



MANAGEMENT OUTLOOK



Manufacturing Globalisation continues in 2020

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Digital Manufacturing and Simulation

The role of digital technologies in manufacturing is set to increase significantly by 2020, with the technologies adopted depending mainly on what is being made rather than where .

Integration of production systems from head office to shop floor and from design to quality monitoring, encompassing computer-aided design (CAD), computerised numerical control (CNC), enterprise resource planning (ERP) and product lifecycle management (PLM), is predicted to be the main emphasis of developed nations generally, with the strongest proponents being German companies, and with the exception of French companies.

Chinese companies predict factory layout and planning will be their biggest digitisation effort. Multi-plant harmonisa-

tion scores low overall. There is debate over whether a manufacturer's plants should be standardised across the world to achieve economies of scale or flexible enough to meet local requirements.

From these results, it could be concluded that the respondents favour the latter approach.

Globalisation

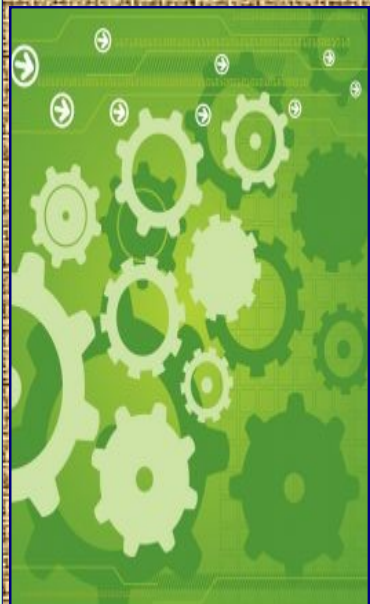
If the trend to digitised manufacturing is not a clear picture, the progress of globalisation is more certain.

Manufacturing will become increasingly internationalised to 2020 with more companies manufacturing for global markets and operating manufacturing plants in a greater number of countries. The biggest change will be a shift from manufacturing in one country to manufacturing in many.

There are wide regional differences in whether companies see their future in further standardisation or specialization of manufactured goods, with a tendency to use subcontractors to localise products for specific markets.

Most companies show an aspiration to move along the supply chain from extraction of raw materials towards finished goods. Only US companies expect to stay in the same position in 2020 and only Indian companies expect to move marginally closer to the raw materials end of the supply chain. Respondents in all other countries expect to move closer to finished goods, with the biggest changes expected from Dutch and Swedish companies.

Currently, manufacturing is moderately internationalised with 46% of the responding companies concentrating their operations in only one country.



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By 2020, this picture will have changed radically to an 80:20 split in favour of internationally based operations, with all responding companies from the Netherlands and Sweden expecting to manufacture on a multinational basis together with almost all UK respondents.

However, in the US, a substantial group expects to move against the trend. On the other hand, a small proportion say they see a future where they will have withdrawn from international operations to manufacture in one country alone. It's not clear from the responses as to why this would happen: we can only surmise that these people feel that by 2020 the advantages of production in lowercost countries will have been eroded, and been replaced by greater concerns about the side effects of multinational manufacturing such as on domestic employment and the environment.

All companies, except a few in France, will manufacture for international markets in 2020. Currently, all but a few in France and the US do so. Many sectors have already subcontracted manufacturing to regions with cheaper labour. While manufacturing labour wage differentials between developed and emerging economies are showing some signs of erosion, parity is unlikely to happen by 2020.

However, low-cost labour is not the only driver. Proximity to new markets also matters. The rapid development of countries such as Brazil, Russia, India and China (BRIC nations) as industrialised nations has brought billions more consumers to

the global market. Other drivers for globalization include proximity to raw materials as the volatility of fuel prices impacts the cost of transport. Local infrastructure and capital investment schemes also play their part.

Business leaders, such as Bill Amelio, chief executive of computer-maker Lenovo, Lakshmi Mittal of steel firm Arcelor, Carlos Ghosn, chief executive of Renault and Nissan, and Sam Palmisano, chief executive of IBM, now talk of global companies that have transcended their national origins.

They talk about the internationalization of companies as having three phases. First, a company manufactures at home and sells its goods through sales agents based in other countries. Then it sets up subsidiaries in overseas markets that are clones of the mother company, which is still headquartered in the country of origin from where it controls the subsidiaries. Finally, the national headquarters dissolves and operations are based where the company deems they are best suited, depending on a number of factors such as costs, capital investment incentives, proximity to principal markets, and access to talent and other resources, such as raw materials.

Standardisation versus Localisation

Overall, there is a fairly even split between companies that believe they will produce standardised products and those that will localise them in 2020, which reflects a very similar picture to today's world. However, this average masks large regional differences over the next ten years.

Indian companies see themselves migrating heavily from standardised products to localised, presumably as their knowledge of individual market requirements matures beyond traditional one-size-fits-all mass production. Companies from Germany and the UK see a similar trend, although to a lesser degree than Indian companies.

Chinese companies expect the proportion of standardised products they make to double to 2020, implying a significant increase in mass production capability.

Companies in the other developed nations predict a trend away from localisation to standardised international products by 2020, except companies in Sweden, which predict no change.

Subcontracting

If products are to be made for an increasingly international audience, then many will have to be tailored to each regional market. But who will do the tailoring – the manufacturer or subcontractors? By 2020, the balance will have tipped in favour of using subcontractors to help localise products for international markets. This fits with the general trends towards the internationalisation of manufacturing.

The biggest change will occur among Swedish companies, which predict they will move to a model where 75% of localisation work is done by a mix of subcontractors and their own efforts, a reversal of the current model where 75% of localisation is done inhouse only.

Currently, on average there is a



roughly 60:40 split in favour of a manufacturing company localising products for international markets themselves, rather than using a mix of subcontractors and their own efforts to do so. But by 2020, companies localising products themselves without the help of subcontractors will have shrunk to less than half (46%) while the number of companies relying solely on subcontractors to localize products will have almost doubled (from 7% to 12%). Swedish and Dutch companies will lead the charge on relying on subcontractors alone.

On average, 55% of companies surveyed subcontract manufacturing and responses broadly point to an expansion of subcontracted manufacturing to 2020. The same proportion of companies expect subcontracting levels to stay the same as predict the levels will increase, but few expect subcontracting to shrink in the next ten years.

While regular visits to subcontractors outweighs on-the-ground management by a factor of 7:2 on average, Chinese and US companies are as likely to deploy local management as regular check-ups. Anecdotal evidence suggests a heightened awareness of the need to manage subcontractors well. The majority of executives see their management policy in 2020 as unchanged. A few will visit more frequently, fewer still will deploy local management and one or two will attempt control through their ERP systems.

Low-Cost Labour

The large labour-cost differentials that proved so attractive in encouraging companies from developed

nations to shift or outsource manufacturing to emerging economies are already showing some signs of erosion. So looking to the long-term, where will companies be manufacturing in 2020?

Respondents seem uncertain. Asked to name where the source of low-cost labour will come from in 2020, many executives stayed with countries that are already well-established, such as China and India.

Several mentioned the entire continent of Africa, where the conditions for setting up manufacturing – such as existing infrastructure, political stability and encouragement of inward investment – vary enormously between North, sub-Saharan and South Africa.

Very few mentioned South or Central America as possible regions, which is surprising given that Mexico and Brazil are two economies tipped by economists to benefit from such inward investment. However, South American countries are far from ideal manufacturing locations: Brazil is known for its complicated tax environment and Mexico can already be considered high cost compared to China and India.

Several respondents mentioned individual developing countries, such as Cambodia, where some manufacturing already exists (in Cambodia's case, it is mostly garment manufacture), which could be a suitable location for low-cost manufacturing. Thailand is also considered as an option.

However, there seems to be a lot of uncertainty among manufacturers.

Even where executives identified a new location, when asked what they were doing to prepare, many admitted to doing nothing.

The results also show a degree of dissimilarity as to what factors will affect the rise of the next manufacturing base. Low-cost labour inevitably scores high, but there are other contributory factors, such as stability of the political regime, infrastructure, ease of capital investment and the educational level of the population.



