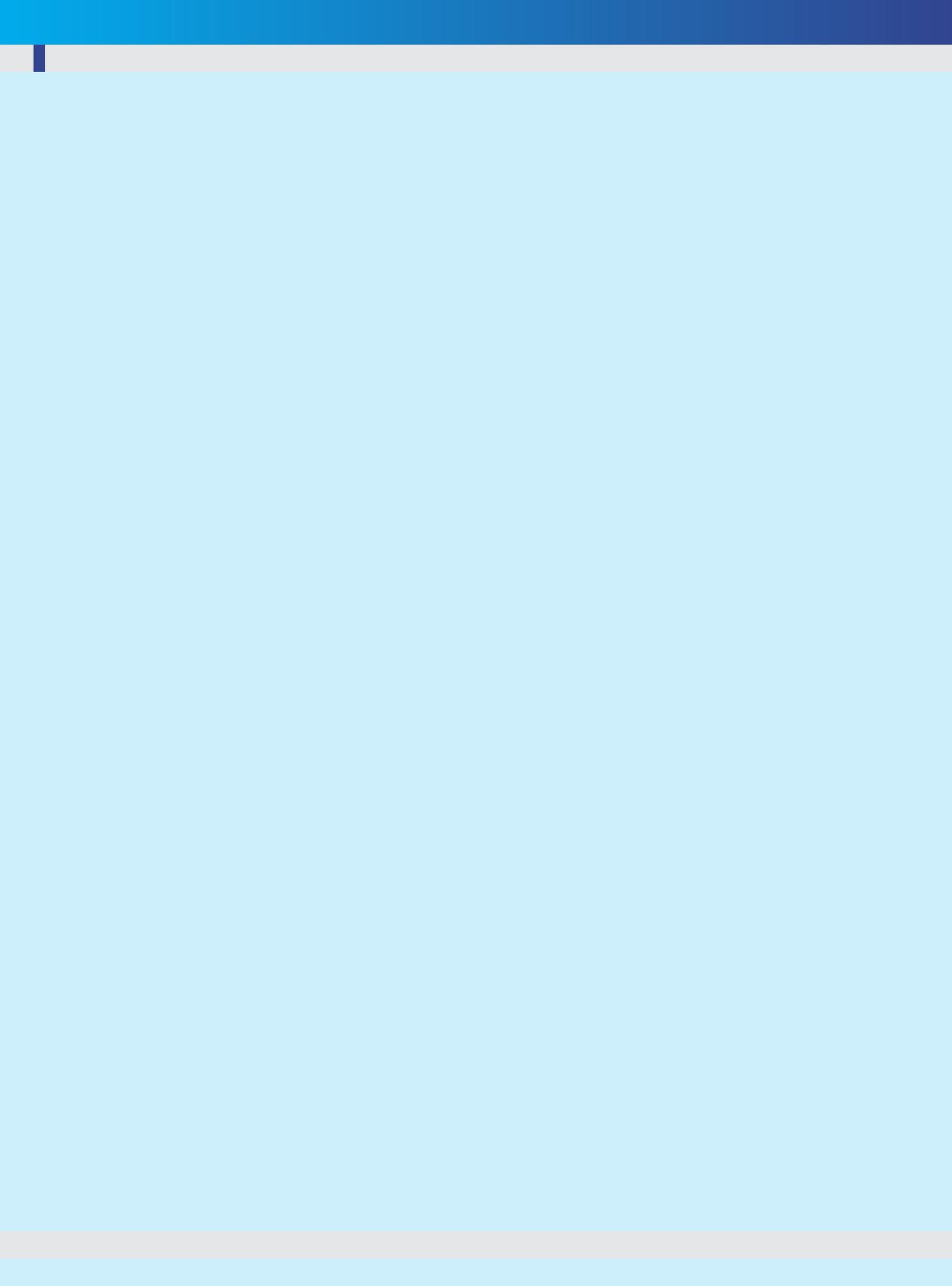


TRENDS in MANUFACTURING

A report looking at the changes
within technology, processes
and people in some of the UK's
best factories





The manufacturing journey

Barclays Head of Manufacturing, Transport & Logistics, Graeme Allinson, previews an in depth look at UK manufacturing trends and the lessons they teach us about the future of UK manufacturing

There are many reports and case studies that provide excellent snapshots of manufacturing best practice in action; they are often inspirational and to be applauded. However, in the following pages and with the help of Cranfield School of Management's Dr Marek Szwajczewski, we wanted to take a broader view of where UK manufacturing has been, where it is going, and how it might get there.

As Director of the long-running Best Factory Awards, Dr Szwajczewski has been tracking the sector through the ups and downs of the best part of 20 years. He will have seen manufacturing's share of GDP move from what we know with the benefit of hindsight to have been an unsustainably high 20-plus per cent share of GDP to what we might now regard as an unacceptably low 13 per cent or so.

This insight into manufacturing trends has enabled us to take a look at the journey UK manufacturing has taken over those years and how it has adapted. The story of that journey allows us to understand the momentum that is present in UK manufacturing, and provides confidence that it has a good and viable future. The fact that manufacturing is not static; is not standing still, shines through. It's vibrant, it's moving, it's changing, and it's adaptable.

There is a growing mood of optimism surrounding UK manufacturing and a good deal of positive sentiment. This report serves to add solid weight to that sentiment and provides much evidence of the strategies and methodologies that some of the best manufacturers are deploying with a zeal that will see them prosper not only in the present climate of favourable exchange rates for export but be able to compete when currencies conspire to present a more level international playing field.

If the successes of the manufacturing plants exemplified here and their approach to becoming world class players can be spread still further across UK manufacturing, there is every reason to be optimistic about a more rounded home economy.

At Barclays, we work hard to enhance our reputation as the bank of choice for the UK firms that will maintain and grow Britain's place on the global manufacturing stage. The success of manufacturing needn't and won't be at the expense of the strength of financial services within the UK. In fact, it is quite the opposite; a strong financial services sector in the UK will be a real catalyst for the growth that the manufacturing sector seeks.

I hope that you find this report an informative insight to what continues to be a vibrant UK industry.

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Manufacturing trends

UK manufacturing has changed a lot over the last 20 years; the untidy, cluttered factory of the past containing mountains of inventory and with long lead-times has become a distant memory. As we head into a new decade, just how much has manufacturing changed?

Over a long period championing and hosting its annual programme to seek out and examine Britain's best manufacturing plants; Cranfield School of Management has collected a large database of factory performance information that provides a clear insight into the key trends in this core industrial sector over the past two decades.

The Best Factory Awards were established to recognise and reward examples of manufacturing excellence, to document examples of best practice for others to emulate, and to provide high quality, detailed benchmarking data. The awards that plants can win include four specific industrial sector awards, several special categories and the overall Factory of the Year Award.

However, the programme is not just about winning awards; there are other benefits to entering, one of which is the provision to each entrant of a confidential and detailed individual benchmarking report. This document is industry-specific and contains more than 80 tables of valuable information, some of which companies may not have had access to before. These benchmarking reports can be a catalyst for change and help kick-start continuous improvement efforts within an organisation.

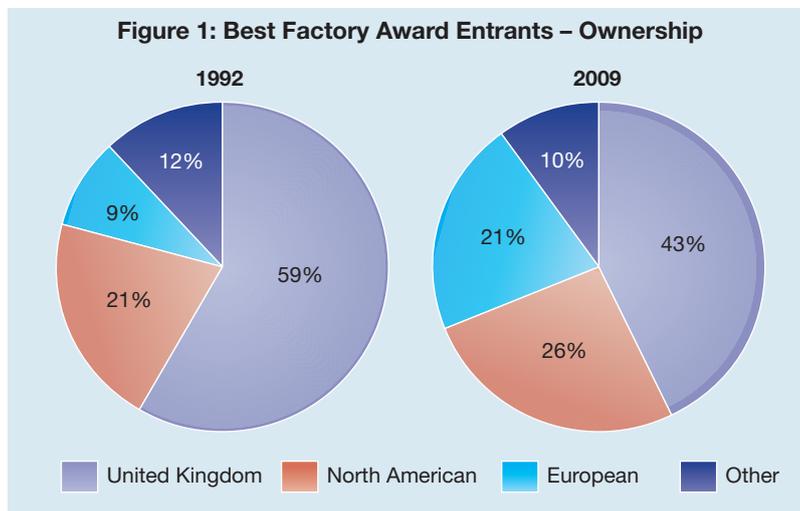
Best Factory Award Entrants - Ownership

So who owns the factories that have entered the Best Factory Awards over the years? Figure 1 shows the ownership of the plants that entered the Best Factory Awards in 1992 and 2009. At the start of the 90s the majority of the companies entering the awards were UK-owned, with the second largest group owned by North American (predominately US) firms. This proportion has changed over the years and in 2009 the number of participating plants owned by UK companies had fallen while the proportion of North American-owned and European-owned plants had increased. This mirrors, to a degree, the changes in ownership that have been taking place in the wider economy. Although Japanese-owned plants do not appear as a separate group (they are in the "other" group) a few entered the awards both in 1992 and 2009.

Key Trends

So what have been the key trends that we have seen? Over the two decades, the role of the factory has changed, moving away from just optimising utilisation and driving down costs. Factories no longer compete purely on price; they differentiate themselves through quality, delivery, innovation or service. They manufacture products that are more reliable and/or technically superior. They provide the customer with added value, for example by offering products and service solutions that simplify the customers' life. This is achieved by managing more effectively the customers' value chain, helping to reduce their manufacturing lead times, or by providing a complete solution that reduces the total cost of ownership.

The Best Factory Awards audit questionnaire collects information on a large number of manufacturing metrics, covering the spectrum from cost to inventory to operational performance. Examining this data, we can say that the average value of most of these measures has improved for the factories that have entered the awards over the last two decades.

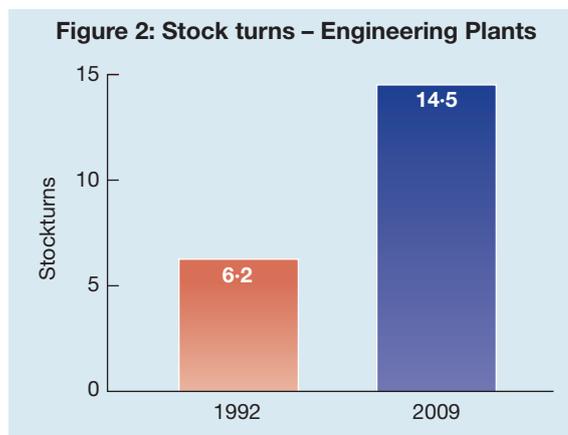


Let us consider a few areas of performance.

An area where performance has improved among the Best Factory Award entrants and among the UK industry as a whole, is in machine set-up and changeover times. In the past, machine changeover between batches or products had been a very time consuming operation, often taking hours if not days. The adoption of the SMED approach and the use of quick tool changeover methods have helped to reduce the time spent on them, thereby cutting inventory levels in the factory, reducing manufacturing lead times and allowing the factory to be more flexible. Many of the Best Factory Award winners have been outstanding models of just what can be achieved. For example, Gripple (Best Engineering Plant 2009) has ensured that SMED principles are embedded into its production equipment design. This has meant that over the years, changeover times have come down from two hours to just two minutes on some of the plant's newer machines.

The last twenty years have seen manufacturers reduce their inventory levels; they have adopted pull systems of production, introduced kanbans and just-in-time delivery from suppliers. Alongside a reduction in inventory levels, we have seen an improvement in total stock turns. The trends in the levels of total stock turns of plants indicate overall improvement across the sectors. By way of example, Figure 2 shows that the average inventory turns for engineering sector plants have improved from 6.2 in 1992 to 14.5 in 2009. Overall, the average level of stock turns for all the entrants to the Best Factory Awards in 2009 was in excess of 12 turns per year but, of course, some were achieving higher levels than that.

One of the less widely acknowledged trends we have seen is the promotion up the management agenda of maintenance matters. Most senior managers now recognise that improved maintenance can directly impact productivity and contribute to competitive advantage. This observation is echoed by Jonathan Starling, managing director of Spidex Software, who contends that “previously maintenance was often perceived as simply an overhead and too often first in line for reduction in headcount when cost-cutting was required... recently organisations have realised that their maintenance function is an integral component in maximising the overall productivity of the operation”. This recognition has been followed by increased adoption of one of the key approaches to improving maintenance, machine availability and uptime – total productive maintenance (TPM). The benefits of using the methodology is greater productivity, increased productive capacity and



improved quality. The use of TPM is high among the best factories with more than 43% of entrants to the 2009 Awards using this approach.

We have also seen the up skilling of machine operators to enable them to carry out first line maintenance. Dr Alan McLenaghan, senior vice president of technology at Saint-Gobain Containers Inc and a manufacturing veteran with more than 20 years experience, remembers the idea of the operator maintainer being discussed at a chemical company in the early years, but never really being put into action. However, he says “more recently, and I include Saint-Gobain Glass in this, I have seen many companies train their people to be able to operate, troubleshoot, understand, carry out planned preventative maintenance checks and even repair the equipment they operate”. We have come a long way from the early days of it being an aspiration.

One particular performance measure that we have seen rise in popularity is overall equipment effectiveness (OEE). The measure indicates how well a business is utilising its resources – both equipment and labour. For Adrian Pask, senior consultant with OptimumFX, the significant rise in the use of the measure has only come about in the last five years. He feels that companies’ understanding of the measure has greatly improved: “Four years ago we spent most of our time explaining what OEE was, now we spend our time explaining how to use it effectively.”

Another trend we have witnessed over the years is the improvement in factory housekeeping; Dr McLenaghan has found that the factories he now visits are getting “more organised, more logical, tidier and safer”. Many of the entrants to the Best Factory Awards have adopted the Japanese approach to housekeeping – 5S. The approach can help to reduce down-time and avoid delays, this all impacting the bottom line through greater efficiency.

Figure 3 shows that around half of the plants in engineering and the electronics sectors had adopted the method in 2001, but by 2009 the vast majority were using the method.

Over the years the lean manufacturing approach has grown in popularity and, some would argue, has become the pre-eminent approach to managing operations. What is certainly the case is the vast majority of the plants that enter the Best Factory Awards have implemented lean manufacturing; for example in 2009 more than 86% of the entrants were using the approach.

However, as the adoption of lean is reaching a plateau, we are also seeing an increase in the adoption of six sigma. In 2009 at least a third of the entrants in each sector had adopted the method, and if we look specifically at the engineering sector in 2009 around 36.8% of the entrants had adopted this approach. What we are also seeing is an increase in the use of lean manufacturing and six sigma in combination; the Thorn Lighting Spennymoor plant (Factory of the Year 2009) saw the combination of lean and six sigma as the most powerful accelerator on its journey to excellence.

Over the years we have seen an increased recognition among manufacturers of the important role played by people in attaining excellence. Managers recognise that the participation, creativity and knowledge of the employees are important to success. They also understand that this does not happen by itself and that they, as managers, have an important role to play. That is why, in the best factories, the management team has created and fostered an environment where the contribution of shop floor employees can be maximised.

Sandra Brown, of Sandra Brown Associates, a former director with years of experience running FMCG (fast moving consumer goods) operations, comments that in her experience, manufacturing has become “more inclusive from the employees’ perspective” and, importantly, shop floor workers feel that their contribution is sought-after and valued. The use of lean,

5S and six sigma has, for McLenaghan and Brown, helped to increase the involvement of the shop floor. McLenaghan contends that UK manufacturing has really embraced the obvious principles of continuous improvement and this is also why, for him, the sector does not stand still and is always innovating, always improving.

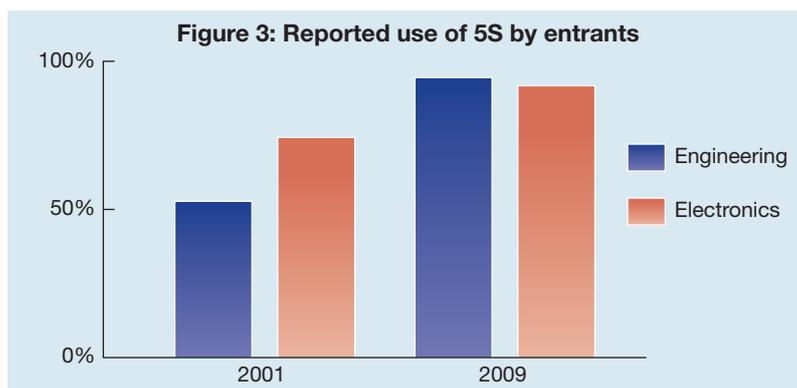
Attitudes to training shop-floor employees have changed significantly. In the past, little investment was put into training because it was expensive and time consuming, taking workers away from productive activity. The companies have come to recognise the fact that training does provide long term benefits; for Sandra Brown the “importance of training is better understood, not just the technical skills, but also the importance of the professional development of staff at all levels”.

The data collected as part of the Best Factory Awards process goes some way to supporting the changes that have taken place. For example, in 2009 in the engineering sector, the average number of training days for existing employees was 10 compared to just five in 1994.

Over the years, we have seen manufacturing embrace technology, whether it was process technology or information technology. The development and exploitation of technology has provided manufacturing companies with the capabilities to compete. Companies now regularly invest in process technologies to add value to the production process. Alongside this expenditure, firms are now investing in information technology to help them become more effective in terms of planning, control, communication and innovation. The capabilities that technology now offer the manufacturing manager are, for McLenaghan, impressive. In his business it is now possible to “link ordering systems to online quality systems, optimisation software, furnace control software linked to glass quality analysis, real time remote access to plant control systems from anywhere in the world”. What was once the dream of the information technology professional has become the everyday reality for the operations manager.

Finally, among the many trends we have seen one worth mentioning, which McLenaghan also highlights, is the improvement in relations with trades unions. In particular, he stresses the increased partnership between the unions and the plant management on issues such as multi-skilling, internal promotions and safety.

Manufacturing has seen many changes over the last 20 years, and it is a pleasure to see most firms are not standing still – they keep innovating, keep improving, and keep growing.





Benchmarking

Lots of manufacturers have an inward focus and therefore little understanding about the actual operational performance of the other companies in their industrial sector. Such insularity can lead to dangerous complacency

The idea that significant performance improvements will automatically put a plant among the best in its sector is often wide of the mark. At Cranfield School of Management, our research activities regularly come across companies that believe their performances are outstanding only to find that when we compare them with the best in their sector, they become disappointingly mediocre. Only when performance is compared with the best in a particular industry sector will a true picture emerge of just how good it really is. By comparing a plant's current performance against the best in a sector, it is possible to see where the gaps in performance exist and, consequently, where opportunities for improvement are to be found. Benchmarking can help to highlight the areas of focus for a plant's continuous improvement activities.

A structured approach

Benchmarking can provide a structured approach by which a comparison of manufacturing operations can be carried out. At its core, it is concerned with systematically comparing a company's performance

with that of a competing organisation in order to improve how it performs the same or similar functions or activities. The intention of the approach is to encourage continuous improvement, to lift the firm to higher performance levels, and to improve the competitive position of the organisation. The learning and knowledge that comes out of benchmarking can result in improved processes and products and ultimately, of course, better performance.

There are different types of benchmarking, from the simple to more complex process benchmarking (an in-depth comparison of a process across two or more organisations). One of the simplest and easiest forms of benchmarking is to carry out an internal comparison; to compare performance within the business. If a manufacturer has several plants it is easy to compare the performance across several metrics of one plant with the others in the group. The comparison of the data will help to indicate performance gaps and help to encourage managers to take the final step towards making improvements.

However, although an internal comparison is simple enough to undertake, the outcomes do not enable a company to understand the true size of the

2009/10 Factory of the Year, Thorn Lighting

gap that separates it from competitors. Also, this inward focused comparison does not help to build awareness of the need for change – while sister factories can sometimes be considered a threat, this is not always the case.

An internal comparison can be a starting point, but to gain the most benefit a company needs to take an external perspective – it needs to compare its manufacturing operations with others in its sector.

Such benchmarking involves measuring and comparing one's business processes against comparable processes in leading, broadly comparable, types of organisations to obtain information that will help to identify and implement improvements and to leverage the learning processes that will aid their delivery. The use of key performance measures and their comparison with similar performance measures in the 'best in class' companies is an important part of this improvement activity. The measures help to expose performance gaps and, crucially, their nature and size.

Using the output from a benchmarking exercise a company's management team can develop a plan for performance improvement. And, of course, the benchmarking data can also be used on a regular basis to help measure objectively the extent of improvement that has been achieved. Operational performance benefits can include, for example, improved quality, reduced manufacturing lead-times and lower cost.

Among less obvious benefits, benchmarking can also create the buy-in necessary for change, especially among employees at the lower levels of the organisation. It can help to create a culture that is more open to new ideas; importantly, ideas from outside. As part of this change it can help to overcome the natural barriers that employees have to the achievement of higher performance levels, with the benchmarking data serving to demonstrate that these new levels are attainable.

The use of this approach will expose a company or plant to the performance achieved not only by average competitors but also to the high levels of performance that are attainable because they are being achieved by the best operations in the industry. The initial diagnostic benchmarking exercise can also lead to more detailed process benchmarking focused on improving performance in one particular area where a large gap was identified.

The use of this kind of 'health check' exercise can be a powerful tool in setting and developing company strategy. Dr Stephen Wright, from PACE Performance Group revealed that when he worked for a large consultancy a simple health check benchmarking



exercise with clients would often, "allow you to understand the state of the business; it gives you enough valuable data for the executives to be able to get around the table to talk about the gaps and the strategy. It is a very simple process that effectively starts the dialogue about what they want and which direction they want to go". In his experience this exercise is not too difficult to undertake and the result is easy to understand.

The company's manufacturing performance should be evaluated on a regular basis by comparing the current performance to the past performance as well as crucially to the current performance in the sector. This evaluation provides information that is useful in helping to revise the competitive priorities and the manufacturing strategy.

The problem with undertaking the exercise is, of course, getting the information. While regulatory financial and operational reports on companies, analyst assessments, some sectoral data monitoring and media reports are all readily accessible and may provide useful background, very little data detailed enough for reliable benchmarking is available in the public domain. And contacting companies to try to exchange data is not always going to succeed since, as Sandra Brown of Brown Associates points out,

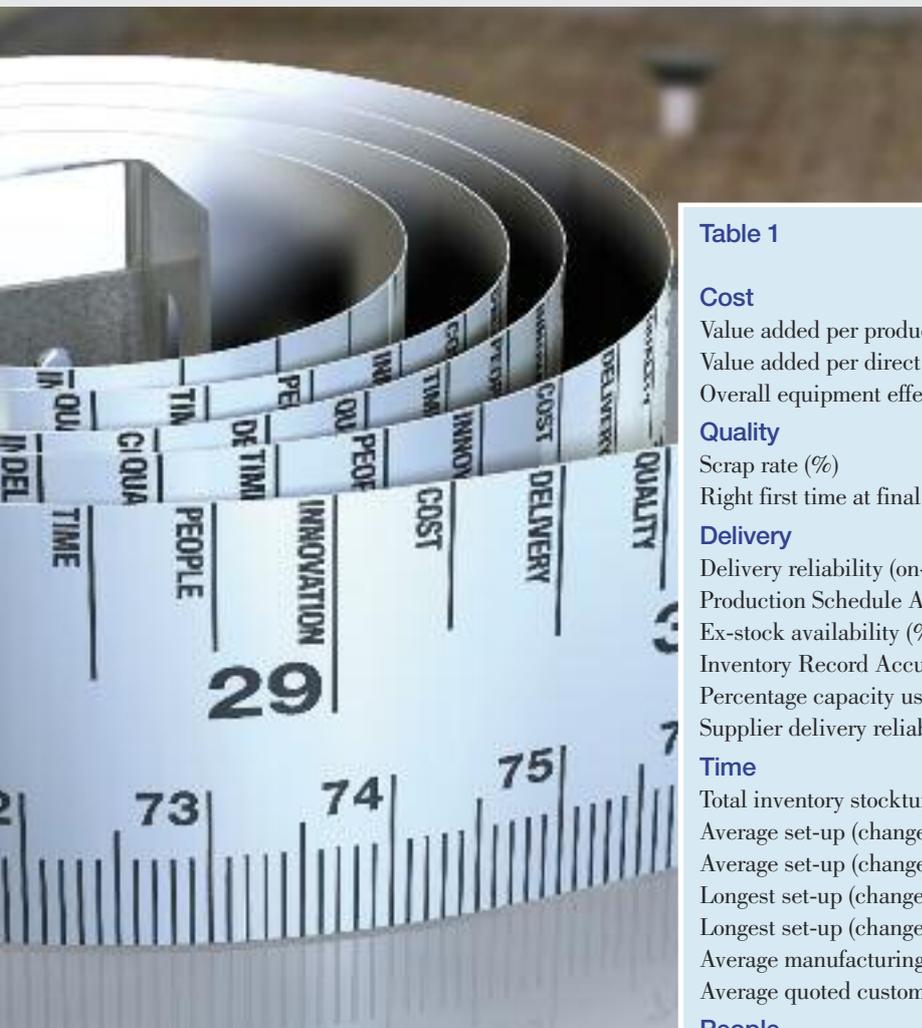


Table 1

Cost

- Value added per production employee (£)
- Value added per direct employee (£)
- Overall equipment effectiveness (OEE)

Quality

- Scrap rate (%)
- Right first time at final test (%)

Delivery

- Delivery reliability (on-time and in full) (%)
- Production Schedule Adherence (%)
- Ex-stock availability (%)
- Inventory Record Accuracy (%)
- Percentage capacity used for changeovers (%)
- Supplier delivery reliability (%)

Time

- Total inventory stockturns (turns per year)
- Average set-up (changeover) time in component manufacture (mins)
- Average set-up (changeover) time in final assembly (mins)
- Longest set-up (changeover) time in component manufacture (mins)
- Longest set-up (changeover) time in final assembly (mins)
- Average manufacturing lead time
- Average quoted customer delivery lead time (days)

People

- Absenteeism (%)
- Employee turnover rate (%)
- Training on the job for existing employees (days)
- Training on the job for new employees (days)
- No of improvement ideas per production employee
- Number of reportable accidents
- Number of reportable accidents per million hours worked

Innovation

- Time taken to bring a new product innovation to the market (months)

companies are protective of information on their performance for competitive reasons. This is why she recommends the use of independent benchmarking schemes such as the Best Factory Awards or specific industry forums.

Measures for Comparison

Since measurement is an important element of benchmarking, which particular measures should be used to make the comparisons between factories?

What measures should be used to answer the question: “Where are we better?” And, critically: “Where are we weak?”

The view of the practitioners is that a comparison needs to be carried out using a wide range of different measures. Brown makes the point that no matter what the marketing and finance departments may think, when it comes to determining where a plant stands in the sector, “no one measure above all others will give you an accurate picture of an operations standing”. Both Brown and Mike Rushworth, operations director with previous Factory of the Year Award winner Vitacress Salads, recommend that companies undertaking a comparison should always try to take a balanced approach using a range of different measures. These should cover the three areas of cost,

quality and service (delivery). Taking a balanced approach is also favoured by PACE Performance Group’s Dr Stephen Wright although he recommends using the balanced scorecard as a guide and also points to the importance of including a measure for innovation.

Comparing a manufacturing operation on cost, quality and delivery is important but as Adrian Pask, consultant with OptimumFX, says, it is essential not to forget about the people. They are at the heart of the organisation and the best companies know that they make the difference. It is important, in Pask’s opinion, to understand the level of motivation and expertise of the people. There are several possible measures that can be used to better determine this such as, for

example, the levels of absenteeism.

There is a whole plethora of performance measures that could be used; however, for those aspiring to be world class and wanting to understand where the gaps exist and where the improvements need to be made, then the general view is that the comparative measures shown in Table 1 are the ones to concentrate on.

A Condensed Set of Measures

The list of measures in Table 1 is long and could be even longer with the inclusion of other more specific factory measures such as batch size, for example. However, when undertaking an initial quick health check of an organisation, it is better to focus on fewer measures rather than a voluminous list. A reduced and more focused list can make the process more

Thorn Lighting is described as having continuous improvement and innovation built into its DNA



effective. So, what would this reduced list look like?

Its components can be identified by concentrating just on the key operational measures. Pask, Brown and Rushworth all agree on the importance of Overall Equipment Effectiveness (OEE). As Brown states: "In my view the standard OEE metric provides the most helpful high level measure of an operation's overall physical performance. As it combines plant availability, performance and quality, it gives a broader insight into the business performance." The OEE metric and the three measures that make it up have been found to be very useful tools in continuous improvement in their own right.

Rushworth along with Brown and Pask indicate the importance of customer service, especially in the fast moving consumer goods (FMCG) sectors such as food; hence, for them, delivery reliability (on-time and in-full) is a critical measure. They also point to the importance of having a measure of quality. Pask considers that stockturn is an important measure to include in any comparison, especially if the manufacturing plant is starting on the lean journey. The excellent performance of a factory is, for Pask, due in no small degree to an engaged, committed, well led workforce. So for him, it is important to include a measure that indicates the degree to which this has been achieved.

While the experts do not necessarily agree on exactly which are the top measures, a consensus does emerge which indicates that the following measures are the important ones on which to compare factories:

- Value added per production employee (£)
- Overall equipment effectiveness
- Scrap rate (%)
- Right first time at final test (%)
- Delivery reliability (%)
- Total inventory stockturns
- Set-up and changeover times (mins)
- Absenteeism (%)
- No of improvement ideas per production employee

Conclusion

Comparing the performance of one manufacturing plant with others in the same sector and, in particular, with the best-in-class in the industry can provide an indicator of performance gaps. These can then become the focus for improvement activities. By using schemes like the Best Factory Awards, it is possible to carry out a comparison and with the information be able to make the jump to higher levels of performance and improve the competitive position of the company.

What world class looks like

A list of previous Best Factory Award winners quickly reveals that they operate in diverse sectors and manufacture a heterogeneous range of products. So how can these factories be, in any way, the same and have common success factors?

Despite assumptions that might suggest the contrary, it soon becomes apparent on examination that Britain's best factories think and act in a similar way in some significant areas. The managements of the best factories have mastery of their manufacturing operation, allowing it to achieve superior operational performance; for example in such key areas as cost, quality and delivery lead times. This is due, in no small part, to the fact that they have paid attention to the manufacturing basics. They have:

- Improved material flow in the plant – the best factory has good material flow on the shop floor, batch sizes have been reduced, machines and equipment are close together, materials travel short distance and there is little work-in-process.
- Improved communication throughout the plant using visual management techniques
- Good housekeeping standards; a clean uncluttered factory where there is 'a place for everything and everything in its place'
- Reliable equipment – the machines are well cared for, breakdowns have been eliminated. This has been achieved through a switch towards the Total Preventive Maintenance approach.
- Few layers of management – a flatter structure along with a breakdown of the barriers between the shopfloor and the management
- Employees who have been organised into teams
- Employees who understand the concept of lean and live by its principles
- A strong focus on health and safety
- Getting the basics right is important, but there is more to best factories than this. There are other elements that are interrelated with the fundamentals of being a best factory. Let's take a look at these, starting at the top.

Leadership

A key driving force behind a good factory is found among the senior management team. One of the most

important goals for them is to be the best, to be world class. They have a vision for the factory and are committed in their quest to achieve it. The vision is clear, consistent and communicated throughout the organisation – from the top right down to the shop floor. At the best factory, everybody is aligned to the same vision. This is translated into the major areas of focus and the key metrics and techniques to achieve the vision. Everyone in the factory is aware of the key metrics and is measured and rewarded against these to help ensure the achievement of the vision. As Tom Pickering, CEO of Icebreakers Executive Interim Management Ltd and a former manufacturing director, says: "In an excellent factory if you ask anyone what their role is in achieving the plant objectives, they will know". There is also regular monitoring and feedback about progress. This alignment around common goals fosters a teamwork environment, ensuring that inter-departmental strife is eliminated and that all levels concentrate on what is truly important to the success of the business. For Sandra Brown, of Sandra Brown Associates, a former director with years of experience running fast moving consumer goods (FMCG) operations, the mark of a good factory is the fact that "employees at all levels understand where they fit in, what their contribution means, who the customer is, who the competition is, and they are comfortable talking about it".

The best factory has a specific approach to leadership – the style is different from the traditional command and control approach; it is more supportive and involves the delegation of decision making down



Gripple: The 2009/10 Best Engineering Plant

the organisation. The managers adopt the leadership role when necessary, but they also increasingly act as coach and mentor to the employees.

The leadership team promotes the importance of continuous improvement and is visible in showing its commitment to it. It also takes a lot of pride in achieving success, which is celebrated and recognised, especially the achievements of the shop floor employees.

Customer Focused

The best factory is customer focused – its intention is to delight the customer; the strategies that are developed are directed by customer needs and requirements. It develops organisational structures that support the focus on the customer and tries to ensure that there are numerous connecting links between the factory and the customer.

The best factory management do not guess or speculate about what delights the customer, rather they talk to their customers, conduct periodic customer satisfaction surveys, and they work closely with customers to develop new products or enhance existing ones.

Empowering employees

The employees are an important element of an excellent factory. The people are, as many best factory winners will tell you, their company's best asset; importantly the employees are seen as more than a resource (which can be expendable), more than just an appendage to the production equipment. The best factory management respect their workers and recognise the fact that they are capable and willing to improve the factory processes. The managers don't just give the employees the opportunity to comment on what improvements could be made, they actively encourage them to get involved in improvement activities and projects. A key component of this environment is that the employees have unambiguous performance expectations, defined goals and clear feedback. In addition, there is a reward and recognition system in place. For Brown, the "celebration of success – either corporate or individual" is important, especially the achievements of the shop floor employees.



Power Panels: The 2008/09 Factory of the Year

Training and development

The best factory managers know that the participation and knowledge of every employee are important elements in their success. They spend a lot of money and time developing the skills and knowledge of their employees through regular training and development. Previous Best Factory Award winners, such as Gripple, Twinings, Thorn Lighting, Saint-Gobain Glass and Power Panels all attested to the value of continuous employee training and development.

Teams

The skills, capabilities and commitment of the individual are important, but operational success lies in harnessing these within a team environment. This is why the organisation of people in teams has become the main approach in the best factory. The teams tend to be self-managed, flexible, multi-skilled and, importantly, empowered to carry out continuous improvement. The teams are empowered to make changes; authority has been passed down to them and they have responsibility for the management of their area.

Quality

Quality is still important to customers and an area where firms can gain a competitive advantage. However, it is a dynamic attribute and the level of quality that delights customers changes over time. The management recognises this and continuously works on improving quality. David Fox, chairman of Power Panels, puts his company's success partly down to a focus on quality and the desire to continuously improve it. Some of the best factories like 2008 Factory of the Year Power Panels have, through the adoption of six sigma, seen significant improvements in quality.

Flexibility

The best factory is flexible; an attribute it has achieved through compressing lead times, reducing inventory levels, and improving planning systems and processes. Alongside these activities, flexibility has been increased by reducing setup times, increasing employees' levels of multi-skilling and introducing variable working hours contracts. At 2009 Factory of the Year Thorn Lighting, which has the ability to respond quickly to customer demand, multi-skilling is the norm with many of the employees being able to make any product in the range.

Continuous Improvement

One of the main traits of the best factory is the importance managers attach to continuous improvement (CI). Through harnessing the power of

CI, they have been able to make significant progress in performance. This has also been important from an organisational culture standpoint, because it facilitates the involvement of the employees. Employees have been taught how to use the various improvement tools and techniques, and facilitation support (from CI facilitators or black belts) is available to help with the improvement project. By supporting and nurturing CI, senior managers have been able to ensure that it has become the norm “the way we do things around here” for the employees.

Always Looking to Get Better

Senior management is not satisfied with just maintaining the status quo. The business environment changes, customer needs evolve and what was good last year, last quarter, may not be good enough now. Successful firms recognise the need to get better, they have a passion for excellence, and they have the self assurance that they can get better – and be the best. The best invest in their factories – changing products, changing manufacturing processes and even their business models. The successful organisation is regularly looking at ways to improve and stay ahead of the competition.

Agile

The best factory is also agile – having the capability to respond quickly to changing markets. The senior managers do not view the factory in the narrow sense whereby its sole function is regarded as being to produce a particular product. Instead, they view the factory more in terms of a group of core competencies and skills rather than products or product families. In order to be able to meet changing market requirements, the factory has a dynamic infrastructure. It is designed so that equipment can be reconfigured to deal with significant volume changes and the introduction of new products and technologies; in order to be able to deal with the changes, the labour force is multi-skilled and empowered. In the best factory, the employees’ skills and knowledge are the principle assets of the organisation and the equipment and technologies are there to leverage the impact of these assets.

Innovation

The best factory is an innovator, involved in developing new products, new processes, new systems and new services – innovations that give it a competitive edge, differentiate the firm from its competitors and help it grow in the future. Being customer-focused gives it a good understanding of customer needs, which, in turn, provides an important input into the new product

development process. The employees are involved in innovation and they provide critical input to the design of new products to ensure they are designed for manufacture. Close collaboration between the factory and the product development team ensures that the new product introduction goes ahead smoothly and on-time.

Managing Materials and Supply Chain

The best factory has moved away from the traditional ‘arms length’ adversarial relationship with its suppliers, to one that is much closer; more of a partnership. It expects a lot more from its suppliers – for example, more frequent delivery, use of kanbans, vendor managed inventory, help with innovation, – but in return it helps by sharing with them its future plans, providing training for their employees and also giving support, if required, for their own improvement initiatives.

Environment

The managers at the best factory are concerned with environmental issues, especially the management of energy and waste. They are taking actions to minimise the use of natural resources, like materials and energy, reducing solid waste and shrinking the business’ carbon footprint. The various resource inputs to the manufacturing process, such as light and energy, have to be paid for, so reducing their use, especially at a time when many are rising in price, has an impact on the bottom line. The results that Best Factory Award winners have achieved is impressive; for example Saint-Gobain Glass UK in 2008 had cut its CO2 emissions by 13%, its nitrogen oxide emissions were 38% of their 2001 level, and between 2001 and 2007 it cut waste from 6000 tonnes to under 2000 tonnes despite having seen output grow over the period.

Technology

An important part of the best factory’s success is down to the way it uses its process technology to give it a competitive edge. Any advantage it has can, over time, erode and so the management has a strategy of continual investment in technology. This is based on clearly defined visions of the future competitive requirements. The knowledge base required to take advantage of the technology must be developed and management effort put into the planning and introduction of the new technology to ensure success.

*Saint-Gobain Glass
UK: A former
Factory of the Year
and Best
Process Plant
award winner*





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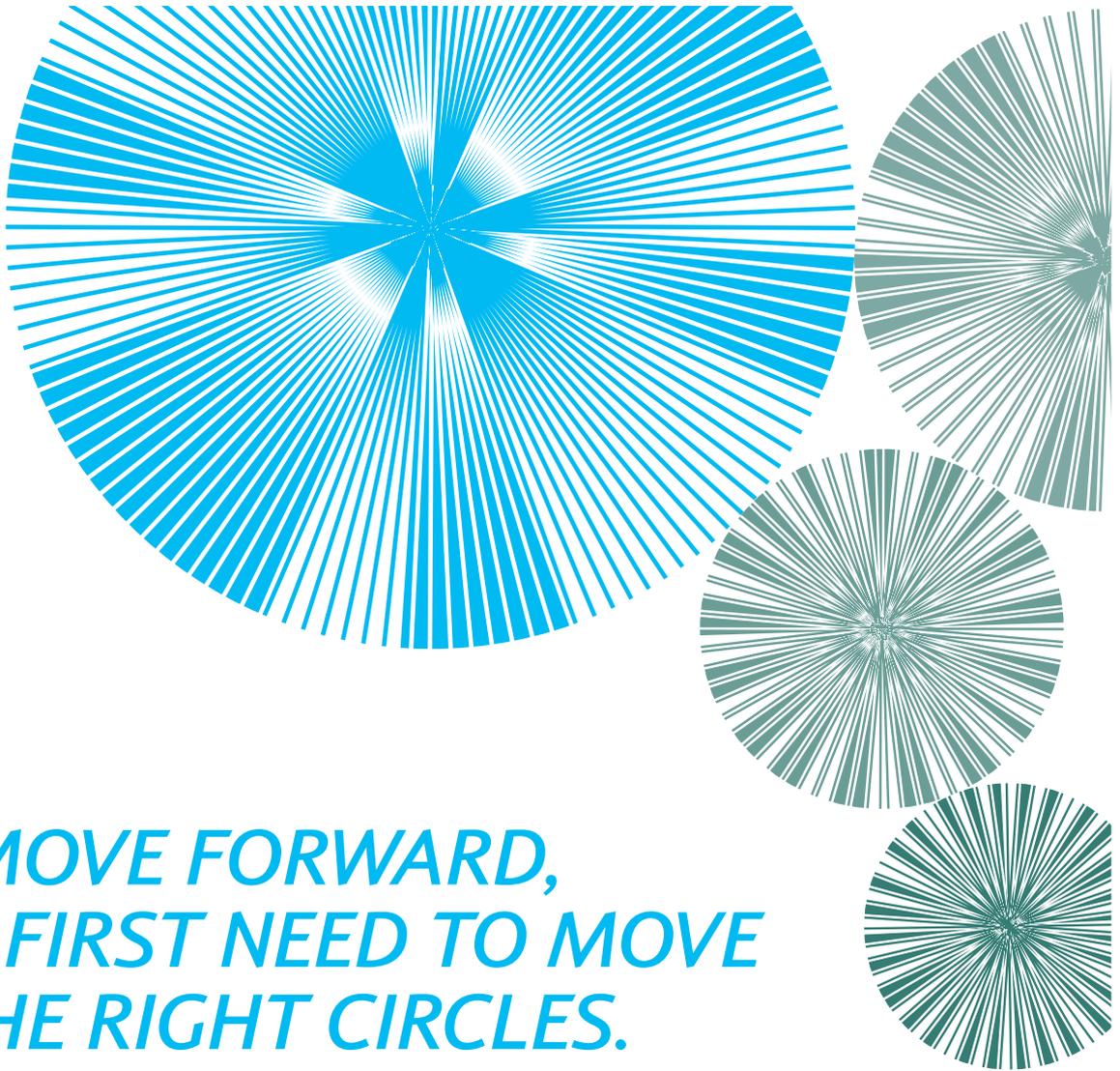
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