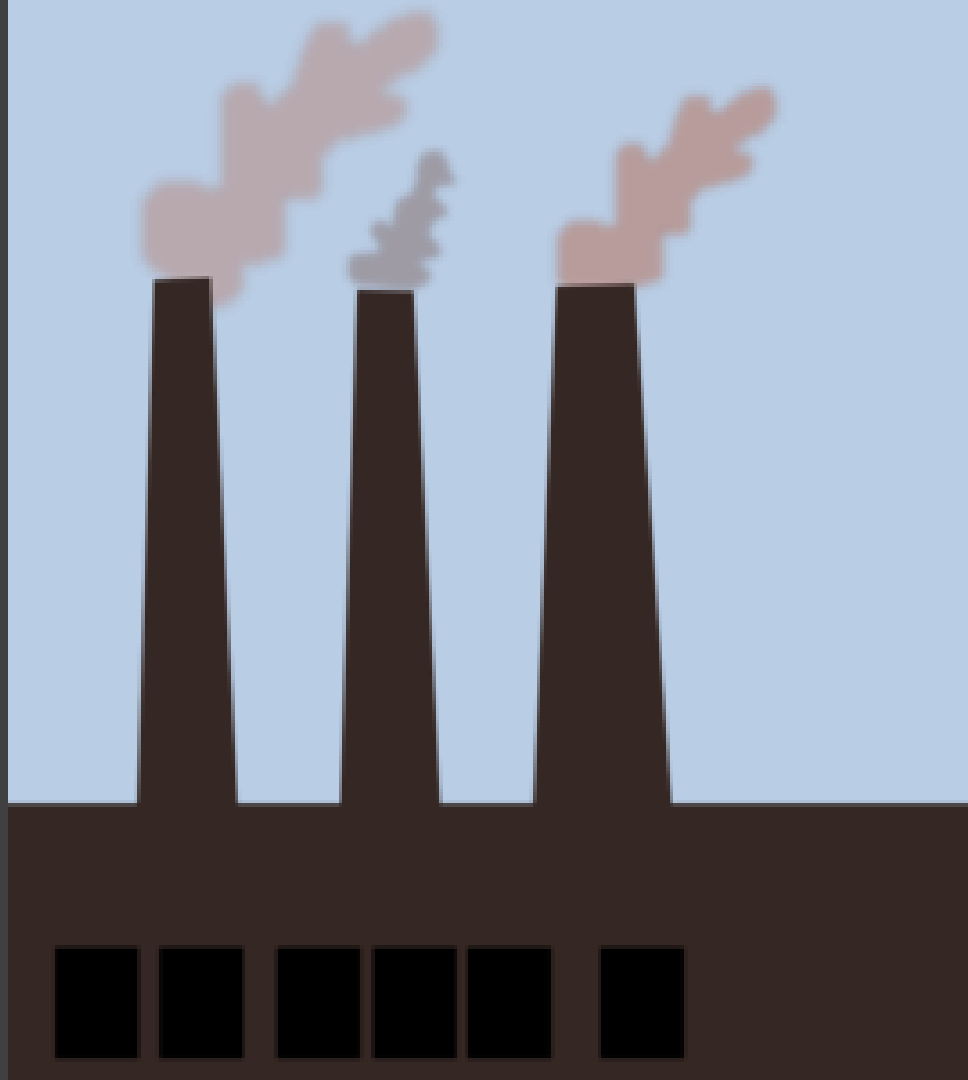


Opportunity Costs

- The opportunity costs of certain information assets must be factored into selecting and publishing them.
  - Externalities from consuming/ publishing alternative data sources are difficult to determine
  - Traditional analytics suffers from the “endowment effect”

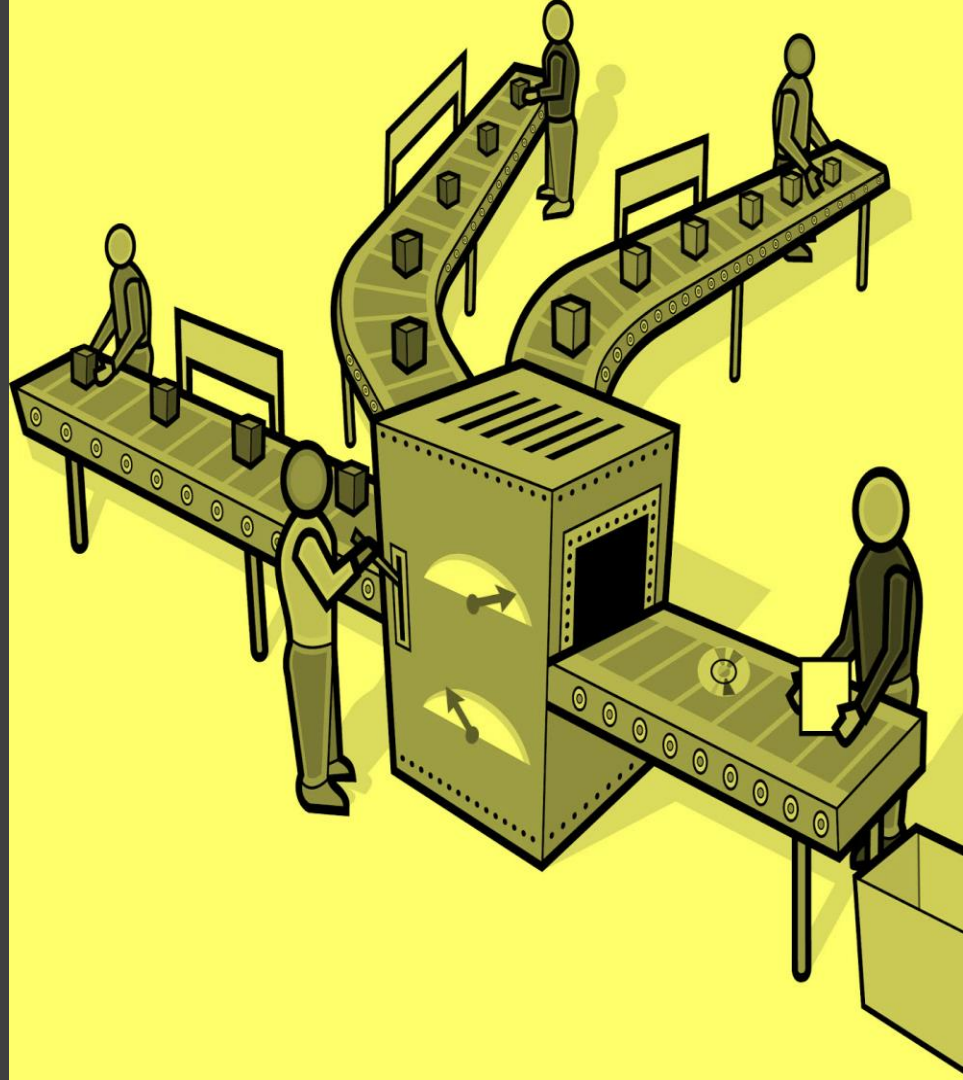
Production Frontier

- How the information production possibility frontier affects information-related behavior and investments.
  - Common but poor rationale for weak information governance
  - Embed/automate IG; model ROI
  - Apply the future value of an information asset to fund innovations today



Yield Curve

- The information yield curve concept can gauge the relative affects of information asset management maturation.
  - Integrate the concepts of information monetization, management & measurement
  - Visualize the effects of info asset management maturation (or not) over time

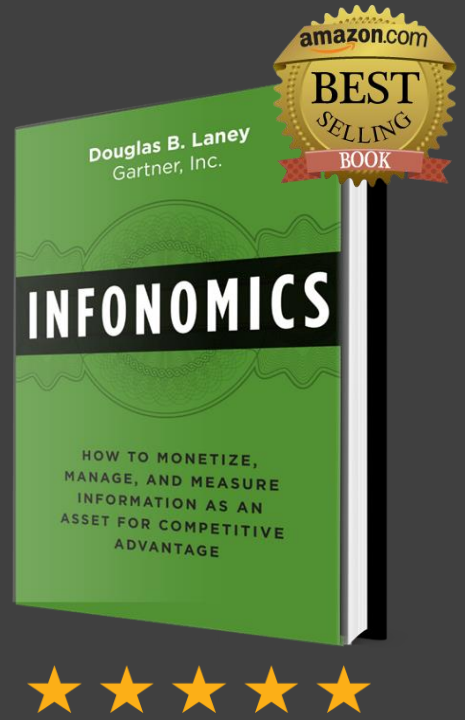


Recommendations

- ✓ Monetize your (and others!) information in a variety of ways.
- ✓ Manage your information with the same discipline as your other assets.
- ✓ Measure and improve your information's potential and realized value.
- ✓ Understand and take advantage of information's unique economic characteristics.

Elevate Your Data Strategy

- Caserta.com
- doug.laney@caserta.com
- @doug_laney
- Follow #Infonomics on Twitter & LinkedIn
- Become certified on Infonomics via Coursera



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CIO BUSINESS TECHNOLOGY LEADERSHIP

Must-Read Book of the Year.

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THE RIGHT PARTNER FOR YOUR DATA JOURNEY

Transformative Strategic Consulting & Advanced Technical Implementation