

How Technology Changes Business

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Exponential Evolution of Technology

Deconstruction of the value chain

Technology makes the difference

Exponential improvements in technology has impact on business, which we will discuss from two sides

1. Impact on traditional business architecture of all industries
2. Impact on individual companies.

Digital Transformation is a process or a journey involving many building blocks and people in the company.

Exponential Evolution of Technology

Human minds are more adopted to estimating linear change than exponential change.

A Log Scale will have a straight line for exponential change.

Digital Technology in the last few decades has progressed in the same way, exponentially.

It all boils down to 3 fundamental laws addressing the core concepts of digital information processing, communication and storage:

1. **Moore's Law:**
 - Every 18 months processing power will double.
 - Originally, it says so about the number of transistors you can fit on a silicon chip
 - The reality of the law is challenged since under high density, you see quantum effects, which negatively affect the working of processor.
 - However, this is a temporary challenge, since we can always make modifications to the chip such as using different material or design, or even move on to quantum computing.
2. **Butter's Law:**
 - Communication speed will double every 9 months.
3. **Kryder's Law:**
 - Amount of data stored per cm² of hard drive will double every 13 months
 - Trend has slowed down to doubling every 16-17 months

Of course, these laws describe the theoretical potential of technology. **Only part** of this potential actually goes into **performance improvement** for the mass market devices. The **other part** will go into consumer **cost reductions**, so that technology becomes not only better, but also economical.

Since we are conditioned to understand linear progress, we always underestimate the progress. Hence, even companies many times **underestimate** or are even blind to the impact of **digital technology**.

If *technology improves exponentially*, but *companies progress linearly*, there is a widening gap between the two. The gap shows what value can be delivered using current technology and the value that is currently being delivered by the company. Innovative startups try to fill this gap by providing consumers solutions using the latest technology in a very different way, such that incumbent players in market are unable to see or even fully understand.

Exponential increase of processing power, communication speed and storage capacity is foundation for today's digital transformation

Gap between linear and exponential developments is usually filled by disruptors

Deconstruction of the value chain

Industry architecture defines a company's internal structure, processes and ultimately its business strategy.

Historically, architecture was a vertically integrated **value chain**. It is a chain of suppliers, producers and distributors, all aligned vertically. A company would usually integrate all the steps in the chain and form an oligopoly with other integrated companies. This worked back then, since

1. transaction costs were very high.
2. competitive advantage was driven by scale.

Digital Technology made it easier and cheaper to accumulate, process and communicate information. This reduced the transaction costs. Links in the value chain became loose and eventually started to break-up. This gave rise to a stacked architecture, where each layer still performs its own independent function, but it now interacts with other players in the same layer, and the rest of the layers.

This independence and inter-operability allowed each player to succeed with its own success factors. New services can now emerge and try their luck in market, prosper or die without affecting the lower stacks. Hence, competitive landscape has changed dramatically. Incumbent players can now be attacked by new, small players. Each layer can have its own economics, which can be very different.

Shift from vertical value chains to stacked architecture

Players in the different layers compete on different success factors: scale at bottom, innovate at the top

New players disrupt by attacking specific layers of the stack

Technology makes the difference

Solow Computer Paradox:

"You can see the computer age everywhere but in productivity statistics"

If we look at the last few decades, the GDP growth has not been proportional to Technology spending. Technology spending is the total money spent on hardware, software, data centers, networks and human resources. In other words, *technology investments didn't help us create more economic value.*

But this doesn't mean that companies stop spending on IT. Here are the theoretical reasons:

1. Maybe technology has beneficial impact but not on GDP, which is narrow metric.
2. Maybe it had a positive impact, which will show only over long term.
3. Maybe it had positive impact in short term, but neutralised by other factors or agents.

There's also some empirical proof. Top performing companies tend to have higher technology intensity index compared industry average. Digital leaders in banking industry outperform laggards in customer loyalty and ultimately in revenue growth.

Digital technology has visible impact on business performance

Some impact is neutralised by increasing complexity

Right technology investments bring higher revenue growth and profitability