Technology & Innovation

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All companies have technology.

Technology means the process by which an organisation transforms labour, capital, materials and information into products and services of greater value.

This concept of technology therefore extends beyond engineering and manufacturing to encompass a range of marketing, investment and managerial processes. Innovation refers to a change in one of these technologies.

Extending further one can further classify technologies as

(A) Sustaining Technologies (B) Disruptive Technologies

- These concepts are very different from the Incremental - versus - Radical distinction.
- Pace of technological progress can, and often does, outstrip what market needs. This means that the relevance and competitiveness of different technological approaches can change with different markets over time.
- Customers and financial structures of successful companies colour heavily the sorts of investments that appear to be attractive to them, relative to certain types of entering firms.

Sustaining versus Disruptive Technologies

Sustaining technologies foster improved product performance. Some sustaining technologies are radical in characters while others are incremental. What all sustaining technologies have in common is that they improve the performance of established products, along the dimensions of performance that main stream customers in major markets have historically valued. Most technological advances in given industry are sustaining in character.

However, occasionally disruptive technologies emerge; innovations that result in worse product performance at least in near term. Disruptive technologies bring to a market a different value proposition than had been available previously. Generally, disruptive technologies underperform established products in mainstream markets. But they have other features that a few fringe and generally new customer value. Products based on disruptive technologies are typically cheaper, simpler, smaller and frequently more convenient to use. Transition were disruptive technologies relative to vacuum tubes. Small motorcycles introduced by Honda, Kawasaki and Yamaha were disruptive technologies relative to powerful Harley - Davidson and BMW. There are few more examples.

Sustaining Technology	**Disruptive Technology**
Silver halide Photography film	Digital Photography
Wireless telephony	Mobile Telephony
Printed Greeting Cards	Free Greeting Cards, downloadable over the internet
Classroom and Campus based instruction	Distance education, typically established by Internet
Offset Printing	Digital Printing
Manned fighter and bomber aircraft	Unmanned aircraft
Cardiac bypass surgery	Angioplasty
Wooden Furniture	Plastics Furniture
Steel or Asbestos Pipes	Plastics Pipes
Jelly filled telecom cables	Optical fiber cables
Metal luggage	Moulded luggage from Plastics

Some managers and researchers familiar with these ideas are in anxious state because the evidence is very strong that even the best managers have stumbled badly when their markets were invaded by disruptive technologies. Most urgently, they want to know whether their own businesses are targets for an attacking disruptive technologists and how they can defend their business against such an attack before it is too late.

Other interested in finding entrepreneurial opportunities, wonder how they can identify potentially disruptive technologies around which new companies and markets can be built.

(Many companies which are well managed and have their competitive antennae up, listen to their customer, invent aggressively in new technologies and yet lose market dominance.) Many companies which are weak stumble for many reasons as

- Bureaucracy
- Arrogance
- Tired executive blood
- Poor planning
- Short term investment horizons
- Inadequate skills and resources
- Bad luck

Good Management can lead to Failure and the failure framework is built upon three findings

1) Sustaining Technologies & disruptive technologies

2) Pace of technological progress can outstrip what markets need. This mean that relevance and competitiveness of different technological approaches can change with different markets of over time.

3) Customers and financial structure of successful companies colour heavily the sorts of investments that appear to be attractive to them, relative to certain types of entering firms.

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