Infonomics: The Economics of Information and Principles of Information Asset Management

ABSTRACT

Information increasingly is the stuff of our capitalistic cosmos that affects the orbits of so many enterprises. Just because data may be the dark matter that permeates the economy, that shouldn't stop us from trying to formally measure it and manage it. Imagine any enterprise unable to account for its inventory of finished goods and materials. Yet, this is the unfortunate circumstance for organizations that traffic in or heavily leverage information. Established financial standards and econometric methods fail to enable quantifying this increasingly ubiquitous and admittedly amorphous class of asset. Until they do, or perhaps as a harbinger, this session will illustrate several methods enterprises can and should be using today to formally account for the value of their information assets.

BIOGRAPHY

Doug Laney
Eminence Lead, Deloitte Analytics Institute
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Doug currently heads thought leadership and marketing for the Deloitte Analytics Institute. Previously he launched and ran the enterprise analytics strategies research and advisory service for the IT analyst firm META Group (now part of Gartner). In this role he advised hundreds of organizations around the world, published over 100 articles and was a regular speaker at industry events on topics from information management to business intelligence. Doug is also considered one of the pioneers in the field of data warehousing, and is an analytic solution innovator. He led the development of the industry's first commercial data warehouse project methodology (still in use worldwide today), and developed ground-breaking methods for online, collaborative, self-service research and benchmarking. More recently, Doug has been asked to join the faculty of the Data Warehouse Institute and teaches a course on applying traditional asset management and valuation principles to information assets.

Deloitte.

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MIT Information Quality Industry Symposium

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Deloitte Analytics Institute
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About the Speaker

Doug Laney

- Heads thought leadership, research and marketing with the Deloitte Analytics Institute—a function within Deloitte Consulting LLP to enhance the firm's global business analytics go-to-market capabilities.
- Formed and led META Group's (now part of Gartner) enterprise analytic strategies research and advisory practice. Authored 100+ articles and research pieces, and spoke now-and-again.
- Developed the data warehouse industry's first commercial project methodology, ITERATIONS®, while leading Prism Solutions' (now part of IBM) US and Asia-Pacific data warehouse consulting practice.
- Publishes primarily on Deloitte's *RealAnalytics* LinkedIn group, @DeloitteBA on Twitter, and Deloitte's Real Analytics site.
- Contact Doug at douglaney@deloitte.com

Who cares about information?

What is an asset?

Webster	A single item of ownership having exchange value or convertible into cash. Total resources of a person or business such as cash, notes, and goodwill.
American Institute of CPAs	Any economic resources (tangible/intangible) that can be owned or produce value. Assets have a positive economic value.
Financial Accounting Standards Board	A probable future economic benefit obtained or controlled by a particular entity as a result of past transactions or events.
International Accounting Standards Board	A resource controlled by the enterprise as a result of past events and from which future economic benefits are expected to flow to the enterprise.

Where are information assets on the balance sheet?

	2010 US$m	2009 US$m
Noncurrent assets		
Goodwill	**3,412**	3,125
Other intangible assets	**1,233**	1,189
Property, plant, and equipment	**451**	479
Investments in associates	**243**	332
Deferred tax assets	**176**	13
Trade and other receivables	**8**	5
Available-for-sale financial assets	**33**	26
Other financial assets	**88**	61
Current assets		
Inventories	**3**	4
Trade and other receivables	**800**	738
Current tax assets	**4**	17
Other financial assets	**27**	21
Cash and cash equivalents	**175**	129
Assets classified as held for sale	**25**	-

So is information really an asset?

No

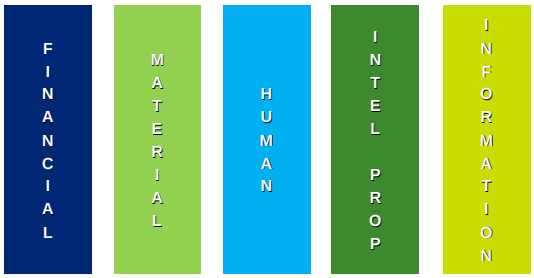
- It is not on the balance sheet.
- You can't account for it because it is so amorphous.
- It is not really consumable like other assets.

Yes

- It can have an exchange value.
- It can generate a positive economic value.
- Well, we could count/measure it, but how?

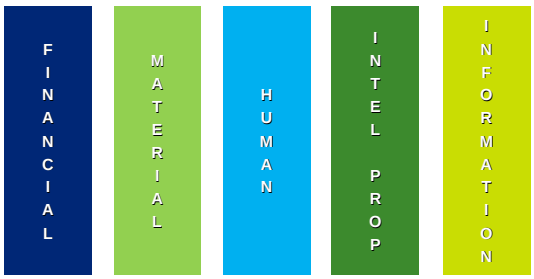
Beyond the balance sheet: Other kinds of assets

Stuff businesses manage



How do we manage these assets?

What we do ***to*** these assets

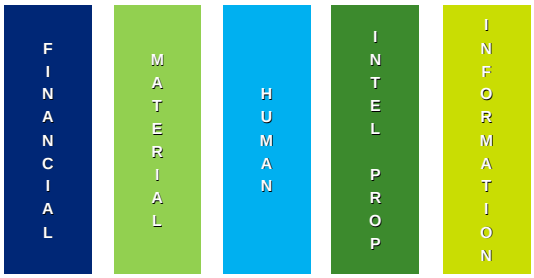


- Collect
- Produce
- Organize
- Prepare
- Inventory
- Distribute
- Combine
- Locate
- Govern
- Enrich
- Secure
- Monitor

How do we leverage these assets?

What we do ***with*** these assets

- Sell
- Spend
- Lend
- Trade
- Share
- Apply



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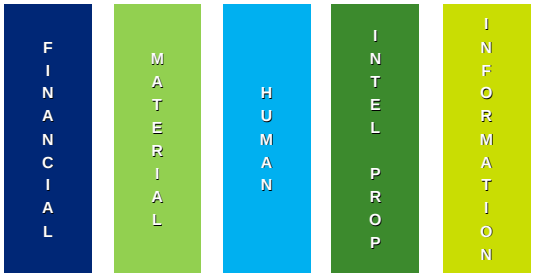
The asset lifecycle

Asset Consumption
(value realization)

- Sell
- Spend
- Lend
- Trade
- Share
- Apply



Asset Management
(value augmentation)

- Collect
- Produce
- Organize
- Prepare
- Inventory
- Distribute
- Combine
- Locate
- Govern
- Enrich
- Secure
- Monitor

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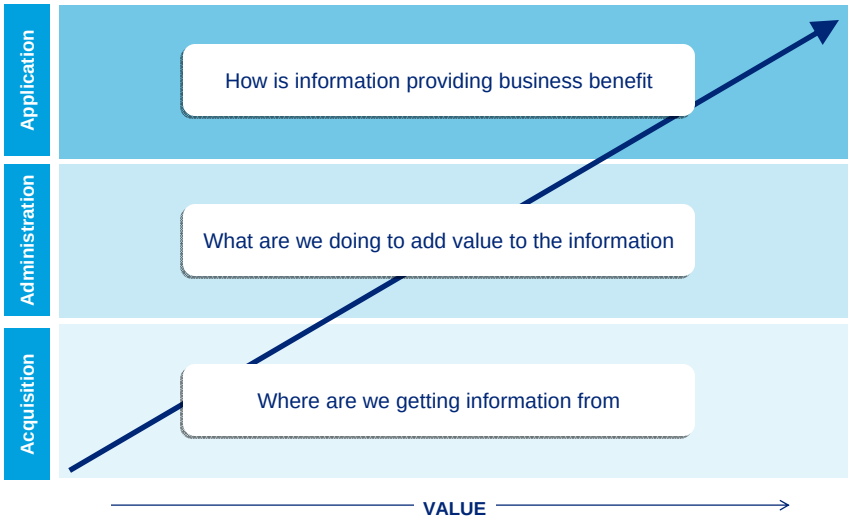
The information supply chain



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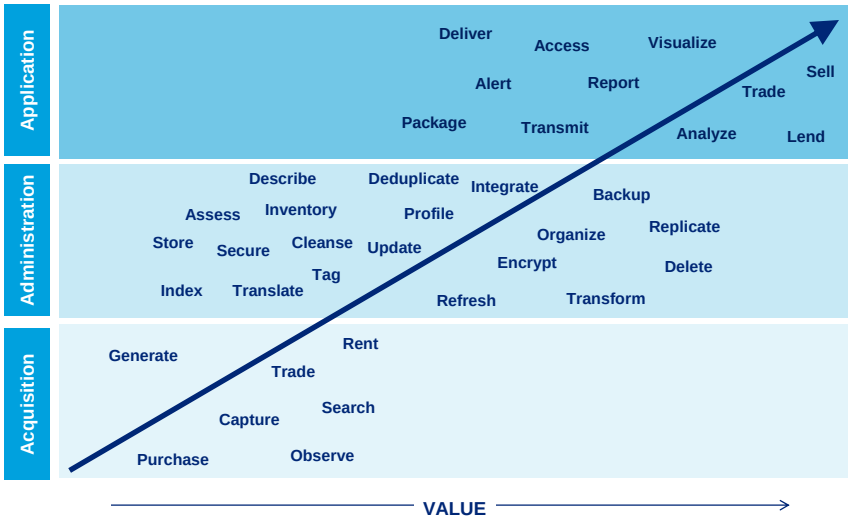
The information supply chain (cont.)



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Why worry about information's value?

Business reasons:

- Determining the relative effectiveness of various information assets on the business
- Determining what investments to make in information and information management solutions
- Improving company valuation premiums
- Including information as an asset in secured lending
- Reducing the risk of undesirable or illegal information exposure

Why worry about information's value? (cont.)

Accounting reasons:

- Information is meets the definition of an asset
- Information has a probability of generating future value
- Information is distinct from financial and material assets
- Compliance with Financial Accounting Standards for measuring intangible assets

A brief history of accounting innovation

Luca Pacioli
Father of Accounting

1953 - Arthur Andersen computerizes the payroll of a GE plant

1936-38 - SEC-chartered committee standardizes financial statements

1923 - General Motors' controller develops ROI and ROE calculations

1845 - William Deloitte founds the first of the Big-8 accounting firms in London

1772 - Darwin's grandfather, Josiah Wedgwood, invents cost accounting

1494 - A Venetian merchant codifies double-entry accounting methods

2200 BC - *The Code of Hammurabi*. One of the earliest transaction legal codes

7th Century BC - Coins invented in Lydia

575 BC - Greek banks start to mint coins, accept deposits, make loans

7500 BC - The first accounting records in Jericho & Sumerian cities

1979 - Dan Brinklin and Bob Frankston create VisiCalc for the Apple II

1990's - Rise of accounting packages and integrated financial systems, e.g., Peachtree, Quickbooks, Oracle, Peoplesoft, SAP

How to establish an asset's economic value

Method	Description	Information asset implications
Market approach	What the market will bear for selling this asset? Requires an active *arm's-length* marketplace and a salable asset.	Is there an active marketplace for given types of information assets? Perhaps so for publicly captured information or customer lists. Most of our information assets are not legally saleable.
Income approach	What income stream this asset will generate? Often requires an alternative for comparison.	How can any unit or portfolio of information be ascribed to a business function that generates an income stream if it is not directly sold?
Cost approach	What will it cost to replace this asset if lost? Requires that this asset can be replaced somehow.	What was (would be) the cost to generate, capture, or otherwise reacquire that information? This requires that all units of information are assumed to have a (probable) economic benefit.

Factors affecting an information asset's utility and ultimately its economic value

Objective factors	
Accuracy	The data accurately represents reality or a verifiable source.
Integrity	Appropriate links and relationships exist among data.
Consistency	Each type of data has a single representation
Completeness	Records are not missing fields. Data sets are not missing instances.
Accessibility	Data is easily retrieved and/or integrated into business processes.
Precision	Data is recorded with the precision required by the business.
Timeliness	Data is updated with sufficient frequency to meet the business requirements.

Subjective factors	
Relevance	The data is applicable to one or more business processes or decisions.
Usability	Business process(es) and/or individuals understand and are able to leverage this data.
Believability	Data is deemed credible by those using it.
Clarity	Data has a unique meaning and can be easily comprehended.
Objectivity	Data is unbiased and impartial and not depend on the judgment, interpretation, or evaluation of individuals.
Scarcity	Is the data proprietary, secret, and difficult to come by?

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Information asset valuation: What can be counted?

Information-related characteristics

- Quality features (completeness, accuracy, etc.)
- Relevance (its bearing on a process, uniqueness)
- Timeliness (accessibility, currency)

Information-related costs

- Cost to acquire it
- Cost to administer it
- Cost to apply it
- Revenue lost if we don't have it

Information-related benefits

- Process/function performance gain
- Revenue/margin contribution

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Information asset valuation:

Method 1: Intrinsic Value of Information

How good and easy to use is the data versus how likely are others outside the organization to have it also? This the presumptive value of information, enabling apples-to-oranges comparisons.

$$IVI = \frac{Accuracy * Completeness * Accessibility}{Ubiquity}$$

Variations
- Include other objective or subjective measures
- Consider record and/or data set completeness
- Assume latency (timeliness) is a given

Information asset valuation:

Method 2: Business Value of Information (BVI)

The value of information to a business process: How good is the data? How applicable to the business or a particular business process is it? How quickly can we get fresh data to the point of the business process?

$$BVI = \frac{Accuracy * Completeness * Relevance}{Latency}$$

Variations
- Include other objective or subjective measures
- Weight information measures as appropriate
- Assume latency (timeliness) is a given

Information asset valuation:

Method 3: Loss Value of Information (LVI)

The cost of not having information: What would it cost to replace the data, and what is the financial impact to the business if the data were lost over a time period (t)?

$$LVI = AcquisitionCost + \sum_{1}^{t} LostRevenue$$

Variations

- Include cost of down-time for other assets until information is replaced or assets can be re-deployed
- Include a factor for making up revenue shortfall in other ways over time

Information asset valuation:

Method 4: Performance Value of Information (PVI)

Value of information to business objectives, represented as key performance indicator (KPI) targets: How much does having a unit of information incrementally contribute to moving closer toward all *n* KPI targets over a given period?

Requires a baseline and control group

$$PVI = \sum_{1}^{n} (\delta KPI(i)n - \delta KPI(c)n)$$

Where:
i = influenced
C = control

Variations

- Compute financial KPIs to determine economic value of information
- Run what-if experiments instead
- Change data factors to see what happens
- Use historical results as a control group if other factors and constant

Information asset valuation:

Method 5: Economic Value of Information (EVI)

The bottom-line financial value for the information asset: The Performance Value of Information (PVI) for a revenue metric, less the cost of acquiring, administering, and applying the information.

$$EVI = PVI(r) - (AcquisitionCost + AdministrationCost + ApplicationCost)$$

Assumptions

- Consider that information acquisition, admin and application costs may be shared with other types of information
- Be sure to share costs across PVI time periods

Information asset valuation:

Method 6: Market Value of Information (MVI)

The income that can be generated by selling, renting or bartering with this information. How much is a business partner (*p*) willing to pay for access to this information?

$$MVI = \sum_{1}^{p} ExclusivePrice * DiscountRate_{p}$$

Variation

- Include a discount for the time-value of information
- Subtract the sales, preparation, packaging, and delivery costs to achieve a net value

Infonomics: Key Takeaways and Recommendations

- Idle information is an expense; leveraged information is an asset.
- Look to your own organization's supply chain and material/financial/human asset management practices. Encourage adopting and adapting them for information asset management.
- Periodically benchmark your own information management capabilities along a continuum of characteristics. Set a course for improvement.

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