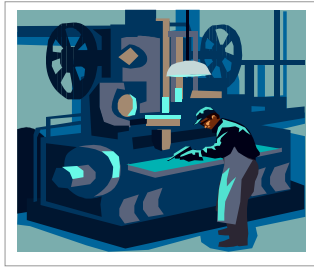


Manufacturing: It is survival of the best

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Recovery in the UK manufacturing sector is faltering. To thrive, companies need to implement best practice in their manufacturing operations – and create IT infrastructures that can sustain end-to-end integrated supply chains. Yet many companies have failed badly when it comes to harnessing IT. How can CEOs and CIOs reinvent their IT operations to break the cycle of underperformance and deliver long-term success?

Recovery in the UK manufacturing sector was not expected to end so soon. Until summer 2004, most employers' organisations were reporting signs of growth in the sector, as companies started to claw back business and fill order books. Now those signs have begun to fade. According to the Office of National Statistics (ONS), manufacturing output dropped 0.4% during the three months to August 2004. Monthly output fell by 0.8% in August alone, when analysts' average forecast had been for a 0.3% rise. It was the biggest decline since October 2002 and the first time manufacturing output had fallen for three months in a row since the period between November 2001 and January 2002.

The British Chambers of Commerce has warned that the manufacturing sector is once again struggling against worsening underlying conditions: a combination of oil price rises, increases in interest rates and a stagnant US economy has affected demand at home and abroad. However, there is less concern nowadays that manufacturing is the laggard in a two-speed economy, even though manufacturing's share of economic output has gradually declined, dropping below 16% in 2002. Instead, the worry today is that manufacturing will not be able to make up for a slowdown in service industries and sectors, which are heavily dependent on consumer demand.

What the ONS figures don't reflect is that, despite the slowdown in manufacturing output, many companies remain more confident than they were 12 months ago. While the chemicals and man-made fibres sector saw output fall 1.9%, and the paper, printing and publishing industries saw a drop of 1.7%, electrical and optical equipment companies saw quarterly output actually increase by 2% after strong growth in July 2004. Indeed, four of the 13 manufacturing sub-sectors saw output grow during the last quarter.

So what are the secrets behind the continued success of these sub-sectors, and the success of individual companies in other sub-sectors? UK manufacturing's share of economic output has fallen as production has shifted to new manufacturing powerhouses such as China and India, so how can UK manufacturers ensure yet more business doesn't flow overseas? In short, what must UK manufacturers now do to survive and thrive?

China steps up pressure on western rivals

UK manufacturers certainly cannot assume that competition from developing countries will remain the same. The bad news is that it's set to intensify. Cheap, plentiful labour has always been seen as the driving force behind the development of China's manufacturing strength. Yet it is no longer the whole story. A survey by the US-based Industry Week in October 2004 found that China's manufacturers are embarking on heavy investment in innovation and infrastructure. Chinese companies' capital expenditure (CAPEX) will be equal to at least 20% of sales in 2004, compared with just 3% for US manufacturers. Much of this investment by Chinese manufacturers will be in IT, an area where they have traditionally lagged behind their western counterparts. According to the 406 managers of Chinese manufacturing plants surveyed by Industry Week, spending on IT will amount to at least 5% of sales in 2004. By contrast, the 681 US managers questioned by Industry Week plan to spend only an average 1.4% of sales on IT. On top of that, more than half of the Chinese companies provided an average of over 20 hours of training per employee per year; only a third of US companies offered the same level of training. Chinese companies may need to play catch-up on past investments by US companies, but it seems they are tired of price cutting: they are trying very hard to move up the value chain, and to compete on product quality and efficiency, not just low labour costs.

Moreover, the goals of this investment are very different in the two countries. While both Chinese and US producers chose *high product quality* as their most important objective, the former ranked *innovation* in second place, while the latter placed it in seventh place. Most US and European companies still regard China as a cheap production base, but not as a hub for activities such as research and development, because of concerns over protection of intellectual property and the quality of staff. Yet China is clearly looking to compete on innovation. However, Western countries simply can't afford to move all their manufacturing capacity abroad and expose so much valuable proprietary knowledge to increased risk of theft.

Recovery of Indian manufacturing sector

Indian manufacturers are also showing signs of competing strongly again, according to a report issued by India's credit rating agency, Crisil in October 2004. Crisil's survey of about 500 companies shows a rising trend of healthier businesses that now stretches back five years. This comes after a decade of balance-sheet cleaning by Indian companies through the sale of non-core assets and improved working practices. With over-full order books for the top capital goods companies, manufacturers are now stepping up CAPEX in order to add capacity – yet are able to do so without damaging their balance sheets because earnings are forecast to rise by about a fifth in 2004.

India's ability to compete is most likely to be constrained by poor infrastructure. Pot-holed roads and inefficiently run airports add to costs and could hold back an export-led manufacturing sector that depends on efficient overland transportation. The Indian manufacturing sector faces two other hurdles: a low savings rate [20%], which could inhibit investment and rather modest foreign direct investment [just \$4bn into India, against \$50bn into China]. But we are seeing multinationals losing their hesitancy and now investing in engineering-based manufacture in India.

What it means for UK manufacturing companies

When China and India were producing a combined total of 4m graduates a year, and their wages were considerably lower than the UK, the central question was whether the UK could compete in future. The answer is simple: only by raising productivity to considerably higher levels than it stands at today. Productivity may seem to be only one factor in the short term, but in the long run it will matter more than anything else – and the UK's record is wanting (see Figure 1).

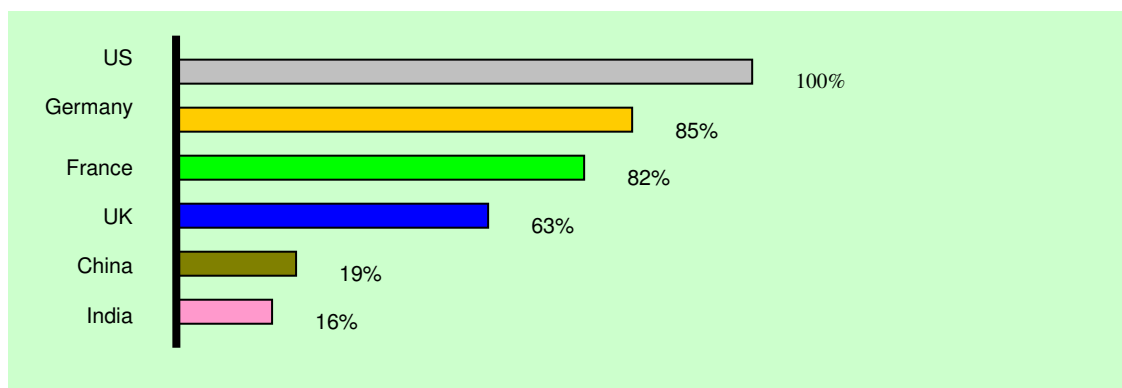


Figure 1: Productivity league (Source: Broadberry & O'Mahony 2004^[4] and Centrix Analysis)

According to the latest figures from the Economic and Social Research Council (ESRC), US output per worker is 39% higher than the UK, with France and Germany 22% and 19% ahead respectively^[1]. Why does the UK lag behind? Among the many reasons are lower investment, failure to innovate, poor labour relations, antagonism towards manufacturing from government, a short-term approach to business among senior executives and financial institutions, failure to keep up with technical developments, lack of entrepreneurship, over-regulation of business and overly rigid and narrow-minded attitudes to work among employees.

Why hasn't the UK, with most of the labour flexibilities of the 1980s still in place, and a 12-year run of continual, non-inflationary growth, managed to catch up? Firstly, the UK has under-invested over decades: investment per worker is 40% higher in France, 60% greater in Germany, and 35% more in the US than in the UK. Second, the UK suffers from a lack of skilled workers compared to France and Germany: just a fifth of German workers and a third of those in France are characterised as having low skills, but 55% of the UK workforce are classified as low skilled. Although it may be politically incorrect to say it, poor productivity in the manufacturing sector is clearly the result of poor management practices and poor use of IT.

Manufacturing companies in the UK could dramatically improve their productivity and performance by embracing best management practices, eliminating unnecessary tasks, aligning all tasks in a process in a continuous flow, recombining workers into cross-functional teams dedicated to a particular process, and continually striving for further improvement. This would allow companies to manufacture and distribute products with less human capital, less space, machinery, time, and lower overall expense, while becoming vastly more flexible and responsive to customers' needs (see [Why integrate, when you can aggregate](#) by Pal and Hammond).

The decline in manufacturing is not just a British phenomenon. Even in Japan and Germany, traditionally seen as powerhouses of industrially driven growth, manufacturing is a much less significant generator of economic prosperity than before. For example, between 1980 and 2002, the share of employment provided by manufacturing fell from 25% to 19% in Japan and from 34% to 24% in Germany. It is a common debate that manufacturing is more valuable to an economy than services - because it is associated with greater research and development, which has positive spillover effects on the rest of the economy. But the evidence behind that argument is rather weak. Even if that view is true, the companies likely to be performing the effective R&D are unlikely to be those, like MG Rover, that have struggled to sell their products.

The fact that the UK is getting investments in the manufacturing sector from other countries, bringing in their own technologies and their own management practices demonstrate that things can be done in the UK if one gets the good management practices and IT right. The payoff from good management practice is impressive, according to a study carried out between 1994 to 2002 by management consultants McKinsey^[2]: while average ROCE across all companies was 12% during the 9-year period, companies that raised their management practices score in McKinsey's evaluation by one point increased their financial returns by 42%^[3]. IT also has a role to play. Service industries have thrived by using IT as a strategic tool to give competitive advantage, but manufacturing companies have often failed to exploit IT effectively. The implementation of integrated standard application software, such as Enterprise Resource Planning (ERP) systems, had proved time-consuming and highly risky. Often ERP implementation costs were many times greater than initial estimates, benefiting only systems integrators, while companies failed to drive through the projected benefits. As a result, some manufacturing companies are managing IT solely on the basis of cost (see [Taming the beast: containing spiraling IT infrastructure costs](#) by Pal and Fuller). Yet our work with clients and research have identified a number of best practices that manufacturing companies can introduce to ensure IT makes a difference to their bottom-line (see Figure 2).

Successful strategies for UK manufacturing

Mass production in Britain and other developed countries is a thing of the past due to competition from low-wage nations, weak economic growth and currency pressures. Manufacturing companies in developed countries are now turning to production of specialist items for narrow market niches, often on a make-to-order basis for specific customers, where they compete less on price, and more on quality, design and specification. This is a space in which companies from low-cost countries cannot compete easily because they do not have the customer relationships, systems to support flexible make-to-order production, or research and product development skills.

Best Practice	What it means...
IT is a board responsibility	Making IT work has little to do with technology itself. Just because a builder can acquire a handsome set of hammers, nails, and planks doesn't mean he can erect a quality house at reasonable cost. Making IT work demands the same thing that other parts of the business do – inspired leadership, superb execution, motivated people, and the thoughtful attentions of the board. Board members of manufacturing companies need to learn about and understand IT in the same way they learn about and understand finance, manufacturing operations, customer service, and marketing. Board members who delegate IT responsibility because they think they have more interesting things to do, do so at their peril.
Create a long-term IT plan	Because winds of change buffet IT more than any other area of the organisation, companies will benefit from a long-term, disciplined, strategic view of IT investment, and a firm focus on using IT to enhance the company's productivity. A detailed IT plan allows manufacturing companies to develop their IT capabilities deliberately and systematically to enhance business performance.
Develop a unifying IT platform	Most organisations are amazingly complex, with departments or initiatives that are like independent countries, each with its own business applications, technologies and culture. Project costs soar because skills are isolated in individual teams rather than harnessed across the business; knowledge and components developed in one area aren't re-used elsewhere; and consultants are brought in again and again to solve the same problems in different areas of the business. Ongoing maintenance costs run rampant as the company struggles to maintain the skills to handle heterogeneous hardware, multiple versions of operating systems software, and varied sets of applications, while almost certainly overpaying for licenses because no-one has a picture of overall demand. Executives must understand the root cause of this complexity, which is encouraged by leading software companies and large systems integrators (who are often also the consultants on business change programs), and embark on projects to simplify and rationalise their IT provision. They aim should be to develop a common technology architecture that meets the needs of the business but is less costly and easier to manage.
Use IT in product manufacturing	Manufacturing companies with superior IT management are generally good at designing and manufacturing products and achieve better results with smaller budgets. IT must move beyond CAD software and engineering databases to supporting manufacturing and assembly lines to make a real difference in productivity and to companies' bottom-line.
Use IT to integrate R&D, manufacturing, sales, and customer service	Manufacturing companies whose sales performance is consistently higher use integrated standard software more intensely. They integrate sales data with manufacturing and R&D databases in a seamless way. Their sales information systems provide direct access to data on capacity and production scheduling, so that the feasibility of any customer request can be checked before an order is placed. The benefits are obvious. Delivery delays or orders that cannot be fulfilled would become a thing of the past, while jobs could be scheduled on the spot, and products manufactured at planned cost.
Use IT to integrate end-to-end order management across the company	Companies must develop an end-to-end order management process framework that stretches from purchasing through materials management, production planning, manufacturing, and on to delivery to customers. IT can help organise orders efficiently through this end-to-end process. Despite these capabilities of IT, the factory of the future has yet to become a reality in the UK manufacturing industry.
Create a customer-centric IT service by use of <i>service aggregation</i> to fit the needs of the business	Progressive companies have reinvented their IT departments into services structure. They create a network that distributes IT services and resources across the company to the users who need them, rather than assigning particular resources to single departments. They set-up a "service management" group to concentrate on IT planning and process re-designs. Business users play a central role in managing service delivery, and often lead service management initiatives, adding pivotal resources to implementation projects. Companies who transform their IT into a service to the business can improve performance and productivity in a way that leaves competitors behind.
Re-configure end-to-end business processes prior to introducing standard ERP systems	It's essential that manufacturing companies re-design end-to-end business processes before new ERP systems are introduced. It enables them to select the right software for their business and not the fancy features offered by software vendors, and ensure they are automating sound process from which non-value adding activities have been stripped out, rather than making flawed processes a little more efficient.
Make sure the cost of external help to implement ERP systems is no more than twice the cost of the systems	Suppliers of software and their partners want you to believe that their new technologies and implementation expertise will blow away what has come before. You can't blame a sales person for trying to sell, or CIOs for having a queasy buy-or-lose feeling. However, implementations deliver most business benefit when you use external implementation resources but involve your own staff – who understands the business best – in pivotal positions and the roll-out.
Develop a high-performance IT culture	First on the agenda must be to establish an accountable IT leadership team. An IT organisation that has clear guidance, a shared mission, and high expectations can focus its staff around work in line with the business's needs and correct performance and productivity problems. To do this, all IT managers, including CIOs and CTOs, must be hands-on people who are deeply involved in projects and teams.

Figure 2: Best practices for IT for manufacturing companies

However, businesses in high-wage countries following these niche strategies will often look to keep their costs down by using components or even complete sub-assemblies made in factories in low-wage regions such as Eastern Europe or Asia [see Figure 3]. We expect the volume of such "outsourcing" to rise, although most of the companies adopting this stance will retain the intellectual property behind their ideas, and continue to do most of their research and development in the UK.

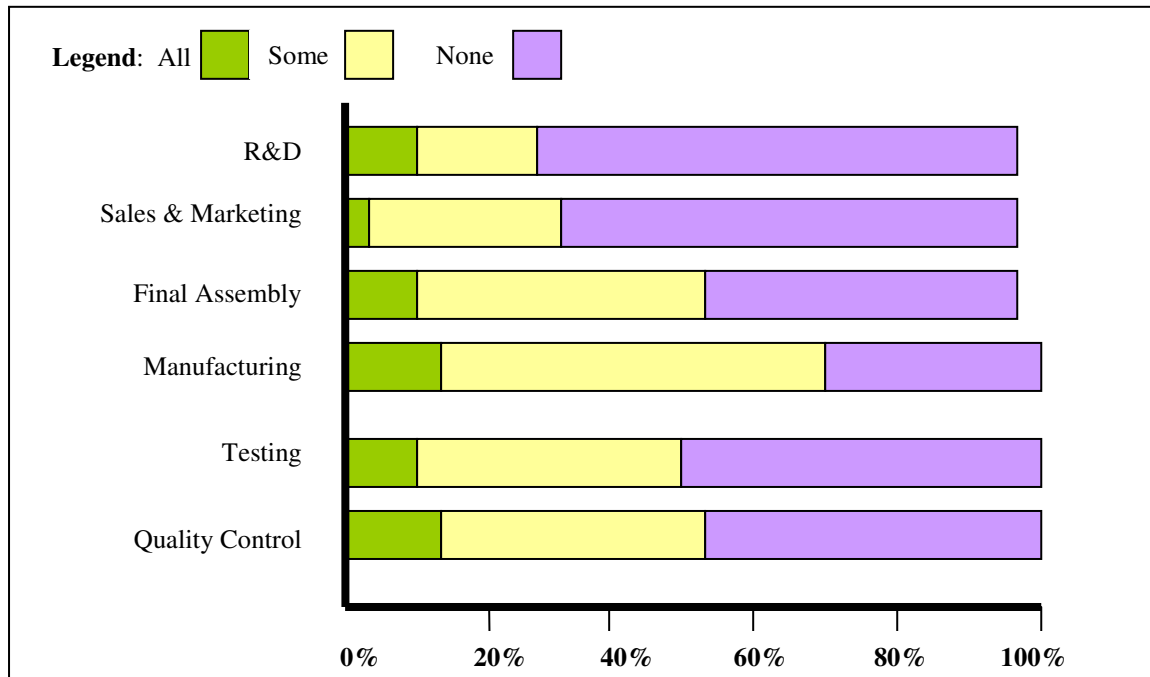


Figure 3: Manufacturing – moving offshore? (Source: NOP/EEF World Competitive Challenges Survey 2004)

However, even with this new focus on niche products and selective outsourcing, the future of many UK manufacturing companies is uncertain (see *Offshoring: Saviour or Value Destroyer* by Pal and Hammond). UK manufacturing executives must understand how IT can enable product innovation of the type that drove productivity growth in the US during the 1990s, and apply it in their own operations. Of course, IT is no more a silver bullet when it comes to supporting product innovation than it is in any other area, and achieving the expected benefits still involves careful and intelligent implementation of IT. Manufacturing companies should also look at how IT – along with good management practices – is continuing to be applied in new ways by the most successful manufacturing and service companies to deliver fresh competitive advantage.

We believe UK manufacturing companies *can* improve productivity and performance and compete with the very best if they apply best management practices while harnessing IT effectively. Instead of IT being regarded as a specialist activity, IT must become a top priority for board members. They have to become more knowledgeable about the power and potential of IT to do more than simply reduce manufacturing cost but instead become a vital management weapon to improve productivity and performance. Senior executives will need to manage the transformation of current IT operations into a service-based culture that provides the business with what it needs in turn to provide superior quality services to customers (see *Why integrate, when you can aggregate* by Pal and Hammond). These strategies will deliver the improved productivity, coupled with best management practices and higher quality services, that will differentiate successful manufacturing companies in the UK from others, and allow them to thrive against competition from low-wage economies

About the authors

Lisa Hammond is the CEO of Centrix; Sukhendu Pal is a consultant.

About Centrix

Centrix is a leading independent consultancy that brings together the best of business, service and technology to create lasting value for its clients.

What Centrix Brings

Centrix brings together expertise in business, service and technology to help our clients develop and implement IT strategies that deliver lasting value, improved productivity and enhanced performance. We help clients to develop end-to-end service chains that drive out costs while delivering superior customer service and increased productivity. Within the IT function itself, we can help you deliver a programme of service enhancement, and infrastructure rationalisation and standardisation, backed by good governance processes, that will allow you to deliver flexible and agile IT services to support those end-to-end business service chains at minimum cost. Our *Economic Value Assessment* makes the business case and quantifies the true costs and benefits of the proposed strategy, and we provide a range of other tools, models, and methodologies to ensure those benefits are achieved.

Notes

1. ESRC Research Report: The UK's Productivity Gap, October 2004.
2. Stephen J. Drogan and John Dowdy, "How good management raises productivity," *The McKinsey Quarterly*, 2002 Number 4, pp. 14-6.
3. The average ROCE for year 2002 was 6%, meaning that the benefit for corporate financial performance could be as high as 85%.
4. S. Broadberry and M. O'Mahony, "Britain's Productivity Gap with the US and Europe: "A Historical Prospective", *National Institute Economic Review*, July 2004