ADD N°07

ARGON CONSULTING JOURNAL OF IDEAS

PROCUREMENT
R&D AND INNOVATION
PRODUCTION AND MAINTENANCE
SUPPLY CHAIN AND LOGISTICS
CUSTOMER RELATIONSHIP MANAGEMENT
SG&A OPTIMISATION
FINANCE AND PERFORMANCE
CHANGE MANAGEMENT

TOWARDS **A NEW KIND OF MANUFACTURING EXCELLENCE....**

The pursuit of competitive advantage has long been the key challenge for businesses. To the extent that, in Manufacturing, Manufacturing Excellence is (too) often limited to identifying opportunities for cost reduction.
However, in the context of an ever-changing market and in the face of increasingly fierce competition, new topics are emerging: agility, digital, human capital, etc. These topics have revolutionised the definition of Manufacturing Excellence by bringing to light new drivers that did not previously exist.

Just as it has been these past three years, the aim of this magazine is to provide you with a new (sometimes disruptive) perspective on the topics that concern you. That's why, in this new issue of ADD, we will be introducing you to new areas of Manufacturing Excellence.
Our aim is to answer this key question: how can Manufacturing Excellence be defined and achieved? There are two initial components to the answer: (i) the "traditional" drivers in the pursuit of Excellence are still relevant but their execution must be reconsidered in order to respond, for example, to the challenges of agility and competitive advantage, (ii) new drivers are appearing and must be considered in the way that Operations are executed.

In addition to the feature articles written by our experts, we will share with you the vision of Jean-François Claver, Chief Industrial Officer of Imerys, which highlights the importance of Excellence in the construction of business culture. The interview with Hugues Oger, Director of SDA Industrial Operations (SEB Group), illustrates the growing weight of agility in achieving Manufacturing Excellence.
One of our customers, a major player in the agricultural chemical manufacturing agreed to tell us about the completion of an outsourcing project demonstrating that Manufacturing Excellence can also be achieved with external help.
Finally, Augustin Huret, designer of an Artificial Intelligence solution and founder of the company MondoBrain, illustrates the growing (if not undeniable) role of Digital in the pursuit of Manufacturing Excellence.

I hope you enjoy reading and that it gives you a fresh perspective on your Operations.

Yvan Salamon
President

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MANUFACTURING EXCELLENCE: **FOCUS**

To improve their competitive advantage (in the broad sense), manufacturing companies must cultivate their "Excellence". That means maintaining the executional performance of their Operations.

This kind of performance is no longer limited to reducing costs or maintaining a maximum quality level.

Companies are facing new challenges:

- Rethinking their approach to industrial strategy to further anticipate potential disruption and integrate the increasing relevance of Digital;
- Being able to react to increasingly rapid, unexpected or profound changes in the market (customer or supply-side) and thus developing their agility;
- Considering the growing importance of their human capital in the face of their operational and cultural transformation challenges.

Consequently, Manufacturing Excellence is becoming (now more than ever) a subtle combination of multiple criteria: direct and indirect cost management, agility, meeting quality standards, ability to change while integrating human constraints, etc.

Although there are clear ideas about how to manage costs and quality, the issue of agility is more obscure. Nonetheless, this dimension is becoming an increasingly decisive factor for Manufacturers in their pursuit of Excellence.

For Argon Consulting, "**industrial agility**" can be defined (and measured) according to three dimensions:

- **Adaptability to needs**, or the ability of the business to react to product/services changes in its market through manufacturing speed (reduction of its time to market);
- **Volume reactivity** or the time taken to react to an overall fall or rise in demand for a product family;
- **Mix flexibility** or the company's ability to adapt to the slightest change in the product references of any item in its product mix.

In a more volatile market context, making the manufacturing facilities and organisation agile is really a matter of competitive advantage for the company. It is necessary, not only to be capable of "instantly" responding to changes in the market, and therefore the expectations of internal and external customers, but also of doing so while controlling quality and the manufacturing cost (by reducing lead times and inventory and optimising change, etc.).

How can all these challenges be reconciled to achieve Manufacturing Excellence?

From our point of view, the underlying drivers are the same:

- **Industrial strategy:** although defining a strategy is often considered a factor in cost optimisation, it can also be a source of rigidity (setting a goal for the next 3, 5 or 10 years). So methods of thinking and decision-taking must evolve in order to make more space for scenarios, integrating more widely internal operational experts and new opportunities (such as Digital, for example).
- **Innovation and R&D:** time to market as well as the company's ability to effectively and efficiently industrialise clearly play major roles in cost reduction, quality and agility, even more so that customer requirements have significantly increased.
- **Planning and the Manufacturing Supply Chain:** in recent years, one underlying trend in Supply Chain and Planning has been strengthening the management of this function by creating dedicated organisations, which guarantee skills acquisition. However, at present we are noticing that some sectors (where the Supply Chain is based on complex models) are having to rethink their operating procedures to help manufacturers regain control of their own planning and thus ensure optimum cross-functional operations (optimising the cost/inventory/service trinity).
- **Excellence in manufacturing practices:** traditionally promoted as a way of improving quality and manufacturing costs, Manufacturing Excellence methods are also very effective drivers for optimising manufacturing agility (Lean and Six Sigma) and supporting cultural transformation.
- **Digital:** now an inescapable force, through the implementation of new technologies and potentially limitless changes, Digital has become a factor in optimising costs and manufacturing agility through the development, for example, of ultra modularity in production lines or the emergence of artificial intelligence.

Our ambition, in this issue of ADD, is to focus on the drivers that will help to improve Manufacturing Excellence within production sites.

So, in the coming pages, we will illustrate four drivers: industrial strategy, planning and the manufacturing supply chain, excellence in manufacturing practices, and Digital.

Lastly, on the understanding that business transformation is only possible (and successful) when supported and managed by people, we will find out how the pursuit of excellence must include human capital considerations.

MANUFACTURING EXCELLENCE: A BALANCE BETWEEN EXECUTIONAL EXCELLENCE, AGILITY AND DIGITAL…

In an increasingly challenging market context, the pursuit of Manufacturing Excellence is a key factor in preserving (or improving) the competitive advantage.

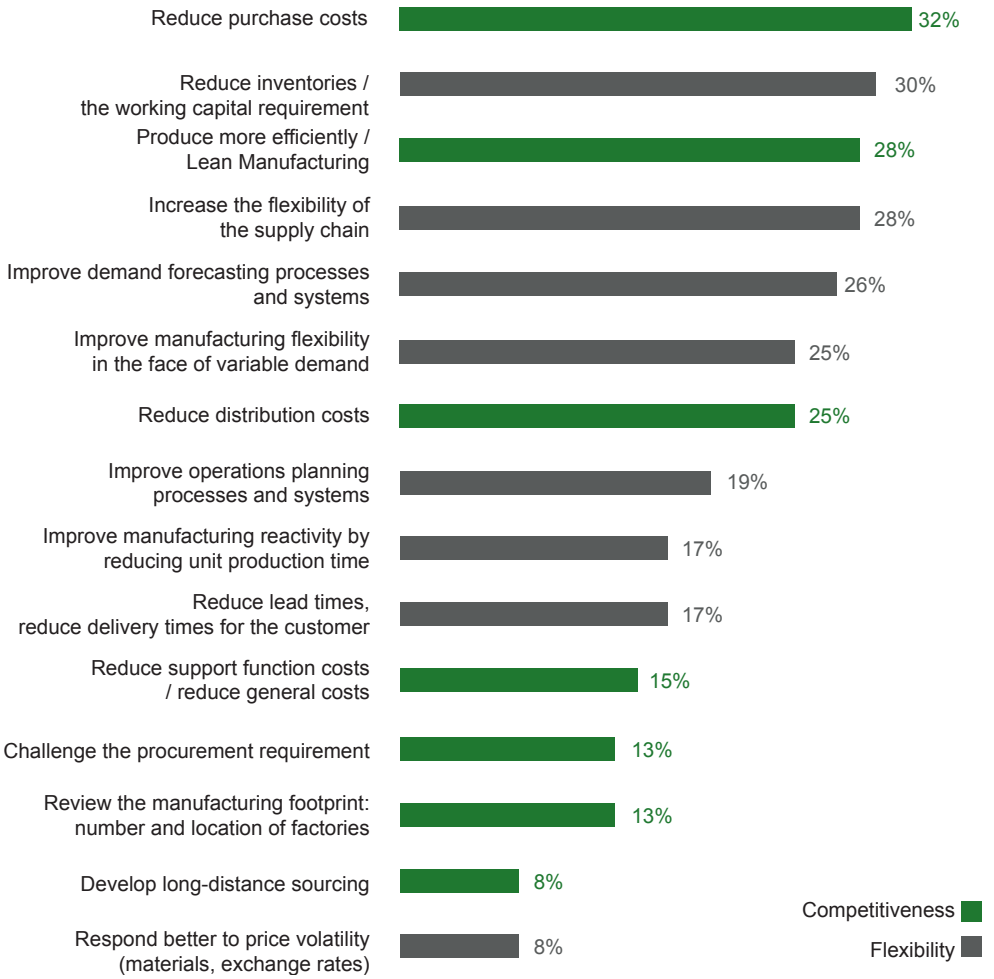
Which drivers can be implemented to attain a new level of Operational Excellence? Although the pursuit of Excellence is nothing new for manufacturing businesses, new drivers do seem to be emerging.

The study that we carried out, in partnership with the BVA Institute and HEC group, on approximately one hundred company directors, allowed us to define the “new areas” of Manufacturing Excellence.

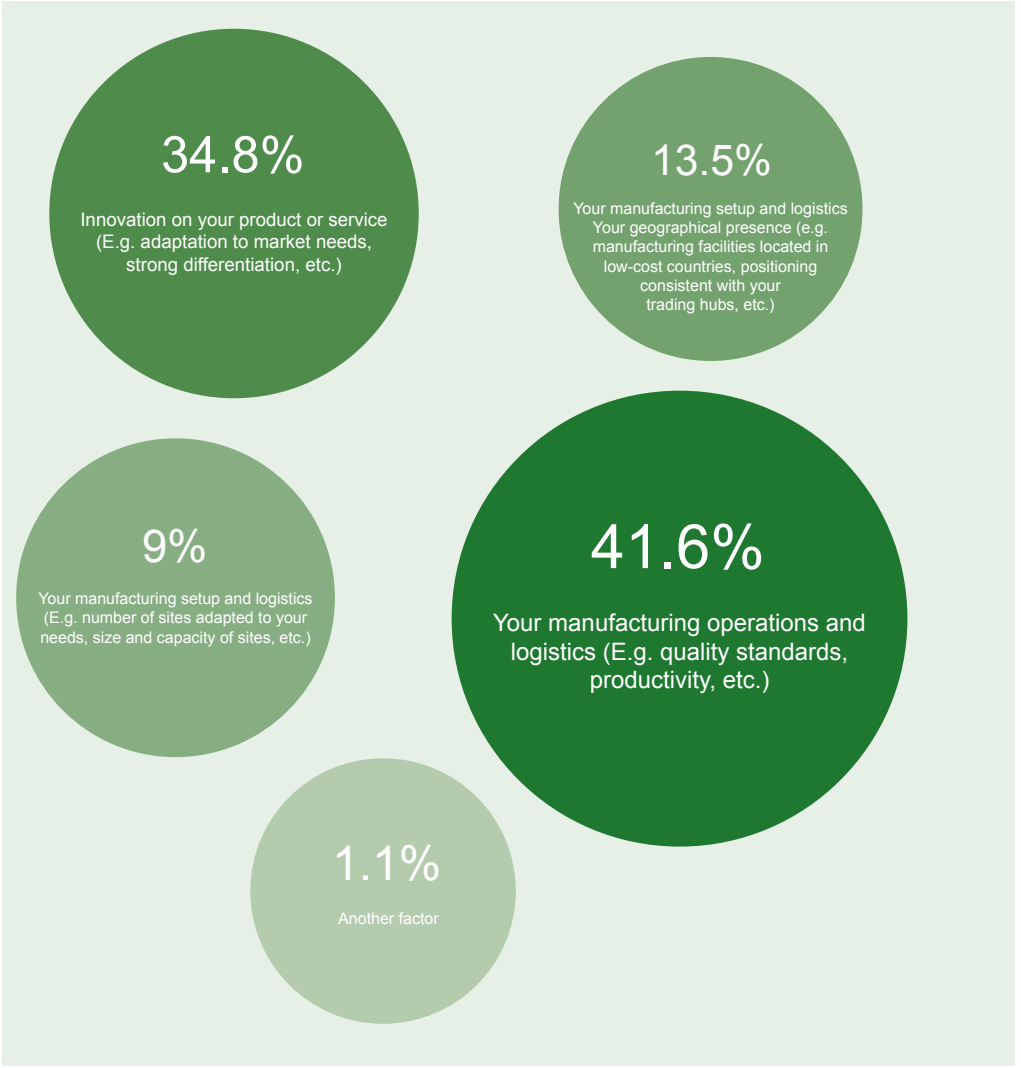
Of the 10 priority challenges mentioned by directors, logically three relate to competitiveness/cost. 32% of respondents cited the reduction of procurement costs, over the effectiveness of production (28%) and the reduction of distribution costs (25%). Another key challenge: managing uncertainty. Company directors place their trust in the virtues of flexibility to help them overcome it. Reducing inventory, creating flexibility in the Supply Chain, improving demand forecasts, manufacturing flexibility: each of these topics appeared in more than 25% of responses, thus revealing that improving flexibility is a major asset in the pursuit of Operational Excellence.

When we asked company directors which factors accounted for the performance of their companies, they primarily cited the significance of manufacturing execution and logistics (approximately 42%), followed by the concept of innovation (approximately 35%). Consequently, directors confirmed that performance is driven by Excellence in practices but also the company’s ability to react effectively to changes in its market (which refers back to the idea of agility).

In your opinion, what are the major challenges that your company must overcome in coming years in order to stay ahead?



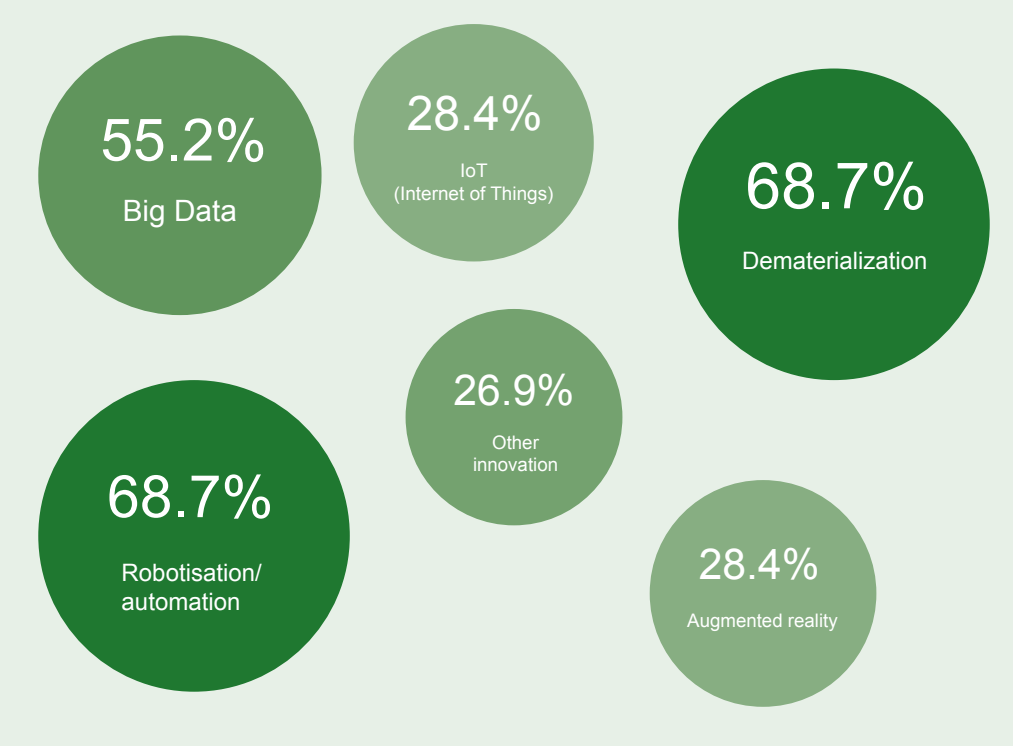
What is the main factor accounting for the manufacturing performance of your company?



Furthermore, more than 80% of them stressed the importance of implementing operational Excellence benchmarks. The impact of these benchmarks is essentially demonstrated not only in the improvement of performance (obviously) but also by harmonising practices and supporting cultural change. Consequently, these responses reveal the essential role of human capital in the improvement of manufacturing performance (and business transformation).

78% of the companies surveyed considered Digital to be a determining factor in their pursuit of Excellence and performance, mainly influencing industrial execution: human performance, mechanical performance, development of new standards, etc.

Which digital innovations do you think are relevant in your company?



Lean-type actions are still a preferred driver in the pursuit of Excellence and performance. 72% of companies think that these actions have had a positive impact on agility, whereas 12% say the opposite and 16% confirm that they have not implemented any actions of this kind.

Finally, these two studies demonstrate that companies, which are fully aware of the challenge represented by the pursuit of Excellence, have focused their action on cost reduction. They are aware of the impact of new drivers, although they are not always implemented.

MAKING INDUSTRIAL STRATEGY A DRIVER OF EXCELLENCE

Jean-François Laget, Partner, Argon Consulting
Jean-Baptiste Sebag, Senior Manager, Argon Consulting

Manufacturing strategy (location, blueprint, specialisation or multi-sourcing, etc.) is at the core of companies' concerns, as it has been identified as one of the foundational drivers for reducing costs and improving Operational Excellence.
It can be defined as all the decisions that structure the manufacturing system to make it more competitive and better suited to the competitive environment. Some important points to remember to make manufacturing strategy a driver of Excellence.

1. Five key questions to ask oneself

- **Which Core Business?** What is the company's Core Business? Which production stages (value chain) are retained internally?
- **What?** What is the allocation of products between sites? Should the focus be on specialised or multi-product plants?
- **Where?** Where should manufacturing facilities be developed? How can qualified labour be accessed at the right price without causing logistics costs and the carbon footprint to skyrocket?
- **How much?** What is the target manufacturing (and therefore logistics) blueprint? How many manufacturing sites do I need for production and what size should they be?
- **How?** What level of performance should be expected from manufacturing units? Based on which standards?

However, these questions, which are often addressed in isolation and on different timescales must be looked at holistically.

2. Speeding up the pace of questioning

Of course, each of these questions should not be addressed with the same frequency or over the same timeframes. The matter of Core Business may be reviewed every year, depending on technological changes and market movements, whereas the manufacturing setup ("How") requires a longer-term vision to have sufficient ROI. Should we then automatically prioritise short-term ROI in order to improve agility, even if it means losing out in terms of costs? Can cost optimisation and agility really be reconciled to achieve Excellence?

There are two ways to successfully reconcile them:

- Analysing the market context and the competitive environment to identify the timeframe over which the strategy can be implemented;
- Listening out for disruptions and having the means to change course.

3. Arbitrating between cost and agility using robust models

An increasing number of manufacturing firms are currently wondering how to find the right balance between specialisation and multi-sourcing, thus revealing the growing significance of "What". The basic questions on this topic are (i) knowing what the company wants to prioritise (costs that naturally drive specialisation, or rather agility, which instead drives multi-sourcing) and (ii) setting the right level of company reactivity (reallocating products by minimising transfer and manufacturing costs). In order to answer these two questions, it is essential to refer to robust economic models that measure the impacts not only on manufacturing costs but also on service rate and inventory levels.

Can we really reconcile cost optimisation and agility to achieve Excellence?

4. Strengthening the concept of scenarios building

Strategic questioning can be a source of rigidity. Indeed, the challenge is to define for the next 3, 5 and 10 years, the guiding principle of the company, its vision.

Making strategy a driver of Excellence must therefore break with this "traditional" approach, that means being able to contemplate the maximum scope of possibilities. The company's ability to increase the number of scenarios when establishing its strategy should enable it to react if its environment changes.
Consequently, a company that is seeking to outsource its business must also plan alternative scenarios, e.g. in case of changes to the economic or legal environment of the destination country.

5. Thinking Digital right from strategy conception

Digital has become an inescapable force in improving competitive advantage in the manufacturing sector, yet is often included very late in strategic planning. It appears as a driver retrospectively, whereas to a certain extent it should direct planning from upstream. The development of 3D printing may call into question everything that was thought about the geographical presence of a network of repair workshops: low investment and operating costs may make it possible to increase the number of small local units versus a few large regional repair centres. It therefore seems necessary to break with traditional approaches, by considering the impact of Digital on each of the five key questions.

6. Widening the scope of stakeholders

Manufacturing strategy matters, which are very often limited to the Executive Board, should in fact involve every area of the business, from R&D to downstream Logistics. Completely overhauling the company's operations (up to the definition of its Core Business) requires not only having a "Vision" but also understanding where the obstacles and operational risks lie. This means understanding the Business Lines to be able to propose an operational strategy that guarantees Excellence.

It therefore seems necessary to [consider] the impact of Digital as far upstream as possible

OUTSOURCING AS A DRIVER OF EXCELLENCE IN TERMS OF COSTS... AND PRACTICES

Jean-Baptiste Sebag, Senior Manager, Argon Consulting
Business Unit Manager, Client Company

Our client has been trading for over a century and is a major player in agricultural chemical products. It is established in the main European countries. When faced with changes in its regulatory environment (at European level) and in its supply and distribution markets, it decided to outsource part of its production.

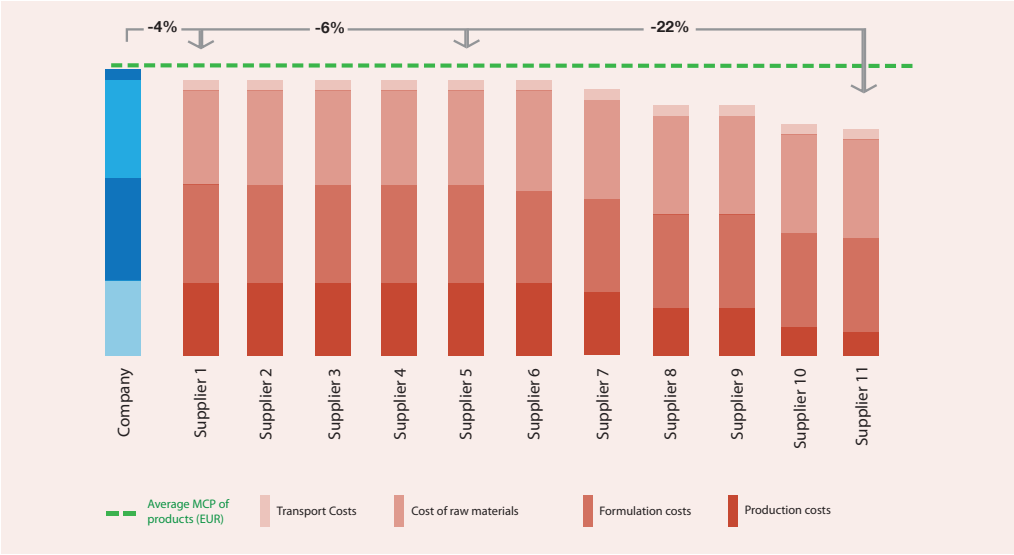
In this project, our client saw the possibility of attaining a new level of Excellence both in terms of costs (low-cost locations, leaner manufacturing structures), flexibility (production tools that are better adapted and more efficient than its own assets), etc. and in terms of manufacturing practices (as the business in question is not its core business line, it wanted to find specialists who could improve its quality level and innovation speed). How did it go? - three key points.

1. Identifying challenges relating to cost as a competitive advantage

"Like all manufacturers, we thought we had a clear vision of our costs [...] the first contribution of consultants is to challenge us... a necessary step for change."

Identifying competitive advantage / cost challenges involved modelling areas for Production Costs optimisation, i.e. modelling all (visible and invisible) costs. Taking this step back demonstrated how the company was really working and pointed out its shortcomings, thus helping to establish a standard for comparing the performance of the company to that of its potential providers of outsourced manufacturing.

This approach made it possible to create a “should cost model”: what should the supplier’s performance be in theory given industrial best practice and its theoretical costs (direct labour, location, sourcing of raw materials, transport, frequency, etc.)?



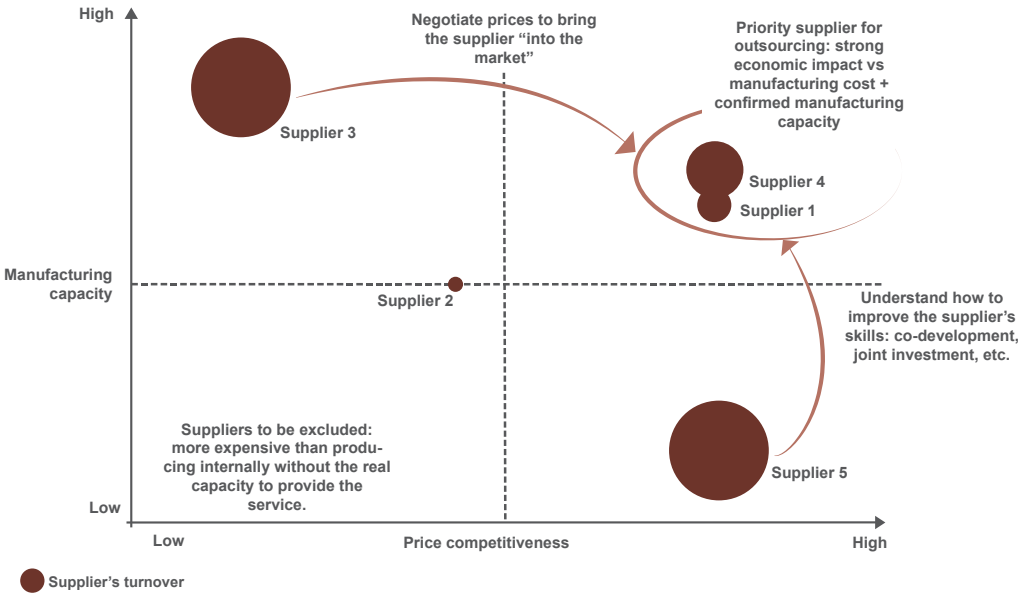
For example, this analysis shows that transport costs do not have an impact on the competitive advantage / cost of products, which makes it possible to contemplate a large geographical screening.

2. Evaluate the Excellence of supplier practices: agility, innovation, etc.

“Without this “life-size” test phase, we would probably have made the wrong choice based on a simple economic vision. It has revealed and confirmed that low-cost countries are not necessarily the most beneficial!”

Contrary to what we may think, the challenge was not to find potential suppliers but to qualify them and understand their level of Excellence. Qualifying the supplier is done in several stages: both remotely and on site. The objective being to assess not only its relative capacity (vs internal capabilities) but also its absolute capacity based on Manufacturing Best Practices. In this case, the challenge was to successfully manage a very complex product mix and to quickly integrate product and packaging innovations (by participating in the industrialisation phase, among other things). It was from this step that we actually went from a traditional, core strategy to an applied strategy.

Example: supplier capability matrix



3. Ensuring successful implementation

"This approach organized with Argon Consulting, makes us more flexible... we are optimizing our costs without taking the risk of never being able to change our mind."

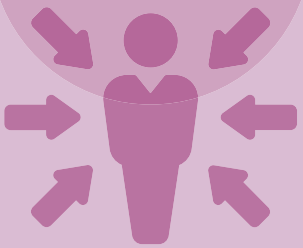
Combining a traditional approach with specific operational and economic assessments, the strategy defined was theoretically operable and robust. We still needed to define a roadmap that enabled the company to empower its supplier to capitalise on a new level of Excellence. Some key points to bear in mind when building the roadmap:

- Maintaining minimum internal qualifications by identifying key skills (and retaining people) to guarantee the relationship with the supplier and ensure the level of Manufacturing Excellence;
- Establishing a "dual sourcing" period (internally and externally) to ascertain the real capability of the selected supplier;
- Implementing audits and qualification processes to maintain the level of pressure on the supplier (on costs, quality and lead times).

It was in this way that the selected solution became competitive and flexible... while still allowing for a roll-back. Outsourcing can therefore become a real driver of Excellence.

TOWARDS A CUSTOMER ORIENTED INDUSTRY

Fabrice Bonneau, Managing Partner, Argon Consulting
Thierry Lucas, Partner, Argon Consulting



The cost pressure associated with the arisen profile of the Supply Chain function has resulted for many companies in the tacit sharing of accountability: the factory takes care of reducing its manufacturing costs and the Supply Chain takes care of improving service and reducing inventory.
These changes were beneficial because it was necessary to implement Supply Chain essentials. However, they are now showing their limitations. Given the increasing need for agility, and with the facturing organisation focusing on costs, conflicts can arise in Manufacturer / Supply chain relations. Most companies come to the conclusion that Manufacturing Excellence should result in a “more customer-oriented” factory, with better balance between cost and agility.

Some “fortunate” companies, which have a simple and flexible manufacturing process and a small number of customers based in close proximity to their production, have long since put the plant directly in contact with the customer.

For many others (with heavy, more inflexible manufacturing processes, producing on a campaign-by-campaign basis and/or connected to complex distribution networks) it is hard to make manufacturing customer-oriented in practice.

In the continuous pursuit of Excellence, it is necessary to challenge the myth of a cross-functional Supply Chain organisation managing all supplier flows to the customer and viewing the plant as an effective executor. It is also necessary to define another, more "uncoupled" blueprint for managing manufacturing operations, based on:

- A downstream Supply Chain (responsible for serving the end-customer) propagating customer demand and expressing prioritised demands;
- Manufacturing that is highly accountable, beyond its cost, for the quality of response to this signal and for the inventory that its lack of flexibility or reactivity can generate.

Eight golden rules for operating, in a complex environment, a model of Excellence where manufacturing is customer-oriented and therefore highly accountable for the cost/inventory/service trinity

#1: Retain cross-functionality at strategic and tactical levels

Although the new blueprint for managing manufacturing operations can result in the uncoupling of the downstream Supply Chain from Manufacturing, a cross-functional vision is required, particularly in the medium term, to ensure both the balance of capacity and demand and the optimisation of inventory across the chain. This results specifically in the management by the Supply Chain, of an S&OP[1] model, which has become increasingly critical.

#2: Establish a clear service contract between Industry and the downstream Supply Chain

As the downstream Supply Chain is the "customer" of Manufacturing, the service objectives are clearly defined and managed, taking into account any "fixed" lead times, flexibility markers or priority levels based on the type of request and products (block busters, flagship products or new items, etc.).

#3: Make plants accountable and incentivise them with clear KPIs

As with any effective management system, performance objectives result in clear objectives, reflecting the whole cost/inventory/service trinity (such as a maximum inventory level or service rate). As with the manufacturing cost, this expectation is cascaded in the targets of Managers and manufacturing teams.

#4: Secure flows in the face of uncertainties

The recent DDMRP[2] concept has highlighted this rule, which we have long been applying with our clients: the optimal positioning of the right "security mechanisms" in the right places across the entire manufacturing process is a key driver in balancing cost and agility. The same goes for the decision of how to organise flows: by operation, product family or customer. These considerations must be based on a detailed model of flows.

(1) Sales and Operations Planning
(2) Demand Driven Material Requirements Planning

#5: Set up a "Manufacturing Supply Chain" and the related skills

Manufacturing has a central/local Supply Chain structure and closely-related capabilities It points young workers with high potential in the direction of planning roles. These roles form an integral part of a Supply Chain global HR business line.

#6: Define the Management System of this Manufacturing Supply Chain

A day-to-day performance management system is set up to ensure good decision making at an operational level. Specifically, this is reflected in rituals between the different Planning/Purchasing Call-off/Production/ downstream Supply Chain functions, the definition of typical weeks, 5-minute meetings, escalation processes, etc. whose aim is the constant optimisation on an operational level of the cost/inventory/service trinity.

#7: Anticipate the level of agility that can be activated and manage commitment

Agility is still too often associated with "Energy and Firefighting Mode". When instead we ought to:

- Anticipate agility: planning capacity reserves by carrying out an information and monitoring review[3] and increasing flexibility with respect to critical resources in order to provide room for manoeuvre in the short term without dismantling flows;
- Control plans and commit: defining timelines for the stabilisation of the production plan to ensure it is realistic and committing to them;
- Concentrate agility: focusing agility on Business priorities shared and formalised according to a customer service rationale without neglecting the stability of plans and manufacturing commitment.

#8: Maximise and best utilise the flexibility available within the manufacturing system

Plants frequently focus too closely on productivity and seek to increase their campaign sizes. Whereas, they ought to be taking the opposite approach:

- Potentially available flexibility is formalised, for example, by way of a maximum number of changes;
- This flexibility is used entirely on optimising batch sizes via suitable methods.

The same goes for requirement allocation processes for multi-sourced products which, when well-managed, create reactivity and flexibility.

So where exactly does Lean come in?

Lean must, of course, form part of this approach and features on two levels:

- Working on processes to create additional flexibility (e.g. SMED[4]);
- Improving execution to guarantee an excellent rate of adherence to planning, without which any service improvement is impossible.

That means using the Lean approach as it was originally conceived, rather than as a machine to reduce costs.

(3) Industrial and Commercial Plan
(4) Single-Minute Exchange of Die

SEB'S INTERNATIONAL EXPANSION IS IMPROVING ITS MANUFACTURING AGILITY

In the face of increasingly complex and changing markets, manufacturing agility has become a key challenge for international companies. That is the case for SEB Group, which is optimising its processes to remain competitive, especially in Europe where it is firmly established. Interview with Hugues Oger, Director of SDA Manufacturing Operations (SEB Group).

Why is SEB implementing a manufacturing agility strategy?

Above all, to satisfy our clients, whose purchasing behaviours are increasingly volatile and hard to anticipate. Manufacturing agility is the best solution to achieve this. Indeed, it enables us to support the salesforce by rapidly manufacturing new products and adjusting production volumes to demand. The other challenge is leveraging our manufacturing footprint. 12 of SEB's 29 production sites are located in the part of Europe where the cost of labour is far from competitive. Nevertheless, this foothold plays a pivotal role when it comes to reactivity and product quality. A key issue in mature markets.

Hugues Oger
Director of SDA Industrial Operations (SEB Group)
SEB Group

"Manufacturing agility enables us to support the salesforce by rapidly manufacturing new products and adjusting production volumes to demand"

Beyond Europe, is SEB's worldwide expansion improving its manufacturing agility?

Yes, it is improving its manufacturing agility because it enables us to produce the same products in different locations across the planet bringing them closer to their markets, thanks to shorter distribution circuits that take into account local specificities. That is particularly the case for the household goods business, which requires relatively little CAPEX.

What are the major drivers implemented by SEB to develop its manufacturing agility?

For two years, SEB has been implementing three drivers to direct its gradual transformation, supported by both Manufacturing and the Supply Chain. The first driver concerns product architecture, which must be increasingly flexible. Specifically, our products are based on common components that reduce costs and simplify the production process by delaying as late as possible the moment where the products will be differentiated in plants. The joint involvement of Marketing, the Supply Chain and Manufacturing is essential to overcoming this challenge.

"The joint involvement of Marketing, the Supply Chain and Manufacturing is essential in overcoming this challenge"

The second and most simple to implement driver is the reduction of supplier lead times, through which the group has already managed to gain on average 14 days.
The third and final driver relates to reducing the lead times from our plants, which represents a real performance driver. In fact there is no point, for example, in us producing in Europe if we do not significantly reduce this lead time compared to a production site that is far away but capable of moving its products more quickly thanks to well-run logistics.

What difficulties has SEB encountered?

It is sometimes hard to get people to accept that manufacturing agility means progress. The concept of flexibility is actually often associated with job insecurity. But that is not the case. Production teams can be required to work more or less from one week to another, according to the order book. This is always done based on an agreement that is governed by labour laws and attempts to preserve the balance between professional and private life. We also have to change people's mindsets when it comes to competitive advantage. We must admit that it is possible to become more competitive in terms of total costs, even with a unit cost that is slightly higher as a result of the efforts deployed in manufacturing agility.

What advice would you give to a company that wishes to improve its manufacturing agility?

Firstly, it is necessary to get all the Senior Managers together and obtain their unwavering support. Then, it is necessary to mobilise all functions concerned from the outset: Manufacturing Operations, Supply Chain, Operational Excellence, IS, Human Resources, Marketing, etc. Lastly, it is necessary to demonstrate perseverance. Changing culture requires time.

> "It is necessary to get the Senior Managers together and to mobilise all functions concerned from the outset"

ARTIFICIAL INTELLIGENCE: A NEW DRIVER OF MANUFACTURING EXCELLENCE

Augustin Huret, Founder and CEO, MondoBrain
Interviewed by
Jean-Baptiste Sebag, Senior Manager, Argon Consulting

Nobody can dispute the fact that Digital has a major impact on Operational Performance (cf. ADD6: Is Digital Technology going to also transform your Operations?). In the sphere of manufacturing and within the scope of the plant, we regularly hear about machine learning or artificial intelligence. Based on the "limitless" use of data, this digital evolution has revolutionised production methods and the management of manufacturing performance. We spoke to Augustin Huret, founder of the company MondoBrain and designer of a new Digital Manufacturing solution.

Three key ideas to remember about Artificial Intelligence.

1. Capitalising on a full understanding of the process

There are essentially three sources of knowledge on products and processes: human knowledge, historical data and organisational knowledge.
Every challenge relating to Manufacturing Excellence can be overcome by combining these sources to improve performance in a sustainable way.

Firstly, the technician needs to assess the ongoing or future situation and simulate (or test) any adjustments in real-time. Until now, there was no way of doing this "scientifically".
Data and process control has long relied on statistical knowledge. Yet in reality the challenge is being able to understand what is specific to each situation.

Knowing that in general you require a temperature of between 310°C and 325°C and a rate of 24 m/min ± 2 is a good starting point, but what we want to know is how best to adjust the temperature when the rate is 25.2 m/min.

> "The relationship between information, understanding and action must be immediate"

Consequently, Digital Manufacturing implements extremely simple tools and processes that provide operations staff with the means to make the best decisions at each stage, in real-time, based on their knowledge, historical data used by artificial intelligence and the organisation's knowledge.
However, new technology has also provided new data visualisation methods that make it possible to simulate decisions and assess their performance and robustness.
Finally, thanks to the principles of algebraic geometry, it is now possible to extract, for each unique situation, the best adjustments that, in the past, made it possible to maximise performance in a robust manner.

2. Going from "reaction" to "action", thanks to the instantaneousness and exhaustiveness of information.

In addition to algorithms, Digital Manufacturing is based on cloud computing. This has provided so much calculation power in the last few years that it is no longer necessary to work globally and generically referring solely to the average and standard deviations. Computers can explore all available data without summarising it, and extract real understanding and description from optimum adjustments on a case-by-case basis.

Having said that, in order for this information to be immediately useable and capable of aiding decision-making, the simplicity and ergonomics of tools must be such that all Operators, Technicians or Managers can instantly understand and "discuss" it with the machine.

The very fact that an interface requires its users to read some kind of operating procedure in order to understand how it works is cause enough for some to reject it off hand. Systems that are so ergonomic that they are almost fun and totally intuitive are what is needed. The relationship between information, understanding and action must be immediate.

3. Installing a performance management mode based on (Big) Data to anticipate and predict: the ultimate aim of Manufacturing Excellence!

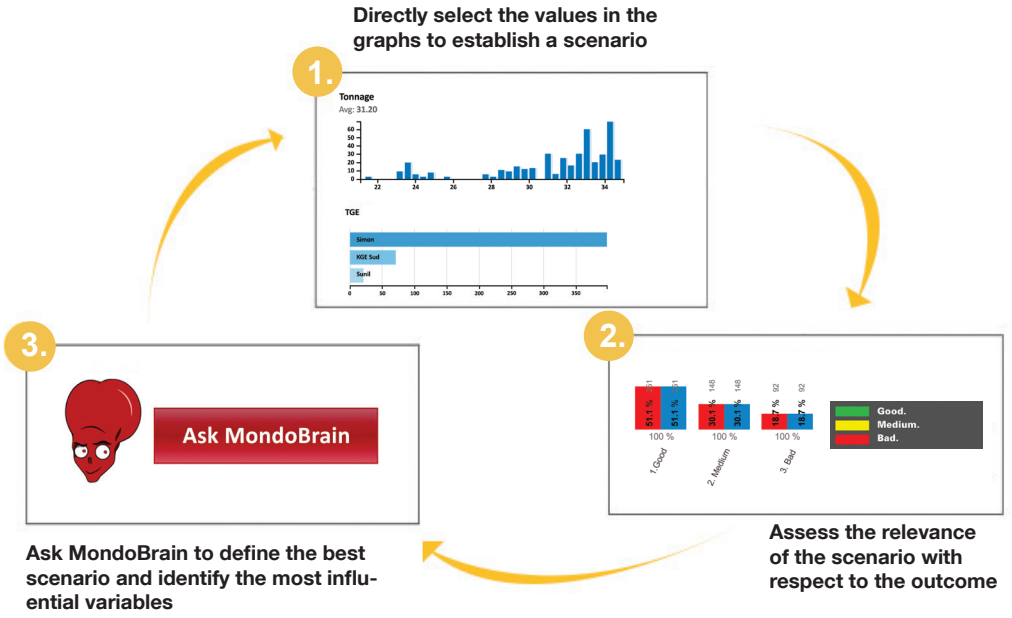
Digital Manufacturing tools, such as MondoBrain, have heralded a new era for Manufacturing Excellence. After a number of years and elaborate attempts, the convergence of data visualisation technologies, applications ergonomics, machine learning and cloud computing have made it possible to share knowledge as close as possible to the action. These technologies place decision-making as close as possible to the knowledge and understanding of the specific context.

It is possible to provide operations staff on a day-to-day basis with the methods to best manage their production based on what the entirety of our past knowledge has enabled us to understand, experiment and test. Production becomes a constant experimental design from which it is possible to extract the best practices specific to each constraint.

Consequently, organisations can both leverage the skills of their teams in a more delegated manner and provide them with the tools to make the best decision, taking into account experience already acquired.

Lastly, these tools ensure that decisions are completely traceable and thus allow for real-time management of process impact and stability.

THE THREE KEY STAGES OF THE MONDOBRAIN INTERFACE



OPERATIONAL EXCELLENCE: A REAL CORPORATE CULTURE

The French group, Imerys, operates in 50 countries and is a world leader in mineral specialties for Manufacturing. Although the Group is decentralised, it has a Corporate Manufacturing Division to disseminate the best existing techniques and practices to all its entities, in keeping with an Operational Excellence rationale. For Jean-François Claver, Chief Industrial Officer, this profound change dynamic impacts on how the company operates as a whole. Explanations.

Why is Operational Excellence essential nowadays?

With globalisation, competitive environments have become vastly changeable: lots of companies are springing up, especially in emerging countries, and established players must adapt very quickly to maintain their competitive advantage. Instilling a culture of continual improvement is a prerequisite for staying in the race, even if this does not guarantee that the company will become a leader in its sector. The different segments of manufacturing must therefore adopt an Operational Excellence approach.

Jean-François Claver
Chief Industrial Officer
Imerys

What difficulties do companies encounter when deploying their continual improvement approach?

Many companies are lacking the internal skills needed to deploy their improvement system properly. They underestimate the difficulties they have to overcome and fail to obtain the necessary external resources, whether that means hiring new staff or using consultancy services.

Operational excellence is not just some fad: it's a real Company discipline that has to be implemented. The ease with which this can be achieved varies from culture to culture. In Japan, where people's everyday behaviour is already very structured, this type of approach is rapidly disseminated within companies. In Europe, it is necessary to repeat the same processes for a very long time before they become properly integrated and begin to feel natural. Like lifelong therapy.

> "Operational Excellence is not just some fad: it's a real Company discipline that has to be implemented"

What are the right questions to ask when launching an Operational Excellence programme?

It is necessary to define precise targets to hit. Indeed, Operational Excellence is not an end in itself. It makes it possible to increase sales, reduce costs, improve the quality of services and products, mobilise personnel or – more importantly – improve the safety of personnel. Often, the target set is a combination of all these dimensions, with weightings based on the company's circumstances. For example, a manufacturing company that is well established in a developing sector where there are significant customer demands will prioritise a programme based around service and product quality. Conversely, a player whose margins are being eaten away by new competitors will concentrate on reducing costs.

Which factors guarantee the success of an Operational Excellence programme?

Once the objectives have been clearly defined, the approach must be supported by the Senior Management and the whole management team must be on board and aligned with it in advance. Next, a solid organisation with sufficient resources and skills must be created to deploy this improvement approach, while raising employee awareness and delivering training. The idea is not to cause a big bang, but to gradually take action in keeping with a sequential development rationale, based on

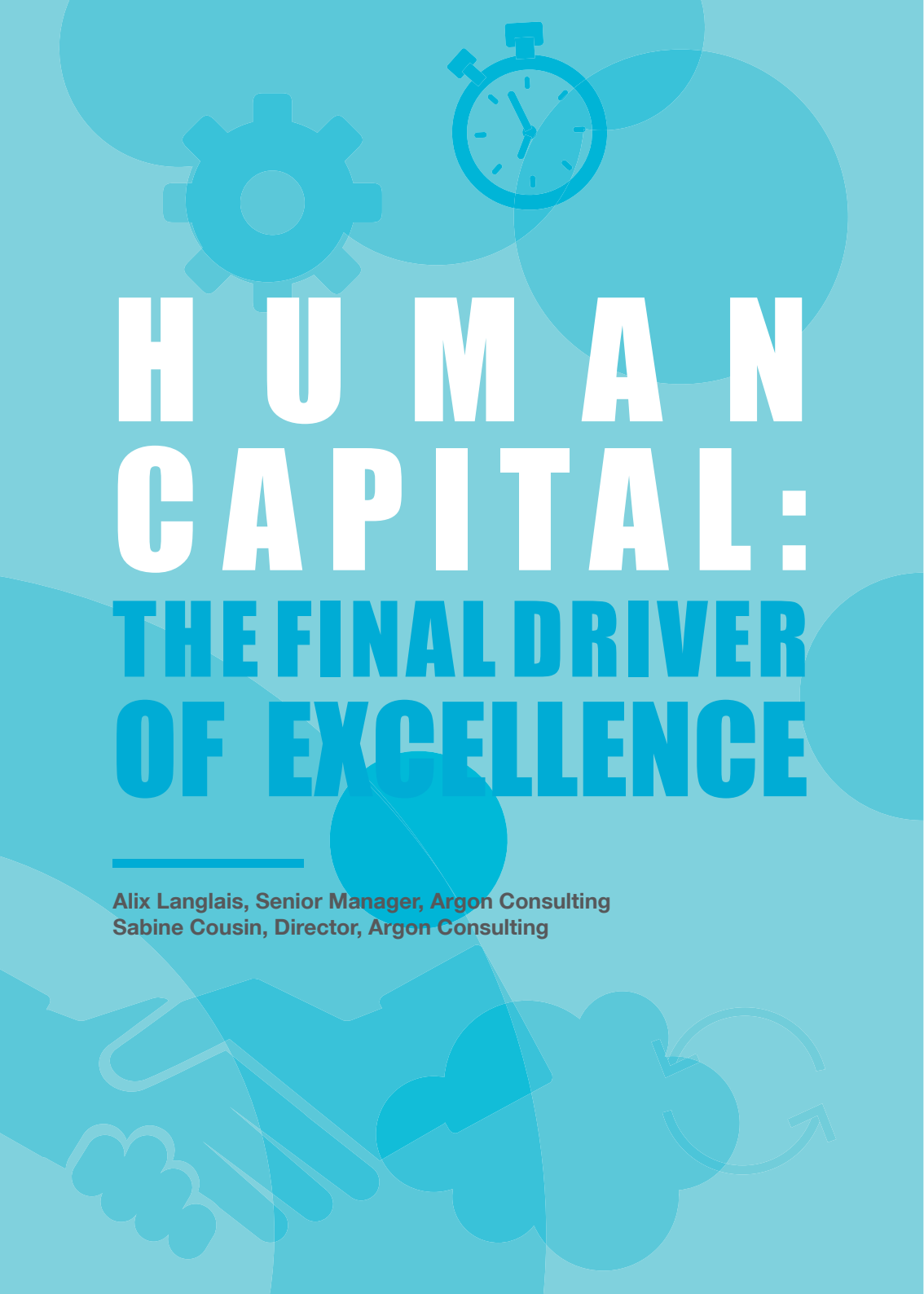
pilot units, to identify, test and formalise good practices and then disseminate them to the Group as a whole. For example, at Imerys, ten or so reference sites were chosen to perfect the Operational Excellence tools best suited to the Groups' varied production systems. A cross-functional team made up of Operational Excellence champions was also created to support and accelerate the dissemination of these practices throughout the Group.

Furthermore, it is essential to bring all the company's staff on board, particularly operational staff, whose involvement in improvement activities will improve not only their safety and working conditions but also production line performance.

Lastly, it is vital that the company communicates on the Operational Excellence programme itself in order to give it meaning. It must use all available internal communication tools (intranet, newsletter, internal magazine, display boards, etc.) and adopt a branding approach. At Imerys, therefore, all employees are aware of Imerys' Industrial Improvement programme, known as I-Cube, which has a very recognisable logo.

Asking yourself every day what you can do to be more effective than yesterday is a specific mindset that you only acquire after years of practice, especially if you want this attitude to be present on every level. It cannot be dictated, it is learned, experienced and, with time, becomes a way of doing things. Continuous improvement therefore requires a structured system and a long-term commitment from all employees.

"Continuous improvement therefore requires a structured system and a long-term commitment from all employees"



HUMAN CAPITAL: THE FINAL DRIVER OF EXCELLENCE

Alix Langlais, Senior Manager, Argon Consulting
Sabine Cousin, Director, Argon Consulting

The interviews conducted and published in this magazine show that securing a successful transition towards Manufacturing Excellence also means achieving a cultural transformation.
Below is an overview of different practices focusing on the Human aspect, which facilitate and/or accelerate the achievement of Manufacturing Excellence.

#1: The culture of Cross-functional management

When faced with the problem of achieving Operational Excellence, no single person has the answer. To find a solution it is necessary to confront the problem from a cross-functional perspective, to call on collective intelligence by sitting around a table together with the stakeholders concerned: at the very least this should include Engineering, Methods, Production, Procurement and even Marketing, Sales, HR and Information Systems, depending on the level of complexity. These stakeholders must demonstrate open-mindedness, mutual trust, kindness, the ability to listen and modesty... as must the people who appointed them!

Three key points to keep in mind to ensure that a cross-functional approach takes shape:

- Have the right level of expertise and the ability to see the bigger picture with respect to any given matter;
- Incentivise by making the stakeholders in question accountable; have a clear mandate in a given timeframe, facilitate decision-making and only escalate strategic decisions;
- Rethink Management so that it accepts and encourages suggested solutions whatever they may be, allows mistakes, fully assumes its role as decision-maker, delegates while agreeing to celebrate wins and accept responsibility for any failures.

Securing an organisation's transition towards Manufacturing Excellence also requires a successful cultural transformation.

The collective pursuit of solutions requires "soft" skills: critical thinking and the ability to challenge "historical practices", the ability to understand and deal with problems holistically, creativity, entrepreneurship and the ability to motivate and challenge exchanges. In short, a collaborative yet more agile way of working.
These skills must be encouraged among all stakeholders in the company (managers, experts, operations staff, etc.). For example, it is preferable to have an "enlightened expert", who is capable of listening to and understanding the customers requirement in its environment, than an "ingenious engineer", who is motivated by technical performance at any price.
A new profile of employees is therefore appearing, whose "expertise" lies in their ability to make others work together and bring out creativity.
This operating method represents a cultural challenge for a great many companies. Success often comes as a result of external support (an outsider's perspective) to change these practices.

#2: The ability of operations staff to adapt

Whether the company is responding to a new manufacturing process, a change in product mix or volumes, or confronting a quality problem, one of the challenges of Operational Excellence is to maintain a constant service level.

It is necessary [...] to call on collective intelligence by sitting around a table together with the stakeholders concerned

For production teams, that means being capable, on a collective scale, of quickly changing machines or the way of doing something while maintaining the same quality level. The balance between multi-skilled and operational staff and experts, who are all able to adapt quickly to new constraints, is a matter highlighted by the pursuit of agility.

That means rethinking organisations, the scope of flexibility and supporting this change.

#3: Local managers as a pillar of Excellence

As part of the pursuit of Excellence, local managers have a double role:

- They are the first point of dissemination of culture and cross-functionality: they participate in defining cross-functional solutions and welcoming changes with an open mind and benevolence. By acting as role models, they convey this state of mind and encourage their teams to do the same.
- They encourage their teams to develop their critical thinking and to suggest improvements that could be disseminated within the company.

Local managers fulfil this double role through their sustained presence on the ground and supportive stance towards teams. This new attitude must be supported and valued by the Management.

There is one prerequisite for these different "human" practices that facilitate and/or accelerate the achievement of Manufacturing Excellence. That is sharing the meaning of the transformation that leads to Manufacturing Excellence, i.e. sharing the "Why?". It will then be easier to align all the Managers and employees. The latter become the stakeholders or even the drivers of the cultural transformation that will lead them to Manufacturing Excellence.

All these practices will be the theme of the next ADD magazine.

Sharing the "Why?": a prerequisite for achieving Manufacturing Excellence

List of **contributors**

Fabrice Bonneau – Managing Partner

Fabrice is a graduate of the Ecole National des Ponts & Chaussées, France, and holder of an Aggrégation in mathematics. He works mainly in the domain of operational performance in Manufacturing. He is also the President of the Department of Industrial Engineering at Ecole National des Ponts & Chaussées, France.
fabrice.bonneau@argon-consult.com

Sabine Cousin – Director

Sabine is a graduate of the University of Heidelberg, Germany. She is a Change Management specialist and works on Transformation Programmes. She also supports management teams on Leadership & Organisation matters.
sabine.cousin@argon-consult.com

Jean-François Laget – Partner

Jean-François graduated from Institut Supérieur de l'Aéronautique et de l'Espace, France, and has an MBA from HEC Paris. He specialises in competitive advantage programmes focusing on operational performance in the Manufacturing, Luxury and Health sectors.
jean-francois.laget@argon-consult.com

Alix Langlais – Senior Manager

Alix graduated from Ecole Centrale de Paris, France, and is a personal and professional development coach. She specialises in design, governance and management of transformation programmes, as well as change management. She is particularly involved in supporting Operations staff.

alix.langlais@argon-consult.com

Thierry Lucas – Partner

Thierry graduated from Ecole Polytechnique and Agro ParisTech, France, and specialises in Supply Chain and Manufacturing in the Aerospace, Health, Metal and Manufacturing sectors.
thierry.lucas@argon-consult.com

Jean-Baptiste Sebag – Senior Manager

Jean-Baptiste is a graduate of Sciences Po, France, and ESCP Europe, and specialises in competitive advantage, manufacturing performance and procurement projects, from strategy through to operational implementation.
jean-baptiste.sebag@argon-consult.com

Managing Editor: Yvan Salamon / Editor in Chief: Fabrice Bonneau / Marketing Director: Aline Rivet / Editorial Staff: Argon Consulting, WordAppeal / Design: M&C SAATCHI ONE / Photo Credits: Getty Images / Printing: Enveloping / 2017

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Argon Consulting is an independent **international consulting firm**, whose business is to **help its clients** achieve a sustainable **competitive advantage** through **Operational Excellence**.

For more than 10 years, our teams of consultants based in Europe and internationally have been supporting **operational transformation projects** (R&D, Procurement, Manufacturing, Supply Chain, Distribution, Functions Support, etc.), while taking into account the human factor via Change Management. We also support them in **optimising their SG&A** and **managing their performance**.

At present, Argon Consulting has more than **120 consultants** from the best engineering and business schools in its **European Offices** (Paris and London).

At Argon Consulting, we think that every company has the ability to significantly improve its **operational performance**. Our challenge as a consulting agency is to identify this **potential** and turn it into **a sustainable source of value**.

In 10 years, we have become the **leading firm** in France in the domain of **Operational Excellence**. In 2016, **Gartner** recognised us as **one of the 20 best consulting firms in the world** in the sphere of Operations. We were also voted, in the same year, Best Consulting Firm 2017 by the magazine **Capital** in the domain of **Supply Chain** and **Operations**.

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