

Teaching Supply Chain Analytics

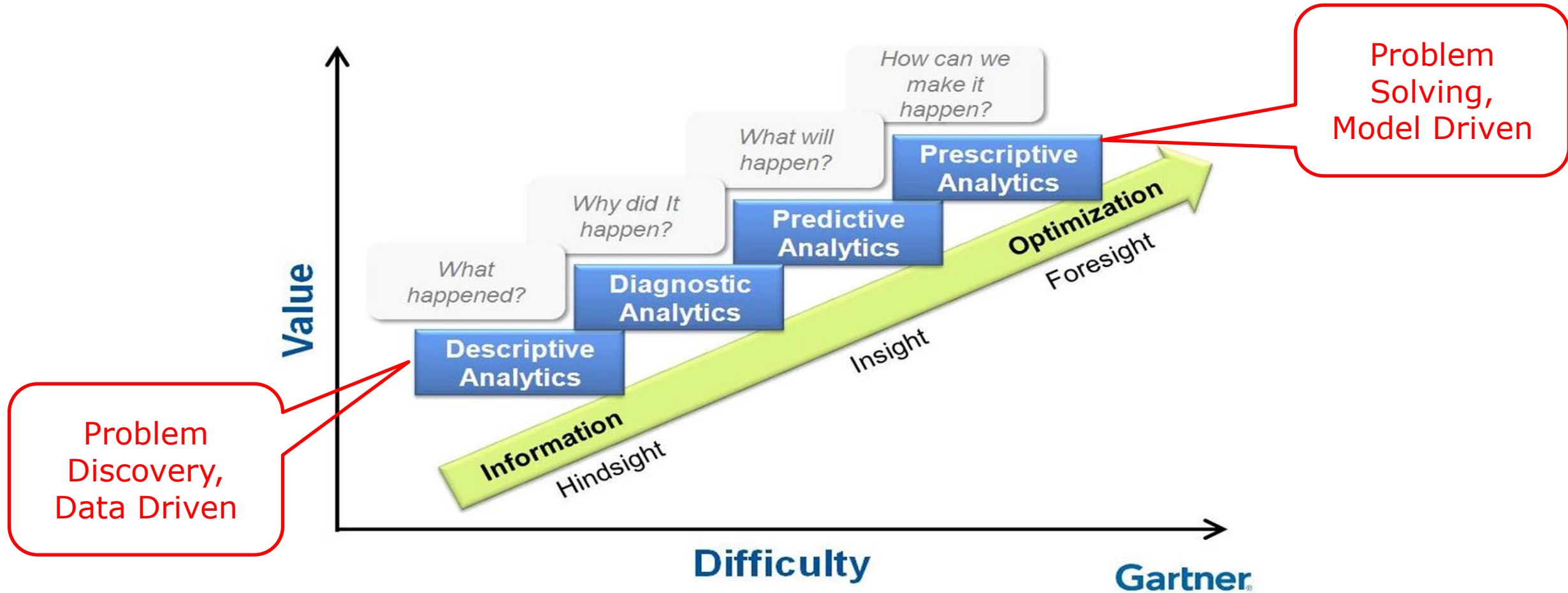
from Problem Solving to Problem Discovery

Dr. Yao Zhao

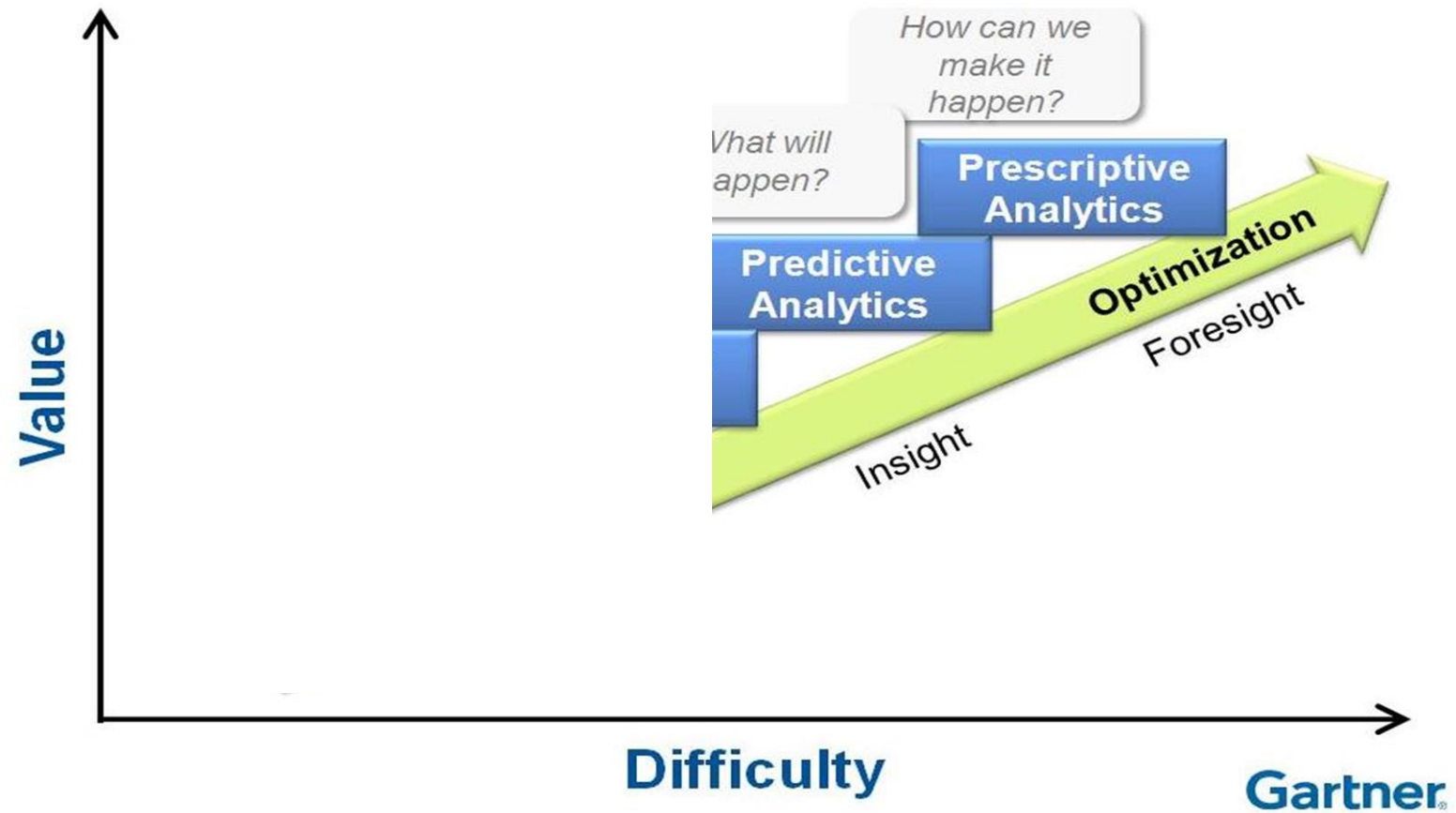
Professor @ Rutgers Business School

<https://yzhao12345.github.io/>

From Problem Solving To Problem Discovery



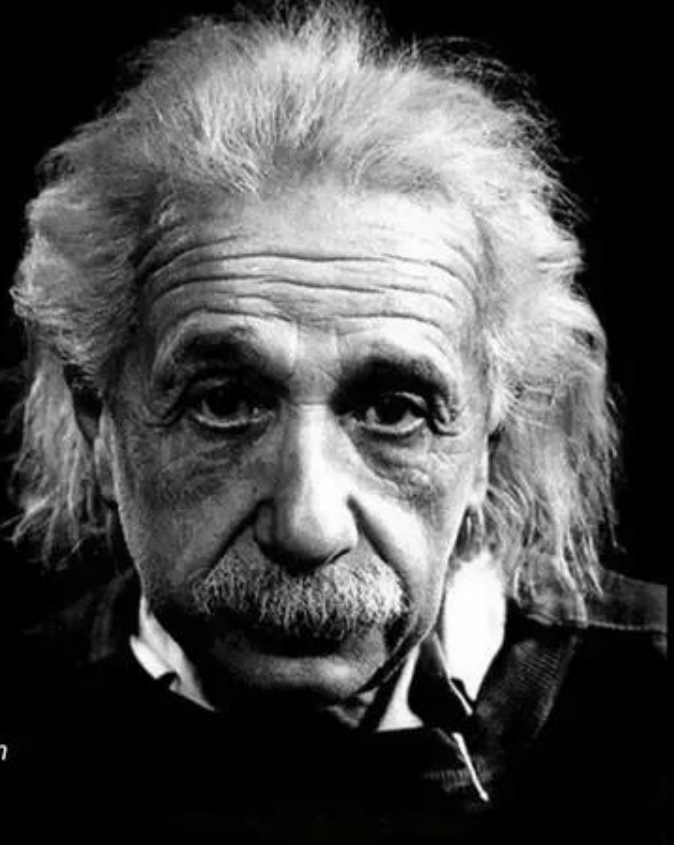
What Do You Teach?



People Thought Otherwise

"If I had an hour to solve a problem and my life depended on the solution, I would spend the first 55 minutes determining the proper question to ask, for once I know the proper question, I could solve the problem in less than 5 minutes."

- Albert Einstein



A problem well stated is a problem half solved.

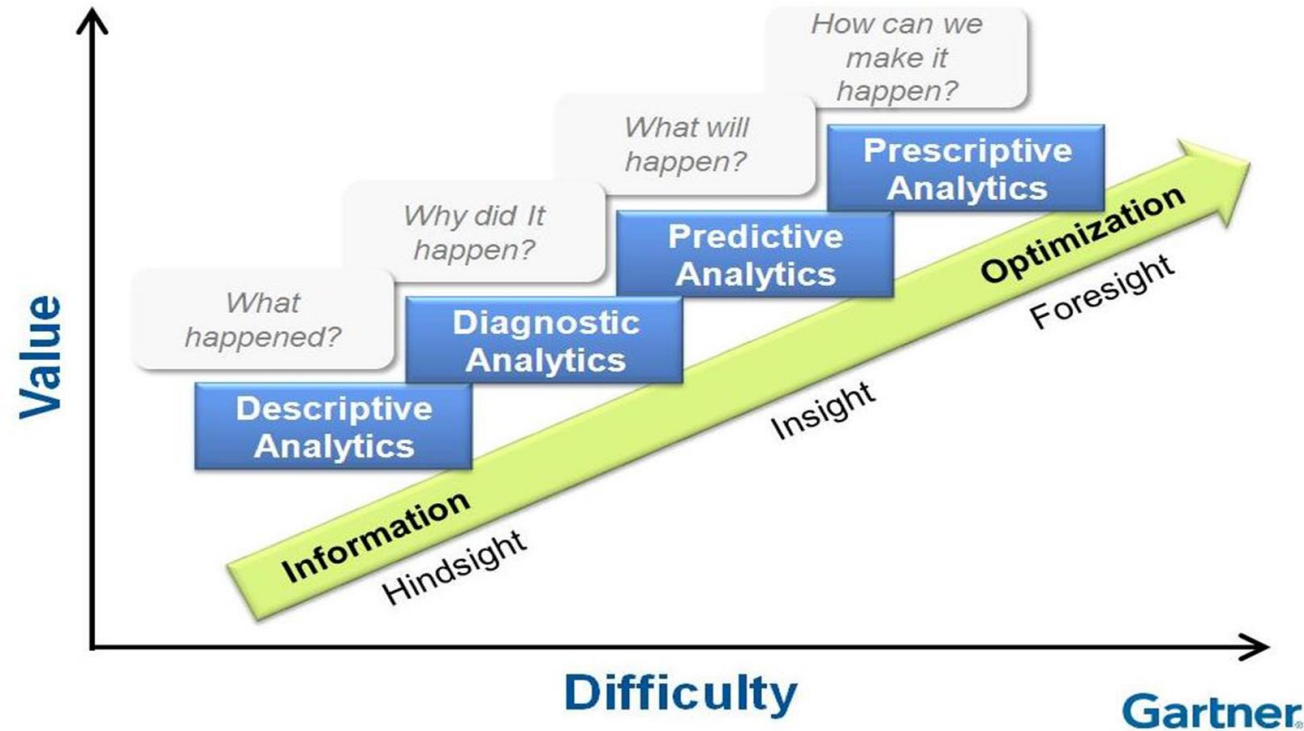
Charles F. Kettering



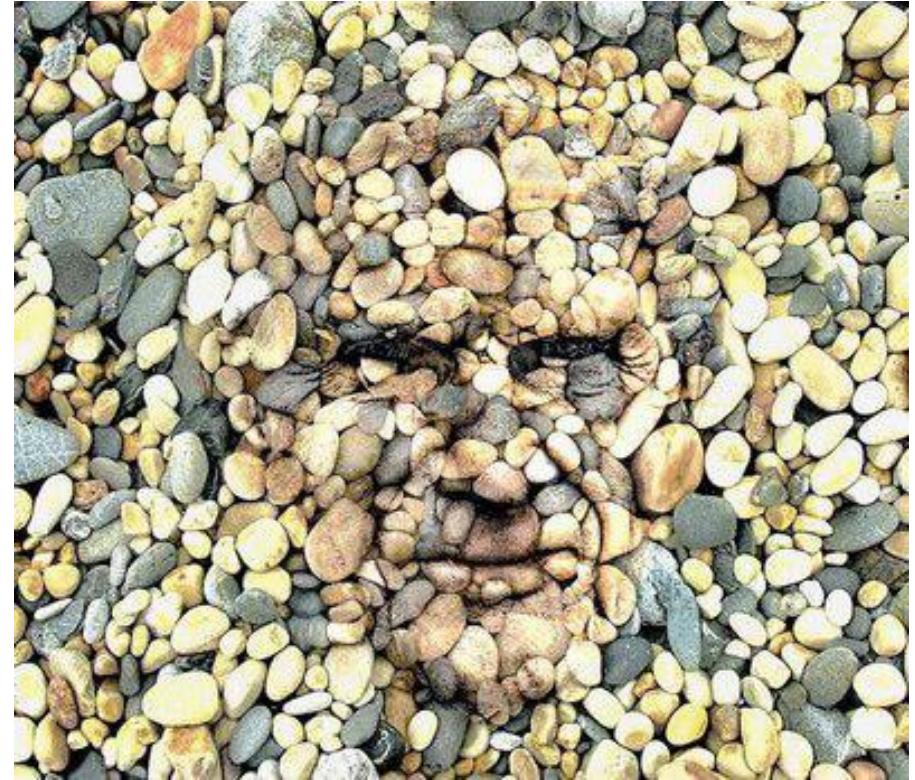
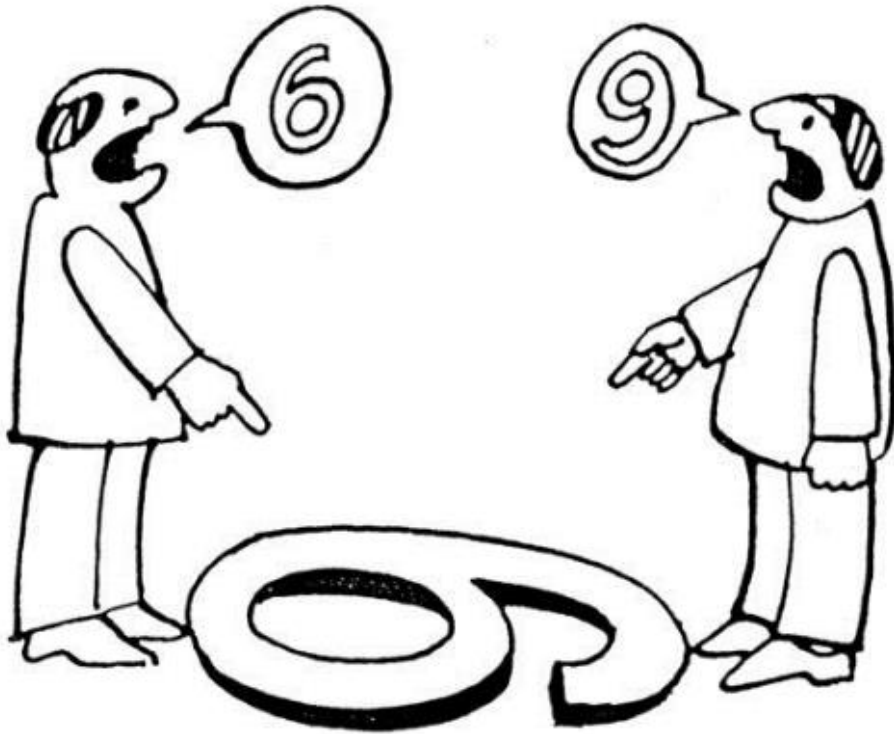
American inventor, engineer, businessman, and the head of research at General Motors from 1920 to 1947

Extremely Valuable & Difficult

Analytics Are No Longer a Nice to Have



Data Interpretation – Transform Data to Insights



Do you really understand the data?

Example 1: Compaq vs. Dell (2001)

- Compaq was the market leader with the largest market share
- Healthy cash flow, many patents
- But Compaq sold itself, abandon its strong brand, Why?

- Computer industry background
 - Computer companies have the same key technologies, CPU, operating systems, etc.
 - Competing on customer service & cost structure



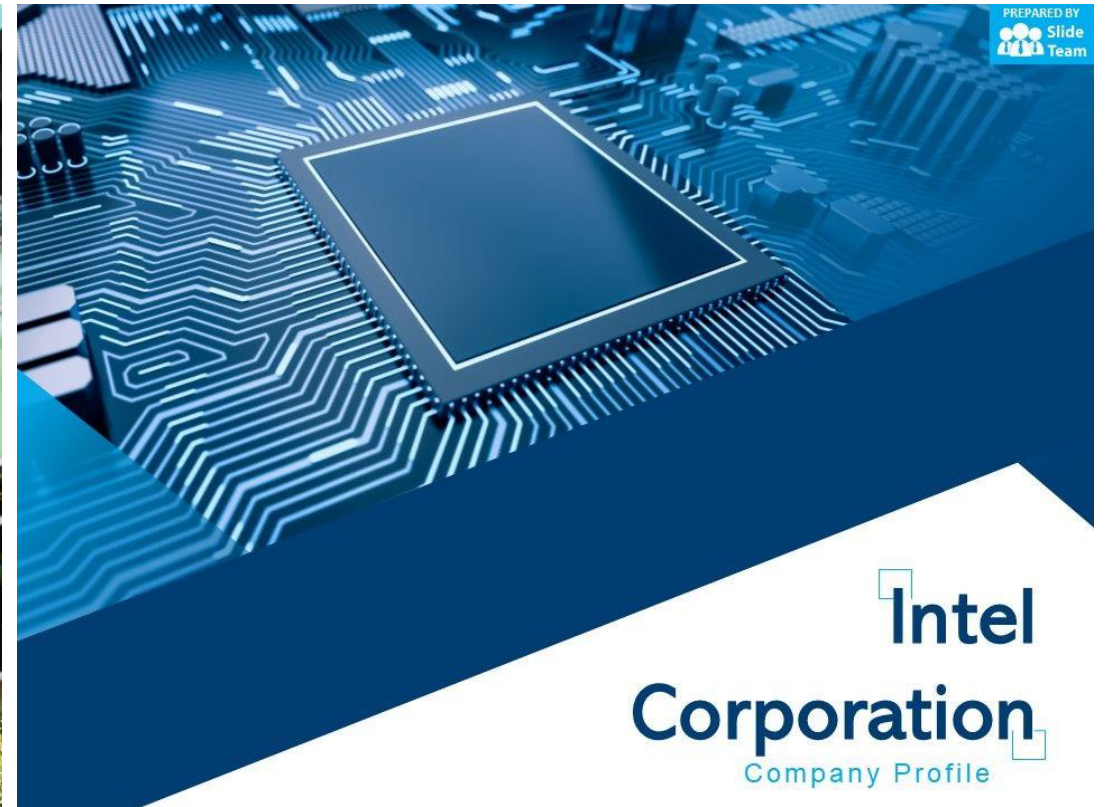
Interpret the Data

Company	Gross Margin	Inv./Sales	Days of Inv.	O.C./Sales
Compaq	23.18%	5.32%	18.64	14.25%
Dell	20.62%	1.42%	4.96	10.08%

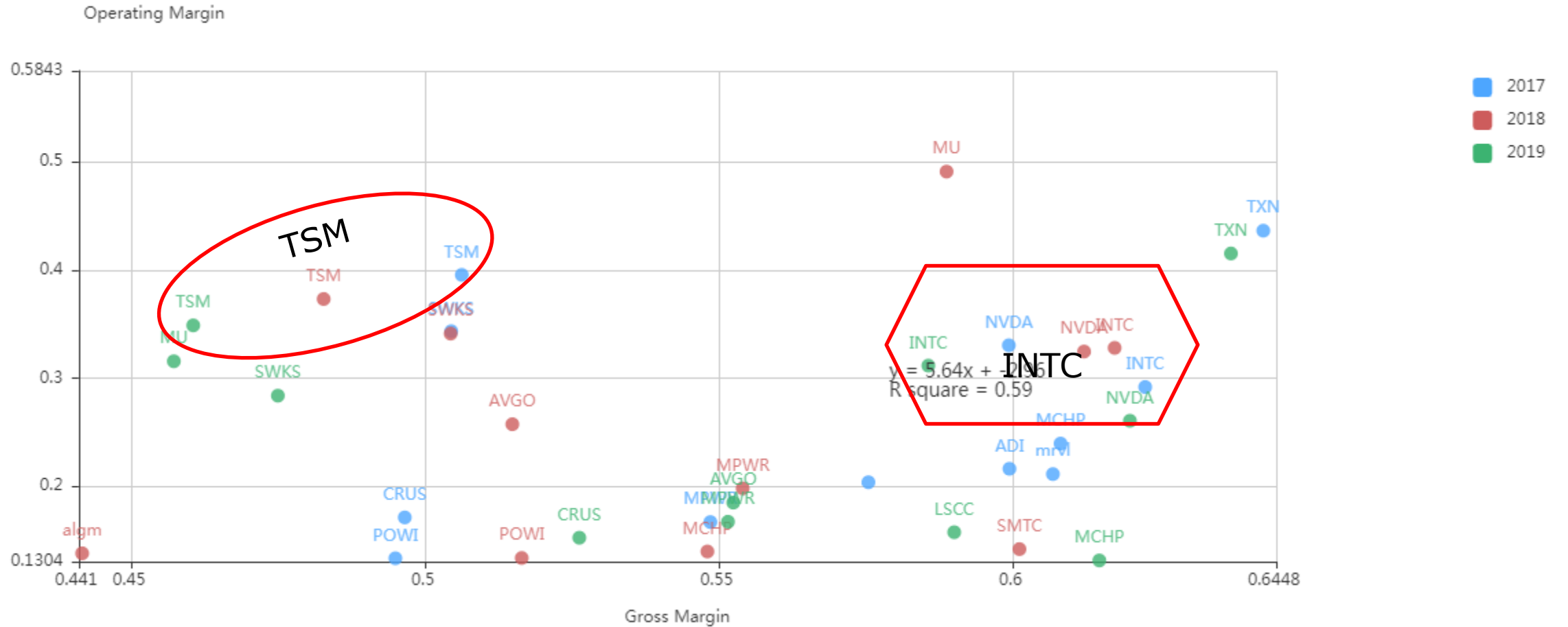
Data comes from <http://yahoo.marketguide.com> (2000)

- Dell outperformed Compaq by 1% in Operating margin
- Why is this 1% so critical that Compaq, the market leader, gave up the competition and sold itself?

Taiwan Semi. Mfg. Co. (TSM) To Open 5nm Factory in Arizona



Taiwan Semi. Mfg. (TSM) vs. Intel Corp. (INTC)



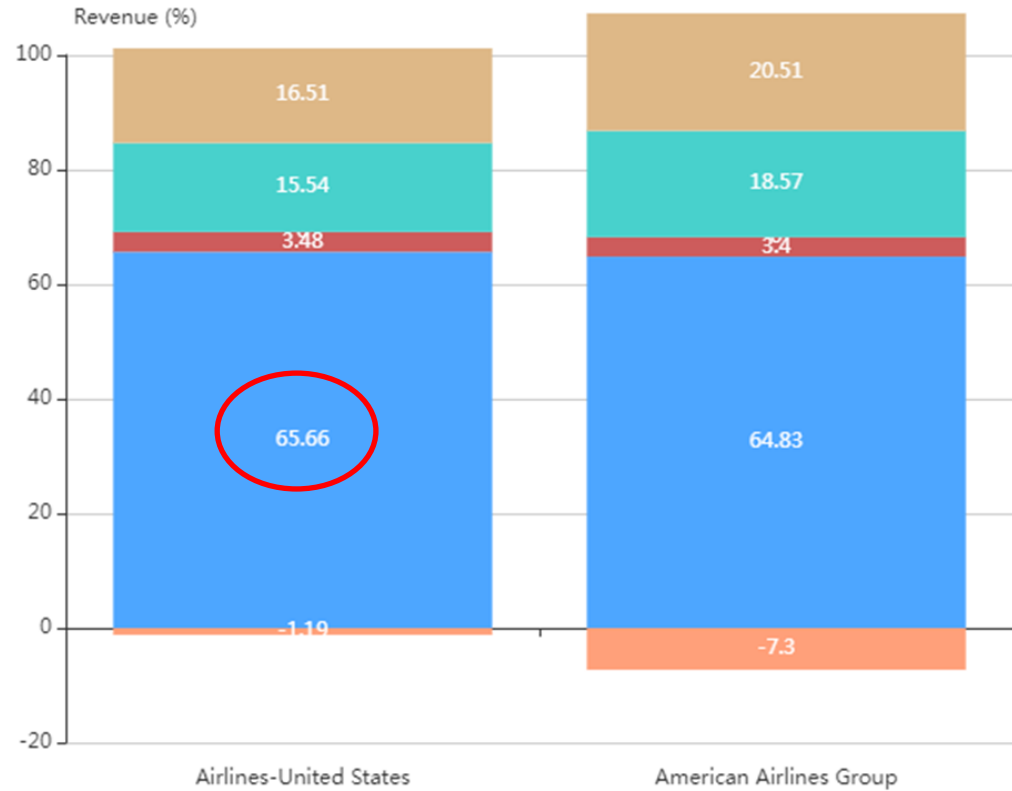
Semiconductors 2017-2019

Example 2: Airlines



"The worst sort of business is one that grows rapidly, requires significant capital to engender the growth, and then earns little or no money," Warren Buffett said. "Think airlines."

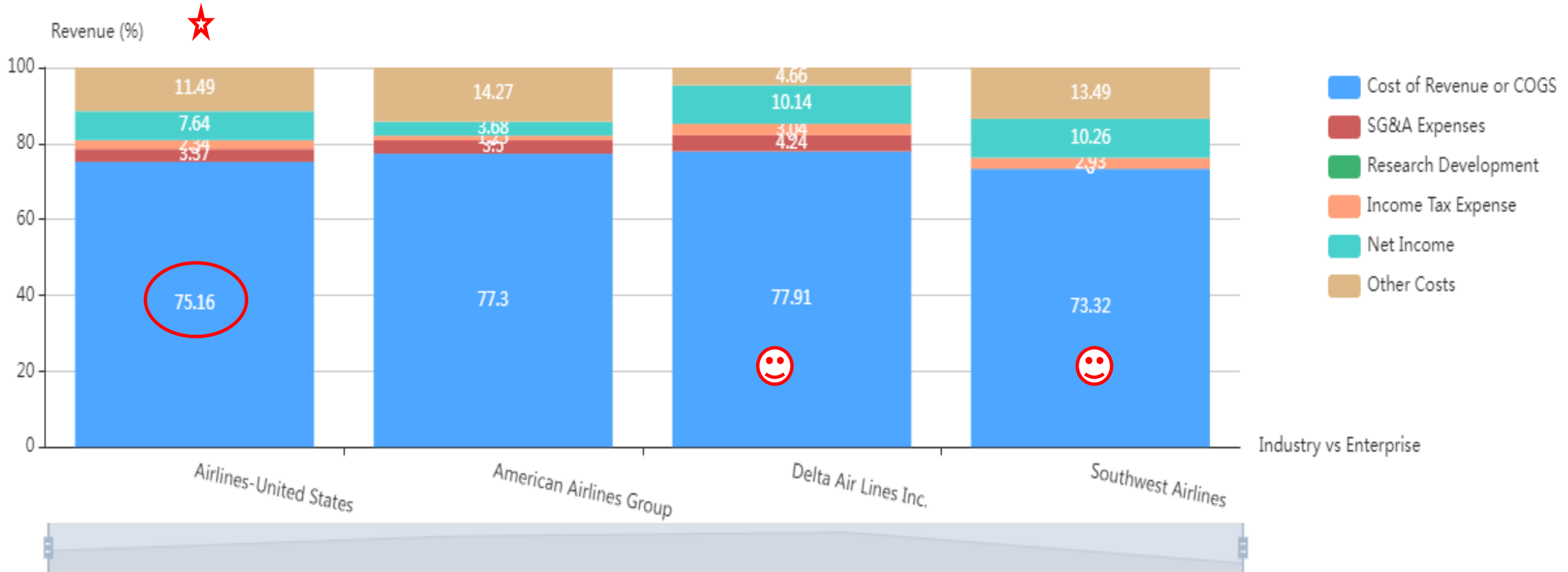
Airlines (US) 2015 vs 2016



2015



2016




US Airlines 2019

Example 3: The Health Care Sector

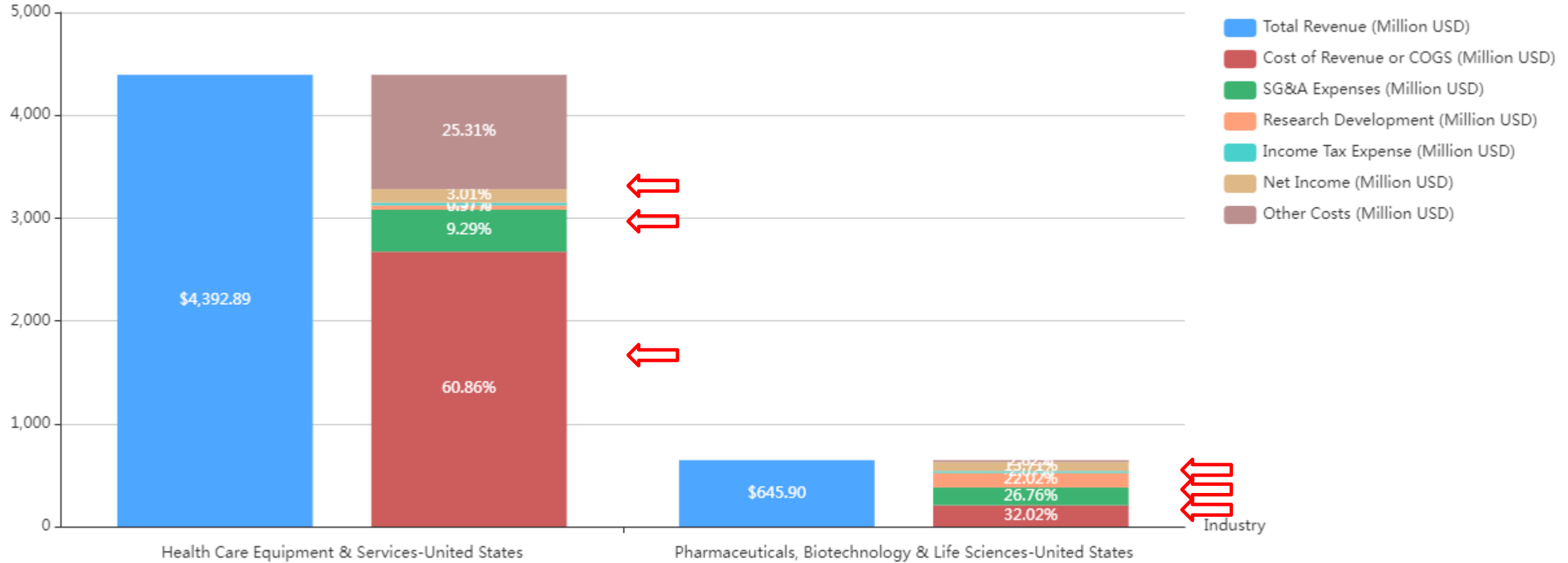


 Pharmaceutical, Biotechnology & Life Sciences

 Health Care Equipment & Services

Raw materials: Outsource or Not?

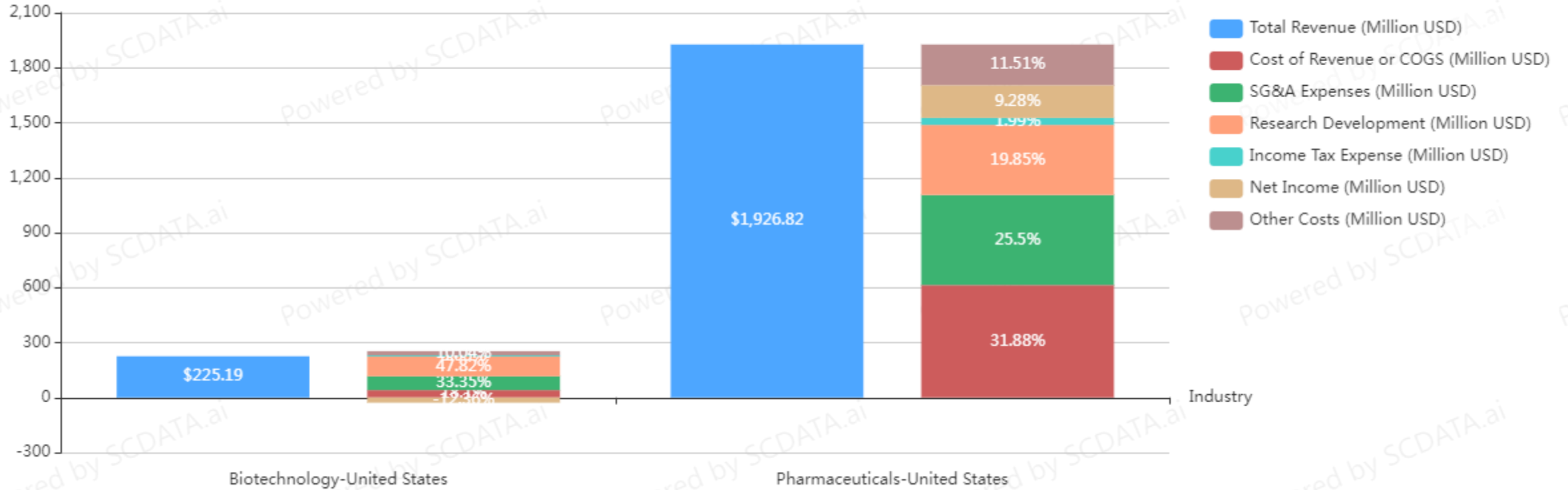
Average (Million USD)



Distinct cost structure / business model!

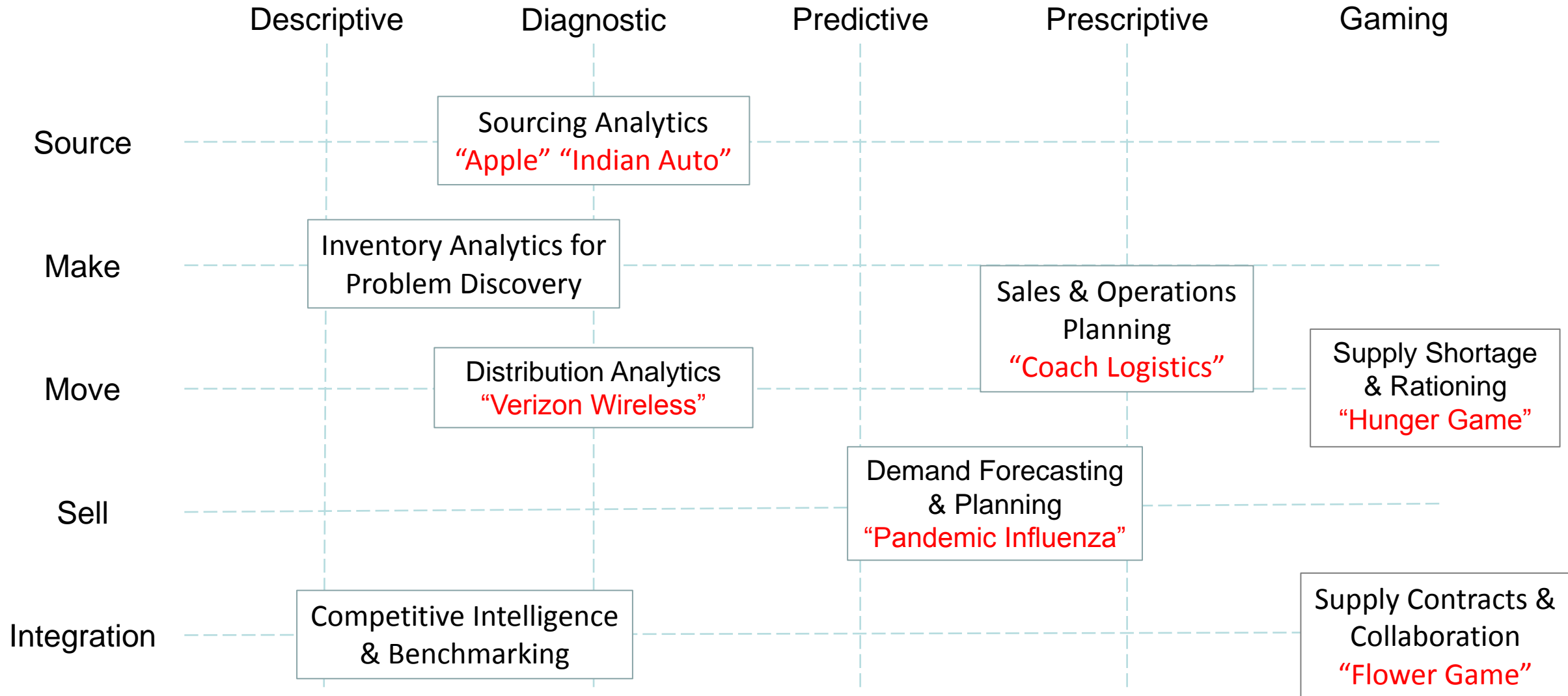
Raw materials: Outsource or Not?

Average (Million USD)



Biotechnology vs. Pharmaceuticals

Teaching Supply Chain Analytics: Modules





If you define the problem correctly,
you almost have the solution.

Steve Jobs

“ quote fancy