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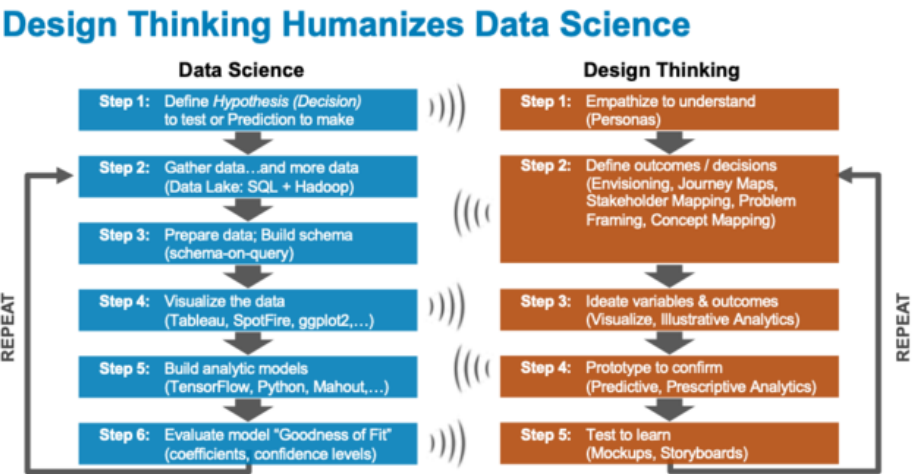
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# Exploit the Economics of Artificial Intelligence with Design Thinking and Data Science

- Posted by Bill Schmarzo on January 15, 2019 at 12:24pm
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In my most recent blog "Design Thinking Humanizes Data Science", I discussed how Design Thinking and Data Science complement each other. They are not just two sides of the same coin, but the same side of the same coin in their objectives to "diverge before converging" in driving business stakeholder collaboration with respect to identifying, brainstorming and envisioning the variables and metrics that might be better predictors of performance (see Figure 1).



Source: "Scientific Method: Embrace the Art of Failure", University of San Francisco School of Management Big Data MBA

Source: Bill Schmarzo "Big Data MBA" Course Curriculum

Figure 1: Design Thinking Humanizes Data Science

The complementary natures of Data Science and Design Thinking are bonded by several common characteristics including:

- Open culture for sharing and ultimately standing on the shoulders of others
- Inclusive culture where "All ideas are worthy of consideration"

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## ECONOMICS, SAY HELLO TO DESIGN THINKING AND DATA SCIENCE

A recent article from the University of Chicago Booth School of Business titled "Why Artificial Intelligence Isn't Boosting the Economy—Yet" highlights a common problem with new disruptive technologies – there are substantial upfront investments in these disruptive technologies, resulting in a negative short-term Return on Investment (ROI). To quote the article:

*"The economy is early in the AI adoption wave, with start-up funding for AI having increased from \$500 million in 2010 to \$4 billion in 2016. According to the researchers, this implies intangible investments in AI may have accounted for 0.55 percent of "lost" output—or output that national productivity statistics didn't measure—in 2017."*

In my blog "Why Accept the Hype? Time to Transform How We Approach Emerging Tec...", I highlight that the biggest cost for emerging technologies is the lost economic potential caused by early mis-positioning. The emerging technologies never gain the level of organizational adoption necessary to drive material economic impact (see Figure 2).

### Economic Impact of the Hype Curve

Wasted financial and human capital investment in technologies without the proper business focus and justification leads to delays in the realization of the subsequent and potentially significant economic benefits later

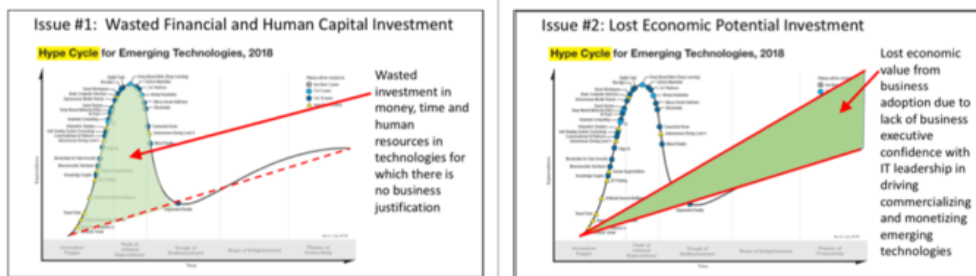


Figure 2: Lost Economic Value Due to Over-hyped and Mis-positioned Technologies

In further exploration of the dangers of the Hype Curve, I realized that I had the right idea but the wrong perspective. It's not a "technology hype" issue, it's an "economics productivity" issue! The real issue is the economic "Productivity J-Curve", which is the time period in emerging technology investments where productivity growth is underestimated, followed by a period where its productivity growth is overestimated.

The research paper "The Productivity J-Curve: How Intangibles Complement General Purpos..." written by Erik Brynjolfsson, Daniel Rock, and Chad Syverson introduced the Productivity J-Curve (see Figure 3).

### Productivity J-Curve

Skewed measurement of productivity growth after a *major new technology* is introduced



Redrawn from the article ["Why Artificial Intelligence Isn't Boosting the Economy—Yet"](#)

Figure 3: From the article "Why Artificial Intelligence isn't Boosting the Economy—Yet"

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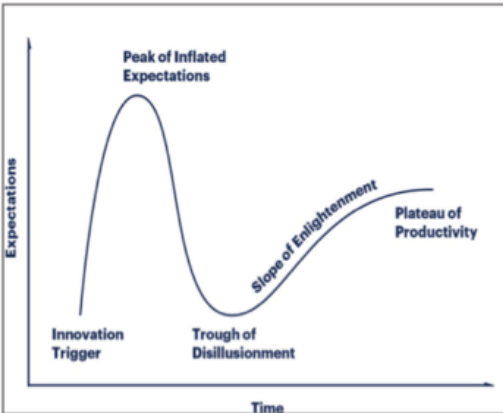
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## Hype Curve versus Inverted Productivity J-Curve

**Hype Curve**



**Inverted Productivity J-Curve**

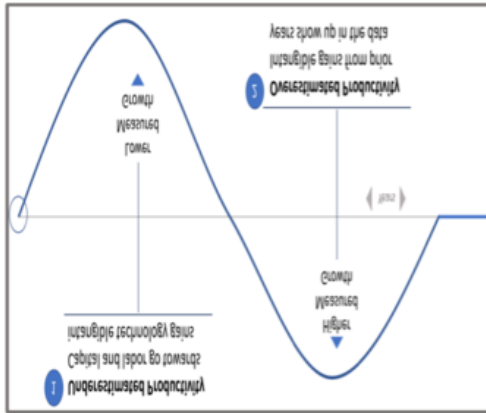


Figure 4: Hype Curve versus Inverted Productivity J-Curve

So how do we minimize the Productivity J-Curve “Underestimated Productivity” ramifications? How do we get to a faster return on investment on these emerging technologies? Enter the economic Learning Curve.

## Understanding the Economic Learning Curve

The economic **Learning Curve** describes the relationship between experience and productivity; how experience accumulated around a specific task drives down the cost of the execution or performance of that task (see Figure 5).

### The Learning Curve

**Learning Curve** is a relationship between experience and productivity; the more times a task has been performed, the less time is required on each subsequent iteration

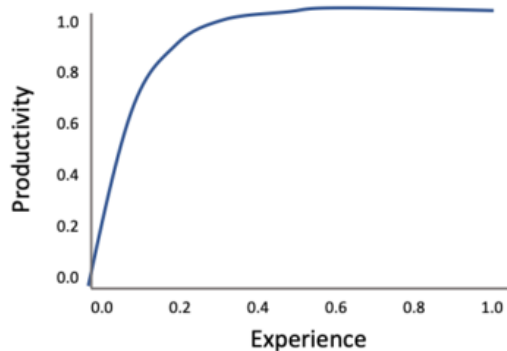


Figure 5: The Learning Curve

The Learning Curve concept was the subject of Malcolm Gladwell's book "Outliers, The Story of Success" that postulated that practicing a specific task for 10,000 hours (20 hours a week for 10 years) is required to achieve world class performance (a rule that has been challenged, but that's not the focus of this blog).

So how do we accelerate the learning curve in order to get the area of higher productivity when we don't have 10,000 free hours to invest? Meet the world of economics.

## Call to Action: Data Science meets Design Thinking, Ruled by Economics

The key to accelerating the economic learning curve isn't just accumulating experience, but also requires a few other items to successfully accelerate the learning curve. Going back to the "Why Accept the Hype? Time to Transform How We Approach Emerging Tec..." blog again, we get the following recommendations:

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**4) Use Design Thinking to Drive AI Organizational Alignment and Adoption.** Embrace Design Thinking as a way to drive organizational alignment and adoption with respect to where and how artificial intelligence technologies can be best deployed to drive meaningful business and operational value.

These four items provide the recipe for prioritizing financial and human investments in those tasks designed to accelerate an organization's Artificial Intelligence learning curve. Ultimately, we can blend the value creation focus of Economics – with the customer, product and operational analytics insights discovery of Data Science and the ideation, alignment and adoption capabilities of Design Thinking – to help organizations of all sizes to exploit the economic value of Artificial Intelligence.

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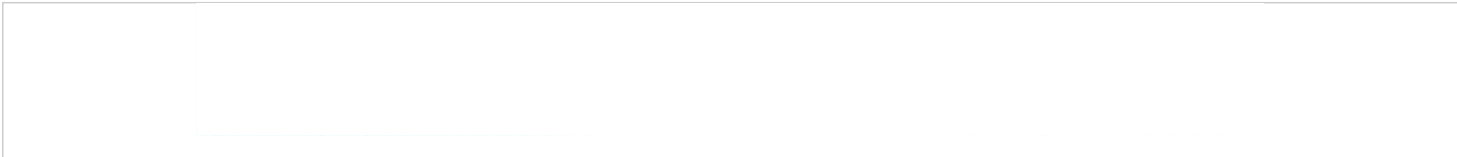
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