

# THE DEAN OF BIG DATA

The Adventures of Dean o' BD  
Across the 8th Dimension  
of Digital Transformation

VOLUME 1

"UNLEASH YOUR DATA'S  
ECONOMIC VALUE"

"THINK LIKE A DATA  
SCIENTIST"

"CAN'T SWIM WITH  
SHARKS WITH BUSINESS  
STRATEGY ANCHORED  
IN CEMENT"

"ECONOMIES OF  
LEARNING ARE MORE  
POWERFUL THAN  
ECONOMIES OF SCALE"

"ALL IDEAS ARE WORTHY  
OF CONSIDERATION"

Bill Schmarzo

# The Adventures of Dean o' BD Across the 8th Dimension of Digital Transformation



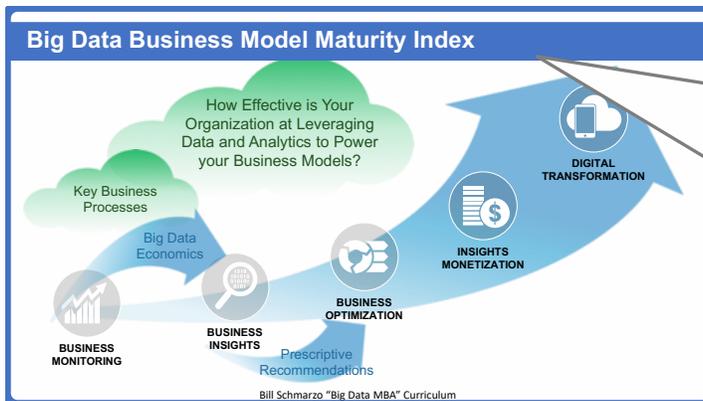
Dean o' BD, and his sidekick Val, have discovered a magical device to supercharge an organization's Value Creation process. They blend rare earth minerals – specifically value engineering, economics, design thinking, data science and AI / ML – to create a potion that radically accelerates the digital transformation process; driving the transformation from reporting to predicting and autonomous, and empowering the organization's front-line intelligence.

However in this current mind-blowing episode, Dean o' BD and Val find themselves in a dimension where digital assets never wear out, never deplete, and can be used in infinite use cases at zero marginal cost; a dimension where one can leverage Big Data, IOT and AI / ML to create assets that appreciate, not depreciate, in value.

How will Dean o' BD and Val not only survive this life-altering dimension, but what learnings can they bring back to other organizations who must also navigate the Digital Transformation dimension?



Dean o' BD starts the journey by asking: "How effective is my organization at leveraging data and analytics to power our business?"

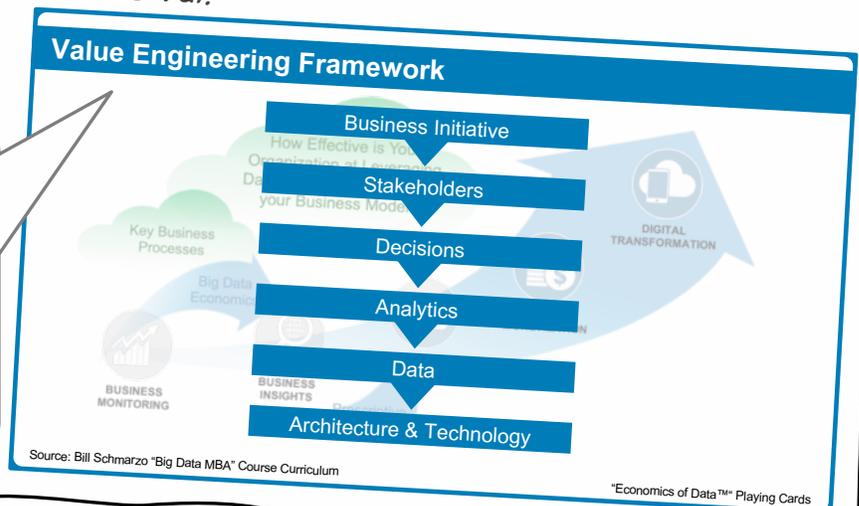


"Big Data Business Model Maturity Index provides a roadmap to guide organizations to be more effective at exploiting data and analytics to optimize key business processes, uncover new monetization opportunities and create a more compelling user experience."



"If what my organization seeks is to exploit the potential of data science to power our business models, then the **Value Engineering Framework** provides the "How" we can do it" states Val.

"The Value Engineering Framework starts with the identification of a key business initiative that not only determines the sources of value, but also provides the framework for a laser-focus on delivering business value and relevance."



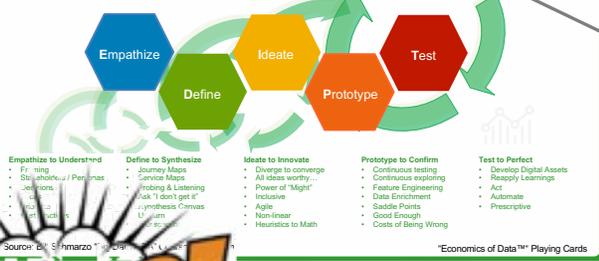
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Meanwhile, Dean o' BD contemplates: "How can I better understand the sources of customer and market value creation? What sort of 'black magic' incantations must I learn to uncover those deep secrets?"

## Design Thinking: Validate Sources of Value Creation

Customer-empathetic process to uncover and validate requirements & insights as to address challenging business and operational problems



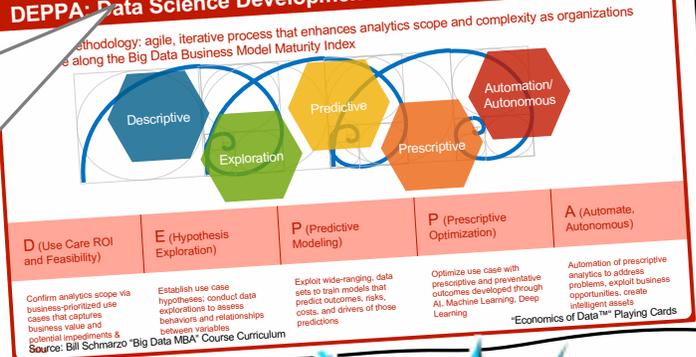
**Design Thinking** is a human-centric approach that creates a deep understanding of users in order to generate ideas, build prototypes, share what you've made, embrace the art of failure to learn and put the innovative solution out into the world for feedback and refinement.



"That's very sneaky." states Val. "But how do we codify the customer, product and operational insights or propensities that are gleaned from this process?"

**DEPPA is agile, iterative Data Science maturation process** that enhances an organization's analytics capabilities as they advance along Big Data Business Model Maturity Index. From Descriptive Analytics to Predictive / Prescriptive Analytics ultimately to Automation and Autonomous Analytics

## DEPPA: Data Science Development Process

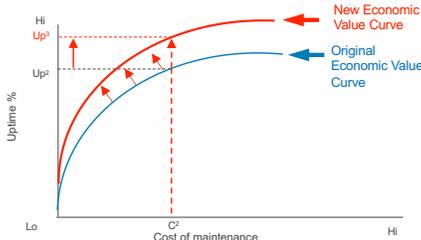


"But you ain't seen nothing yet" states Val. "We can leverage data and analytics to transform our economic value curve; to **"do more with less"** with superior customer, product and operational insights!"



## Transforming the Economic Value Curve

The way to beat Law of Diminishing Returns is to re-engineer the sources of value into a new **Economic Value Curve**; that is, increase Uptime from Up2 to Up3 with same Maintenance costs.



**The Economic Value Curve** quantifies the trade off between the different variables that measure operational success. To transform our economics value curve, we use data, analytics and design to re-engineer the operational process - applying operational intelligence at the front lines of customer and operational engagement

# The Adventures of Dean o' BD Across the 8th Dimension of Digital Transformation



"How does an organization value an asset like data that never depletes, never wears out, and can be used across an unlimited use cases at near zero marginal cost?" wonders Val.

**Accounting** provides retrospective methodology for determining value (value in exchange), where value is determined by what one paid for that asset.

However, **Economics** provides a forward-looking perspective for determining valuation (value in use), where value is determined by what value the asset can generate

## Essential Value of Data

Asset that never depletes, never wears out, and can be used across unlimited use cases at near zero marginal cost

**Accounting** provides a retrospective methodology for determining valuation (value in exchange), where value is determined by what one paid for that asset

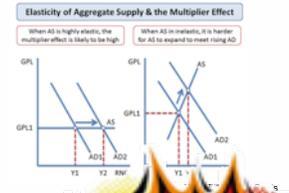
**Economics** provides a forward-looking perspective for determining valuation (value in use), where value is determined by what value the asset can generate

**Economic Multiplier Effect:** an increase in investment produces an increase in value greater than the initial amount

**Marginal Propensity to Consume (MPC):** the proportion (multiplier) of value that is increased with each increment of investment

**Marginal Cost:** the incremental cost added by producing one additional unit of a product or service

Source: Bill Schmarzo "Big Data MBA" Course Curriculum



"Digital Transformation sweeps aside traditional industry borders to create and capture new sources of customer, product and operational value!" states Dean o' BD.

## Digital Transformation Value Creation Mapping

Digital Transformation sweeps aside traditional industry borders to create and capture new sources of customer, product and operational value

### 1) Identifying Sources of Value Creation (DVE, Value Engineering, Design Thinking)



### 2) Codifying Sources of Value Creation (Data Science, DEPPA)



### 3) Operationalizing Sources of Value Capture (DataOps, DevOps)



Bill Schmarzo "Big Data MBA" Curriculum

Organizations need to apply the **Digital Transformation mapping** to:

1. Identify, value and prioritize the sources of customer value creation
2. Codify customer, product and operational insights (propensities)
3. Operationalize customer, product and operational propensities into operational system



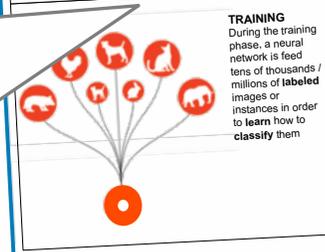
"**Deep Learning** learns on massive data sets with millions of records to identify characteristics, patterns and relationships in the data to make decisions such as cats versus dogs or healthy cells versus cancerous cells." observes Dean o' BD.

**Backpropagation** improves neural network predictions by adjusting the weights and layers until expected results match actual results

**Stochastic Gradient Descent** minimizes the cost function by iteratively moving in the direction of steepest descent (slope)

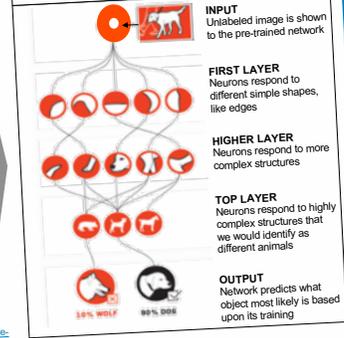
## How Deep Learning Works

### Training Stage



<http://deeplearning.epingyang.org/2016/11/16/how-neural-networks-recognize-a-dog-in-a-photo/>

### Prediction Stage

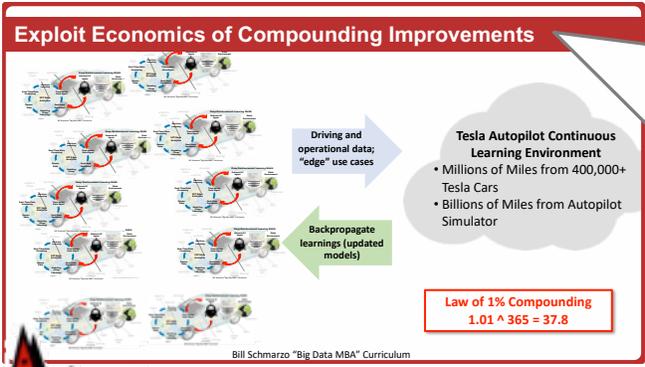


Source: Bill Schmarzo "Big Data MBA" Course Curriculum

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"Learning magnifies itself across a collection of similar physical assets so that the accumulated intelligence can then be back propagated to the individual assets." proudly observes Val.

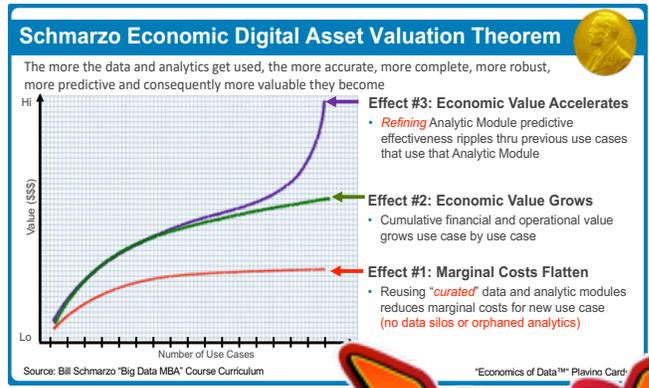


AI leverages Deep Learning, Machine Learning and Reinforcement Learning to create a "Rational AI Agent" that can learn a successful strategy from continuous engagement with the environment. The agent can actively adapt to the changing environment to maximize the AI Utility Function.



"I get it!" states Dean o' BD. "The Economic Digital Asset Valuation Theorem" clarifies why organizations need to invest in creation, sharing, reuse and refinement of their data and analytics assets."

- **Effect #1: Marginal Costs Flatten.** Marginal costs associated with reusing data and analytics flattens.
- **Effect #2: Economic Value Grows.** Reusing data and analytics accelerate time-to-value while de-risking use cases.
- **Effect #3: Economic Value Accelerates.** Analytic model refinement lifts economic value of all associated use cases.



## Mastering the Economics of Digital Transformation

- Big Data Business Model Maturity Index:** Frame how organizations become more effective at leveraging data and analytics to power their business models
- + **Value Engineering:** Identify, validate, value and prioritize sources of customer, product and operational value while building organizational alignment
  - + **Design Thinking:** human-centric approach to create a deep understanding of users to ideate, prototype, test, share, embrace the art of failure and innovate
  - + **Data Science:** Data Monetization engine to codify, operationalize and scale customer, product and operational value
  - + **Economies:** Economies of Learning more powerful than Economies of Scale
- = **Economic Value of Data / Digital Asset Valuation Theorem** states the accumulative value of an organization's data and analytic assets appreciate, not depreciate, with usage and learning

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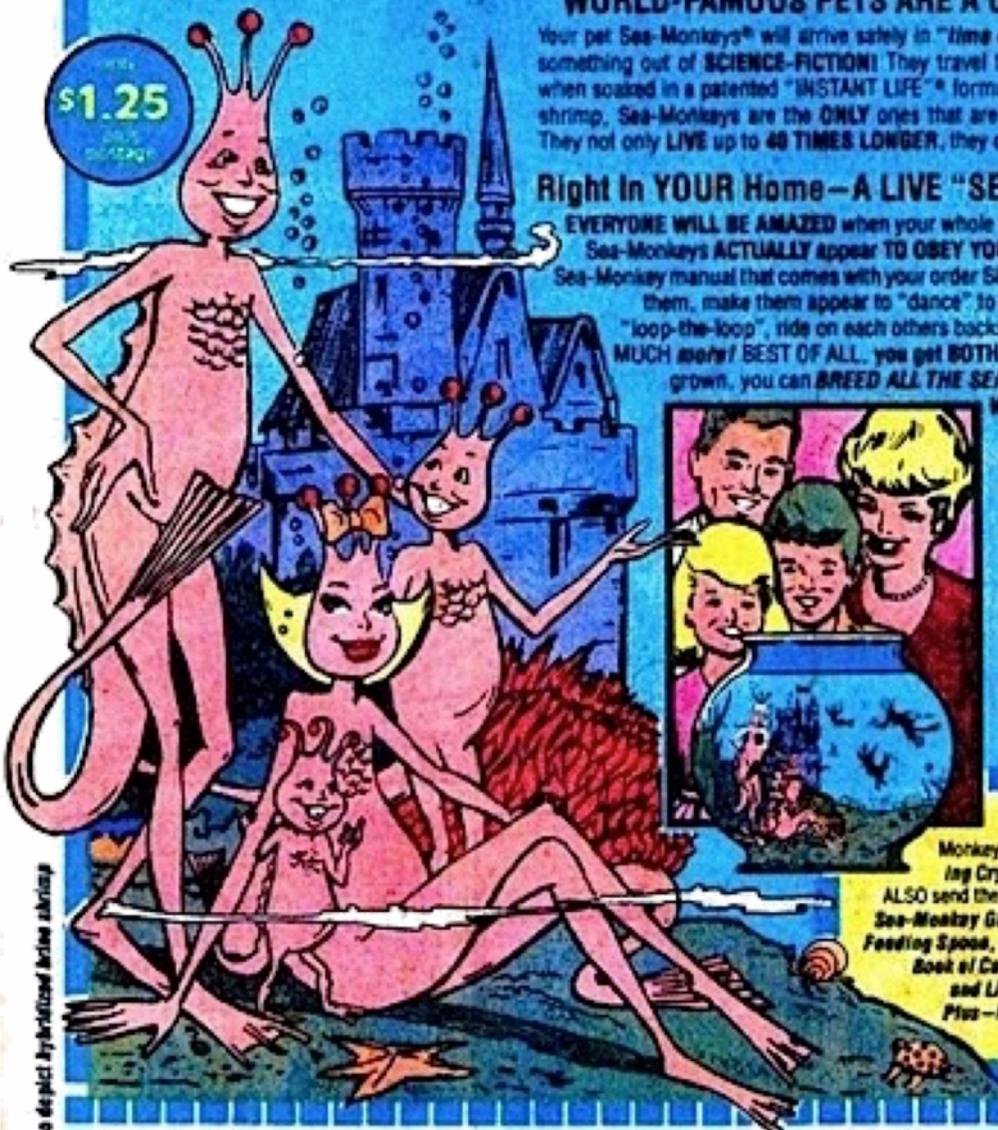
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