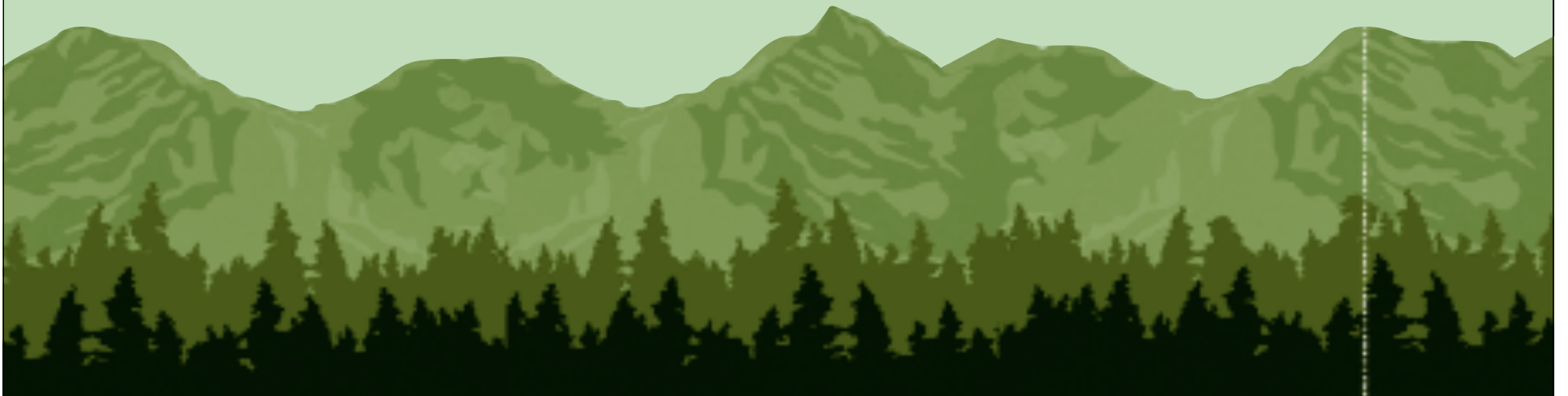


**Professor Andrew Hargadon**

University of California, Davis

# Innovation and Sustainability



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# What is innovation?



# The Great Man Theory

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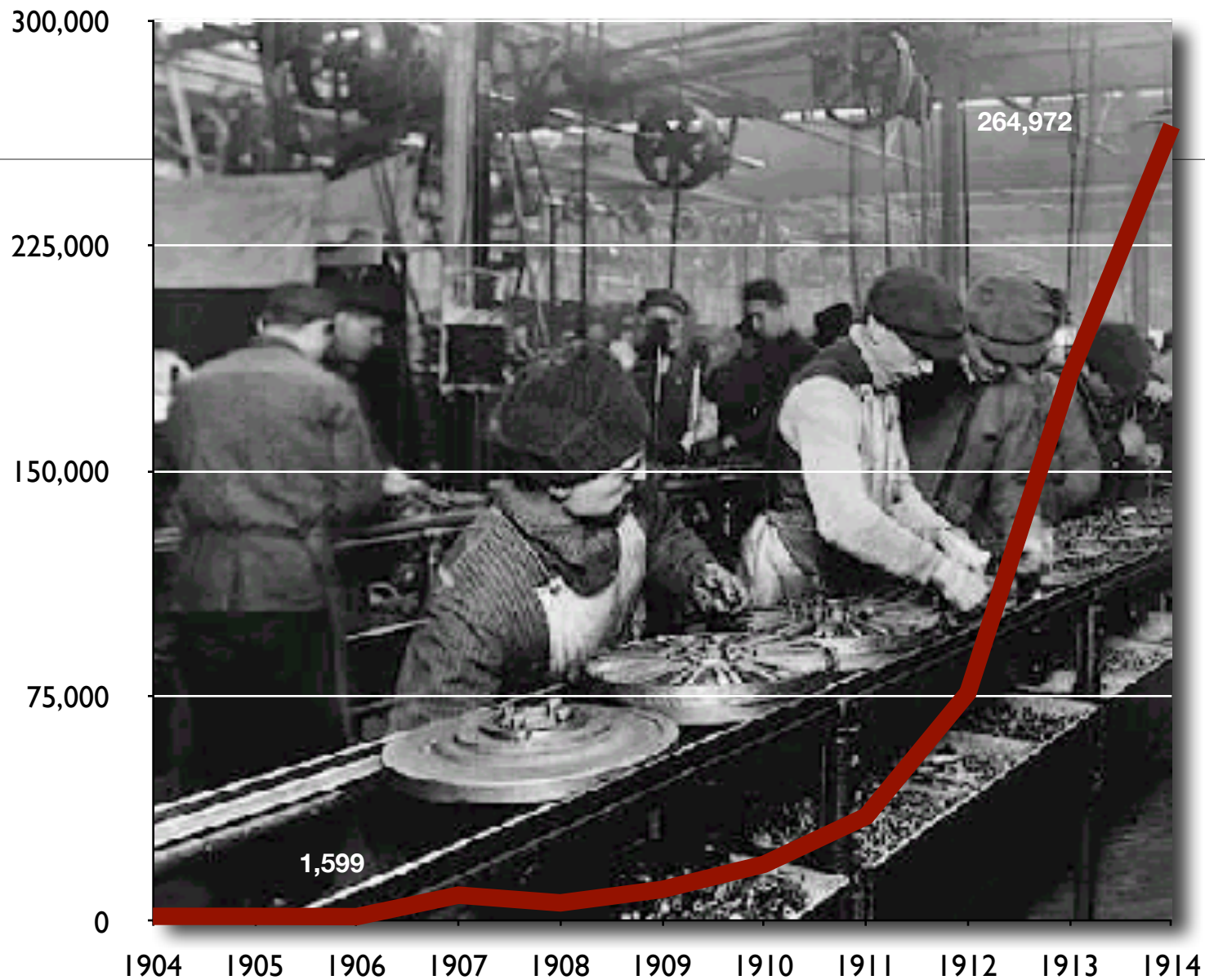
Johann Gutenberg; Printing press (1450)  
James Watt; Steam engine (1769)  
Eli Whitney; Cotton gin (1793)  
Michael Faraday; Electric Motor (1821)  
Cyrus McCormick; Reaper (1831)  
Samuel Colt; Revolver (1835)  
Samuel Morse; Telegraph (1837)  
Alfred Nobel; Dynamite (1866)  
Alexander Graham Bell; Telephone (1876)  
Thomas Edison; Phonograph (1877)  
Thomas Edison; Light Bulb (1879)  
Marchese Marconi; Radio (1895)  
Wright Bros; Airplane (1903)  
Henry Ford; The Automobile (1908)  
Picasso; Cubism (1910)  
Philo T. Farnsworth; Television (1925)  
Alexander Fleming; Penicillin (1928)  
William Shockley; Transistor (1948)  
Watson & Crick; The double-helix (1953)  
Elvis Presley; Rock and Roll (1954)

“*As long as they are not carried into practice, inventions are economically irrelevant. And to carry any improvement into effect is a task entirely different from the inventing of it, and a task, moreover, requiring entirely different kinds of aptitudes... It is, therefore, not advisable, and it may be downright misleading, to stress the element of invention as much as many writers do.*

— Joseph Schumpeter

”





*“I invented nothing new. I simply assembled into a car the discoveries of other men behind whom were centuries of work. . . . Had I worked fifty or ten or even five years before, I would have failed. So it is with every new thing. Progress happens when all the factors that make for it are ready, and then it is inevitable. **To teach that a comparatively few men are responsible for the greatest forward steps of mankind is the worst sort of nonsense.**”*

— Henry Ford

“

*“In a sense, I put together elements that were already there, but that’s what inventors always do. You can’t make up new elements, usually. The new element, if any, it was the combination, the way they were used...The fact that I would do it over and over again, and the fact that I would do it in just the way I did, that made it an invention... The legal wording is “presents an unanticipated solution to a long-standing problem,” that’s an invention and that was clearly PCR.”*

**— Kary Mullis**

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1. Innovation is about  
connecting, not inventing.



How do you become capable of “a minor invention every ten days and a big thing every six months or so”?

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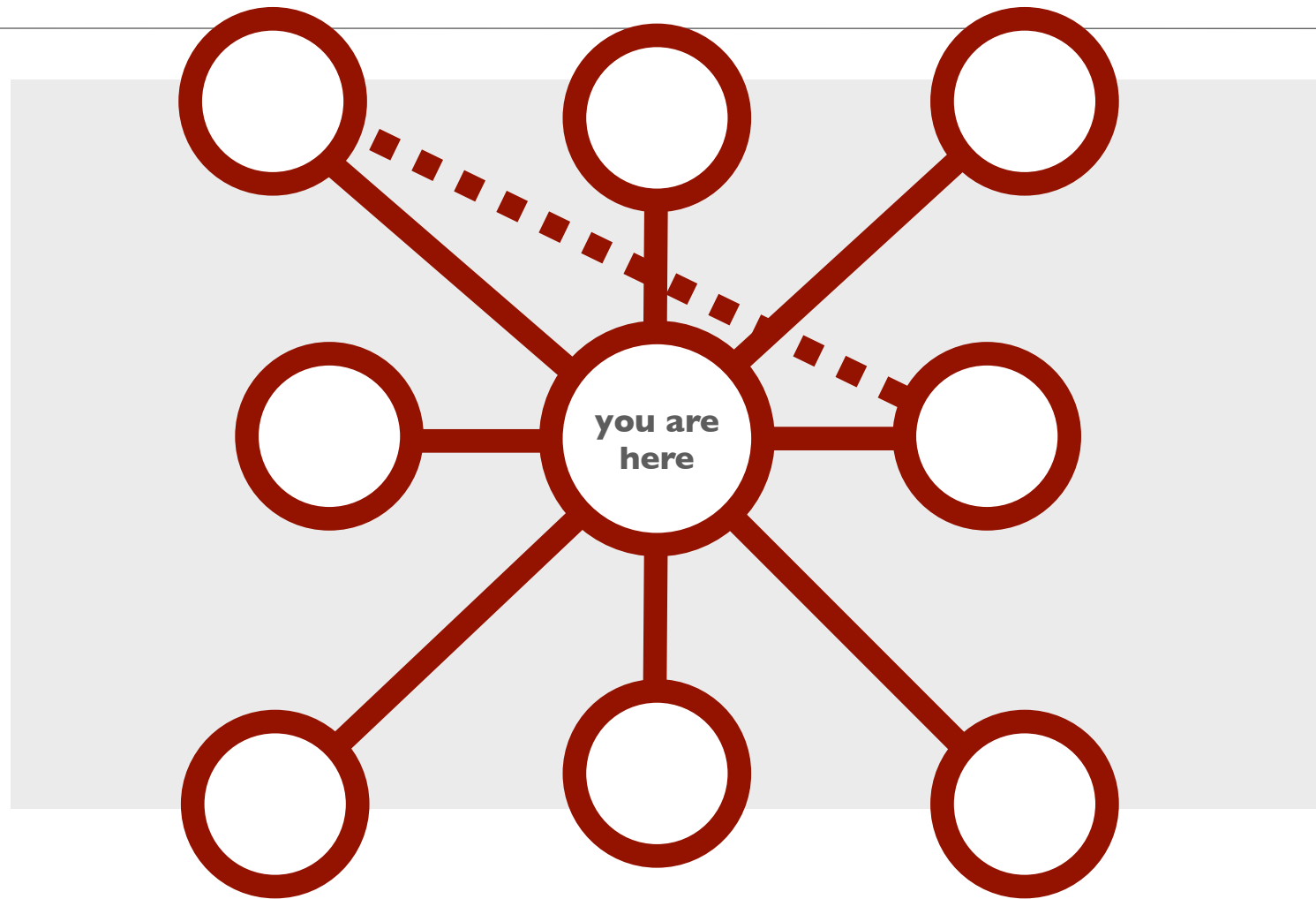
Innovation means moving existing ideas  
from where they're known to where they're  
not—often in new combinations.

***coming up with something new (creativity)***  
*and*  
***getting it done (entrepreneurship)***

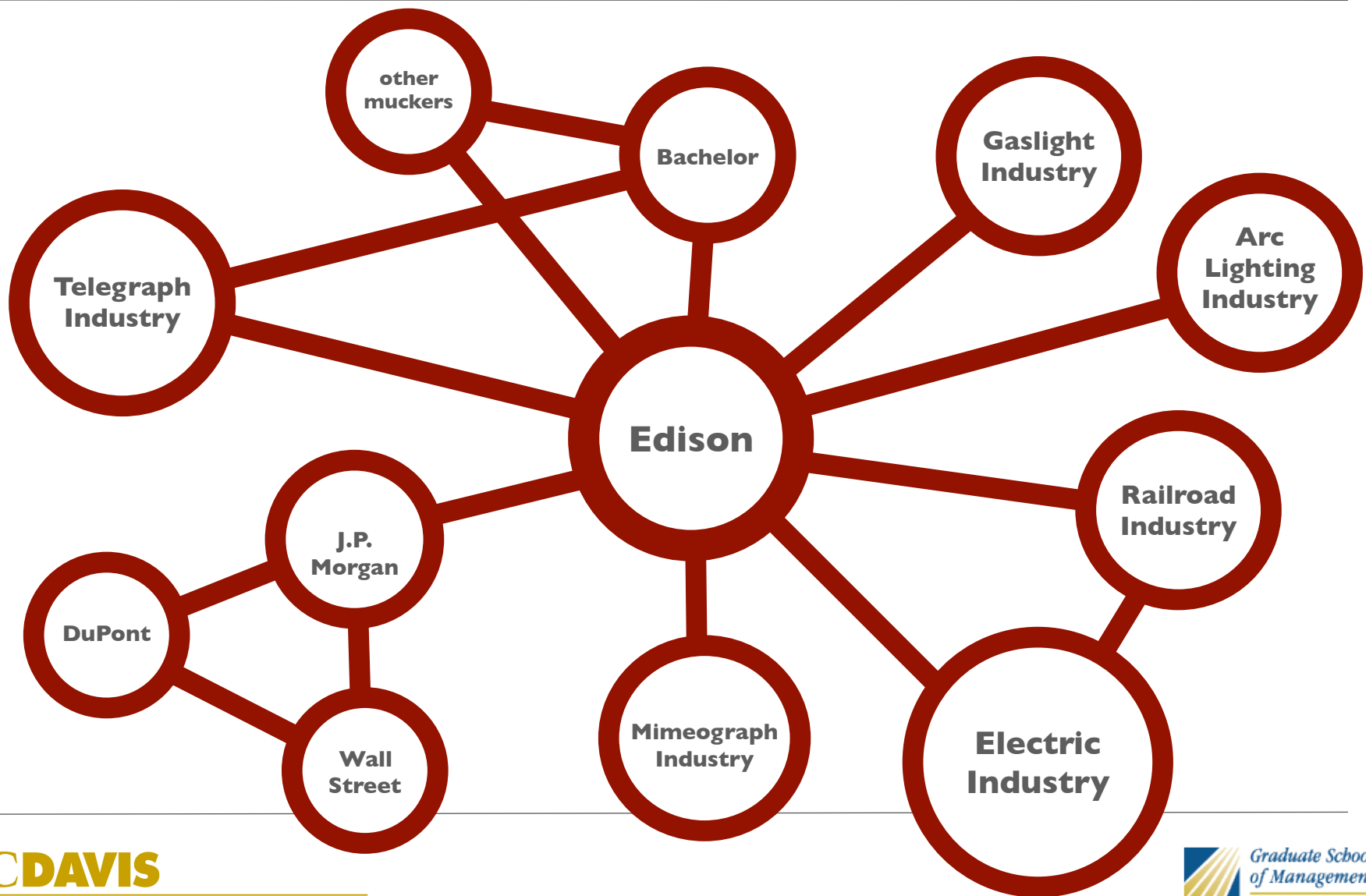
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# Are you creative?







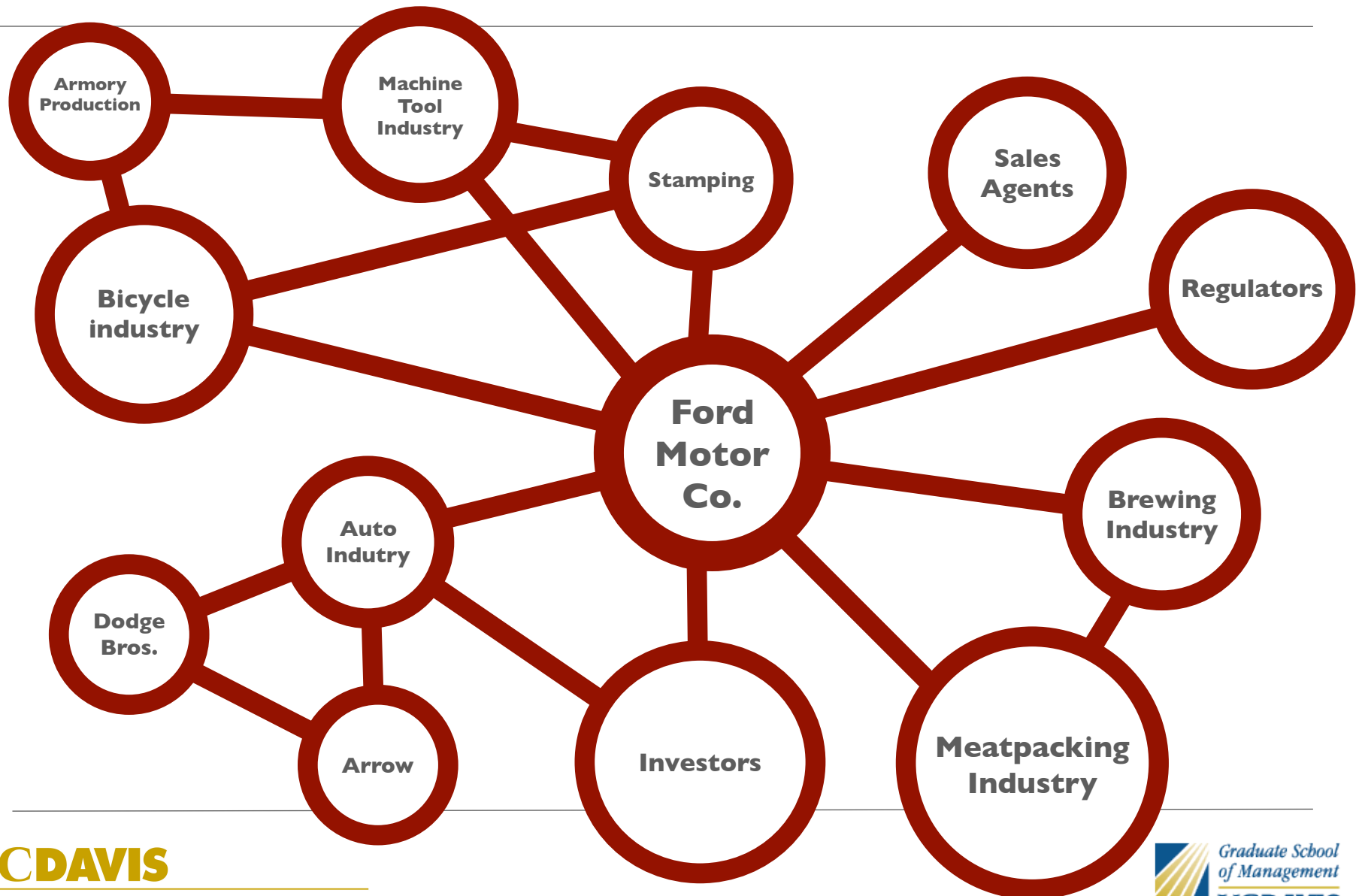




“Objective: *“To effect exact imitation of all done by gas so as to replace lighting by gas with lighting by electricity...not to make a large light or a blinding light but a small light having the mildness of gas”*”

— Thomas Edison





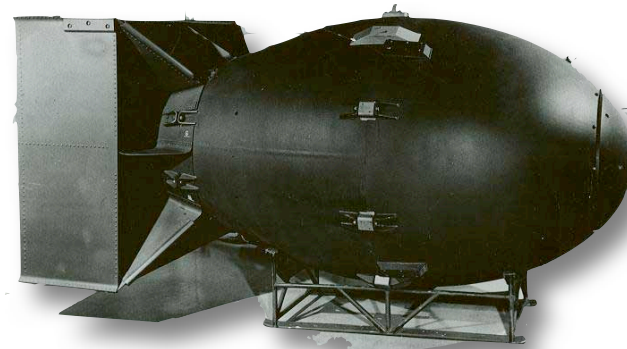
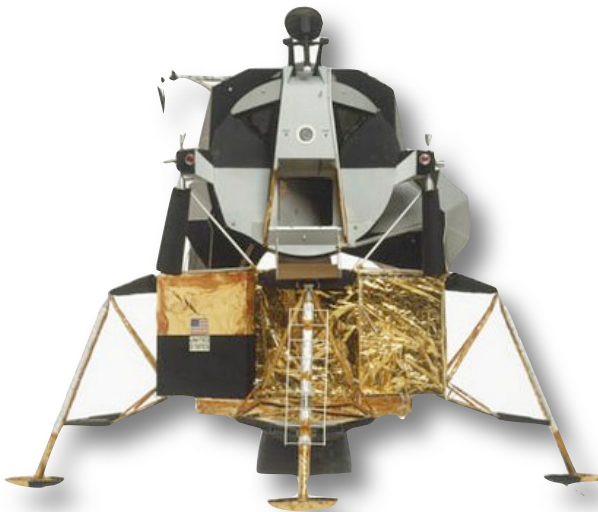
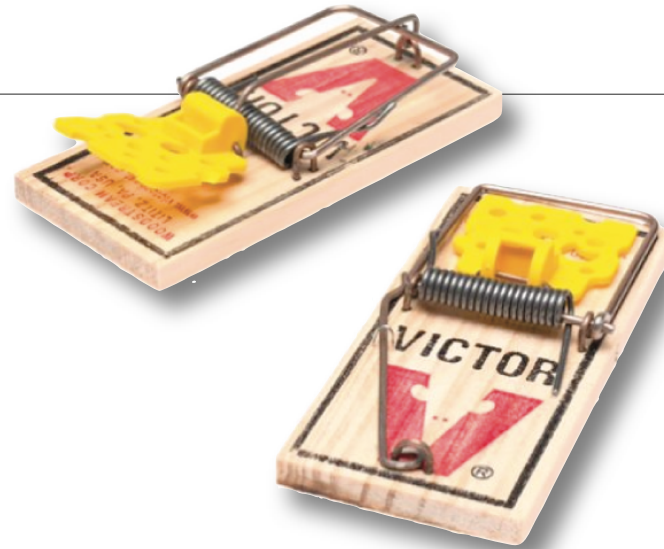
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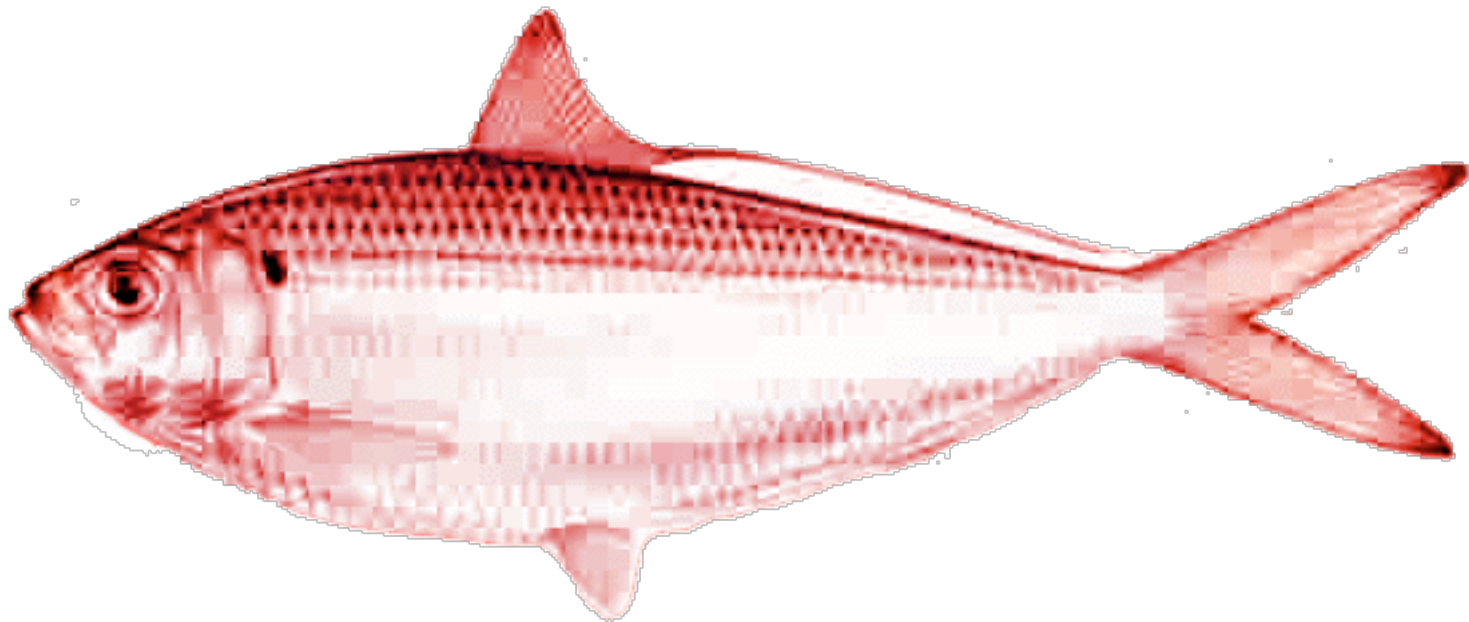
3. Your creativity is a product  
of your network.

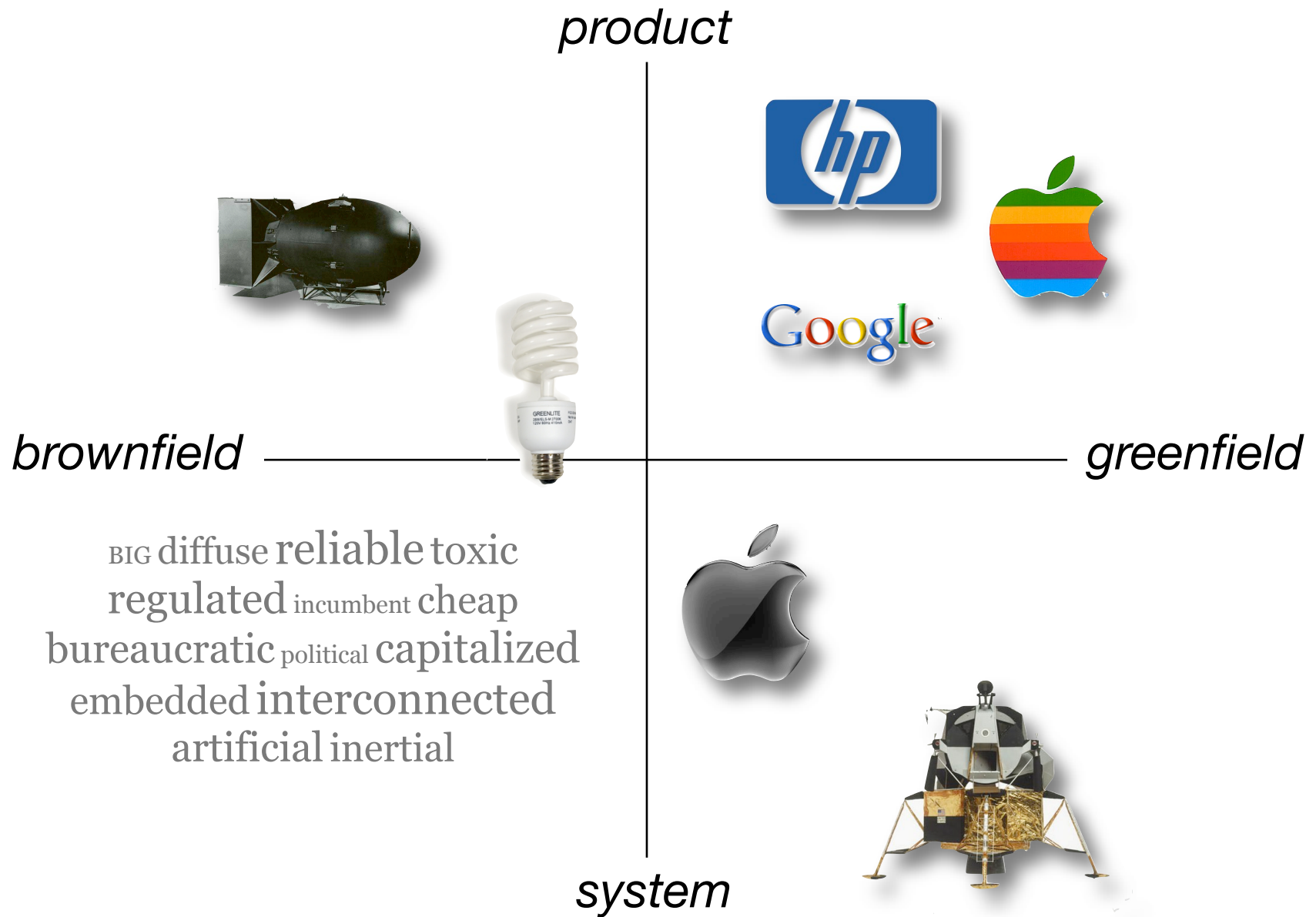
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So how should you pursue  
sustainable innovations?









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# What Detroit Can Learn From Silicon Valley

*Vertically integrated production is a thing of the past. Will the auto industry's catch on?*

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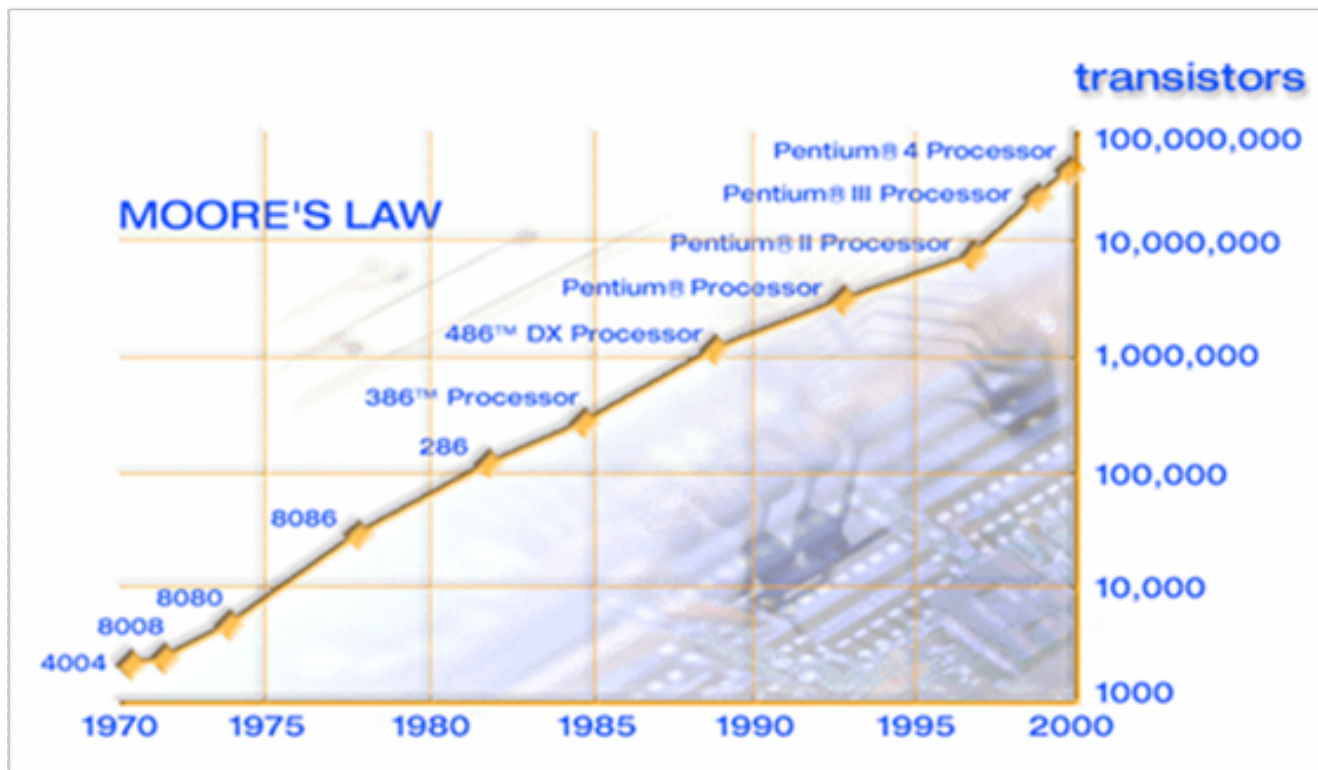


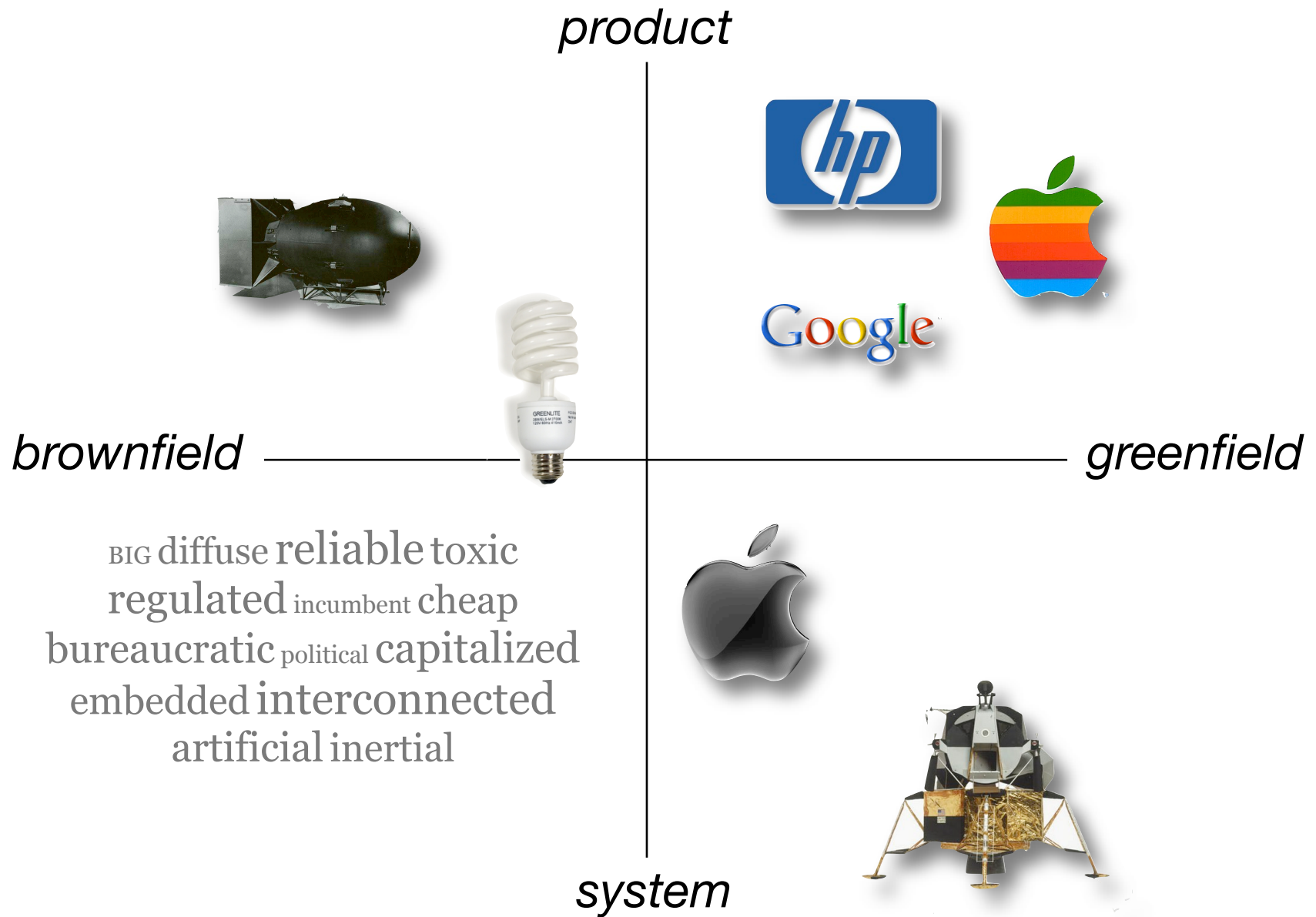
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By ANDREW S. GROVE

Our government has made heavy investments in the U.S. automobile industry. How should it use its influence? It is a difficult question to answer because it appears that the automobile

# Moore's Law







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So how should you pursue  
sustainable innovations?

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Sustainable solutions meet the needs of the present without compromising the ability of future generations to meet their own needs.\*

\* 1987, The Brundtland Commission

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# Three defining characteristics

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Sustainable solutions:

1. Displace current technologies/practices with more sustainable ones;
2. Build from existing ideas, people, and artifacts and address existing needs; and
3. Emerge as evolutions in practice but open revolutionary new paths for change

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Homework:

How does your network prepare you  
to generate sustainable solutions?