



Technology Development - Challenging Theories

The significant improvement in economics and social structure, particularly in Europe, the Asia-Pacific region and North America, over the past 200 years can be closely linked to three, science-based revolutions that have occurred during the same period:

- The Industrial Revolution of the 19th and early 20th centuries created a new world of consumerism by making the exploitation of raw materials less labour intensive and therefore more cost effective.
- With the Information Revolution of the mid- to late-20th century, emphasis turned away from industrial processing and towards the central role that information plays as an enabler in economic and social reform.
- Today, the Knowledge Revolution recognises that understanding is the key in maximising the benefit to be obtained from the information we have or can generate.

In each case, technology has been the engine that has driven these Modern Revolutions. Today, innovative technology is more in demand than at any time in history. Entrepreneurial scientists should therefore be forgiven for thinking that good technology will always find a market. Unfortunately this simply is not the case as many factors conspire to make it increasingly difficult to bring technologies to market:

1. Size Matters

Over the past 100 years, companies that identified the opportunities presented by the Modern Revolutions have typically had access to considerable wealth and have tended to grow into large multi-nationals with multi-billion dollar revenues and increasingly aggressive growth aspirations. However, as a rule, the larger these companies have grown, the less able they have become to maintain the very essence of their success. Innovation and risk-taking are often suppressed and technological advance is overlooked. As a result, those companies with the greatest need for innovation and technology, as well as the greatest financial power to exploit them are tending to become the companies worst placed to develop them.

2. Geographical Drift - Competition from new sources

Whilst it took around 200 years for Europe, North America and Japan to progress through the three Modern Revolutions, today both countries and companies are experiencing their own Modern Revolutions in timescales measured in decades rather than centuries. It is likely that this "evolution" will continue to accelerate. The two most populous nations on earth, India and China, are in the midst of their own Information and Industrial Revolutions, respectively, and will represent a significant, effectively untapped source of innovation and technology in the near future. Many other countries, particularly in Eastern Europe and South East Asia are set to become players in a global innovation and technology market in coming years.

3. Micro-Innovation

As the larger “technology” companies become increasingly unable to support their own innovation, there is a natural drift towards small, entrepreneurial development of innovation and technology. However, this natural process faces many obstacles to success:

- **Size (Still) Matters**
Whilst small companies are good at innovating and developing new technology, these skills rarely extend into innovative approaches to the commercial reality of being a small business. Without service or product-driven income streams to rely on, their future and that of their technology is often dependent on an unpredictable risk-finance market.
- **Funding is Fragmented**
Much micro-innovation is dependent on Venture Financing and as a rule this financing is based on the adage, “back the jockey, not the horse”. This, coupled to the adoption of a herd-mentality by VCs, has resulted in a situation whereby financing is focused more on funding management teams than on the commercial exploitation of good science. In turn, these management teams are forced to spend large amounts of their time seeking new finance rather than developing new technology. It would be interesting to speculate on exactly how much venture finance is actually spent on innovation and development rather than on company overheads.
- **Survival of the Fittest**
Darwinian theory applies just as readily to technological development as it does to species development and the key message to remember is, “Survival of the Fittest, NOT the Best”. How many potentially revolutionary technologies have been lost in small organisations that have failed to consider how they need to compete in a market overwhelmed by new opportunities?

As before, the availability of innovative technology is the driver for the current science-led revolution. Consequently, whilst demand for innovation and new technologies continues to grow, survival in an increasingly competitive market will depend on technology companies realising their position in a world that is turning its resources towards exploiting this new Knowledge Revolution.

About This Article

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