DISRUPTION: PAST, PRESENT AND FUTURE

DuWayne Peterson, former EVP & CIO, Merrill-Lynch
Brad Peterson, EVP & CTO/CIO, NASDAQ
September 29, 2016
The Graduate (1967)
“One Word: Plastics”
BOOM TOWN: DETROIT IN THE 60s
BIRTH OF THE MUSTANG

Lee Iacocca
Former Chrysler Chairman
Former Ford President

The Unexpected ...
here today!

New Ford Mustang—$2368
and we’re not kidding!

Ford Mustang
TEST DRIVE
BIRTH OF THE MUSTANG
COMPETITIVE THREAT

Volvo Invented the world’s first 3-Point Safety Belt In 1959.

Then Volvo gave the invention to the world for free.

Nils Bohlin, Gotenburg, Sweden, 1959

1959 GERMAN VOLVO ENGINEER CREATES THE SAFETY BELT

1965 “UNSAFE AT ANY SPEED” CHANGES THE AUTO INDUSTRY
Odd-Even Plans Returning
As Iran Gas Crunch Mounts

By PETER J. BERNSTEIN
WASHINGTON — Odd-even gasoline rationing may be just around the corner in many states because of the increased likelihood of new oil shortages resulting from turmoil in Iran.

Tomorrow, California will become the first state to resume the odd-even system statewide.

In the East, at least four states — New York, New Jersey, Connecticut and Maryland — have contingency plans ready if officials detect new shortages of gasoline.

In New York, energy officials say Gov. Hugh Carey could reimpose odd-even rationing as a conservation measure even before long gas lines or other signs of shortages appear.

And in New Jersey, state officials say Gov. Brendan Byrne may reinstate some form of rationing in response to President Carter’s recent appeal to cut

As long as production remains at current levels, Lichtblau says, there’s a “tenuous supply-demand balance” in the world. But a cut in Iranian output could trigger a worldwide scramble for oil similar to the one that preceded last spring’s gas lines.

So far, there isn’t any hard evidence that Iran is planning to cut production, U.S. energy officials say.

But the Carter administration, emphasizing the uncertainty of the situation, is taking advantage of the crisis abroad to gain support at home for its conservation goals.

One U.S. official said the United States will have an oil reduction in 45 to 50 days — after the last tankers arrive from Iran — of 700,000 barrels a day of crude oil.

He said there must be “an early and permanent” effort to reduce energy consumption and eliminate waste.

percent alcohol — to equal 10 percent of the nation’s total unleaded gasoline consumption. Currently, it equals less than 1 percent.

However, the view is growing both in and out of government that far sterner measures may be needed to cope with the oil crisis.

Many experts maintain there will be further disruptions of the world’s oil supply.

The ferment in Iran, which could degenerate into anarchy or civil war, might impair that nation’s ability to produce any oil.

Tumult in Iran also could spread to other oil-producing states in the Middle East. Although production has been running at high rates, a number of these Middle Eastern countries — including Saudi Arabia — have suggested they might cut back.

Meanwhile, the chaos in Iran is

1973 OIL CRISIS

1970s FOREIGN COMPETITION – FUEL EFFICIENT CARS
PRESENT
INNOVATION IS CENTERED IN...
RISE OF THE ATM AND A TECHNOLOGY PIONEER AND LEADER
RISES FAST IN THE FINANCIAL SERVICES INDUSTRY

John Reed
Former CEO of Citigroup
Chairman, Massachusetts Institute of Technology Board of Trustees
ATM GROWTH AND USAGE IN THE US PLATEAUS

Source: CreditCards.com
SMARTPHONE AND APP INNOVATION OBVIATES NEED FOR CASH

INNOVATIONS IN TECHNOLOGY REPLACE MOST ATM FUNCTIONALITY
WHAT WAS ONCE YOUR STRATEGIC ADVANTAGE CAN BECOME YOUR ALBATROSS

• ATM transactions are declining, and the number of ATMs have plateaued.
• These firms have collectively 81,000 ATMs at a conservative annual operating cost of approximately $1 billion.
FUTURE
Identify the landscape
TECHNOLOGY TRENDS SHAPING FINANCIAL SERVICES

Innovations Advancing The FinTech Landscape

- Cloud Services
- Smartphone Ecosystem
- Blockchain
- Cryptography
- Quantum Computing
- Machine Intelligence
- Big Data
- Microservices
- Augmented Reality / Virtual Reality
Be aware of exponential improvements in technology and their application to your industry
Law of Accelerating Returns is the reason why information technologies grow exponentially, and they’ll not only impact businesses but what makes us human.

Information technology progresses exponentially...30 steps linearly gets you to 30. 1, 2, 3....you’re at 30. With exponential growth, it’s 1, 2, 4, 8...step 30, you’re at a billion.

Current exponential growth of computing will continue and human-level intelligence will be eclipsed as early as 2029.
Technology continues to advance exponentially

### 2029

- **Software is autonomously learning and creating new knowledge**
- **A $1,000 computer is now 1,000x more powerful than the human brain**
- **VR eyeglasses and headphones are replaced with computer implants**
Apply the Varian Rule to round out your technology vision
A simple way to forecast the future is to look at what wealthy people have today; middle-income people will have something equivalent in 10 years, and the rest of the population will have in an additional decade.
What do wealthy people have access to? Private Drivers / Chauffeurs...
Linear thinking companies get displaced by exponential technologies.

**Taxi Industry**

Uber is riding the exponential curve and disrupting the transportation industry!

- **Sensors**
- **Lidar**
- **Radar**
- **GPS**
- **Guidance**

**Everyone’s Private Driver**

Uber will eventually replace all its drivers with self-driving cars.

**Surge Pricing**

**Clustering Algorithms**

**Smartphone**

**Mapping Software**

**Uber**

**EVERYONE’S PRIVATE DRIVER**
Internet of things • Google Self-Driving Car • Tesla

Tesla Model 3: 400,000 preordered units that representing a sales backlog of $14 billion.
**The Art of the Possible**

**Linear Growth**

*Financial Industry*

Linear thinking companies get displaced by exponential technologies.

*Venture Capital*  
*Wealth Management*  
*Hedge Funds*

**Exponential Growth**

*AI Enabled Financial Services*

*Investments Optimized for Taxes and Long Term Return*  
*Smart Alpha*  
*Daily Living and Life’s Expenses*  
*Robo-advised Asset Allocation and Diversification*

*ETFs*  
*Mutual Funds*
Smart Phone + Uber + Waze + Google = AMPLIFIED DISRUPTIVE TECHNOLOGY IN TRANSPORTATION

Direct Investor Interaction + Nasdaq Financial Framework + Electronic Execution and Recordkeeping (Blockchain) = AMPLIFIED DISRUPTIVE TECHNOLOGY IN MARKETS
As you are thinking about your future

1. Identify the landscape
2. Be aware of exponential improvement
3. Apply the Varian Rule to round out your technology visions

And lastly, always ask yourself....
WHAT’S TODAY’S PLASTIC?