

# HOW PEOPLE WORK

Institution of  
**MECHANICAL  
ENGINEERS**

What managers  
and leaders need  
to know to succeed

Improving the world through engineering



Mechanical engineers possess many of the natural qualities that make great leaders. They're expert problem solvers – determined and driven to make things work and get the job done.

But what about when it comes to their own careers? The propensity to focus on the task in hand can mean that many mechanical engineers lose sight of the bigger picture and of where their abilities could take them.

There has never been a greater need for mechanical engineers to step up to the mark and take on managerial roles. This will undoubtedly involve developing new skills – perhaps becoming more people-focused or commercially aware – and awakening aspects of their nature they have never explored before.

At the Institution of Mechanical Engineers we are experts in understanding what makes people in this industry tick, and our training is tailored to address the challenges they face when moving out of their comfort zone. If you're left to sink or swim, it can be a tough and lonely place. But with the right sort of help and coaching, an exciting world of new possibilities awaits.



**WE  
CANNOT  
BECOME  
WHAT  
WE NEED  
TO BE BY  
REMAINING  
WHAT  
WE ARE**

Max De Pree

**BATTLE OF THE BRAINS**

**LEADING SELF**

**LEADING THE TEAM**

**LEADING THE BUSINESS**

A natural propensity for 'left-brain thinking' shouldn't preclude engineers from developing greater management and leadership skills



**T**here's a difference between 'born' engineers and 'made' engineers," says Penny Taylor, trainer and Fellow at the Institution. She places her ex-husband firmly in the first category and herself in the second.

Her husband had no engineering qualifications, but had great natural technical skills, spatial awareness and a fascination with how things are put together, explains Taylor. "Within two seconds of entering a hotel room he would be taking the light switch to pieces to see how it worked," she recalls.

By contrast, she excelled at maths and physics but her only 'natural' engineering aptitude was making cheap bolts of fabric into garments. She went on to study engineering at university: "They saw something in me they could train," she says.

She does admit, though, to having the engineer's 'left-brain' focus. "I'm very rational. I tend to see the world and its components as a black box, with an input and an output."

Twenty years ago Taylor helped to design and run a Masters Degree in automotive engineering at the University of Hertfordshire. Nearly all the students came out as 'ISTJs' (logical, fact-based, practical, autonomous) on the Myers-Briggs Type Indicator, she says, whereas the 'ESTJs' – the same as the ISTJs, but extrovert rather than introvert – opted to do MBAs.

In the world of engineering, as elsewhere, the first group tend to be the technical specialists, whereas the second make good project managers, explains Taylor, adding that career success depends on understanding what you're best at.

**Eyes**  
Non-verbal indicators such as your gaze will show whether you are truly engaged and listening

**Smile**  
Smiling can help overcome a difficult task or encourage positive results in negotiation

**Shoulders**  
Stand tall, with shoulders back, to raise self-confidence and lower stress

But while playing to your strengths is the best approach, you do sometimes have to move out of your comfort zone, believes Taylor.

"It worries me the amount of time people spend behind their computer screens," she says. "Open-plan offices are supposed to encourage people to talk, but in many cases they seem to achieve the opposite."

Arguably, line managers ought to recognise that many management practices – including open-plan offices – are not suited to introverts' preferred ways of working, and find other ways of helping them to be productive. Introverts, as Susan Cain points out in her book *Quiet*, make up around one-third of the population, but although they have just as much to contribute, their views can go unheard. What's more, if managers are to create 'balanced' teams, they need to be able to manage a range of different personality types.

Taylor explains: "I did some work with a team of very gregarious purchasing managers and they decided they needed someone on the team who was more stable to counter their 'seat of the pants' approach. At first it went well, but then they stopped inviting him to meetings because he threw a dampener on all their ideas."

Taylor believes that all teams need a spectrum of personalities, and that appointing 'professional managers' to lead engineering teams is a positive trend.

"Sometimes an engineer is promoted into management and the net effect is a lost engineer and an incompetent manager," she says. "Technical specialism is very different from management expertise."

A welcome change, she believes, is the move by certain companies – Rolls-Royce, for example – to create 'technical specialist' career branches that allow people to win promotion without going through the management route.

It's a question of horses for courses, explains Taylor – but each horse needs to know the route that lies ahead: "You can coach people into management roles, but they have to understand how different the job is before they commit to it."

lifestyle and what we choose to do."

The concept of 'neuroplasticity' is relatively new. Researchers have found that if we train our brains to behave in certain ways in certain situations, the neural networks governing those behaviours are reinforced and embedded through repetition. But because the brain is infinitely elastic, you can override a propensity for left- or right-brain thinking ('logical versus creative') and train your brain to do other things.

This may be easier said than done, as David Rock, author of *Your Brain at Work*, writes. The trick, believes Rock, is to find out more about your own brain. He discovered that teaching employees about their brains made a big difference to their performance – "and often to their lives too" – which motivated his book.

So logical engineers could be more creative than they think they are – if they just tried.

Most research into different types of brains is focused around gender. "Beyond that level it gets too difficult," Taylor says. Amy Brann, author of *Make Your Brain Work*, agrees. "People are born with different gifts, but I know of no research that proves that engineers are born with different brains," she says. "However, we do shape our brains through our

## WHAT DOES AN ENGINEER'S BRAIN LOOK LIKE?



In a high IQ job pool, soft skills mark those who emerge as outstanding

**Listen**  
Being a good listener is one of the core 'soft' skills that determines a good manager

Alamy

Engineer managers need to recognise their natural style – and develop the skills that don't come so naturally

## who emerge as outstanding

Daniel Goleman

LEADING YOURSELF

**W**hat set of behaviours makes the best leader? It's a question that trainer at the Institution Andy Webber is often asked, and he reels off his response with practised ease. "You need someone who is driven, focused and determined, while being charismatic, personable, and managing relationships well. They need to be a good listener who ensures that everyone in the team is OK, but at the same time is very detail oriented."

It's a lot to expect of any individual – in any sector. Webber himself is quick to point out that anyone moving into a management role will need development in certain areas. "Leadership tends to be a reward for competence in your functional role," he observes. "Whether the functional role has skills that are consistent with leadership or not is irrelevant. "Typically, engineers are problem solvers who like to take things apart and put them together again to understand how they work. And that's part of what a leader needs to do. The other aspect of leadership is

# THE ART OF LEADERSHIP

LEADING THE TEAM

to understand people, and be able to motivate and coach. These tend to be the skills that engineers need to develop – but that’s the same for anyone who becomes a leader.”

To help engineers develop greater self-awareness of their natural style Webber uses DiSC behavioural assessment. Inspired by the work of psychologist Dr William Moulton Marston in the 1920s, this measures four primary personality traits: Dominance, Influence, Steadiness, and Conscientiousness.

“Engineers can be extremely suspicious of it,” says Webber. “They

tend to be task-focused, and not particularly motivated by ‘peopley’ things. So it takes some selling of the theory for them to see the value.”

That Webber receives an exceptionally positive response to DiSC – “It’s very, very rare that people reject it as rubbish” – is testament to his own in-depth understanding of what will appeal to the engineer’s mind set.”

“They want to see a logical need for the assessment, along with evidence-based research that it works. DiSC is a trait tool rather than personality tool. Its main purpose is to demonstrate that everyone is different, and that those differences need to be taken into account when working with other people.”

In DiSC terms, the typical patterns for the ways engineers think, act and interact tend to be Ds and Cs – Dominance and Conscientiousness – or a mix of both. The ‘best leader’

that Webber described earlier combines all four DiSC styles.

“What makes somebody a good leader is the ability to develop the qualities they don’t have naturally to become an all-round mix of all four DiSC styles,” Webber explains. “By nature, engineers are good at getting things done. What they need are the softer skills on the people side.”

Webber believes that training groups of mechanical engineers together, as the Institution does, brings the benefits of a shared set of values that enables delegates to learn, network and support each other. And their learnings are shared across continents. Webber travels the world as a trainer, bringing a broad, cross-cultural awareness.

“More than many other training organisations, the Institution offers a vast experience of how people work in different parts of the world. It’s not an official part of a course, but the question of cultural differences usually ends up being discussed. People on the course will be from different backgrounds, and as managers they will then be leading people from different backgrounds.”

Trainers at the Institution, such as Webber, also have an acute appreciation of another aspect of the engineering sector that exerts very specific demands on managers – remote working. “Many teams work in satellite offices,” says Webber. So we have a good understanding of the challenges of working virtually.”

Although not from an engineering background himself, Webber can both relate to their needs and challenge their views from an outside perspective.

“A management role can come as a bit of a shock as they struggle with letting go of the day-to-day tech.”

That’s the challenge that Webber can help them overcome. •

## HOW TO UP YOUR EQ QUOTIENT

### WHY EMOTIONAL INTELLIGENCE IS THE SECRET OF LEADERSHIP SUCCESS

When Sarah Thompson, a trainer at the Institution, talks about Emotional Intelligence she describes it as ‘a different kind of clever’.

“Think back to when you were at school, and which of your classmates ended up having the greatest success in life. It’s not necessarily the boffin of the class. Often it’s the person who got good grades, but was also able to get on with both the bad lads and the clever kids.

“Some people describe EQ as ‘street cred’. In more technical terms, it is the ability to perceive, understand and

manage your own emotions and the emotions of others.”

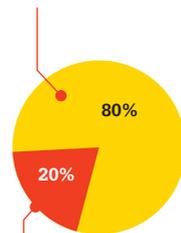
In leadership, Thompson believes that IQ can only get you so far without the softer skills of relationship building. A high EQ encourages the empathy that enables a person to recognise not only their own strengths and weaknesses, but also the needs of others.

This is particularly relevant in the engineering sector – where people’s IQ is rarely called into question – as Thompson believes it is the ability to work more

#### Factors for Life Success

#### Other sources

Daniel Goleman brought the idea of emotional intelligence to attention in 1995



#### IQ

He claimed that IQ contributes to only about 20 per cent of life success factors

effectively with other people that can help catapult careers to new heights. “Engineers can plateau at a certain level because of their desire to be involved in the detail of everything. Developing their EQ helps prevent them from working in isolation.”

Thompson is sensitive to the fact that Emotional Intelligence is a concept that can be alien to engineers, and is careful to couch it in more acceptable terms.

“Engineers want data, facts and evidence, so can struggle with embracing emotions. It’s too soft and fluffy for them,” she says. “At the Institution, we address the subject in a way that helps them to accept it.

“Many are practising EQ already and just don’t know it. Our job is to raise their awareness so that they can recognise the strategies and repeat them.”

Leading a team means tackling difficult conversations. You'll need to turn potential conflicts into positive dialogues

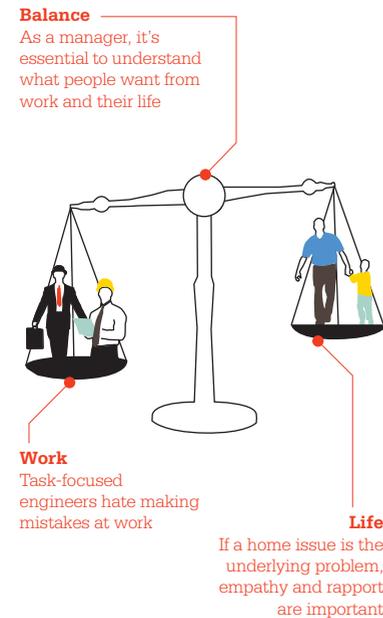
It's one thing being good at your job; it's quite another thing helping other people to be good at theirs. But that's what happens when you are promoted into a management role and leadership skills have not routinely been taught. People have had to learn the hard way.

That way is even harder for engineers than for most people, as Phil Millard, product development

manager of TNA Europe Ltd, which manufactures industrial equipment for the food industry, explains.

"Typically, engineers' thinking centres around tasks, whereas leadership is about emotion," he says. "In our minds we break down conversations into small pieces of information in ways that allow us to answer each with a yes or a no. Being plunged into a leadership role, which is about shades of grey, not black and white, can be difficult."

After 20 years "thinking purely about engineering problems" Millard found himself two years ago in charge of a team that has grown to 14 people. Initially, the experience was a baptism of fire, and he faced a number of difficult conversations with members of his team.



But after another temporary improvement, the man's performance deteriorated again, and the company decided that he would have to go. "We'd spent four months trying to help him improve his performance. But it was only at his exit interview that he blurted out that he'd been having family problems, and that being able to spend some time at home trying to sort it out would be very helpful."

Another difficult conversation involved a female engineer who wanted to work flexibly in order to pick up her children from childcare.

"She is a good engineer and we don't want to lose her," says Millard. "But the project she is working on requires all the engineers to be in the office at core hours to support each other. I told her she could work in the office until 3pm rather than 5.30pm, but it would be likely to affect the quality of her work. We kept going backwards and forwards, and in the end we compromised with a four-day week, which is not ideal for her, but we offered her childcare vouchers, which helped."

In both conversations, Millard was at pains to try to find a good solution for the individuals involved and to keep the dialogue as positive as possible in order to prevent them putting up barriers. "It's about negotiation, which doesn't come easy to engineers, who are used to rules. Everything suddenly is up for debate," he says.

A third conversation has proved less fruitful.

Millard explains: "I work closely with a fellow engineer, and when we're focusing on the same task we come up with some amazing solutions. But I also have to manage him, and he refuses to work extra hours. We can end up shouting at each other and he strolls out."

Is your team open to change?

Will the people in it help each other?

Could some be more involved?

A team can often achieve much more than the sum of its individual members. And to ensure you are harnessing this synergy, you will need the answers to these questions... and many more. To help you focus your efforts, the Institution of Mechanical Engineers has developed a unique diagnostic tool, TPD™, that's designed to encourage optimum team performance.

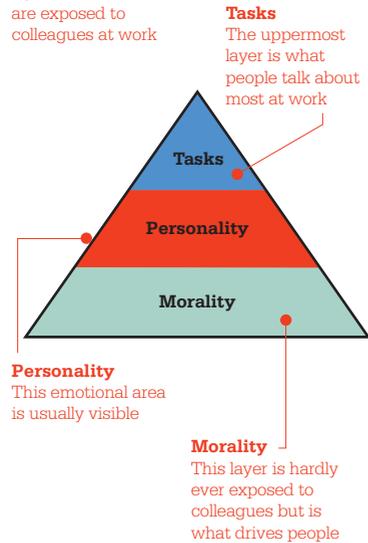
Based on your team's collective responses to 84 quick questions, TPD™ generates a report that enables you to identify positive actions that could be taken in areas where they are likely to generate the greatest return in terms of team performance improvement.

Eleven Team Performance Indicators are used as measures and cover all critical aspects of team performance, which are represented graphically in the report. If you think your team could benefit from TPD™, call or visit our website for details.

...SAYING NO,  
NOT YES.  
IT IS VERY  
EASY TO  
SAY YES

Tony Blair

Pyramid showing the layers of emotion that are exposed to colleagues at work



He continues: “At his annual appraisal I said that despite being a brilliant engineer there seems to be a problem with commitment to the company. He responded by saying that he feels it is a question of give and take, and that the company isn’t giving enough. It turned out that he was having problems at home a few months before, but wasn’t given any compassionate leave. On reflection we should have allowed this: maybe I wasn’t aware of the need.”

Millard believes this particular problem is intractable: “I just have to accept that he’s different from me and try to accommodate him as far as possible.”

Understanding that people are different is important, but understanding how and why can be even more important in managing them effectively, believes Martin Wadeson, national training manager at overhead-cranes supplier Konecranes.

“The greater your understanding of what people want in their life and from their work, the greater your chance of getting them to work in the way you want them to,” says Wadeson. “If they see that you are capable of doing the job you are asking them to do, and if you allow them to express their feelings, get involved in decision-making and make mistakes, you avoid conflict.”

Wadeson worked his way up from the engineering shop floor and, he admits, it took time to adjust. Among the lessons he’s learned is how much easier it is to handle potentially tricky conversations in an open environment: “People have to feel relaxed and able to talk, or they put up barriers.”

When dealing with a dissatisfied customer, Wadeson believes it is essential to keep both customer and employee on your side.

“It comes down to allowing plenty of time to talk about the problem (even though you might decide in the first 10 minutes what it was), making each feel that you are on their side, and asking the right questions to establish what went wrong. The employee has to come out of it feeling as though they’ve learned something, and at the end of the conversation we may even change our own procedures. And we communicate that to the client.”

Millard, who found his first difficult conversation so challenging that he turned to the Institution for some leadership training (see right), believes engineers need ‘emotional inputs’ into their ‘black boxes’ in order to get better outputs.

“Now that I have started to apply what I’ve learned I’m seeing positive results. Yes, I do less engineering work, but the people around me understand more and they are more productive.” •

### How leadership training can help

Millard turned to the Institution for some bespoke leadership training for himself and his colleagues, focusing on people, culture and emotion. One particular slide stands out – a pyramid, with three layers (see left), each representing a level of emotion an individual exposes to their colleagues. At the top is what people talk about all the time – tasks. Beneath it is personality. The bottom layer is ‘morality’ – the values that govern people’s lives.

“The trainer pointed out that it is unlikely that anyone would ever fully explain the bottom layer to their colleagues, and an engineer would keep most of it hidden, even from their spouse,” recalls Millard. “But it is this that drives most behaviour. Just understanding that if you do something that contradicts someone’s underlying morals they will shut down was in itself hugely valuable.”

The training has made a big difference to how Millard manages people. “It guides my conversations – it’s like having an emotional mentor sitting on my shoulder.”

### LEADING THE BUSINESS

# To be successful, you have to have your heart in your business, and your business in your heart

Thomas Watson Sr

The richest opportunities are open to engineers who augment their technical expertise with commercial acumen

Once, engineers used to run Britain’s biggest businesses. Now, after years of decline, a resurgence in

UK manufacturing means that engineers are in the ascendant again – and in growing demand. Steve Pepperell, a consultant at the Institution, explains why.

“Client companies increasingly want the kind of tailor-made solutions that require the technical knowledge and input that sales people just don’t have, so they are now bringing technical specialists into negotiations with them,” he says. “That means that engineers are in daily contact with customers and suppliers.”

What’s more, adds Pepperell, increasing competition and the drive towards customised products and services require engineers to be more commercially aware generally.

“They need to be aware of what customers, competitors and suppliers are thinking and doing, what their capabilities are and the pressures they’re under, to see what they can learn from them and to find ways to adapt their products and services accordingly,” he says.

However, as he points out, engineers, with their logical brains, “tend to look at things that interest them rather than lifting their heads to the horizon to see the bigger picture.”

Many engineers are content to stay in their specialist niche. But growing numbers are keen to become more ‘rounded’ managers, observes Pepperell. These might be young engineers starting to build a career in management, people who’ve been dragged into a negotiation and found themselves at sea, or people who’ve been in a specialist position for 20 years and now need new skills for a new role.

Anatomy of a deal  
**How *Lock, Stock and Two Smoking Barrels* can teach the art of negotiation**

**Tactics**  
Be prepared.  
Think about  
what you want  
to leave the  
negotiation with

**Speaking**  
Talking in  
concrete terms,  
not empty  
jargon, saves  
everyone  
a lot of time



**Listening**  
The ability to  
keep quiet and  
work out what  
the other side  
really wants can  
be your most  
important asset

**Manner**  
You don't have  
to be aggressive  
to achieve your  
goals. A pleasant  
and humorous  
manner can be  
hard to resist

**Body language**  
Non-verbal  
messages can  
be subtle but  
powerful. Lean in  
to the conversation

“Whatever their motivation, if engineers want to improve themselves, it makes sense to develop the skills that are most in demand – and those are commercial and negotiating skills,” he says.

However, developing such skills involves a more nuanced approach than most engineers are used to.

“In the commercial world you’re not dealing so much with absolute facts,” explains Pepperell. “You have to ‘read’ particular situations, and try to work out what people are interested in, their motivations, why they might be taking a certain position. That’s a skill that doesn’t necessarily come easily to people who tend to see things in black-and-white terms.”

It may not come easily, but it’s essential. An engineer who’s not familiar with commercial negotiations can easily make the kind of blunders that could scupper a deal – giving away valuable information that the other party could use against the company, for example, or agreeing to things that could bust the budget.

Being prepared is key: “You have to think hard about what you want to achieve, as well as how to achieve it,” he says.

In some cases knowing what you want to achieve is easy. If you’ve developed a new braking system for a car, for example, you know how big it needs to be, the power it requires and what it is likely to cost. But, increasingly, engineers have to fight their corner here.

“Almost all of the clients we work with negotiate with internal customers,” explains Pepperell. The alternative, he points out, is to accept what you are given, which may result in sub-optimal performance – both of the product itself and the car as a whole.

You can learn how to negotiate – but preferably not through your mistakes, which may be costly. And you don’t have to be aggressive or boisterous to get what you want. “Even the nicest, mildest-mannered individuals can be effective negotiators, because people find it difficult to say no to them,” says Pepperell. “It’s just a matter of understanding a range of tools, techniques and tactics and deploying the most appropriate ones in any given situation.” •

### WHAT ENGINEERS CAN LEARN FROM GUY RITCHIE

Rather than bamboozle delegates on the Negotiating Skills course with lots of theory, Pepperell roots his training in real-life situations. The lives portrayed in director Guy Ritchie’s crime comedy *Lock, Stock and Two Smoking Barrels* may be a long way from most people’s reality, but Pepperell uses the film to good effect.

“I show a two-minute clip that portrays a negotiation between three criminals featuring a lot of tactics,

body language and other non-verbal messages,” he explains. “This is a very quick way to help them see negotiation tactics in practice.”

Around 75 per cent of the course is practice-oriented.

“We do lots of role play and case-study work based on the kind of challenges engineers face every day,” he says. “I always try to keep it really real, and ask them in advance about the kind of situations they want to cover.”

Examples from a recent course include buying and selling a truck, negotiations for influence between two heads of department, salary negotiations, and negotiations between internal

finance and engineering teams over the sale and purchase of materials.

Pepperell thinks the reason the Negotiating Skills course attracts consistently high feedback scores is both its practical content and his own commercial experience. He’s not an engineer, but a sales and marketing man with a 30-year career at Nestlé.

“Commercial managers are much more people oriented and emotional than the typical engineer, and at first delegates look at me as though I’m some sort of alien,” he says. “But they soon get drawn in, in a way they might struggle to do were it an engineer trying to teach them. They find it valuable learning ‘the tricks of the trade’ from someone ‘on the other side’.”



## **THE MOST SUCCESSFUL PEOPLE AND BUSINESSES NEVER STOP LEARNING**

The Institution of Mechanical Engineers specialises in leadership and management training, helping talented technical professionals learn the skills they need to become effective leaders and build and inspire strong teams to support them.

Negotiation Skills  
Presentation Skills  
Communication Skills  
Managing Time  
Commercial Skills  
Innovation and Problem-Solving Skills  
New Engineering Manager  
APM Project Fundamentals  
Qualification  
Financial Management

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