

# Support systems

*As the industry gets more complex, we all need a helping hand.*

**By John Moor.**



**G**lobalisation and relentless technological progress are having a universal and significant effect on how businesses operate.

Whilst globalisation brings new growth and market opportunities, it also brings business risk and an increased threat of competition. In response, companies are moving from the classic 'closed' system – in which they rely upon their internal capabilities to progress – to an 'open' system, where they work with others.

Chesbrough<sup>(1)</sup> described how innovation has transformed from a closed system, where vertically integrated firms conducted internal R&D activities, to an open system – where firms increasingly look outside their own organisations for new ideas and technology for their products.

The changing global environment has eroded the logic that supported the closed paradigm and includes factors such as:

- The increasing availability and mobility of skilled workers
- The venture capital market
- The decreasing shelf life of innovation investments
- Separation of research (exploration) and development (exploitation) activities allows innovations to be exploited externally
- The increasing capability of external suppliers

According to Chesbrough: "The traditional paradigm that companies used to manage industrial R&D is, indeed, over in most industries ... What we need is a new logic of innovation ... the new logic will exploit the diffusion of knowledge. Instead of managing IP as a way to exclude anyone else from using your technology, you manage IP to advance your own business model and to profit from your rivals use. Knowledge diffusion rewards focused execution."

We've seen this in the semiconductor industry over the last few years as companies realise the scale of process technology development is such that few, if any, companies can undertake the task on their own.

However, alliance building is no longer the preserve of large companies; organisations of all sizes working in a global context must configure their partner networks for competitive advantage.

Research undertaken by the National



Microelectronics Institute (NMI, <sup>2</sup>) concludes that successful UK semiconductor firms of the future will ensure that partnering is a fundamental aspect of their business cultures.

NMI undertook this research because it was clear the world had changed significantly – especially for indigenous UK firms. It could see that a fresh look at collaborative practice might provide an insight into the industry's successful future – and the results look promising.

The research found that the supply side – design/foundry/assembly and test – is well trodden route with little variation. However there are differences on the market side, where there is evidence to suggest that differences in commercial performance could be linked to a new, structured way of using partnering opportunities.

The microelectronics industry is global and continues to transform through technology and market developments and the migration of activities to lower cost regions. These major trends mean that, whilst established companies must adapt and innovate continually, start ups must be born with a global mindset – simply to get established.

However, whilst many comment that UK companies often fail to fully exploit their innovations, NMI has highlighted a focus on business philosophy (the partnering model) and linked that directly to performance, rather than simply relating the strength of a company's technology to its performance.

### Technology heritage

The UK has a formidable science and engineering base, as well as a proud heritage of innovation and this is attractive to multinationals. This is evident in the current level of investment in microelectronics research, design and development by foreign owned corporations.

Historically, the UK has been home to a number of large vertically integrated 'national champions' in the electronics field. Examples include:

- Ferranti. Established in 1882, Ferranti produced the second commercial computer in 1949.
- International Western Electric. Established in 1883, the company evolved into STC.
- General Electric Company. Established in 1886, the company turned into a defence and consumer electronics giant.

Other notable companies joined these 'national champions' during the 20th Century. However, by the turn of the Millennium, these firms had all gone – either by acquisition, merger or liquidation. Today, the UK has no large electronics oem or systems integrator. The monolithic giants that were

characteristic and dominant during the 20th Century gave way as they failed to adapt to changing circumstances.

The cyclical nature of the semiconductor industry has been a permanent trend since the 1950s. However, in 2000, the industry started to fall into the deepest and longest recession in its history.

In its aftermath, a new breed of national champion has emerged. These new champions benefit from the legacy of the 20th Century monoliths in regards to their R&D capability, skills and significant engineering experience.

'Green shoots' are emanating within the design sector, with innovative pioneers such as CSR, Wolfson Microelectronics and ARM. These firms have achieved public status with successful levels of profit and growth. However, the remaining members of the UK peer group have yet to achieve similar commercial status. These companies have the potential to become global leaders – like ARM, CSR and Wolfson – if they can address issues of global markets effectively and establish a clear value proposition in addition to their technical and innovative prowess.

Industry trends, such as increasing technological complexity, supply chain disaggregation and the geographic migration of the supplier base, mean UK firms must act globally:

- Key suppliers are often distant; hence a global awareness is mandatory in order to effectively source technology and manufacturing partners.
- Gaining and maintaining entry into supply chains is a key challenge for UK companies as they are typically remote from their immediate customers and do not have a clear line of sight with the final customer.

In order to be successful commercially:

- A global perspective is required to help comprehend how UK firms can respond effectively to the dynamic nature of the supply chain, international business systems and new markets.
- UK firms must continually seek to improve their strategic positioning in the supply chain, whilst strengthening their network of partners to complement their technical capabilities.

A partnering philosophy can play a role here and is highly relevant to technology industries, which are structured globally on both the supply and demand sides. Alliances that span R&D, product development, production and distribution are considered by some to be the most important mechanism for technology transfer in the semiconductor industry.

In order to make these alliances effective, UK firms must master and upskill in new areas such as



#### Above:

In its report 'Partnering the Future - Business Innovation in UK Microelectronics', the National Microelectronics Institute concludes that successful UK semiconductor firms of the future will ensure that partnering is a fundamental aspect of their business cultures.



understanding social capital and networking, management systems and performance criteria. These concepts will help firms in these critical areas:

- Improving their preparedness and ability to manage successful alliances
- Recognising and identifying opportunities in markets, customers and routes to market
- Recognising and identifying opportunities in technology and supply partners
- Improving the robustness of their business
- Weathering the cycles of 'binge and bust' typically experienced in the semiconductor industry.

**What do they mean?**

How do companies interpret the term 'strategic alliance'. In research carried out by the NMI, many companies opted to apply the term 'partner' in lieu of 'strategic alliance', suggesting that the context may be different depending on which side of the fence you are on.

When asked about strategic alliances a participant company noted 'One thing I've learned is that strategic to one partner... is often different from strategic to the other one'.



*"Successful firms of the future will take the concept of collaborating... and make it part of their culture."* **John Moor, NMI**

Hence, alliance partners cover a broad range of third parties which include: customers (users of their technology); investors; design tool firms; development partners; manufacturing companies; and indirect customers. The term 'partnership' has the tendency to suggest the engagement has a commitment or implication beyond a transaction or other exchange.

Here's another quote. 'I think that everything that [my company] does is around partnerships ... strategic alliances are essential to the way we do business'.

**Significant for start ups**

Growing system complexity can often be a significant problem for start ups, as can the infrastructure needed to support their deployment. One firm described what it termed a 'hidden challenge for start ups': young companies may be so preoccupied with developing their technology that they may neglect the more challenging issue of how to deploy that technology successfully once it is market ready.

Today, start ups need to scale their businesses rapidly due to the relatively high costs of starting up.

They must, therefore, have the foresight and a strategic plan to deal with the issues of deployment and scale.

'The thing that typically kills you', said a start up, 'is not [deficiencies in your] technology or that there wasn't that gap in the market, it's simply the fact that you could not achieve enough scale to service that gap in the market. A larger vendor can come along and apply more resource to it ... the scale that is required just to service these market opportunities is too big and a lot of times that's why companies end up getting bought'.

Hence a strategy for partnering is often mandatory for young firms in order to overcome the resource challenges.

Whilst certain partnering practice is endemic amongst firms, their commercial performances vary widely.

Ultimately, whilst firms can be seen to be innovating in technology and differentiating their products, this may not be sufficient for commercial success.

An emerging trend is to use partners on the demand side of a firm's business to provide complementary and supporting products or services. In this way, firms are taking advantage of external assets in a way which is conducive to commercial performance and sustainable business practice. This is both new and significant for the new national champions.

This collaborative model is highly relevant for UK firms and the concepts of open innovation and open business models help to explain the changes currently underway. Applying advanced partnering concepts will help firms to improve or sustain their commercial performance.

It is clear that most companies think they understand partnering – but there is a great deal of variation and the world has changed – hence the message from NMI is 'take a fresh look and focus on the market side'. Ask yourself how working with a partner could accelerate getting your technology to market.

Successful firms of the future will take the concept of collaborating, apply it throughout their organisation and make it part of their culture.

**References**

1. Chesbrough, H. *Open Innovation*. Harvard Business School Press, Boston
2. 'Partnering the Future – Business Innovation in UK Microelectronics', NMI, 2008. [www.nmi.org.uk](http://www.nmi.org.uk)

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