

A UK Engineering Skills Shortage: Myth or Reality?

By Paul Adler, CEO, KorteQ Ltd

Is the UK faced with an inevitable downward spiral in engineering capability, to the ultimate detriment of our world standing in high-value engineering industries?

The commons defence select committee recently stated that the UK must work to keep its "world-class" skilled workforce, and that the shortage of engineers was a "cause for serious concern". Defence procurement minister Lord Drayson told a meeting of the committee that it was "important that we ensure we have confidence in the supply of submarines"...and to encourage scientists to have careers in the defence industry "so that we get greater expertise in the technology".

Rolls-Royce plc is stepping up to the plate: recently launching the third year of a UK Science prize, "part of the group's continuing effort to increase the profile of science and engineering, to avoid skills shortages in the future". Yet the same group has also announced recently the opening of its latest University Technology Centre (UTC) in Darmstadt (Germany), and is reported to be considering a major greenfield investment in a US facility.

Smiths Group chief executive, Keith Butler-Wheelhouse, said of the intent to sell to GE its Aerospace arm, "the structure of aerospace engineering is changing...its increased capital requirements and the growing importance of supplier scale". Although the 2000 UK jobs are not under immediate threat, considering that the division with its 90-year history is currently the UK's third largest aerospace business, the longer-term message for UK skills and IP is clear.

A relentless global industrial logic is in reality driving these business decisions; the imperative to improve competitiveness and scale transcending any special loyalty to the home workforce. Anecdotal evidence suggests that these issues are not limited to the defence engineering sector. UK contracting companies are sourcing engineers from the talent pools in Russia and other emerging economies of the East in a bid to overcome domestic skills shortages and salary inflation driven by scarcity of supply. In the automotive sector the UK's capability seems to be narrowing to focus on niche areas such as F1 racing technologies.

To the aspiring engineer, daily headlines may indeed suggest that the "offshoring" of engineering jobs is an unstoppable trend, and therefore that selecting a career in engineering may prove to be unwise.

The global competition for talent

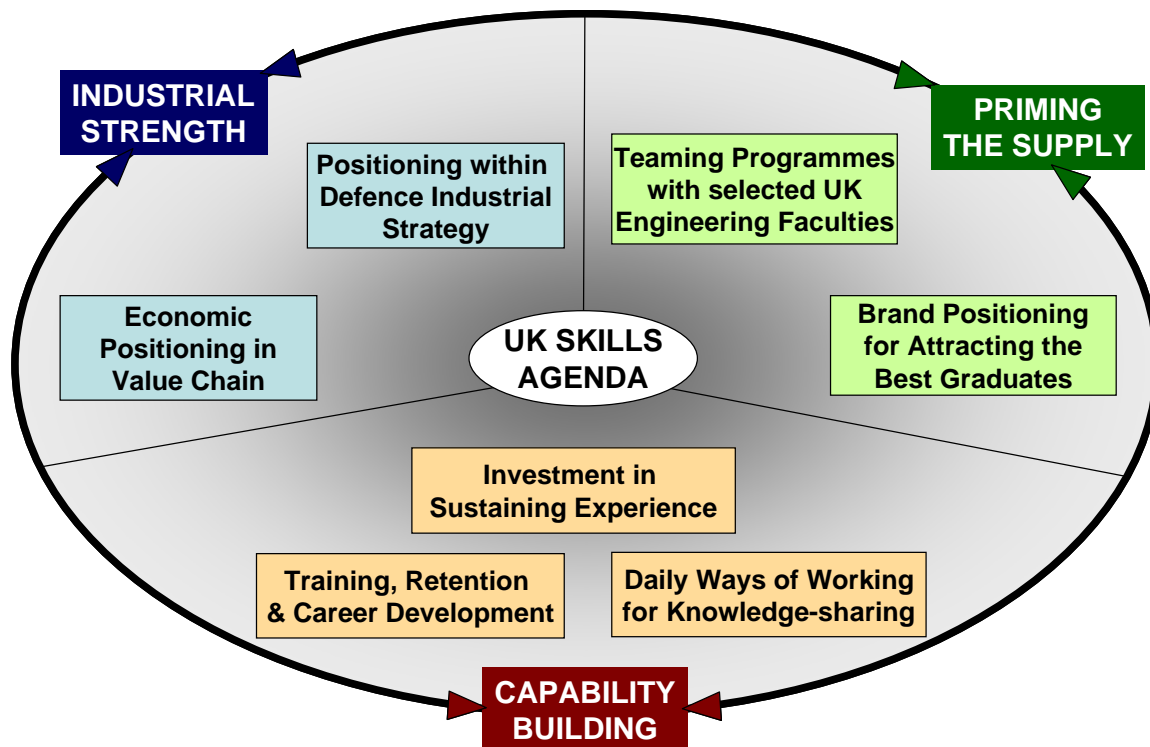
Adrian Wooldridge writes in the Economist's "World in 2007" that the coming years will see a dramatic escalation of the war for talent. Companies are taking longer to fill vacancies – and more have to make do with second-best candidates. The impending retirement of the baby-boomer generation is coupled with a dip in the supply of workers: by 2025 the number of people aged 15-64 is projected to fall by 7% in Germany, 9% in Italy and 14% in Japan.

Job mobility is increasing, and not just in Western economies: both India and China are reported to be suffering acute high-end skills shortages; wage inflation running at 20% and severe problems in retaining trained managers. With unemployment rates among graduates at historical lows (at around 2% in the US), companies must rethink their whole strategy for recruitment, retention, training and development.

How successful are UK engineering enterprises in stimulating a healthy supply of talented graduates, in holding on to their most skilled specialists, in accelerating their development and motivating them to stay, when there are so many attractions to move elsewhere?

How should “UK plc” be responding ?

In an ideal world, Aerospace and Defence businesses would, from a position of strength, be able to prime the supply with focused research programmes and the skilled engineering graduates which the country needs. Maintaining and developing our “knowledge-based” economy, organisations would invest to deliver the challenging and rewarding careers sought by the best graduates, and hence complete the virtuous circle by re-inforcing our high-value capabilities and overall industrial strength.



Moving anticlockwise around the same circle, from the clarity of a more stable and competitive industrial positioning, organisations would be able to offer a more structured career path and headroom to those aspiring to leadership roles. The emerging demand for through-life capability management will require research breakthroughs in cross-enterprise knowledge management and integrated supply chain partnerships. This will in turn shape an updated set of skills and competencies to be delivered through undergraduate education. Engineering students would undoubtedly be encouraged by a wave of positive PR emerging from such a thriving sector.

But today, in practice, how well aligned are these three key factors?

a) Industry consolidation: A source of increasing strength ?

A BAE Systems spokesman, commenting on their recent move for DML, said “We are fully supportive of the UK government’s aims, underlined in the Defence Industrial Strategy, to achieve maritime consolidation...combining front-end design/build capabilities with through-life support in the submarine sector”.

Achieving a dominant position in key platforms and technologies is as important as ever; however the answer is not always good news for the UK, which has for example relinquished to Italy its equity interest in helicopter manufacture. The ultimate equity holding in Airbus is actively being reshaped as the pressure mounts for further streamlining of its industrial capability.

In an article entitled “Keeping the Know-How of a Retiring Generation”, Andrew Baxter of the FT reports that managers have not been educated to see intellectual property as an asset in the same way as cash: “If the average company managed its money in the way it managed its IP, it wouldn’t be in business”. Yet it appears that such intangible assets (including workforce skills, patents and organisational know-how) may account for more than half of a company’s market capitalisation (as argued by Baruch Lev, an accounting professor at New York University, in respect of US businesses). Companies which choose to outsource lower-value-added activities will need to retain sufficient skills and knowledge to support a future “intelligent customer” role, at the same time as managing the transfer of manufacturing know-how to their supply chain partners. How well do UK businesses organise to manage and retain vital IP?

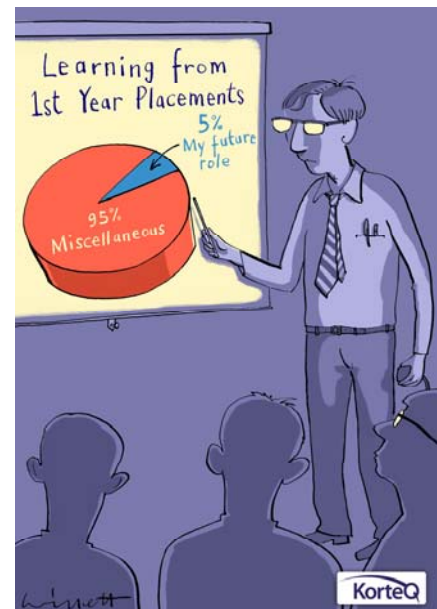
The constantly changing industrial landscape poses a challenge for those developing longer-term capability plans. What balance will be required between the generalist management and contracting capabilities associated with prime contractors offering solutions at the high end of the value chain, and the distinctive R&D, product development and manufacturing capabilities associated with smaller specialists?

b) Priming the supply: Do we really connect with student engineers?

How can we bring out the best in the people whom we recruit? Does the organisation’s approach to communications and knowledge management have a role to play?

The Institute for Employment Studies has found that a quarter of companies in the UK expect to lose 50% of their graduate intake within the first year. This waste of talent is rarely due to salary, in fact only one third of those moving on quote pay as the main reason. Rather, there can be a fundamental mismatch between the experience once work starts, and expectations which were set during the interview process: such as challenge, scope for involvement, responsibility, recognition and potential for advancement.

Innovations which connect the employer’s brand, culture and values with student aspirations can help to bridge the gap. Some universities are organising to produce and distribute “podcasts” featuring recent graduates talking about their experiences in employment. An “entrepreneurs’ society” is often now one of the largest interest groups at undergraduate level.



Historically schooled in the “need to know” approach to communication, our industry might do well to welcome new social networking technologies such as “blogs” and “wikis”. Having been romanced by the idea of a “learning organisation”, this web-savvy generation expects to be able to interact with peers and to debate the key issues and challenges as they arise.

Are we putting sufficient effort into the communication process with students, which could both secure a healthier supply of talented recruits and improve retention rates? Do we track

the rate of graduate attrition, and use the feedback to generate improvements to selection and induction processes? Do we leverage the latest joint research programmes (such as the KIM project supported by UKCeB) in order to foster closer connections with leading Engineering faculties and hence inspire the best students to apply?

c) Capability Building: Getting knowledge quickly to the point of need

In a world where global centres of competence, distributed teamworking and electronic collaboration are the order of the day, the traditional graduate development approach with its series of fragmented three-month placements may need dusting down to remove the cobwebs. Evidence is emerging that forward-thinking companies are investing in sustaining and developing their capability base, by fast-tracking a new generation of engineers and enabling them to be successful in front-line roles within 6-12 months of starting work.

There are two main keys to success:

- using graduate trainees to “download” the know-how of the most experienced engineers, accelerating the learning, improving motivation and retention, *and* mitigating the risks of losing vital knowledge
- using simple tools and techniques to improve mentoring and re-use of knowledge, developing future leaders with a more systematic approach to maintain the flow of critical information between design, build and support functions (including suppliers and customers).

Jeremy Bending, Director Network Strategy for UK Distribution at National Grid plc commented on a recent knowledge capture exercise undertaken by a graduate engineer: “this innovative approach has been a real winner for us. Not only did this ensure that vital expertise has been captured and structured for use throughout our business, but it has at the same time increased the skills and capability of our own project staff.”

Closing Thoughts

With the UK primes investing heavily overseas and second-tier defence companies now apparently under siege from bargain-hunters, the UK’s heritage of engineering know-how is at stake. Companies which organise to **align** their strategies for Industrial Strength, Priming the Supply, and Capability Building will surely be best placed to win the war for UK engineering talent. The solution is largely in our own hands.

About KorteQ

KorteQ Ltd specialises in the management of knowledge and experience, helping clients to accelerate learning and to reduce the risks of knowledge loss. Providing systematic ways of working for learning from past experience and making vital know-how available at the point of need (whenever and wherever in the world), KorteQ teams with organisations who seek to create more innovative and competitive capabilities.

KorteQ is also a member of the KIM consortium supported by EPSRC, which is investigating ways in which “Immortal information and through-life knowledge management” methods can be deployed to help improve UK engineering capability and business performance.

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