FINANCIAL TIMES

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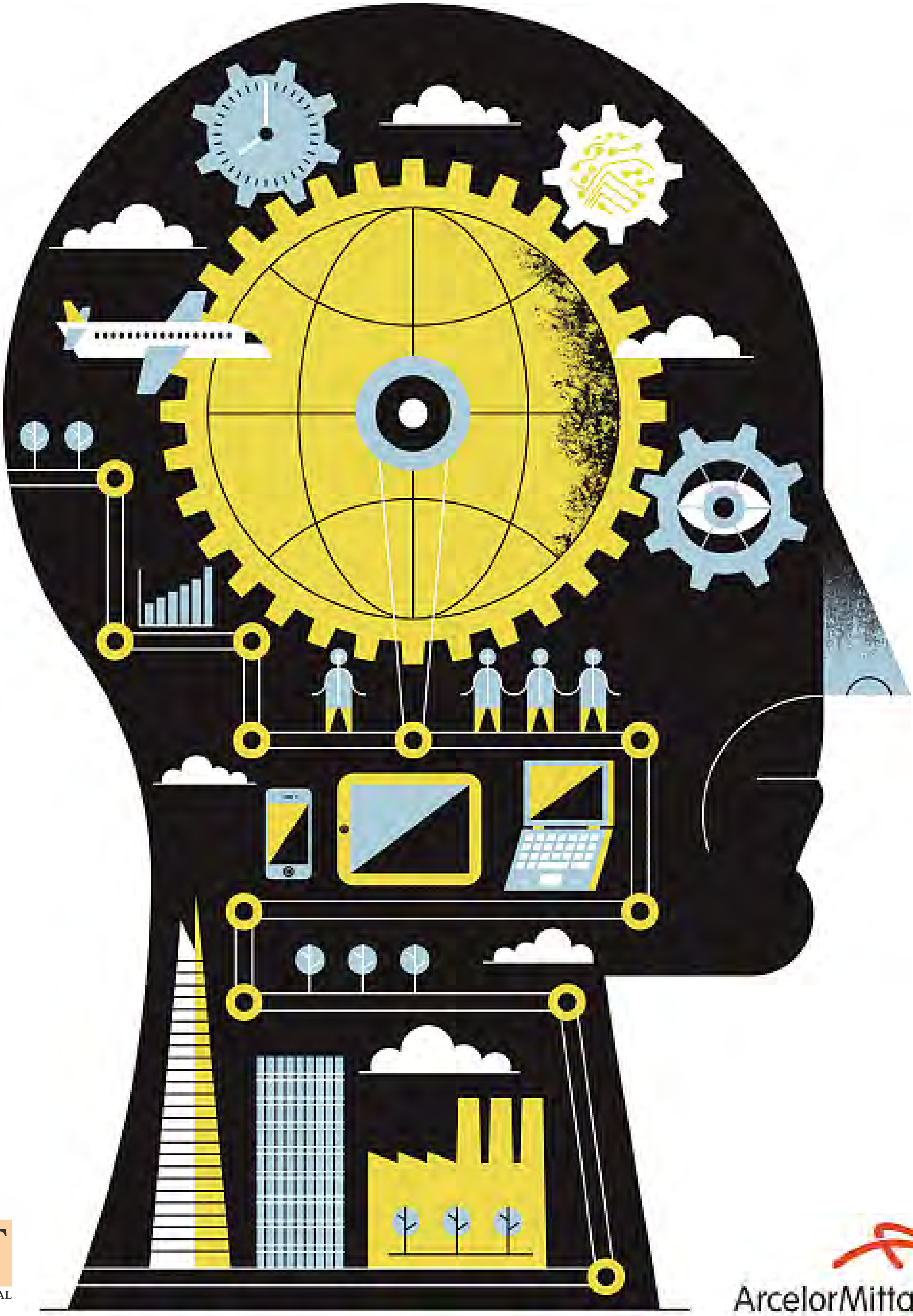
Boldness in Business



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Rewarding innovation

PHOTO: CHARLIE BIBBY

The FT ArcelorMittal Boldness in Business awards, jointly sponsored by ArcelorMittal and the Financial Times, have over the past five years become the pre-eminent forum for recognising entrepreneurial risk taking and business innovation.

The past year has witnessed a wave of re-regulation and central bank intervention in response to the global financial crisis. Amid the continued fire-fighting, there have been glimmers of recovery, notably in the US. But while the symptoms of the crisis may have eased, it has not been resolved.

This applies not only to the transmission of credit in the European banking system, but also to the imbalances between the debt-ridden west and those countries with surpluses in the east, led by China.

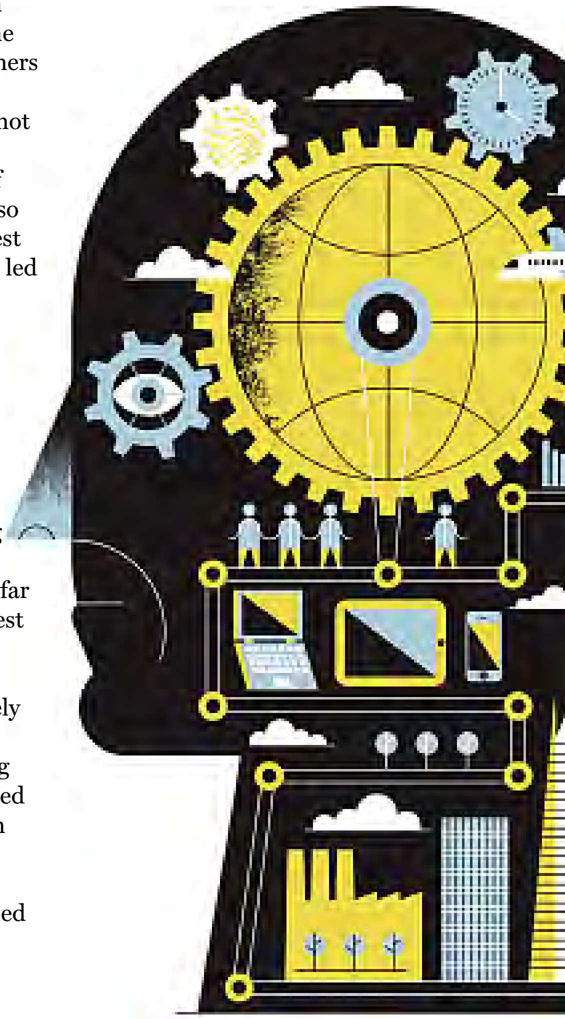
This was the challenging backdrop to this year's Boldness in Business awards and it has, inevitably, informed the selection of the candidates and winners.

We were looking for outstanding examples of companies taking bold decisions, not just in terms of adapting their business models to increase shareholder value but also in creating profitable and socially useful enterprises.

In selecting the shortlist we spread our net far and wide, from the advanced industrialised west to the fast-growing emerging markets of Asia, Latin America and Africa. The winners were rigorously sifted and selected from an extremely strong field.

I would once again like to thank the judging panel for their contributions. Their accumulated expertise has again proved indispensable. I am also particularly grateful to Lakshmi Mittal, chairman and chief executive of ArcelorMittal and co-chairman of the judges, for his continued support of this important set of awards.

Lionel Barber, *FT Editor*



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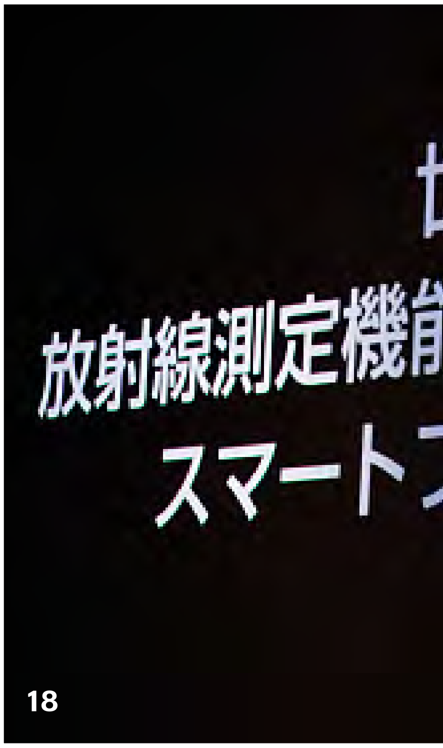

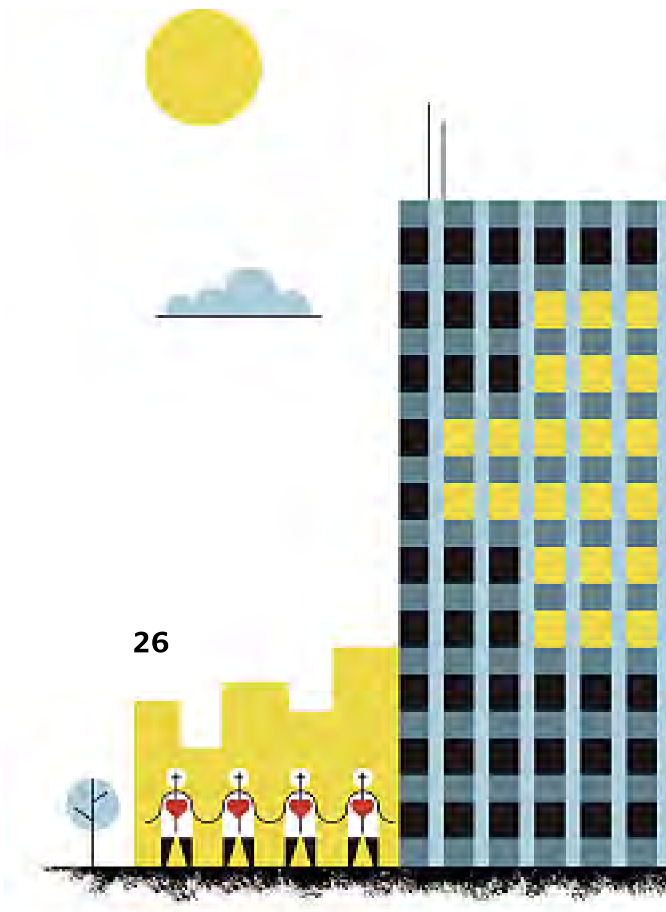

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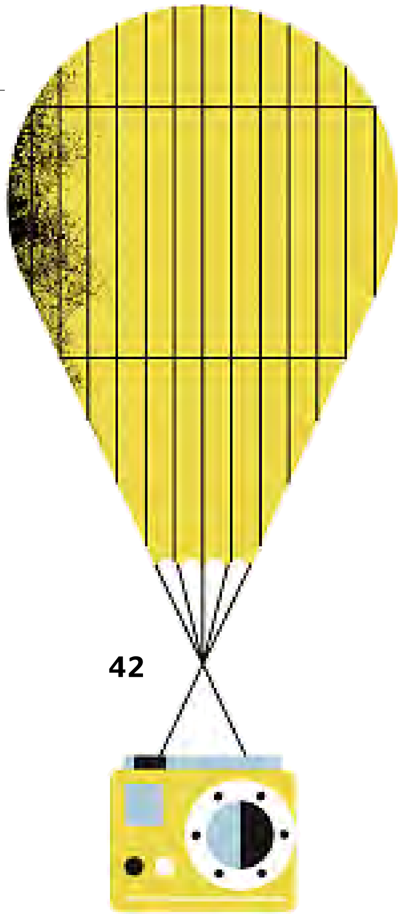

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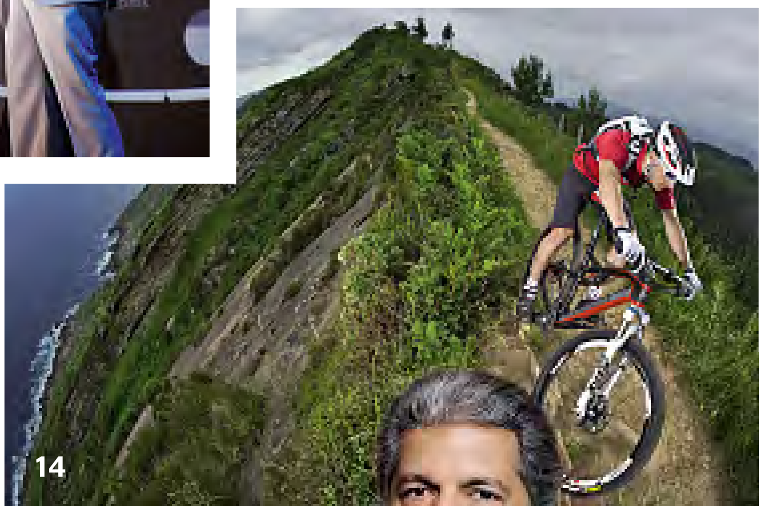

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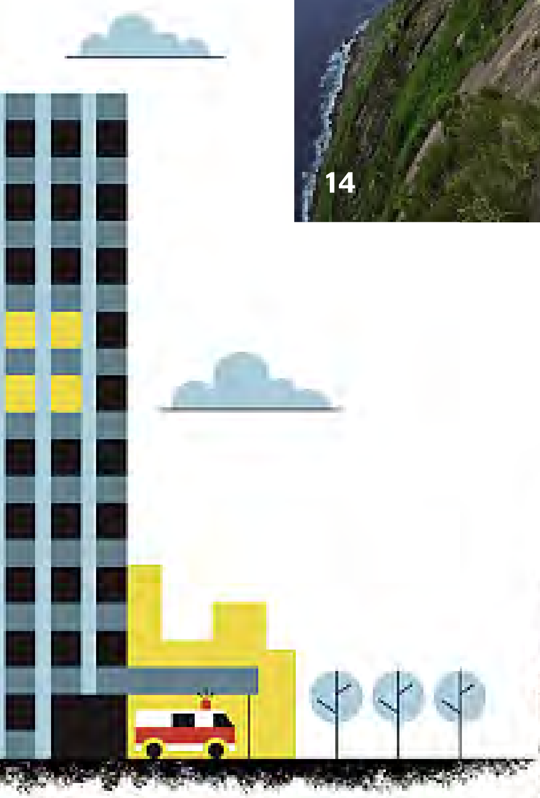

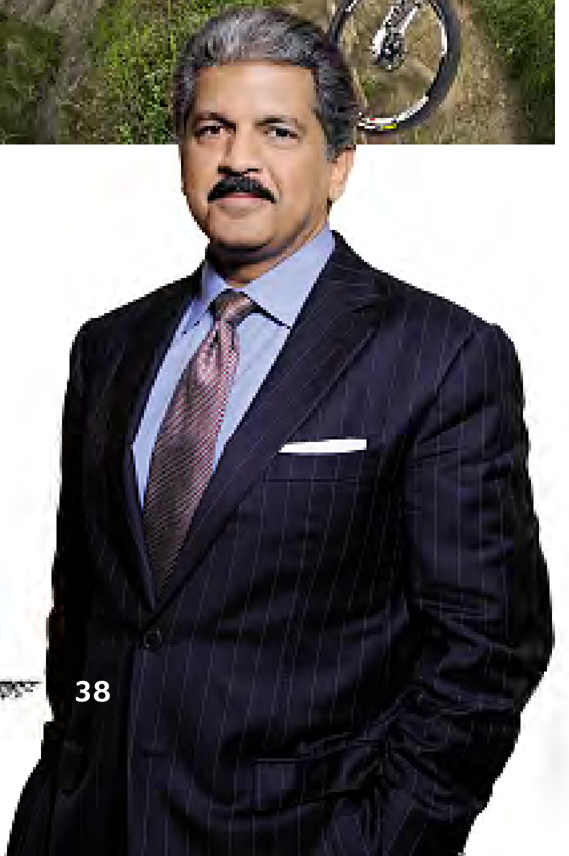

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Learning process

This year's award winners, who represent capitalism in all its diversity, have much to teach one another, writes **John Authers**

There is more than one way to skin a cat. And there are many ways for businesses to show boldness in difficult environments.

Last year was a kinder one for capitalism than 2011: markets largely avoided fresh crises, asset prices rallied and deal-making returned. But it was still a tough 12 months. The capitalist model remains under intense scrutiny.

The western world has continued its weak recovery after a severe downturn during the financial turmoil. The eurozone, while avoiding the much-feared existential crisis, has lapsed back into recession and leaders of the emerging world are under pressure as they try to adapt their own models for development. The need for China, in particular, to modify an approach that has so far focused on exports and cheap labour has created worries for the rest of the world.

Central banks throughout the developed world are still using drastic monetary policy measures to keep the ship afloat. Even the impeccably orthodox European Central Bank joined in last year, saying it would do "whatever it takes" to save the euro.

With the "risk-free" rate that underpins the world's transactions held deliberately low, it is plain that capitalism and markets are not yet functioning normally. Anger about the inequality generated by capitalism has also continued to intensify, and was on full display in an abnormally ideological 2012 US presidential election campaign.

So how can companies tackle these difficult circumstances and find ways to thrive? In a variety of ways, it turns out.

> When growth in the world economy is so weak, you need to look widely for inspiration

Judging the Boldness in Business awards, now in their fifth year, has always been hard: by including companies of any size, in any line of business and in any geographical area, the job of making fair comparisons is always difficult, going on impossible.

This year, the sheer diversity of the nominees that survived the vetting process, and the breadth of what they were attempting to achieve, made that task harder than ever.

However, the diversity of the winners demonstrates why these awards serve a purpose: they are a systematic and exhaustive attempt to find role models for contemporary capitalism. This year it found them in unlikely places, from Spain's Basque region to Japan – both racked by the long-lasting effects of a credit-fuelled binge – and, twice, in India.

The results were not by design. Each award was voted on separately by the judges, without regard to the other categories. But the deliberations produced a range of winners that could not have been more diverse even if it had been scripted.

Unlike in previous years, there are hardly any internationally known companies on offer. Previous winners have included the likes of Apple, Google, Amazon and Twitter, and well-established and respected international companies such as Marks and Spencer, Samsung and Unilever. Yet this year produced a more eclectic group, with few household names.

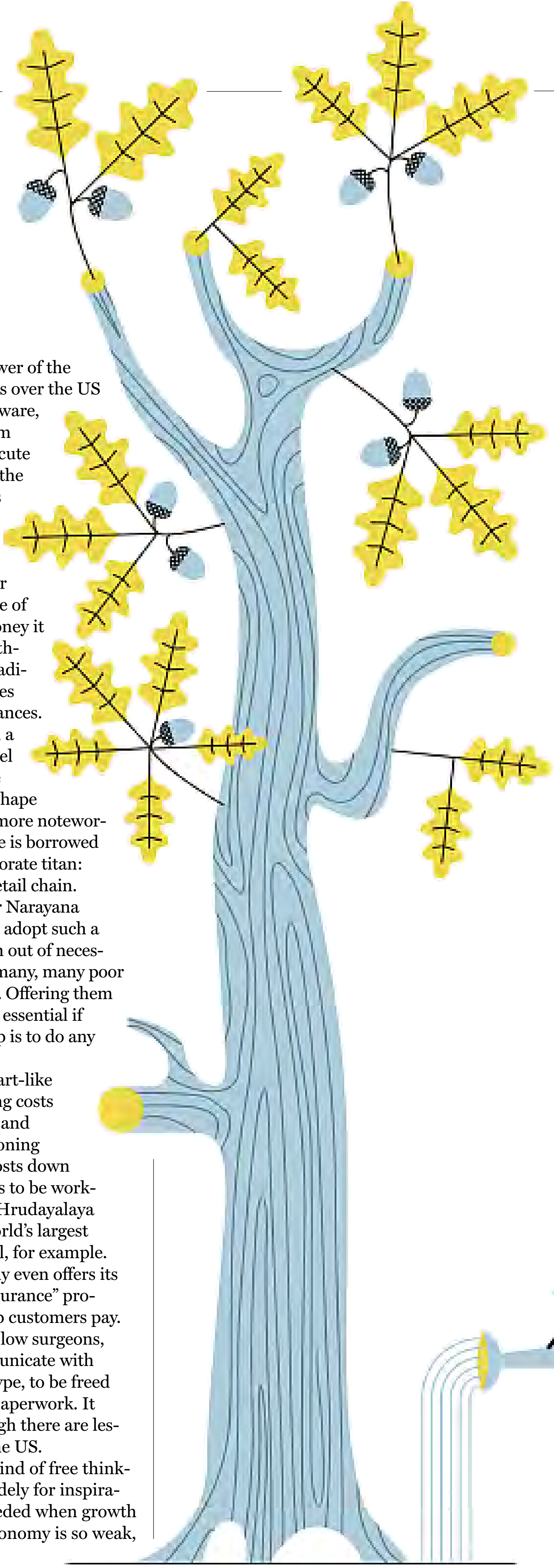
They also produced a startling diversity of models for helping capitalism out of its current fix.

Perhaps the most surprising was from Spain – a country racked by crisis – and structured as a co-operative. Mondragon Corporation, the Basque company that won this year's Drivers of Change award, shares none of its profits with shareholders. Instead, it ploughs them back into a business in which many of its workers have a stake.

It is a collection of more than 250 companies, employing roughly 83,000 people. In 2011, €3.97bn of the €5.93bn sales in its industry division were outside Spain.

Co-operatives and conglomerates are often regarded as dinosaur concepts. But in Mondragon, the conglomerate structure seems to have added security and diversification, as intended, and the co-operative model has not obstructed the company from behaving boldly. There is a lesson for others in this.

Another surprise, and the first unanimous winner of a Boldness in Business award, came in the social responsibility category, won by India's Narayana Hrudayalaya Hospitals.



As any follower of the tortured politics over the US deficit will be aware, world capitalism has few more acute problems than the escalating costs of healthcare. For whatever reason, the US in particular seems incapable of capping the money it spends on healthcare, and this radically undermines the nation's finances.

Remarkably, a promising model to deal with the issue is taking shape in India. Even more noteworthy, its structure is borrowed from a US corporate titan: Walmart, the retail chain.

The need for Narayana Hrudayalaya to adopt such a model was born out of necessity. There are many, many poor people in India. Offering them low-cost care is essential if a hospital group is to do any business at all.

But a Walmart-like focus on keeping costs and prices low, and using its burgeoning scale to push costs down further, appears to be working. Narayana Hrudayalaya now has the world's largest cardiac hospital, for example.

The company even offers its own "micro-insurance" programme to help customers pay. Support staff allow surgeons, who can communicate with patients via Skype, to be freed from onerous paperwork. It sounds as though there are lessons here for the US.

This is the kind of free thinking, looking widely for inspiration, that is needed when growth in the world economy is so weak, and when political uncertainty is so high. Does this mean the judges somehow unwittingly called for a retreat from capitalism red in tooth and claw?

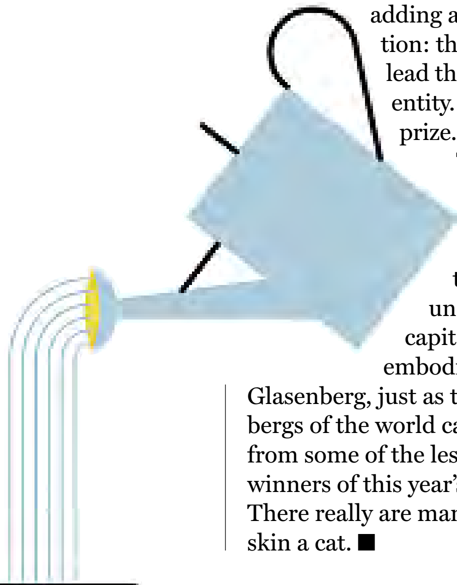
Not at all. Look at the person of the year: Ivan Glasenberg.

Glasenberg, who runs the commodities trading and mining powerhouse Glencore, may seem an odd fit to some. The secretive Switzerland-based group was a private company until two years ago. The difficult work of operating mines in developing countries means making hard-nosed decisions, with low wages sometimes paid for difficult and dangerous work.

Yet the company's 2010 initial public offering created several instantaneous billionaires, including Glasenberg. The man himself is a tough negotiator who speaks freely and would not deny any of this.

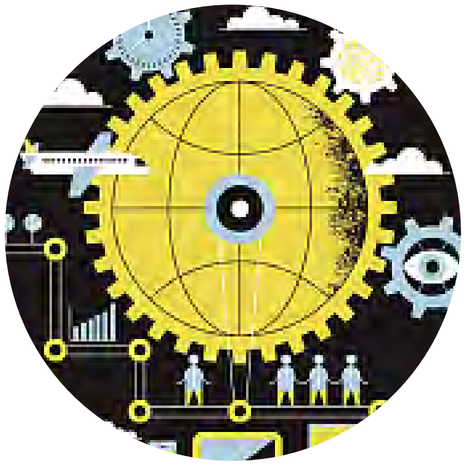
He won the award for pulling off 2012's biggest and most audacious deal – the $76bn takeover of mining group Xstrata. He did this by sticking resolutely to his goal while showing flexibility about how to reach it.

When investors balked at his terms for the initial deal, Glasenberg raised the price, adding a new condition: that he would lead the combined entity. He won his prize.



The point here is that there is a role for the kind of unapologetic capitalism embodied by Glasenberg, just as the Glasenbergs of the world can learn from some of the lesser-known winners of this year's awards. There really are many ways to skin a cat. ■

BOLDNESS IN BUSINESS
JUDGING PANEL



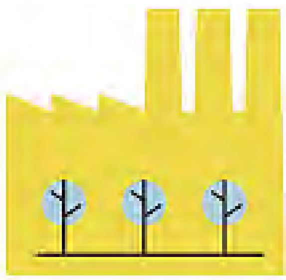
Lionel Barber
Lionel Barber has been editor of the Financial Times since November 2005

Luke Johnson
Luke Johnson is chairman of Risk Capital Partners, the private equity group, and an FT columnist

John Authers
John Authers is the FT's senior investment columnist, with responsibility for the Long View and other columns

Terry Smith
Terry Smith is chief executive of Tullett Prebon, the inter-dealer broker, and founder of Fundsmith, the fund manager

Leo Johnson
Leo Johnson is a partner in the sustainability and climate change team at PwC, the professional services company



Lakshmi Mittal
Lakshmi Mittal is chairman and chief executive of ArcelorMittal, the world's largest steelmaker

Anne Méaux
Anne Méaux is founder and chief executive of Image Sept, the Paris-based public affairs and media relations consultancy

Dipak Jain
Dipak Jain is the outgoing dean on Insead, the business school with campuses in France, Singapore and Abu Dhabi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Picture: Stephen Hird

Scale the heights

The Glencore chief executive fought hard to pull off the deal of the year with the $76bn move for Xstrata, writes **Javier Blas**

When Ivan Glasenberg sat down in September with Sheikh Hamad bin Jassim bin Jabr al-Thani, Qatar's prime minister, the Glencore chief executive's aim was clear: seal the deal to buy Xstrata.

Glasenberg had claimed he was ready to walk away from the transaction if HBJ – as Sheikh Hamad is known – insisted on a high price for the London-listed mining group, in which he was a leading shareholder.

But HBJ called his bluff and, after tense negotiations, Glasenberg agreed to raise Glencore's offer significantly. At about midnight, he telephoned colleagues to inform them he was putting additional money on the table in a final effort to clinch the deal.

For Glasenberg, one of the natural resources sector's most consummate dealmakers, this was a rare setback. But as he walked out of London's Claridge's hotel in the early hours there was no outward sign of concern. Instead, Glasenberg headed straight for drinks at a nearby bar where Glencore colleagues were entertaining clients.

There was no lamenting the billions of extra dollars he had been forced to put up. Whatever the price, Glasenberg had agreed a $76bn deal that would pave the way for the fifth-largest takeover in the history of the natural resources sector. It is no exaggeration to say the Glencore-Xstrata deal ranks alongside the mega-mergers of Exxon-Mobil, BP-Amoco and Chevron-Texaco that transformed the oil industry in the late 1990s.

> The deal ranks alongside the 1990s mega-mergers in the oil industry

Even so, those who know Glasenberg say he was hurt by the setback – and the sharp fall in the share price of Glencore, which he floated in London in 2010. "The man likes to win, and he wins," says William Macaulay, chief executive of First Reserve, a private equity group that was among the first investors in Glencore.

The road that led to the birth of a company that would combine trading with the production of commodities as diverse as copper, oil, rapeseed and thermal coal began more than a decade ago. It was 2001, and

Glasenberg, then chief executive designate of the trading house, was preparing his first big deal: the flotation of a group of coal assets in Australia owned by Glencore as a new $2bn company called Exen Resources. But the plan was derailed by the 9/11 terrorist attacks on New York and Washington, forcing Glencore to shelve the initial public offering.

Instead, the company become instrumental in the creation of Xstrata after the same coal assets – which Glasenberg had initially bought – were sold to the fledgling Swiss mining group. Those assets would become the bedrock of Xstrata's London float the following year, with Glencore the biggest shareholder.

In the years that followed, Glasenberg on several occasions tried to put the companies back together. This included one attempt in 2007, just before the global financial crisis, which failed mainly because Mick Davis, Xstrata chief executive, said it was too difficult to value the privately owned Glencore.

The governance of a merged company was also an obstacle for Davis, who insisted the board of the merged "Glenstrata" should look very much like the board of his Xstrata.

Yet both these problems were diminished with Glencore's 2011 initial public offering.

Within months, Glasenberg and Davis, with high-flying banker Michael Klein acting as intermediary, were negotiating the potential merger. By late 2011, with the foundations of a deal in place, ➤

Glasenberg's charm and competitive style embody Glencore's corporate culture

the two chiefs met in London for a low-key dinner to celebrate their progress. Bankers, lawyers and advisers then began working round the clock on what was code-named project "Everest".

> He has a no-nonsense style with a loathing of corporate blather

When the deal was announced in February last year it was well received initially, despite an early leak. The market rose on the news, with both chiefs, who had sparred for a decade, promising to work together. It was agreed that Davis would be chief executive, with Glasenberg taking a step back to become deputy chief executive, in charge of trading.

However, opposition emerged in the shape of a small but powerful group of Xstrata shareholders unhappy with the merger and its terms. While Glencore was proposing paying 2.8 of its shares for each of Xstrata's, the rebels wanted at least 3.15. Undeterred, with Glasenberg reasoning the rebels lacked the votes to block the deal, they pushed ahead.

At that point they were faced with a much larger problem as news broke that Qatar Holding, one of the sovereign wealth funds of the Gulf emirate, was spending billions of dollars in the market on large tranches of Xstrata shares to build a powerful stake. By early summer, Qatar Holding held enough shares to block the deal – as it soon did.

In June, Qatar Holding said that while it saw merit in a combination of the merger, an exchange ratio of 3.25 shares "would provide a more appropriate distribution of benefits of the merger".

When Glasenberg feigned abandoning the merger if Doha insisted on such a price, the Qataris called his bluff; the Glencore boss, perhaps for the first time, realised he had no option but to pay up.

Yet, ever the dealmaker, Glasenberg saw this set-back as an opportunity to negotiate key concessions, including the agreement that he, and not Davis, would be chief executive of the merged entity.

By the time the deal was approved, it was beginning to look more like a traditional takeover, with Glencore executives lining up to take the top jobs.

PHOTOS: BLOOMBERG

PERSON OF THE YEAR
IVAN GLASENBERG

Glasenberg likes to say he came to the commodities business by accident. As an undergraduate studying accountancy at the University of the Witwatersrand, Johannesburg, in apartheid-era South Africa, he took a course in commodities, where he came across a man sourcing candle wax from South America and selling it to Japan.

"I thought, 'That's unbelievable: talking on the phone in his office, that man made money moving candle wax from one country to another.' It really interested me," he told the magazine of the University of Southern California, where he went on to earn an MBA.

After finishing his studies in 1983, Glasenberg was offered a job in the US at the then little-known commodity trading company Marc Rich + Co. The offer collapsed following founder Marc Rich's entanglement with the law – Rich was later indicted for tax evasion and became a fugitive in Switzerland until Bill Clinton, US president, pardoned him in 2001.

Instead, Glasenberg joined Marc Rich + Co in Johannesburg, working in the traffic department, where trainees ran shipping details, making sure vessels were loaded on time. Rich would later sell his interests in Marc Rich + Co to the company's senior traders, who renamed it Glencore International.

Hard-hitter: Glasenberg was quick to grasp the importance of long-term relationships in trading

Glasenberg was quick to grasp what is arguably the key to a successful trading company: long-term relationships. Combining charm with a ruthless, competitive style, Glasenberg embodied Glencore's corporate culture, which focuses on having hard-hitting traders who are ready to go where others will not. A few years ago, when speaking at the University of Southern California, he advised students that once they had picked their chosen field they should "dedicate to it and work the hours".

Rising quickly up the ladder, Glasenberg moved to Sydney to become a coal trader, followed by stints in Hong Kong and Beijing before, in early 1990, taking over as head of the coal department at Glencore headquarters in Switzerland. His rapid progress is also textbook Glencore, which prides itself on grooming managers from within its ranks. Glasenberg took over as chief executive in 2002, replacing Willy Strothotte.

'You'll sacrifice a lot of things early in your career to be successful'

"You'll sacrifice a lot of things in the early part of your career to be successful," he later told students at his former university. "Many people may [also] say luck is important, but you create your own luck by working hard to ensure you don't miss opportunities."

If Glasenberg, who still lives in Switzerland, has a personal style, it is that of a no-nonsense entrepreneur with a loathing of corporate blather. A sports fanatic, he came close to competing in the Olympic Games in 20km speed-walking. Today, jogging, swimming and cycling are part of his routine. Colleagues say he avoids meetings straight from the airport, preferring first to spend time on the treadmill.

If Glasenberg has run Glencore like a long-distance speed-walking race, slowly building up the business, at times in recent years his tenure has resembled a sprint over hurdles. In rapid succession, he has welcomed outside investors to Glencore with a convertible bond in 2009, floated the company in an initial public offering in 2011 and pushed for the deal for Xstrata the following year.

Yet Glencore today is very different to the company founded only four decades ago. In the early years, the trading house was a pure middleman, focusing on oil and, gradually, a few metals such as aluminium and copper.

In 1987, it took its first step to becoming a diversified commodities group by buying a minority stake in a US aluminium smelter. A year later, it took its first majority stake, this time in a zinc-lead mine in Peru.

The combination of trading house and commodities producer was not new – companies such as Germany's Metallgesellschaft already employed the model. But Glencore, under Strothotte and then Glasenberg, perfected it. Indeed, there is not another company as diversified across the commodity market that produces and trades at the same time.

GLobal, ENergy, COmmodities and REsources: the in-house joke about the origin of the company's name today neatly sums up the all-encompassing behemoth that is Glasenberg's Glencore. ■

Michael Woodford

Person of the Year winner 2012

"Many managers seek to maintain the status quo rather than move from their comfort zones and challenging themselves. Real success will only come to those who take risks in support of their beliefs."

Workers united

The Basque co-operative's success against a troubled economic backdrop points to a new model for success, says **Miles Johnson**

For the curious executives and academics who make pilgrimages to Mondragón, a small Basque town with a population of about 20,000, there are few immediate signs of one of Europe's largest industrial conglomerates.

There, nestled between green mountain valleys, is the headquarters of Spain's seventh-largest company by sales. It owns a range of businesses in areas as diverse as banking, consumer electrical goods, supermarkets and bicycle and car parts manufacturing, with factories from Latin America to China.

The worker-owned Mondragon Corporation has long been a curiosity for outsiders. Observers are struck by its ability to remain profitable while paying more than 90 per cent of its collective workers more than their peers at rival companies.

Founded in 1956 out of a technical college established by a young Catholic priest, José María Arizmendiarrieta, the co-operative has quietly continued to expand beyond its roots in Spain's industrialised Basque region to new markets, with more than half its sales now outside Spain.

Pedro Nueno, professor of entrepreneurship at Iese business school at Navarra university, who has studied Mondragon, says he was struck when he first travelled to the town by the seriousness and international focus of the company.

"As Mondragon was a company owned by its employees, salary levels were never very important, as the management interpreted their jobs as a service to their community," he says. "At the same time it is highly innovative. Mondragon began working in China in the 1980s, a decade before others started to think about its potential."

In a world where financial crisis and recession have hardened public attitudes to high executive pay, Txema Gisasola, Mondragon president, earns no more than eight times as much as the collective's lowest-paid member.

"People with very high levels of responsibility earn a fraction of what they would in a listed company," Nueno says. "They are not motivated by salary, but to make the company grow and become more relevant."

'This is not magic. We are in this market, competing in the capitalist world'

Mondragon – which employs about 83,000 people, of whom half are collective members – is not based on anything revolutionary, but is grounded in efficiency and prudent management, Gisasola says.

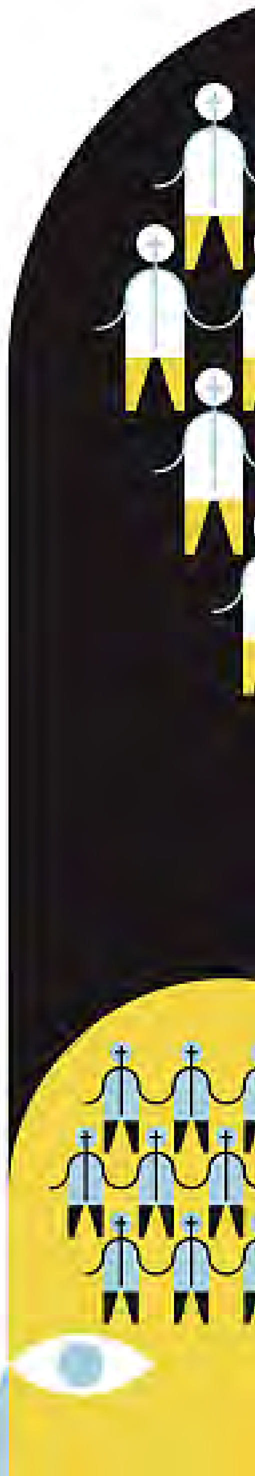
"We receive visitors from many companies and many countries, and some come here with a magical idea of what Mondragon is," he says, speaking from a modestly decorated office with a view of the mountain valleys surrounding the town.

"This is not magic. We are in this market, competing in the capitalist world, and the only difference is how we do things and why we do things. We have to be competitive, we have to be efficient, we have to have quality in our products and give satisfaction to our clients, and we have to be profitable. In that sense we are no different from anyone else."

The company, whose brands include the Eroski supermarket chain and the high-end bicycle maker Orbea, argues that by being owned by its workers, rather than being open to outside investors, its management is able to resist stock market-driven short-termism.

This means consultation and communication with its worker-owners are key. Before important strategic decisions are taken, Mondragon convenes a general assembly with elected delegates representing the various regions where the company operates.

Stable job creation, Gisasola says, has always been at the heart of the company's strategy, with its manage-



ment often setting specific goals for the number of new positions it aims to create at the centre of its annual strategy reviews. The aim at more conventionally structured companies is often to reduce their headcount to boost profitability.

Like other companies, however, Mondragon suffered during the downturn. Revenues rose modestly by 0.5 per cent year on year to €14.83bn for 2011, its most recent published annual results, with consolidated profits falling from €178m to €125m as the recession in Europe weighed on the company.

'Our model allows us to be more agile than others in the face of different challenges'

During this period it still managed to keep its headcount steady and increase its presence abroad, with international sales rising from €4.1bn to €4.5bn. At its 2011 year-end, the company had 94 overseas plants, including 13 in China.

"The difference is how we organise ourselves," says Gisasola. "Some will ask if [the co-operative structure] is a disadvantage, but it is the complete opposite. The company's workers are the owners of the project, so who is better than them to fight for its interests? They come to work because it is their project."

One of the main advantages of its structure has been the ability to redeploy workers from parts of the collective's businesses that have suffered during the economic crisis to others that are experiencing growth.

"Our model allows us to be more agile than others in taking measures in the face of different challenges, both when there is a crisis and when there is not," Gisasola says.

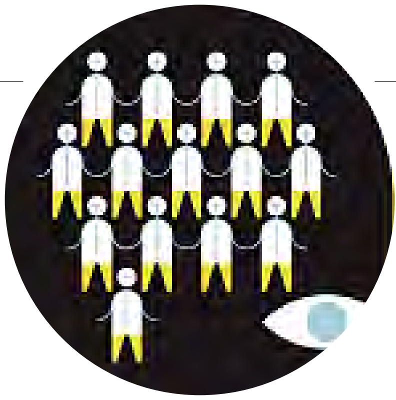
When revenues fell by more than 10 per cent between 2008 and 2009 as the outlook for the global economy worsened, it adopted a strategy of transferring some workers to different parts of the collective, and for others to begin working flexible hours.

Later, when a Europe-wide policy to stimulate new car sales was set in motion – through, for example, scrappage schemes – Mondragon's car-parts business received a flood of orders that needed to be fulfilled rapidly.

While rivals that had cut staff were unprepared, Mondragon was in a better position and could give its workers the opportunity to work overtime to complete orders.

It is in this sense that Gisasola sees no contradiction between the profitability of Mondragon

Reach the top: high-end bicycle manufacturer Orbea is owned by Mondragon



and its commitment to employee ownership and sustainable job creation. It is only by adopting such a structure, he argues, that the collective has been able to expand steadily and internationalise, rather than taking backward steps during the downturn.

"It is a contribution to society to generate employment, but that employment needs to be sustainable, and for it to be sustainable, the company needs to make a profit," he says. "Our commitment is not to capital but to the sustainable creation of jobs."

Mondragon was founded in specific circumstances, but many ask whether the Basque workers' collective model could be replicated elsewhere.

"Of course," says Gisasola, "but to do so you need to be willing to share the results of the company with the workers.

"It's not a perfect system – it has flaws like every model – but we think it's better than the capitalist model. Some people have said to us, 'This could be the third way,' but we do not have aspirations to be the third way of anything. The only thing we promise is that whatever happens, we are all owners of our own destiny." ■

Ingvar Kamprad

Founder, Ikea

"You will find your best ideas among employees on the floor – pick your ideas from those closest to reality. This way you also learn the important distinction between real and imagined needs, between productive and destructive costs."

PHOTOS: BLOOMBERG

Critics round on capitalism

Value of putting shareholders first being questioned

Showing the way: an Eroski grocery store in Madrid, also part of Mondragon's co-operative

Mondragon's co-operative model has attracted increasing attention amid the financial crisis, as criticisms of shareholder capitalism have become more pronounced.

Architects of contemporary free-market ideology such as Alan Greenspan, former chairman of the US Federal Reserve, have said they may have miscalculated the ability of markets to serve wider society, while other corporate leaders have questioned the wisdom of putting private shareholders first.

In the UK, the John Lewis Partnership, an employee-controlled department store chain, has been held up as example by leading politicians such as Nick Clegg, deputy prime minister, who has floated the idea of allowing all employees to buy shares in their companies by law.

Clegg denied he was attempting to create a form of cuddly capitalism, arguing there was evidence that higher levels of employee ownership raised productivity.

Several have questioned widsom of a focus only on shareholders

While there has been no rush among large multinationals to follow the Mondragon example, several leading executives have questioned the wisdom of a focus solely on shareholders.

Jack Welch, former head of General Electric and the man regarded as the father of "shareholder value", surprised many in 2009 by calling the focus on short-term goals "the dumbest idea in the world".

Welch said: "Your main constituencies are your employees, your customers and your products," arguing that his ideas about shareholder value had been misinterpreted.

Paul Polman, chief executive of Unilever, has similarly attacked short-termism, arguing: "I don't think our fiduciary duty is to put shareholders first."

More recently, the new chief executive of Barclays, Antony Jenkins, was dubbed "Saint Antony" in parts of the media when he sought to repair the battered bank's image in part by stressing the need to play a greater role in society. **MJ**

Bright thinking

Masayoshi Son has embarked on his biggest challenge yet after setting his sights on the lucrative US market, says **Michiyo Nakamoto**

If there is a trait that encapsulates the corporate culture of SoftBank and the mindset of its founder, Masayoshi Son, it is a penchant for transformative deals.

Son, SoftBank's irrepressible chief executive, demonstrated his appetite for just such a daring move in 2012 when he announced the Japanese telecoms group would spend $20bn to acquire 70 per cent of Sprint Nextel, the third-largest mobile phone operator in the US.

SoftBank's bid for Sprint will create a cross-border mobile phone group with a subscriber base of 96m and revenues of $81bn, making it the third-largest mobile operator in the world in revenue terms.

The deal, which will more than double the company's current 40.5m subscribers, is not only audacious because of its size. Japan's biggest cross-border merger to date will also bring SoftBank into direct competition with the two industry heavyweights, AT&T and Verizon, and catapult the Japanese group to centre stage in the lucrative US mobile market.

But Son, who has never been one to shy away from a difficult task, appears to relish what could be a bruising fight against stronger rivals. "The fact that two wealthy operators dominate the market means there is an unprecedented opportunity for a challenger," Son said in October as he unveiled the Sprint deal. Sprint has 16 per cent of the US market, against AT&T's 30 per cent and Verizon's 32 per cent

It would be a bigger risk, the SoftBank chief reasoned, "not to take up the challenge".

The comments are typical of the diminutive Son, a Japanese citizen of Korean descent, who has built his business empire against many odds. The key to his success has been a "venture spirit", says Nobuyuki Idei, former chief executive of Sony who now runs Quantum Leaps, a provider to start-ups of consulting services and investment.

Unlike many in the west, who harbour a desire to retire young and become philanthropists, Son "keeps on dreaming", says Idei, who has known the SoftBank chief for many years.

What is more, according to Idei, Son has an ability to think big – a trait that is hard to find in Japan, he says. For example, before the Sprint acquisition, Son worked on a large-scale project with China Mobile and Vodafone to promote the development of new telecom technologies, applications and services.

After the meltdown at the Fukushima nuclear power plant in 2011, he put forward plans to set up a company to build mega-solar power plants.

> It is as if by taking on large amounts of debt, Son pushes himself to work harder

Son's big thinking extends to the debts he takes on when he buys a business, says Idei.

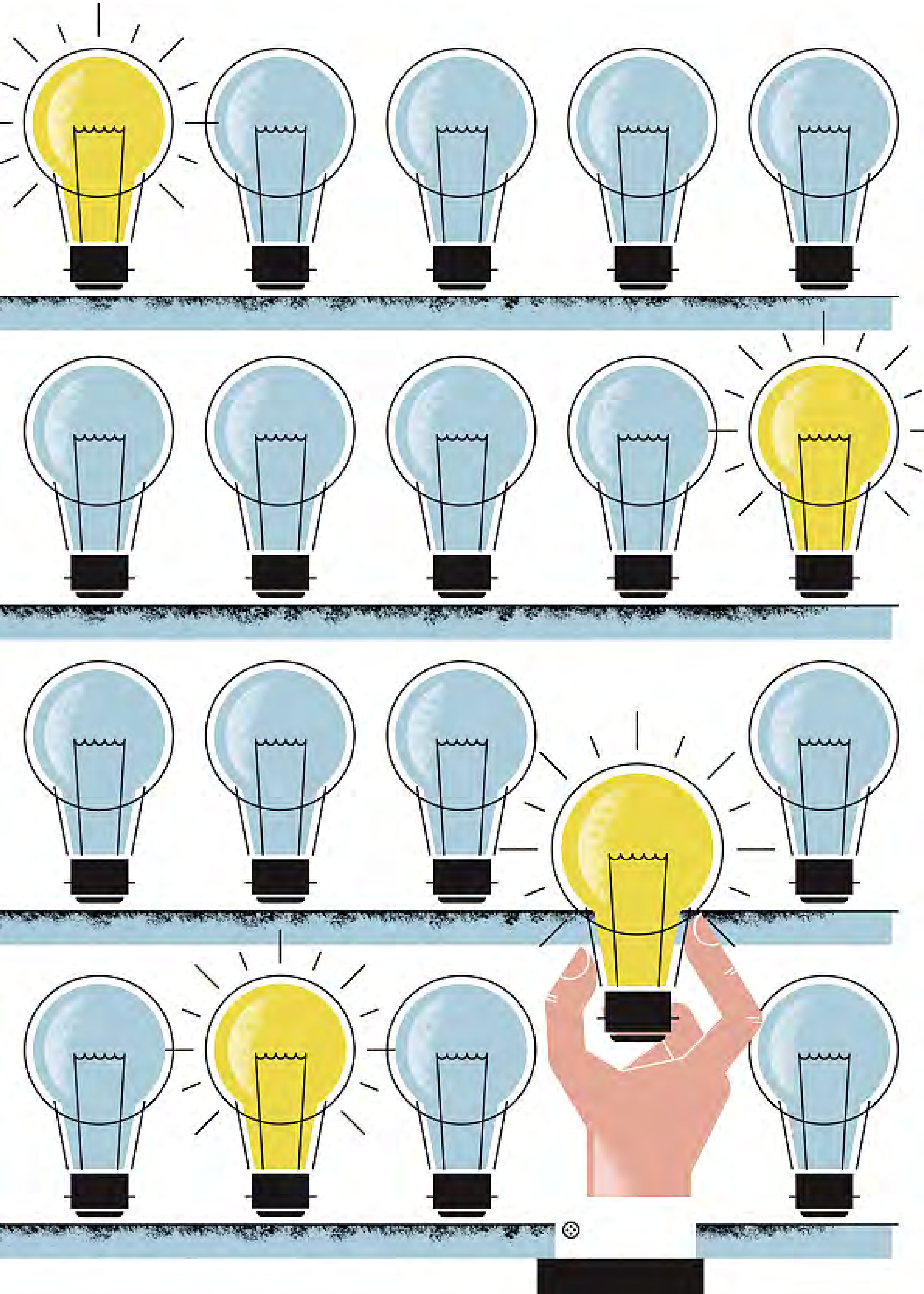
Unlike most executives, who talk proudly about the size of their company's revenues, Son likes to boast about his credit rating, says the former Sony chief.

"When I introduced him to the Keidanren [Japanese business federation], he talked about how his credit rating was high enough for him to take on large debts," Idei recalls. It is as if by taking on large amounts of debt, he pushes himself to work harder, Idei says.

Ever since Son stood on a fruit box more than 30 years ago and declared to his two employees that the company he had started in a run-down office with no business plan would make Y50bn ($536m) in 10 years, Son has thrived by taking big bets.

In the early days of the company that would later become SoftBank, Son invested Y8m of his Y10m in capital to lavishly kit out a booth at a consumer electronics fair in an effort to raise the profile of the start-up distributor of computer software. The strategy worked and the company grew to take a stranglehold on computer software distribution in Japan in the 1980s.

But the ever-restless Son was not content with being a ➤



SoftBank's early holding in Yahoo established Son's reputation as a savvy investor

Tony Fernandes
Chief executive, AirAsia

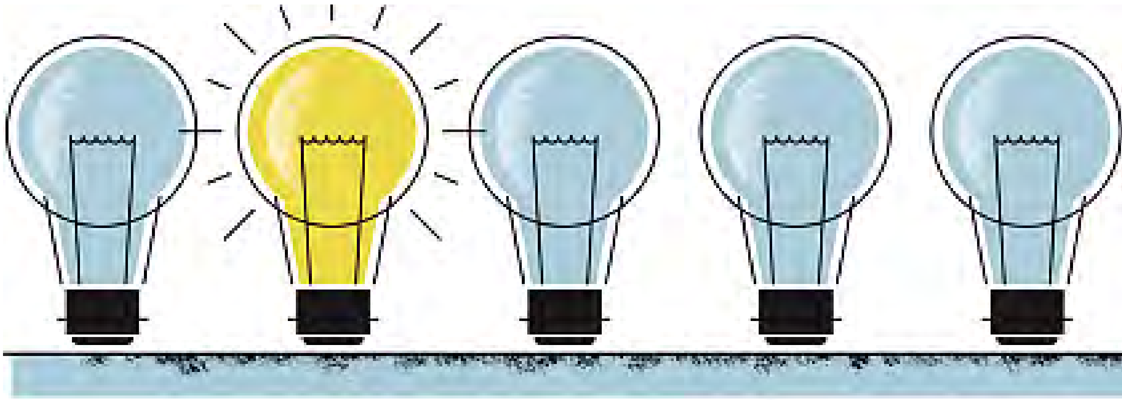
"A fine line separates boldness and folly. Paradoxically, boldness can also mean taking a step back and engaging in deep reflection, ignoring the clamour to 'do something now' that is often the refrain in a commercial enterprise."

software distributor. He also spent the company's funds on a curious collection of acquisitions and investments. In an 18-month period from late 1994, SoftBank acquired Ziff Davis, then the leading US publisher of computer magazines, for $2.1bn; Kingston Technology, a maker of semiconductors, for $1.5bn; and Comdex, the exhibitions group, for $800m.

SoftBank also, in 1996, became the largest shareholder in Yahoo, the web search engine, with a 37 per cent stake – a move that established Son's reputation as a savvy investor in internet start-ups. The company began selling down the stake four years later, and although the exact amount it made from the transactions is difficult to quantify, the sale of a 4 per cent tranche in 2011 brought an extraordinary profit of Y76bn.

By the mid-1990s, although he was still expanding in publishing and exhibitions, Son found new interests. In 1996, with Rupert Murdoch's News Corporation, SoftBank set up a 50:50 joint venture in satellite broadcasting called JSkyB. But what really shocked Japan's business community was another Murdoch tie-up: the like-minded entrepreneurs also quietly acquired a 21

PHOTOS: BLOOMBERG, AFLO / BARCROFT MEDIA



Think outside the box: the irrepressible Masayoshi Son (left) 'keeps on dreaming' of new ventures

per cent stake in TV Asahi, one of Japan's main broadcasters.

The stake was quickly sold back to the Asahi newspaper after the entire Asahi media group rallied around the panicked broadcaster to fend off the duo. SoftBank also attracted controversy with its investment in Aozora Bank, created from the once-nationalised Nippon Credit Bank. The 2003 sale of the stake to Cerberus, the US private equity firm, made the company a Y50bn profit.

It is no wonder that even as SoftBank raised its profile, many found it difficult to understand what the company really did or the nature of Son's ultimate goal. Appearing on television in 2000, Son was told by a well-known newscaster that he was gaining a reputation as a "fortune hunter".

The comment reflected the view of some in the business world that Son used SoftBank to bet on companies, rather than developing businesses themselves. For many years, Softbank, with its constantly changing model, appeared to be a company in search of a business to call its own.

Although Yahoo Japan, a joint venture SoftBank set up with the search engine group, has been hugely successful, it has always been treated as an investment and has never been the core of the company's operations.

When, in 2004, it acquired Japan Telecom, a fixed-line phone company, it looked like SoftBank might have found its calling. But the company's adventure in fixed-line telephony was followed in 2006 by a move into mobile via the acquisition of Vodafone's mobile business in Japan. That deal, which cost SoftBank $15bn, was Japan's largest leveraged buyout at the time and the debts that the company took on to fund it have only recently been paid off.

Mobile telecoms now comprises the bulk of SoftBank's revenues and profits, well outpacing fixed-line sales.

SoftBank said it had always "engaged in the information telecommunications business" and hoped to "continue to be a leader in the industry".

But the company's ability to move out of businesses swiftly when they lose momentum can also be seen as the key to its success in navigating a rapidly changing business environment.

While the strategy might seem precarious, "like a bicycle that will fall over if you stop pedalling", as the company's chief financial officer once worried out loud to his boss, the solution, as Son put it, is to "pedal harder".

That appears to be what SoftBank is doing with the move for Sprint, which, following its success as the first provider of Apple's iPhone in Japan, now faces competition from KDDI, Japan's number-two telecoms group.

This year, Son said the still-booming iPhone business would enable SoftBank to post strong profits in 2013, but looking ahead he emphasised the role Sprint would play in helping the company achieve record profits.

"The more we get to know Sprint, the happier I am and the more confident I am about this deal," Son said. ■

A passion for all things Japanese

SoftBank chief rose from humble roots in his adopted homeland

Masayoshi Son's rise to prominence is testament to the business acumen and steely determination of a man who came from humble origins.

Born into a poor Korean family in Kyushu in western Japan, Son grew up with the Japanese name Masayoshi Yasumoto – a protective measure common among Korean immigrants, who suffered discrimination in their adopted homeland.

Moving to the US to pursue his education, while still a student at the University of California, Berkeley, he developed a prototype translating machine that was later sold to Sharp, the Japanese electronics company.

Although his Korean heritage was a factor in sending him to the US, Son has remained deeply attached to Japan, returning there after he left the US.

In a reflection of his love for all things Japanese, he had a traditional Japanese garden built outside his office in SoftBank's high-rise Tokyo headquarters, complete with arched bridge, a river and even crickets.

"Son-san told me he built it with his own money, not the company's," says Nobuyuki Idei, a friend and former chief executive of Sony. **MN**

Steel - the fabric of life

Windscreen wiper
Windscreen wipers contain steel wire. Our site in eastern France, ArcelorMittal Marnaval, is a world leader in producing the cold-rolled steel wire used in windscreen wiper arms.

Lamp post
The long columns and bases of street lights are made from hot-rolled and tubular steels produced in our plants in Spain.

ArcelorMittal

Gutter
Gutters need to be hard-wearing and resistant to extremes of temperature and climate. ArcelorMittal has developed a double-sided, organic-coated paint, Granite® Rain, that provides an armour-like barrier between the elements and the steel gutter, optimising it for weathering resistance.

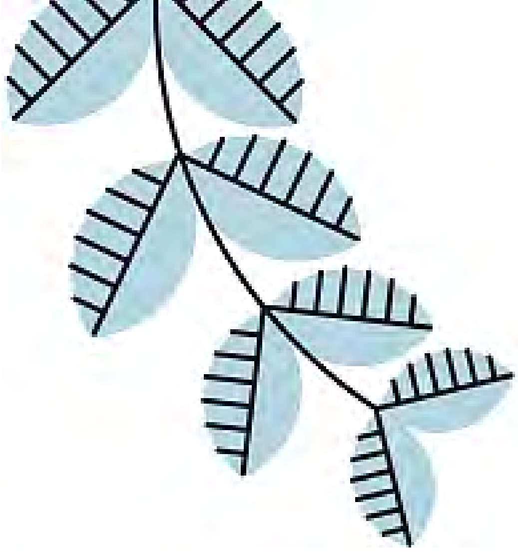
Steel frame
Steel's versatility means it is being used more and more to build houses. Steel meets the needs of low-cost, low-rise, affordable, high-end, high-rise and sustainable buildings. Prefabricated components ensure fast, safe and reliable construction, as well as cutting down on dust and noise.

In high-rise buildings, the use of ArcelorMittal beams in Histar® steel results in 25% to 50% reduction in weight, achieving annual CO_2 emissions savings equivalent to 4,000 vehicles.

Snow shovel
Made from both carbon and stainless steel, snow shovels play an important part in everyday life during the harsh winters in North America and Europe.

Picture: wide.lu

BOLDNESS IN BUSINESS
WINNERS



What the judges said

PERSON OF THE YEAR
Ivan Glasenberg

Ivan Glasenberg pulled off the deal of the year in 2012. After months of fraught negotiations, the Glencore chief executive secured shareholder approval for a $76bn tie-up with Xstrata.

The merger is the fifth largest ever in the natural resources sector, creating a vertically integrated behemoth that dominates sourcing, production, marketing and trading.

Glasenberg's key strengths are his attention to detail, a meritocratic approach and a buccaneering spirit.

While he arguably overpaid to clinch Xstrata, this megadeal will not be Glasenberg's last. His next test will be working with a new top-class chairman, who could serve as a countervailing, as well as complementary, force.

Lionel Barber

DRIVERS OF CHANGE
Mondragon

Mondragon Corporation showcases an approach that rewrites parts of the business rule book.

Guided by democratic principles, the chief executive earns no more than eight times the lowest-paid workers at the co-operative. Workers receive formal training and lifelong education, and members participate in key decisions, from what to produce to how to spend the profits.

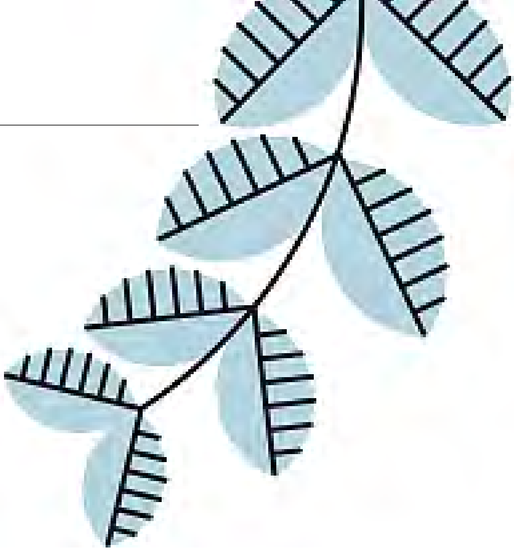
Mondragon's collection of businesses operating in finance, retail and manufacturing is now one of Spain's 10 largest companies. Its impressive record also quietly refutes the conventional wisdom that to be co-operative is to be uncompetitive.

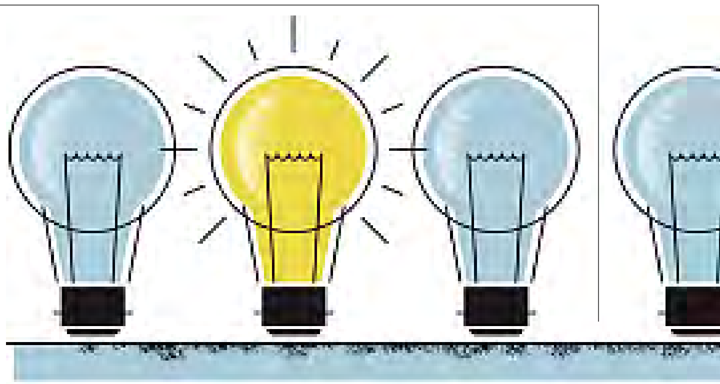
Leo Johnson

ENTREPRENEURSHIP
SoftBank

For the past two decades, Japan has been a difficult place for entrepreneurs – a place where great ideas have gone to die. This makes the achievements of SoftBank, and its founder Masayoshi Son, all the more remarkable. The audacity of its move to take a 70 per cent stake in Sprint Nextel, one of the biggest US telephone carriers, was the culmination of decades of successful and bold entrepreneurship.

John Authers





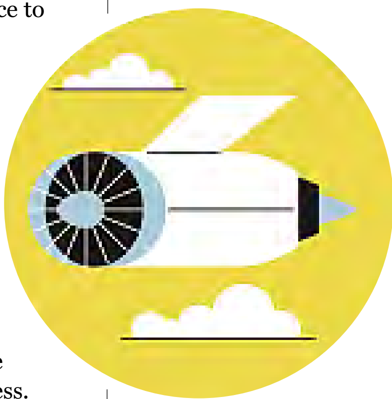
TECHNOLOGY

3D Systems

3D Systems is helping to transform product design and manufacturing for a range of industries, from aerospace to education, architecture and medical devices. The broad reach of its product line is matched by an ability to create high-impact results that drive innovation.

It is also focused on the needs of the user rather than itself – the producer – providing tools that increase efficiency and effectiveness.

This increases its engagement with customers, enabling people to work smarter and with better results. 3D Systems is helping people turn their ideas into action and their dreams into reality. **Dipak Jain**



CORPORATE RESPONSIBILITY/ ENVIRONMENT

Narayana Hrudayalaya

Narayana Hrudayalaya is revolutionising healthcare in India by successfully combining low costs with high quality and highly specialised medical treatments. It had to completely rethink internal processes to treat large numbers of patients, offering access to surgery and cardiac treatments that would otherwise be unaffordable to most Indians.

The company has also brought affordable healthcare to 4m farmers thanks to an innovative micro-insurance programme, a socially responsible investment. **Anne Méaux**

EMERGING MARKETS

Mahindra & Mahindra

The judges are impressed by businesses in emerging markets that are bold enough to move into the developed world.

Mahindra did this by winning a large share of the US tractor market and the purchase of Ssangyong, the Korean carmaker. Mahindra now claims to be the world's largest tractor manufacturer. The judges also looked for solid operating and financial performance and Mahindra satisfied this with a return on equity of 20 per cent. **Terry Smith**

SMALLER COMPANY

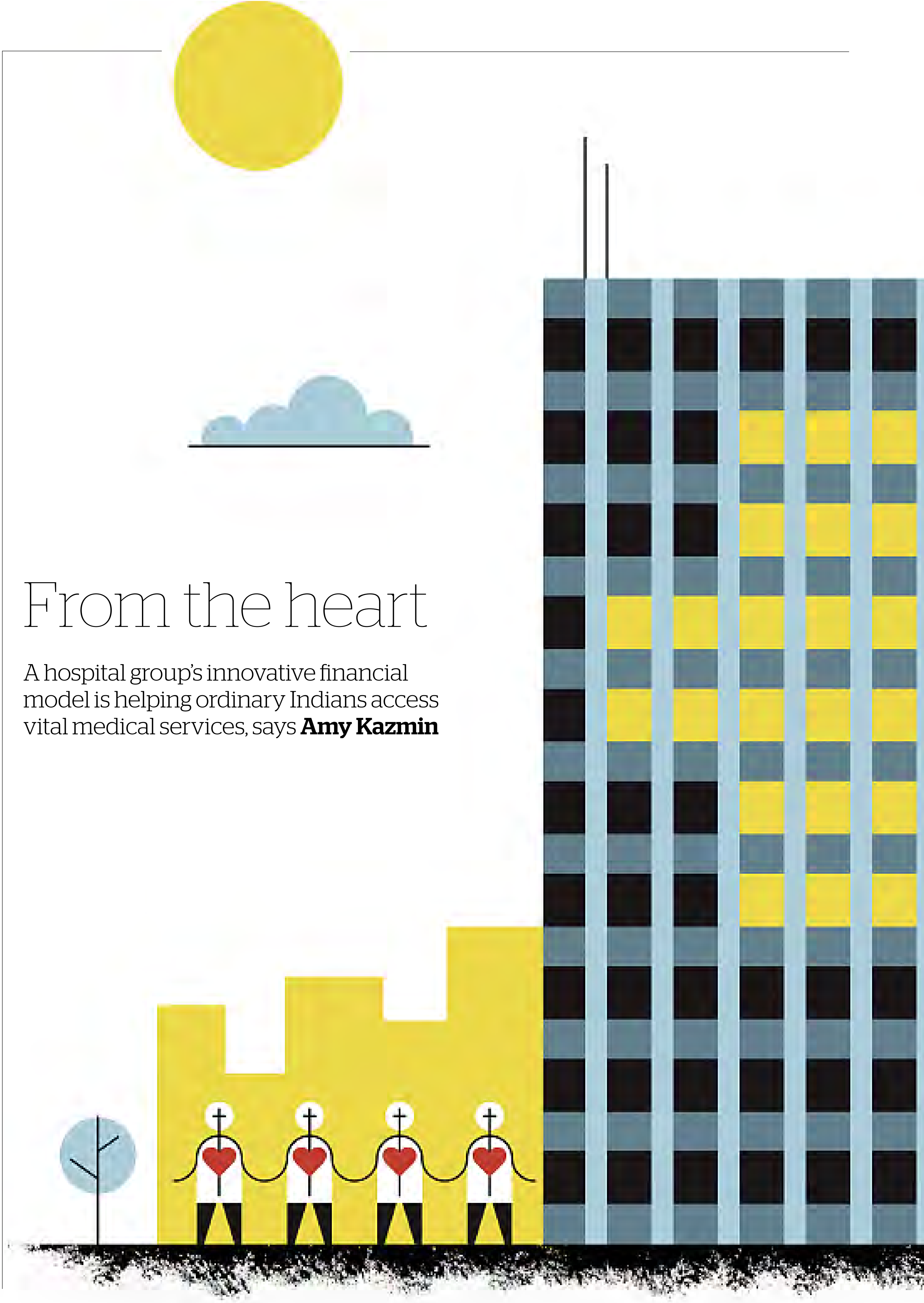
GoPro

GoPro survived at least one dizzying fall in 2012: daredevil Felix Baumgartner had five of its cameras strapped to him when he skydived from the edge of space. Seeing off various competitors, GoPro is approaching an initial public offering after building up a network of vendors in 50 countries, and selling more than 3m cameras over the past three years.

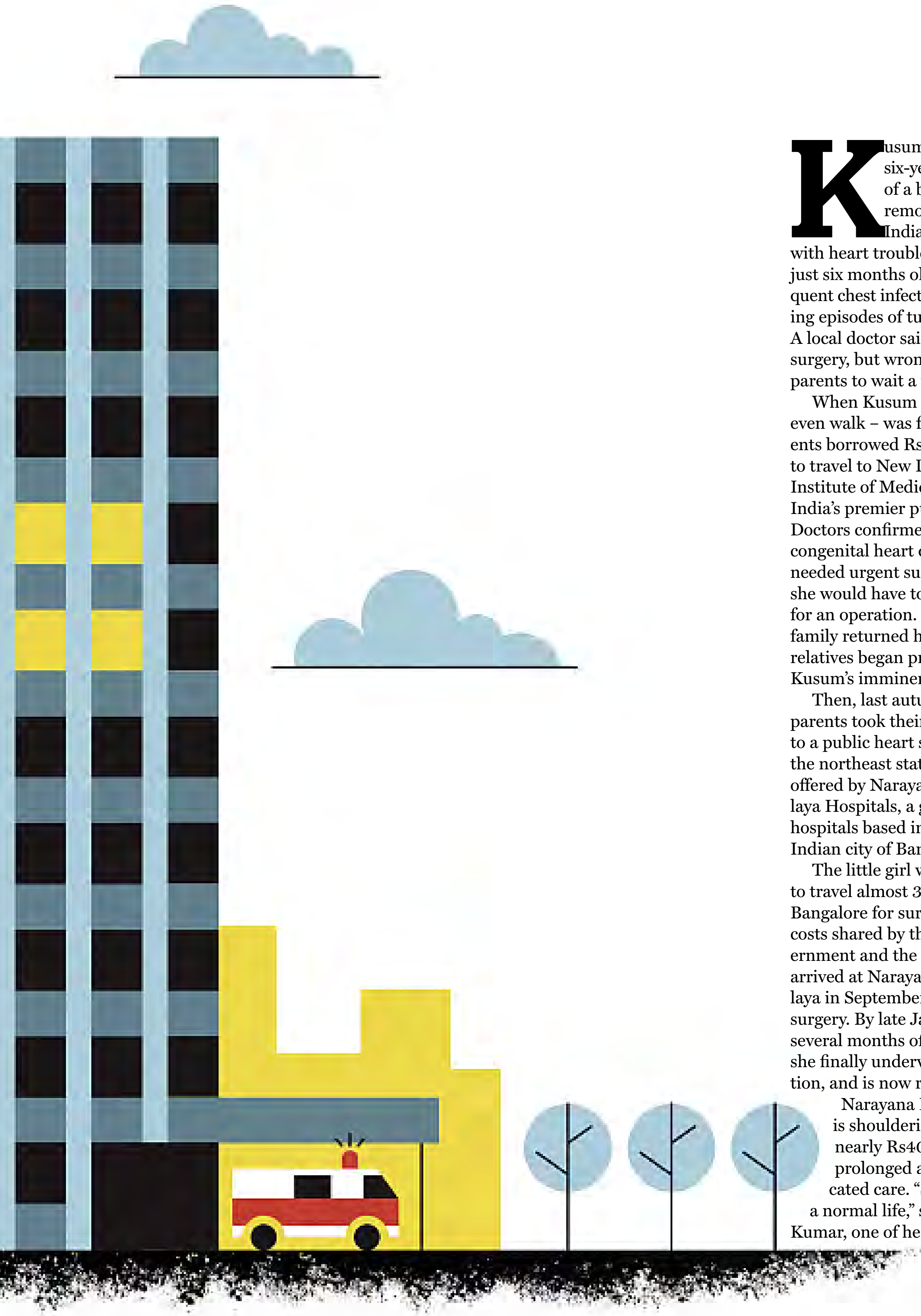
Its technology continues to find new uses – GoPro cameras have been attached to surfboards and surgeons' heads – and it has been done by a Silicon Valley company that has remained small, in an industry dominated by well-established forces. **John Authers**

From the heart

A hospital group's innovative financial model is helping ordinary Indians access vital medical services, says **Amy Kazmin**



CORPORATE RESPONSIBILITY
NARAYANA HRUDAYALAYA



Kusum Sharma, the six-year-old daughter of a blacksmith in remote northeast India, was diagnosed with heart trouble when she was just six months old, after frequent chest infections and alarming episodes of turning blue. A local doctor said she needed surgery, but wrongly advised her parents to wait a few years.

When Kusum – too weak to even walk – was four, her parents borrowed Rs30,000 ($555) to travel to New Delhi's All India Institute of Medical Sciences, India's premier public hospital. Doctors confirmed she had a congenital heart defect and needed urgent surgery – but said she would have to wait a year for an operation. Her dejected family returned home, where relatives began prophesying Kusum's imminent death.

Then, last autumn, Kusum's parents took their daughter to a public heart screening in the northeast state of Assam, offered by Narayana Hrudayalaya Hospitals, a group of private hospitals based in the south Indian city of Bangalore.

The little girl was chosen to travel almost 3,000km to Bangalore for surgery, with the costs shared by the Assam government and the hospital. She arrived at Narayana Hrudayalaya in September, too fragile for surgery. By late January, after several months of intensive care, she finally underwent the operation, and is now recovering.

Narayana Hrudayalaya is shouldering expenses of nearly Rs400,000 for her prolonged and complicated care. "She will lead a normal life," says Vijaya Kumar, one of her doctors. ➤

CORPORATE RESPONSIBILITY
NARAYANA HRUDAYALAYA

Making heart surgery and other high-tech healthcare accessible to all who require it, regardless of their capacity to pay, is the raison d'être of Narayana Hrudayalaya, which was founded a decade ago by Dr Devi Shetty, a heart surgeon.

In a country where most private hospitals cater to affluent patients – and public hospitals are so starved of funds they cannot attract doctors – Narayana Hrudayalaya has a clear focus on patients on the lower rungs of the economic ladder. The group also has an unstated rule that no needy patient should be turned away for lack of money.

"When a corporate hospital is developed, they tell the employees, 'This is the hospital for the rich, but we take care of the poor also'," Shetty explains. "But this is a hospital for the poor, and we also take care of the rich. That is why we exist."

Yet Narayana Hrudayalaya is not run as a charity: the company has a sharp focus on remaining profitable, which its founder sees as crucial for the group to expand and fulfil its goal of reaching more patients.

"I believe charity is not scalable, irrespective of how wealthy you are," says Shetty. "If you constantly do something for free you will run out of money. You have to look at building business models that are sustainable."

That is what the Narayana Hrudayalaya team has sought to do. The group, whose name translates loosely from the local language of Karnataka province as "God's temple of the heart", has about 6,000 beds in 20 facilities across India, including its flagship 1,000-bed cardiac hospital in Bangalore. The main Bangalore campus also has a cancer centre, an eye hospital and an orthopaedics centre.

The group, which is 75 per cent owned by Shetty's family and counts JPMorgan, the bank, and PineBridge Investments, a US asset manager, among its shareholders, had revenues of $132m in the most recent financial year. It expects to end the current financial year with revenues of $169m.

"We believe in making profits, but not super profits – enough money to pay good salaries to employees, to maintain our infrastructure and remain attractive to investors," says Shetty, who still devotes much of his day-to-day time to treating patients. "We definitely want to keep our noses above water. If you don't make a profit, no bank ➤

Sir Stuart Rose

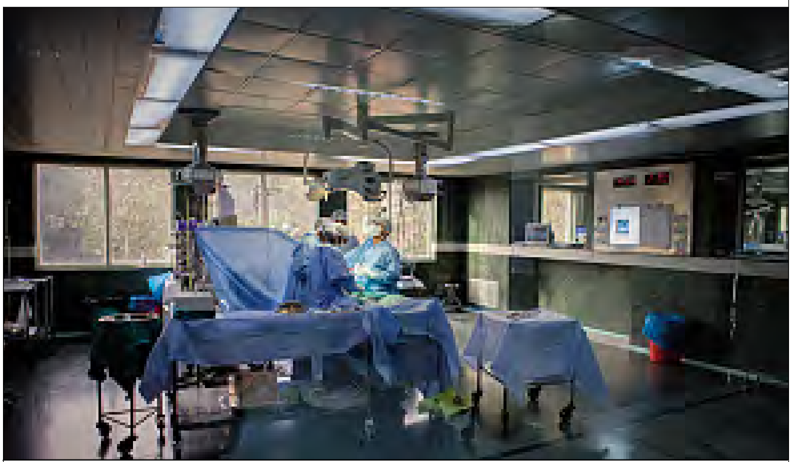
Chairman designate, Ocado

"The downturn masked huge shifts in the way business, government and society access resources, customers, markets and capital. The winners will be those that have their fingers on every trend, demographic and technology, understanding those that matter and those that don't."

> 'Charity is not scalable, irrespective of how wealthy you are'

Cared for: six-year-old Kusum Sharma, pictured with her mother, was treated at Narayana Hrudayalaya's Bangalore heart hospital

PHOTOS: AYUSH RANKA



Good care comes at a cost

Focus on private healthcare creates debt and despair

For most of India's 1.2bn people, their quality of healthcare depends heavily on their ability to pay.

Large Indian business groups and foreign hospital chains have been building ultra-modern private hospitals that earn handsome profits by catering to India's wealthy and the aspiring middle classes.

Meanwhile, India's government-funded public hospitals, which are supposed to provide free treatment, are in disarray, with a shortage of doctors, lack of basic supplies, overcrowding, and crumbling, dirty facilities. Patients, even those with life-threatening illnesses, can be made to wait for weeks or longer for treatment. This forces many families to go deep into debt, often borrowing from informal moneylenders at high rates, to obtain private medical care.

> Public hospitals are in disarray, with patients made to wait long periods for treatment

About 80 per cent of India's healthcare spending is borne by private citizens, one of the highest out-of-pocket healthcare spending rates in the world. Meanwhile, the government spends about 1 per cent of gross domestic product on health, one of the lowest rates in Asia.

According to medical journal *The Lancet*, 39m Indians a year are pushed into poverty as a result of paying for healthcare emergencies. In rural areas and urban slums, the sick often resort to unqualified, informal healers, or simply give up hope.

Not surprisingly, basic health indicators such as maternal and childhood mortality are higher in India than other countries at a comparable economic level. India also has some of the world's highest rates of infectious disease because treatment is so erratic.

Private hospitals are theoretically required to take some poor patients and treat them for free or at deep discounts. But health advocates say only a tiny number of patients can be served in this way. **AK**

Inspiration: Devi Shetty (pictured) set up his hospital group after working for Britain's state-run National Health Service

'A symbol of true socialism'

The UK model of healthcare has been an inspiration

As a young heart surgeon, Devi Shetty, founder of Narayana Hrudayalaya Hospitals, spent six years in the UK, including four at Guy's hospital in London. Today, he recalls Guy's and the National Health Service as a medical "utopia".

"A billionaire and a chauffeur could be admitted to hospital together and lie side-by-side," he says. "That was a symbol of true socialism. It had a tremendous impact on me." It is this ethos - of providing high-quality care for all who need it - that Shetty has sought to recreate back in his home country of India.

The son of a small-business owner from the southern port town of Mangalore, Shetty had aspired to be a heart surgeon since primary school.

After studying medicine in India and training in the UK, Shetty returned to India in 1989 and spent most of the 1990s setting up two private cardiac hospitals for large local industrial groups. He also served as a heart doctor to Mother Teresa, the founder of the Missionaries of Charity organisation who suffered cardiac problems in later life.

But after watching too many parents lose hope for their children after hearing how much heart surgery would cost, Shetty decided to set up his own hospital. He was supported by his father-in-law, who owned a large construction company.

"When I started talking about affordable healthcare, I didn't find many takers [among] business groups," he says. "That's why I wanted to build my own hospital where I could operate on whomever I wanted, with the concept of trying to make a difference." **AK**

Shetty has sought to recreate the NHS ethos of care for all who need it

will lend to you and no donor will give you money."

Over the next seven years, Narayana Hrudayalaya aims to add 30,000 beds across India, mainly by building hospitals in smaller cities and towns with populations of between 500,000 and 1m, or in bigger cities where state governments are offering free or low-cost land.

The twin – and seemingly incompatible – aims of caring for all who need it while still making money are met by an aggressive focus on cost control, paired with innovative funding models to help generate revenues to pay for the treatment of poor patients who cannot pay themselves.

On the cost side, Shetty has sought to create a type of efficiency more typically associated with factory assembly lines than high-tech healthcare.

He uses his hospitals' economies of scale to secure the lowest prices for heart valves and other medical supplies. In interviews he has even likened this approach to that of Walmart, the US retail chain.

He recently met government officials to argue for Narayana Hrudayalaya to pay a lower electricity tariff in the state's tiered pricing system.

The Narayana Hrudayalaya surgeons – who receive fixed monthly salaries, rather than being paid by procedure like doctors at most Indian private hospitals – are also worked hard, being expected to perform at least two heart operations (which might take up to five hours each) a day.

"We believe healthcare is extremely sensitive to numbers – as we do more operations we get better at it, and our costs keep going down," Shetty says.

Narayana Hrudayalaya can break even if it recovers Rs80,000-Rs 90,000 for basic cardiac operations, such as closing a hole in the heart or a simple coronary bypass, and associated post-operative care. But even these prices are far beyond the means of many Indians. So Narayana Hrudayalaya uses a complex mix of cross-subsidies, micro-insurance schemes and charitable funds to generate sufficient revenues to ensure the group covers its costs and turns a profit each year.

About 40 per cent of Narayana Hrudayalaya's patients pay what Shetty calls the "rack rate" of about Rs150,000 for a basic heart operation, including post-operative care in a general ward – a level comparable with other private hospitals. Patients pay even more for amenities such as private rooms.

Revenues generated by these more affluent patients help to cover the costs of the other patients, who pay less than the rack rate. Of those, about 40 per cent have some government health insurance that reimburses hospitals about Rs75,000 for a heart operation.

Shetty himself helped the Karnataka state government establish a farmers' insurance scheme that now covers 4m individuals who each pay Rs10 a month. The state also has another health insurance scheme for the poor. Many other private hospitals refuse such patients because they are put off by the low reimbursement levels, but Narayana Hrudayalaya takes them in large numbers.

Meanwhile, poor patients with no health insurance are charged based on an assessment of what they can pay. The Narayana Hrudayalaya's charitable wing carefully analyses patients' capacity to pay and uses donations to cover the remaining expenses.

The group looks for efficiencies more typical of factory assembly lines

Malti Devi, a 25-year-old farmer's wife from the impoverished Jharkhand state, was waiting anxiously for her five-year-old daughter, Ashikar Rani, to wake up after a complex and long-awaited heart operation. The mother had known for years that her daughter needed heart surgery but could not find any hospital willing to treat her. Finally, she was referred to Narayana Hrudayalaya.

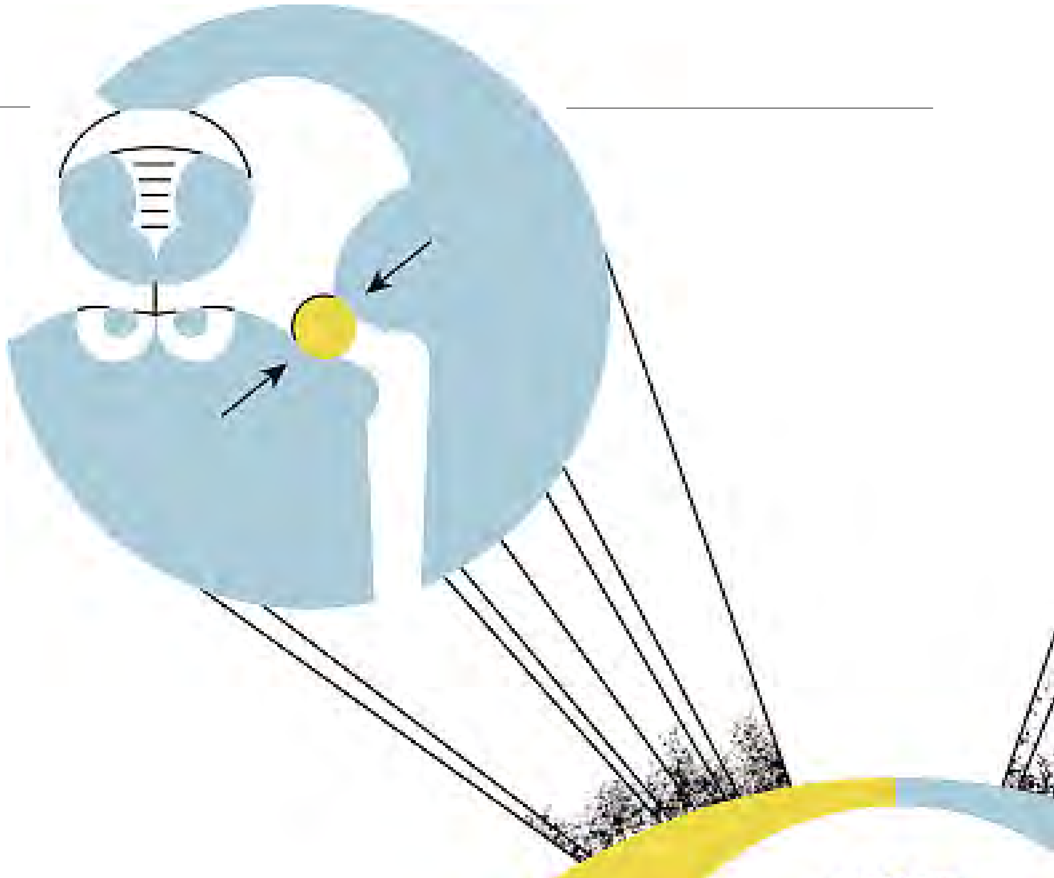
The cost of her daughter's care at Narayana Hrudayalaya is estimated at Rs250,000. Of that, the family is paying Rs70,000, comprising Rs20,000 from their own resources and Rs50,000 borrowed from a women's savings group. The Narayana Hrudayalaya charitable wing will cover the rest. "I am praying to God for my daughter," Devi says.

Charitable donations account for approximately 5 per cent of Narayana Hrudayalaya's revenues. But as the group expands, Ashutosh Raghuvanshi, managing director, admits it will need to be more aggressive about fundraising if it is to meet its aim of providing treatment for all who need it.

"We have no mechanism or department that is looking at gathering funds," he says. "But there are a lot of individuals and organisations that want to give money… but they also want to be sure their funds are being used for what it is supposed to be.

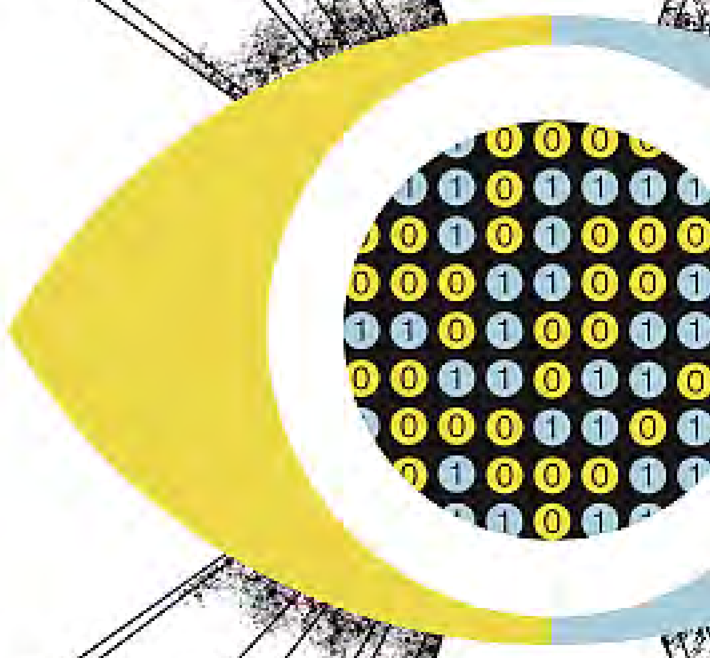
"With the credibility we have established over the years, we need a formal effort to collect funds, so we are now going down that path." ■

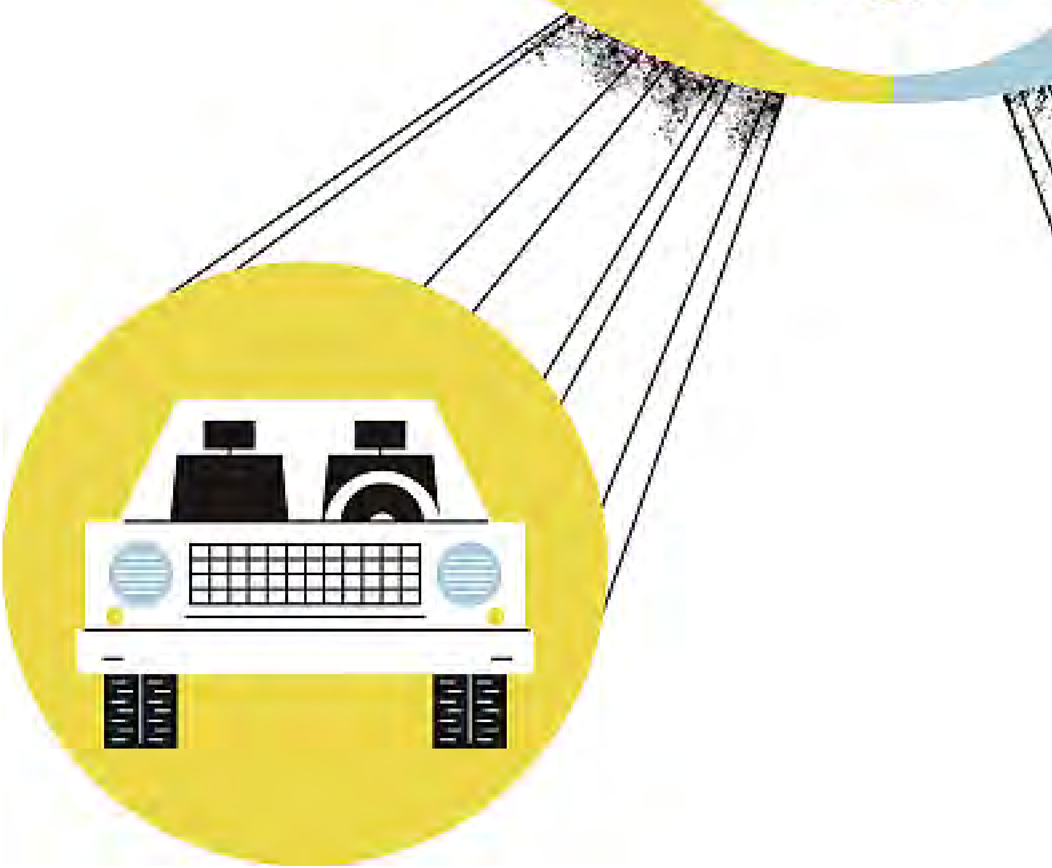
PHOTOS: AYUSH RANKA

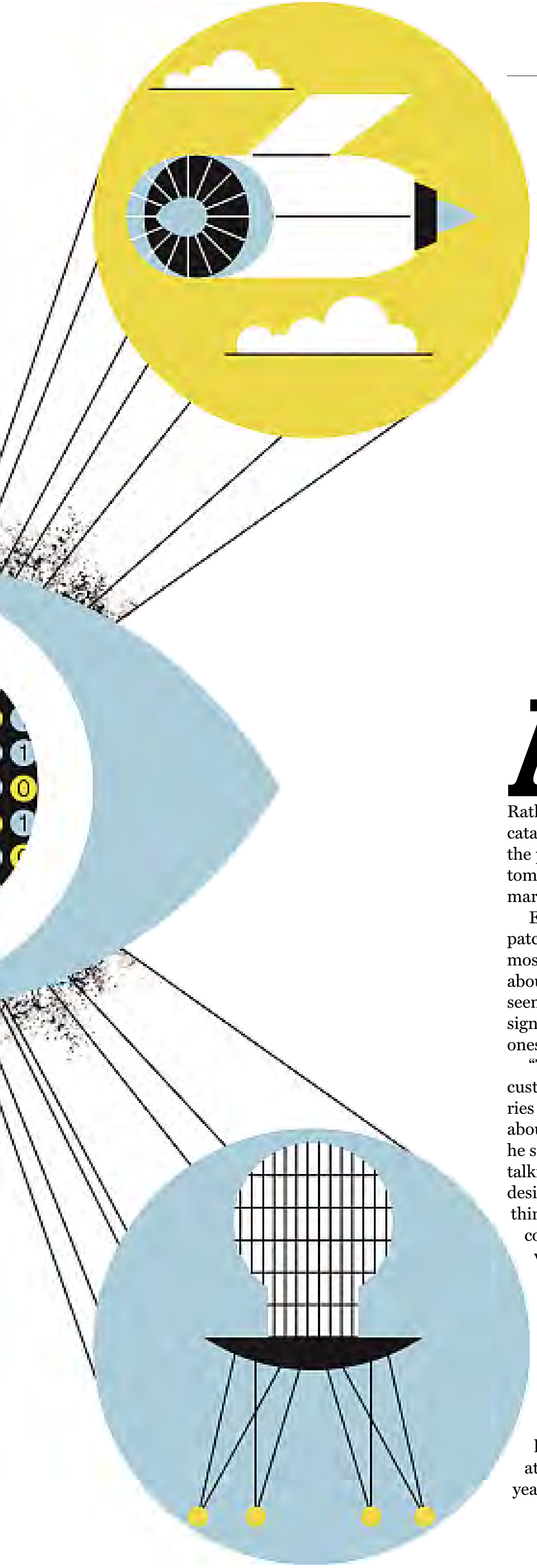


Game changer

The 3D printer group is leading a drive that could radically alter the process of manufacturing, writes **Peter Marsh**







Abe Reichental lifts his arm to show off the elbow patches that adorn each side of his jacket. Rather than coming from a catalogue of standard products, the patches have been customised to show a distinctive marking.

Even though plastic elbow patches might not appear the most obvious thing to enthuse about, Reichental seems excited by the significance of the ones he is wearing.

"The concept [of customised accessories for clothing] is all about differentiation," he says. "I've been talking to fashion designers and they think this technology could be very important for what they're doing."

3D Systems – the US-based business of which Reichental is chief executive – is one of the world's biggest suppliers of 3D printing equipment, an emerging area of manufacturing that has grabbed considerable attention in the past few years. Sipping tea in the bar of a London hotel, Reichental is keen to draw out the connections between ordinary items and the production systems in which his company is among the global leaders.

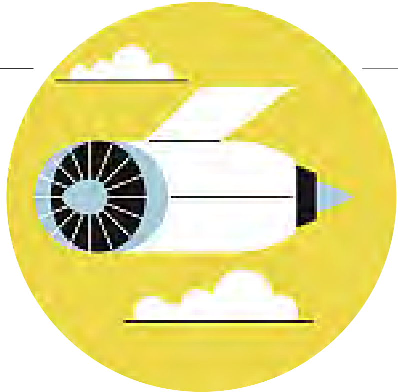
In 3D printing, also called additive manufacturing, complex shapes are built up in layers from their constituent particles of plastics or metal, allowing for the creation of parts and products on a "one-off" basis much more cheaply than traditional production methods. The 56-year-old Reichental has become an evangelist for a set of ideas that some believe could alter the industrial world profoundly in the coming decades.

'3D printing dismantles barriers between design and manufacture'

Taking delight in demonstrating how his machines work, the former aircraft technician's love of showmanship suggests that in another life he could have been a circus ringmaster playing to the crowd.

The thick guttural accent of his native Israel also gives his words special force. "3D printing dismantles the barriers between those who design and those who ➤

TECHNOLOGY
3D SYSTEMS



manufacture," he says. "It will make possible a new interface between artistic endeavour and industry and enable the entrepreneur working in a garage to have a similar level of production resources as a multinational."

He likes to draw extravagant parallels between what he feels 3D printing will bring and other manifestations of "disruptive" technologies. "When Henry Ford invented the mass-produced car, the world initially lacked the infrastructure to make use of it in the shape of highways. In a similar way, we've had a system of manufacturing for a long time but only a few have been able to use it to create good-quality products. Now, 3D printing is helping to democratise production and awaken the creative potential of a wider range of people."

The elbow patches Reichental is so proud of have been made on his company's 3D printers, as have a large number of other items he is keen to discuss. These include anything from aerospace parts and hearing aids to home lighting systems and children's toys.

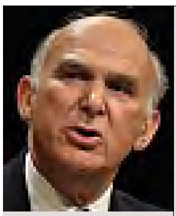
And it is not only big corporations and small enterprises that could benefit, but also consumers in their homes. 3D Systems last year launched a basic $1,300 Cubify printer aimed at domestic users.

Behind all forms of 3D printing is a set of fairly simple principles. Depictions of what is to be made are first devised, either through a design process or through scanning a real-life object with imaging equipment. Then the image – in the form of computer code – is transferred to the production machine, which range from sophisticated hardware akin to modern computer-controlled machine tools to the kind of inexpensive printer that Reichental thinks could eventually become as familiar as the personal computer.

Through a number of competing processes, including fusing metal or plastic paper with a laser beam or solidifying liquid polymer, the required item can then be fabricated.

Compared with conventional production processes, making 3D products requires no expensive tooling and can be accomplished by a direct transfer of digital data to a production machine.

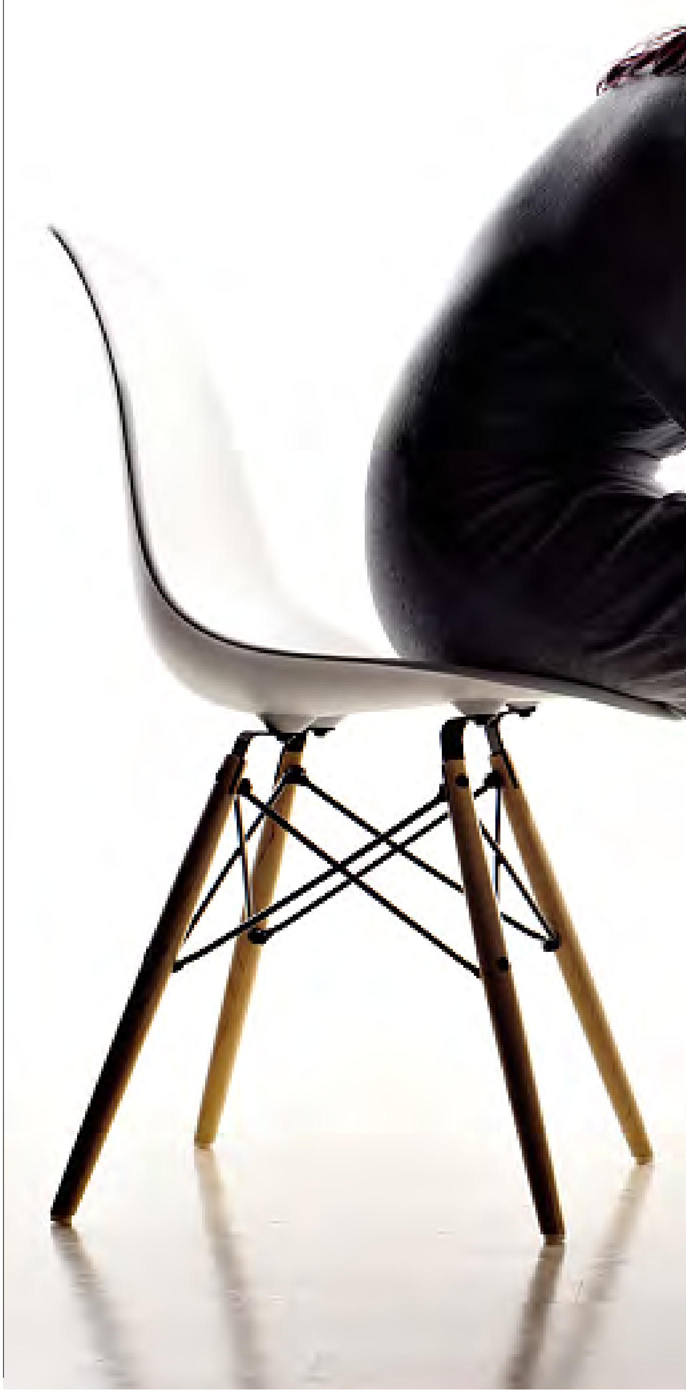
Leading manufacturers such as the US's General Electric, the Swiss-based ABB and Fiat of Italy are also using the technol-



Vince Cable

UK business secretary

"Taking bold and calculated risks is what being in business is all about. That is why it is great to see so many entrepreneurs in the UK starting and growing their own business. There are now a record number of more than 4.8m small and medium-sized enterprises in the UK."



New hope: 3D printers are creating prosthetic limbs and implants for use inside the human body

ogy to make prototype parts and products for testing, while at the same time trying out the processes for full-scale production.

At the other extreme are small businesses using 3D printing to make specialised objects. Italy-based Adler Ortho is using 3D printing to turn out customised implants for parts of the body, such as hip joints that are engineered to fit a specific person, while Canada's Hot Pop Factory uses the technology to make a range of customised jewellery.

However, the excitement about 3D printing has to be put into context. Printer sales in 2012 – including those by 3D Systems and rivals such as the company formed from the merger of the US's Stratasys and Israel's Objet, EOS of Germany and MakerBot, another US company – came to about $1bn, roughly 1 per cent of the equivalent revenues of the global machine-tool industry.

Reichental, however, is keen to point to what he sees as new forms of service-based business activity that could be triggered by 3D printing and that could make the technology more valuable. "Any company that owns intellectual properly in the form of a recognisable brand can use this technology to monetise the value of the brand in a way that would otherwise be hard to accomplish," he says.

For example, Walt Disney World, the entertainment resort, has tried out a 3D printing service that places the faces of young visitors to its Florida theme park on life-like representations of Disney characters such as Cinderella or Snow White. This not only provides a personalised souvenir to replace the traditional photograph but also provides subliminal advertising for the company's brand.

'Companies can monetise a brand in a way that would otherwise be hard to achieve'

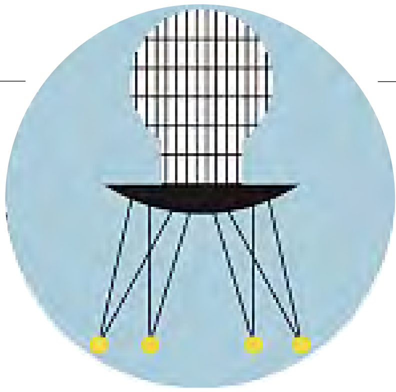
3D Systems has also joined forces with the Smithsonian Institution in Washington, which runs a series of museums and research centres, to make 3D depictions of any of the large number of items in its collection available to the public, from parts of the space shuttle to biological specimens.

"It's a way of using the power of digital capture to replicate what unusual objects look like and make them more widely available," says Reichental.

After settling in the US following a spell repairing helicopters for the Israeli armed forces, Reichental spent 22 years with Sealed Air, a US-based packaging business that, while operating in an unglamorous industry, has a reputation for innovation. But it was after joining 3D Systems as the chief executive in 2003, 17 years after the company was founded in California, that Reichental started to become better recognised.

One of his first jobs was to move the company to South Carolina to give it a fresh start. Since then he has presided over an upsurge in sales and a

TECHNOLOGY
3D SYSTEMS



3D printing explained

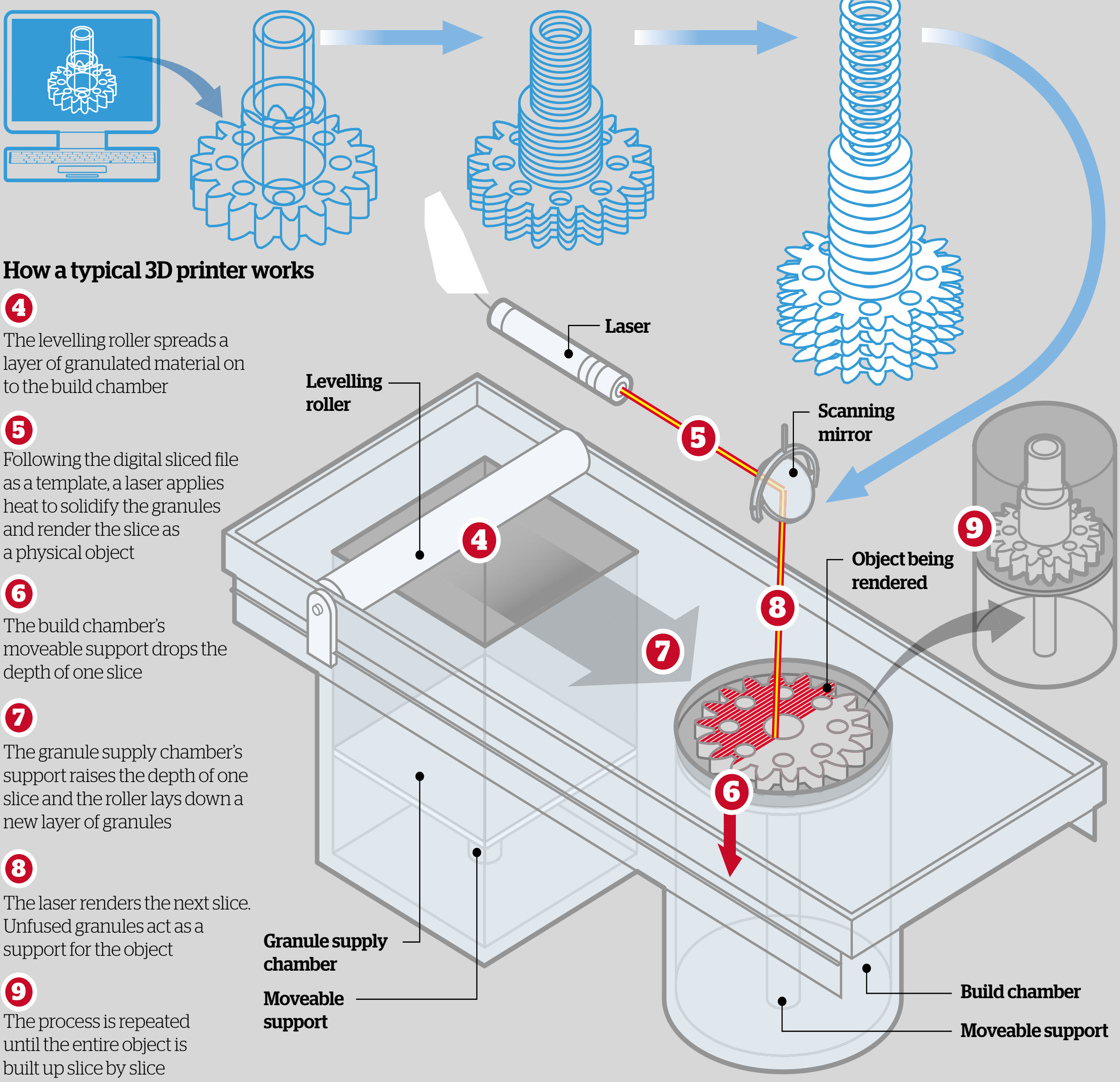
3D Systems makes a range of printers that use the three main processes behind 3D printing technology. The first (shown here) is the powder-based method. It starts with a powder (which could be plastic, metal or even wood shavings) and uses a precision laser to fuse this into specific shapes.

The second process is the liquid-based method, where a laser solidifies selectively parts of a liquid polymer using a curing technique. The third process is extrusion, where a plastic-type material is used to build up complex shapes

1 The shape of the desired part is modeled digitally using a computer-aided design program

2 3D printer software is then used to digitally divide the model into a series of very thin layers or 'slices'

3 The 'sliced' file is sent to the 3D printer



How a typical 3D printer works

4 The levelling roller spreads a layer of granulated material on to the build chamber

5 Following the digital sliced file as a template, a laser applies heat to solidify the granules and render the slice as a physical object

6 The build chamber's moveable support drops the depth of one slice

7 The granule supply chamber's support raises the depth of one slice and the roller lays down a new layer of granules

8 The laser renders the next slice. Unfused granules act as a support for the object

9 The process is repeated until the entire object is built up slice by slice

FT Graphic: Ian Bott

A VERSION OF THIS GRAPHIC APPEARED EARLIER IN THE FT NEWSPAPER rapid rise in the New York-listed company's market capitalisation. Revenues last year were $353m.

Reichental – perhaps partly due to his theatrical manner and habit of saying what he thinks – is not without his critics in the industry. They point to the company's helter-skelter run of acquisitions and the strategy of setting up multiple "service bureaux" around the world to provide 3D contracting, which sometimes compete with the company's own customers.

Reichental has a ready answer for his detractors. "We continue to assemble the tools and capabilities that our customers need to succeed, while removing friction and complexity... and deliver attractive growth and earnings."

Whatever happens to 3D printing in the next decade, Reichental is likely to be a part of the story. ■

Buyer: chief executive Abe Reichental has grown 3D Systems in part by snapping up a number of companies

Growing body of evidence

3D printing is revolutionising many types of surgery

When it comes to people's bodies, every one is different. As a result, it is no surprise that replacing or adding to body parts is one of the fastest-developing sectors of the 3D printing industry.

In the hearing aid industry, companies such as Phonak of Switzerland or the US's Starkey routinely use 3D printing to customise the components of their products that fit into people's ears.

By ensuring the items slide precisely into the ear space, the manufacturers can minimise any air gaps and improve how their products perform.

Similar thinking applies to the orthopaedic devices used as replacements for joints such as knees and hips. Engineers at some of the big orthopaedic implant manufacturers, including Stryker and Zimmer of the US, are using 3D printing to make customised devices that will fit individuals' bodies as closely as possible.

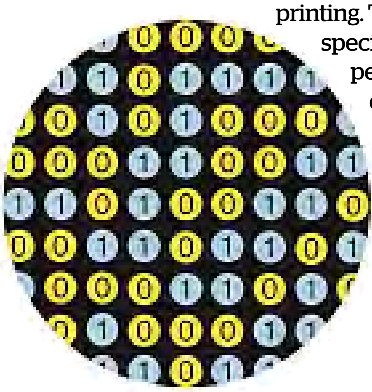
Adler Ortho is a small Italian business that specialises in making joint implants using 3D printing. The implants are specifically suited to people where the design of their new joint has to be exactly tailored to their bodies – for instance, because they have a particularly fragile bone structure where the smallest imprecision in fitting could cause joints to fail.

3D Systems has indicated its interest in this part of the additive manufacturing industry through its acquisition last year of Bespoke Innovations, another US company that specialises in making customised prosthetic devices.

It is also working with ConforMIS, a US company that uses computer modelling to build a 3D image of a patient's knee from medical scans and then constructs a new joint to order.

A 3D image of a patient's knee is built and then a new joint constructed to order

Mcor Technologies is an Irish company that has pioneered an area by creating 3D printing machines that, rather than using plastic or metal to build up shapes, employ sheets of paper as the printing medium. One big market for the technology is in creating cheap, quick-to-make models of body parts, such as skull or jaw components, that can be used in hospitals as guides during complex surgical reconstructions.



Still more radical ideas are being pursued by Organovo, a US business that has devised 3D printers for making one-off copies of human tissue, built up from cell structures based on biological material that is "grown" in a laboratory. The technology of making such tissue structures is still in its infancy, but it could eventually be used extensively in a wide range of medical research fields and in surgery. **PM**

Into the fast lane

The Indian vehicle manufacturer is on the lookout for higher-end marques as it seeks to establish a global profile, says **James Crabtree**

Mahindra & Mahindra is best known in India for its affordable sports utility vehicles and reliable tractors, both markets where the Mumbai-based conglomerate is easily the country's leading player.

But outside India the company is gaining a more adventurous reputation – for eye-catching attempts to buy foreign luxury car companies.

At the end of last year Mahindra entered the bidding to buy a stake in Aston Martin, the British sports carmaker famous for its association with the fictional spy James Bond but whose Kuwaiti owners were seeking new investment.

Also in 2012, the company looked to acquire the remnants of defunct Swedish automotive brand Saab, which had filed for bankruptcy in 2011.

And a few years earlier, Mahindra was in the running to buy Jaguar Land Rover, the then-ailing British luxury carmaker, which was ultimately bought for $2.3bn by India's Tata group.

True, none of the deals came off: on each occasion Mahindra balked at the cost or terms of the deal, according to those familiar with the company's thinking.

The moves – in particular the examination of Aston Martin – did, however, underline its growing ambitions. Like Tata, Mahindra seems set on shedding its reputation as a producer of inexpensive Indian goods as it seeks to turn itself into a higher-end, global business.

The company's leadership has said little about its series of abortive foreign forays, but Anand Mahindra, its Harvard-educated chairman, at least provides a hint of his strategy when he describes why he sees branding as crucial to the company's future.

> The attempt to buy Aston Martin has underlined its growing ambitions

"What do you need now to grow globally? A good base in your domestic market, like the Japanese and Koreans, and thank you very much – we have that here," he tells me, sitting in his company's recently renovated headquarters, near the Taj hotel in the heart of old Mumbai. "But we need brands, because the one thing you cannot build, if you want to grow globally at least – something that can take a lifetime, and we are in a hurry – is brands."

Such talk would have seemed fanciful when Mahindra became deputy managing director at his family's company in 1991. He took over a business that was performing poorly, wracked with union disagreements, and arguably unfit to withstand the burst of international competition that would follow the decision by India's government to open up its economy to foreign investment that same year.

Like many Indian conglomerates, Mahindra has long been a sprawling concern; its current business lines cover everything from information technology outsourcing and defence manufacturing to timeshare holidays. But the heart of the company remains its automotive and tractor divisions, a heritage that stretches back to the moment brothers KC and JC Mahindra diversified their young steel company in the aftermath of the second world war by winning a contract to manufacture off-road vehicles. ➤

EMERGING MARKETS
MAHINDRA & MAHINDRA

Back in the early 1990s, Mahindra says he was advised by a leading (but unnamed) management consultancy to junk the group's vehicle business – advice he rejected, instead beginning the process of turning the company's automobile division around.

One product more than any other confirmed the success of this strategy: the Scorpio, an inexpensive sports utility vehicle aimed at India's emerging middle class. Launched in 2002, it was strikingly inexpensive to buy, selling for as little as Rs500,000 ($9,300). But for a company that had never designed or built a new car of this type on its own, it was a risky and costly venture.

"It was cheaper than any other western company would have made it for, but it was the biggest amount we had ever spent," Mahindra recalls. "It was going to cost us $120m. We had never invested that kind of money before."

'If we want to grow we need the brands to straddle new segments'

The results stretched the company technically too, but the Scorpio remains one of Mahindra's highest-profile and most profitable vehicles, with sales of more than 50,000 last year, including exports to Africa and Asia. The Scorpio and its successors cemented Mahindra as the dominant player in India's fast-growing SUV market, a position it retains, with roughly half of the market by sales.

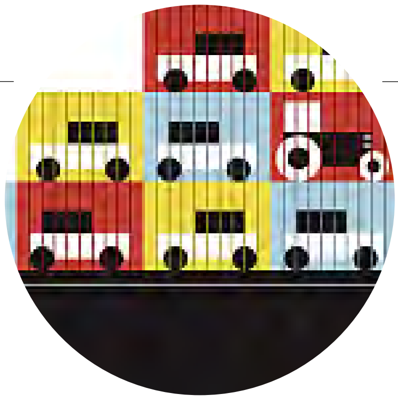
Part of this is luck: India's car market has grown rapidly in recent years, but the SUV segment has done particularly well, growing 59 per cent in the past year alone. But Mahindra also took other risky decisions that positioned it well for growth.

Just two years after losing out in the race for Jaguar Land Rover, it spent $466m on Ssangyong Motor Company, an underperforming South Korean SUV maker whose higher-end brand Mahindra hoped would help it expand into more lucrative Asian markets. At the same time, the company opened a large manufacturing facility, close to the western Indian automotive hub of Pune, at a cost of about $650m. The Pune factory produces the Ssangyong Rexton, a collaboration between the two companies.

Mahindra's eye for foreign acquisitions has attracted considerable attention, in particular because it shows the company is eyeing a further leap into the highest levels of the global automobile industry.

The idea is not entirely implausible, as Tata's example shows. Turning Jaguar Land Rover around put considerable strain on Tata's finances (and could have sunk Mahindra had it won the bid), but the rejuvenated marques are now a huge success.

Finishing touches: the production line at Mahindra's SUV factory in Maharashtra state



Equally, it would not be the first time a company with a heritage manufacturing tractors moved into upmarket carmaking, and eventually luxury SUVs – given that one-time agricultural vehicle maker Porsche followed exactly this path.

Nonetheless, the move for Aston Martin puzzled many analysts, who saw little strategic sense in the tie-up but plenty of expensive research and development investment if it went ahead.

"Mahindra is in a great place and is likely to continue its growth," says Deepesh Rathore, managing director of IHS Automotive, a consultancy.

"But right now it does not have the products to go international, so maybe it needs to spend more time learning what international customers require, rather than jumping in with a half-baked offering."

Despite this, Mahindra insists his company's future lies in new upscale brands for consumers outside India. "When people get more affluent and the luxury market grows they move to premium brands, which are the European and US brands," he says. "So if we want to grow we need to have the brands to straddle these new segments." ■

Vision: Anand Mahindra (left) rejected advice to ditch the vehicle business, instead successfully exploiting a growing market

Maria das Graças Silva Foster

Chief executive, Petrobras

"Business achievement depends on courage, persistence and the relentless pursuit of knowledge. Add courage and the will to make bold decisions, and give the best in everything you do."

PHOTOS: BLOOMBERG, AFP/GETTY

Tractor arm targets deals

Division seeks new markets and global presence

Most Indians recognise the name Mahindra & Mahindra for the sleek SUVs that race through the bumpy streets of Mumbai or New Delhi. But the company also holds a dominant position in a second, more rugged market: tractors.

Like its automobile division, the tractor arm has attracted international attention, in particular at the start of 2012, when it overtook John Deere, the Illinois-based manufacturer, to become the world's largest producer by volume.

The surge is based partly on success in its home market, where the company began making agricultural vehicles in 1962, becoming a leading player during India's "licence Raj" period, prior to the opening up of the country's economy in 2001.

The ensuing liberalisation prompted a boom in the rural economy, which in turn boosted sales. The group's purchase of rival Punjab Tractors in 2007 cemented its lead – Mahindra now has about 40 per cent of the Indian tractor market.

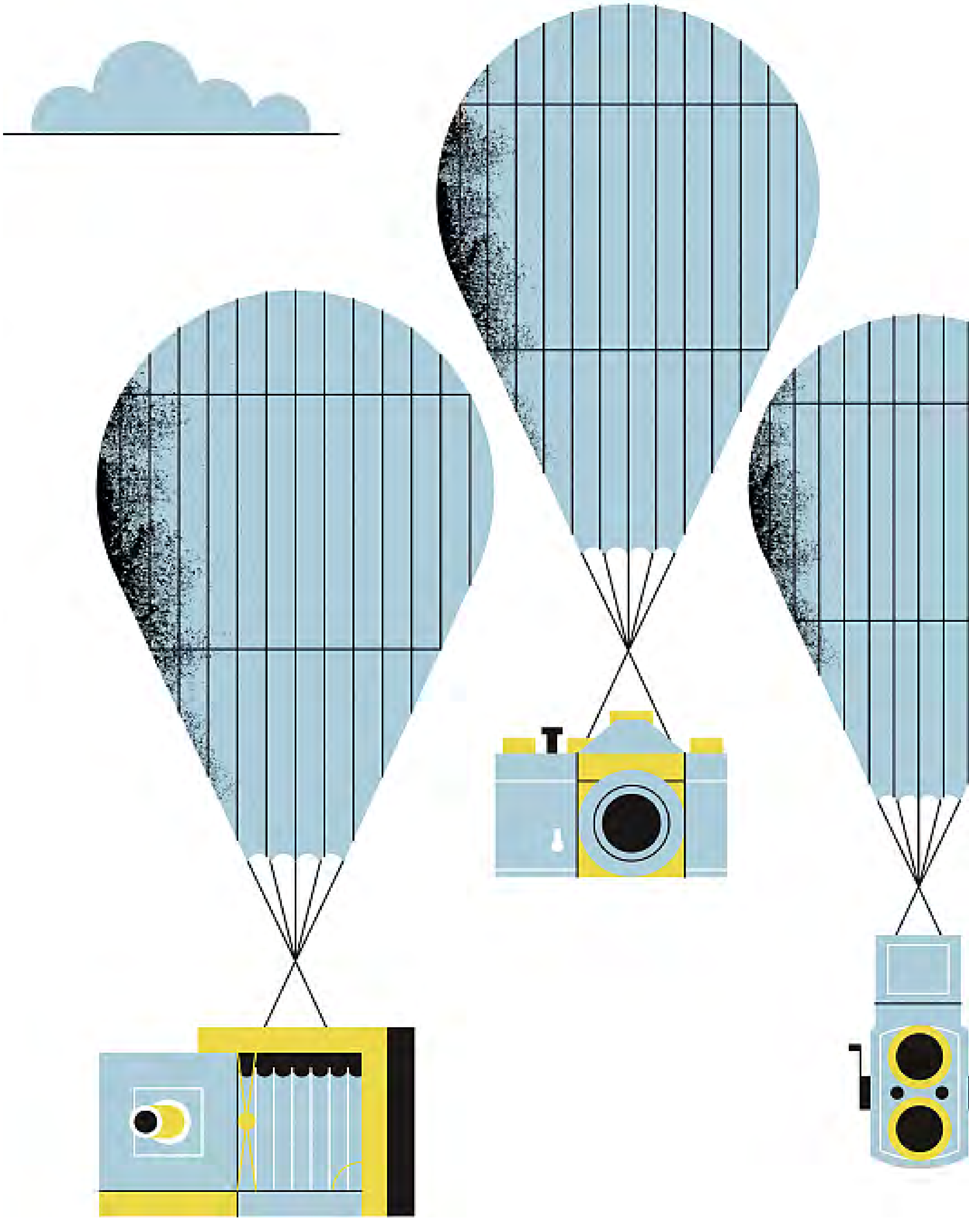
The overtaking of John Deere also followed a period of international expansion, during which it signed two joint ventures in China and increased exports to other developing nations.

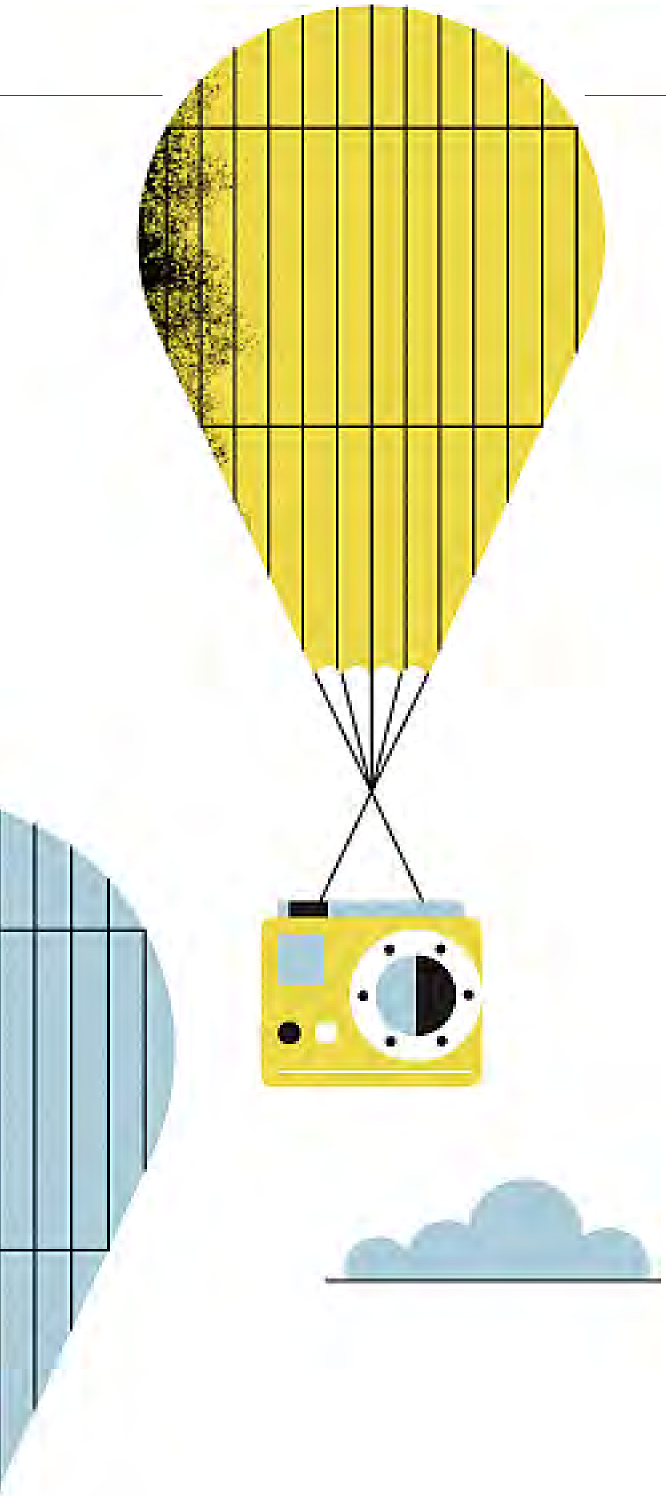
Yet Mahindra admits it has some way to go before it can compete in the top echelons of the global market, a further difference from its SUV division.

> Mahindra has overtaken John Deere as the world's top producer by volume

"When you go from one SUV to the next higher-end model, it isn't really a different game. But in tractors you move into an almost different industry in the way you design and sell them," says Pawan Goenka, president of Mahindra's automotive and farm equipment divisions and a close lieutenant of Anand Mahindra, the company's chairman.

Goenka admits the tractor arm is in the market for potential acquisitions. "In the tractor business we need an international organic play to truly make our mark," he says. **JC**





SMALLER COMPANY
GOPRO

Riding the wave

A desire to record surfing feats has propelled a California camera company to worldwide acclaim in only a decade, writes **Chris Nuttall**

When Nick Woodman worked out a way 10 years ago to capture his surfing highlights with a waterproof camera strapped to his wrist, he unwittingly caught a wave to the next boom in digital imaging.

His company, Woodman Labs, has created the action-cam category almost single-handedly, with its GoPro video camera becoming synonymous with wide-angle footage of daring exploits taken from a first-person point of view.

Whether it is surfing inside the barrel of a wave, skiing down sheer slopes or skydiving from the edge of space, GoPro cameras have been used to record the drama as if through the eyes of those experiencing it – while also having the ability to swivel on special mounts and film the person's own reaction to the thrill.

GoPro's success can be measured by the number of competitors crowding the category, notably Contour, iON, Drift and Looxcie, with Sony also launching a rival action camera last year.

The idea that has taken Woodman, 37, from backpacking surfer dude to potential billionaire was born out of a trek around the beaches of southeast Asia in 2002.

After his first start-up, a web marketing company called funBug, fell victim to the dotcom crash, Woodman spent five months travelling in Indonesia and Australia. It was here that he came up with an idea for a better way of securing the types of disposable still cameras that surfers used to capture their best moments as well as shots of themselves as they rode the waves.

Back then, only professional surfers could benefit from such shots – taken by photographers in the water with them. Woodman's dream was for himself and his fellow surfers to be able to "go pro" and record their "hero" moments in the waves.

"We soon realised that, with a market opportunity so big and nobody else paying attention to it, we had the chance to do something much bigger than surfing and allow people to capture and share their passionate experiences, which before GoPro were just shark tales," he says.

"I thought I was never going to have as good an idea as this again, it was a once-in-a-lifetime opportunity, and so we should go after it with everything we've got."

His girlfriend and fellow surfer Jill, who later became his wife, gave him a fundraising idea for turning the prototype wrist strap he had made into a business. A jewellery designer, she picked up a bead-and-shell belt in Bali that she thought could be improved upon and sold back home.

Woodman ordered 600 to be made in Indonesia and sent back to the US, where the two of them

Action man: Nick Woodman, company founder, captured on a GoPro camera

Key to the success of GoPro HD was that it offered something not possible on a camera phone

travelled the west coast in an old Volkswagen camper van selling the belts at street markets and other events at big mark-ups.

The money they made, along with a loan from Woodman's parents, was enough to start Woodman Labs and GoPro.

The first Hero product appeared in 2005: a 35mm camera that came with a roll of film and a wrist strap whose design and feel Woodman had worked on intensively, even sleeping with it.

Along with a tight group of eight – family, fellow surfers or friends from the University of California, San Diego – Woodman says they worked seven days a week doing the work of 50 people to get the company and its products off the ground.

"Nick is a magnificent product guy," says Michael Marks, a GoPro board member and former chief executive of

Flextronics, the contract manufacturer. "Because he's a user he understands [the camera] viscerally and is totally intent on every detail. As a consequence, he pushes the envelope for what the product can be."

That stretched to Woodman literally test-driving the product: he tried various mounts for a Lotus sports car and spent hours testing them on a racetrack.

In 2008, Woodman Labs came up with a basic digital video camera that was the first Hero to feature the now-familiar 170-degree wide-angle lens.

Sales really began to take off with the release of the HD Hero two years later, the first to offer 1080 pixel full high-definition pictures.

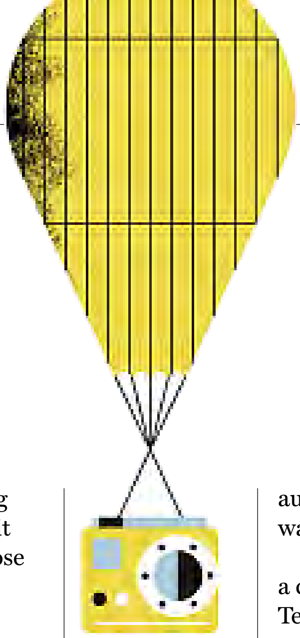
Aided by viral videos of its users' adventures on video-sharing service YouTube, as well as a strong marketing campaign, the GoPro HD has since then dominated camera sales in surf,

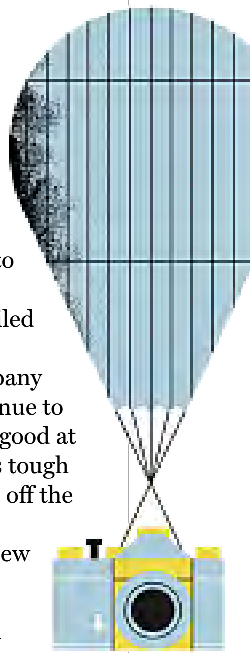
Biz Stone

Co-founder, Twitter

"To succeed spectacularly, you must be willing to fail spectacularly: failure has taught me far more than success. Perseverance, timing and years of effort will eventually create the appearance of overnight success."

PHOTOS: REUTERS





ski and bike shops. According to NPD, the research group, it has a 96 per cent share of those markets, while also breaking through on to the shelves of leading retailers.

"As the business started to grow, we were doubling down on our bets in terms of marketing spend to make GoPro a globally recognised brand," Woodman says, citing television commercials and early sponsorship of the Yamaha Supercross motorcycle racing team.

The GoPro HD arrived just as the appeal of the simple and much-copied Flip video cameras was waning, as more people used their smartphones to shoot video. Key to the success of the GoPro HD was that it offered something that was not possible on a simple camera phone.

More than 3m GoPro cameras have been sold over the past three years. Action cameras have accounted for about $500m in sales in the US alone in 2012.

Woodman Labs has also moved from its base at Half Moon Bay, a popular surfers' haunt close to San Francisco, to a new headquarters in Silicon Valley. Its workforce of 375 is expected to grow to more than 600 this year.

Much of GoPro's success can be attributed to the drive of its leader. Meeting Woodman for the first time – at a party staged in an amusement park with the band The Glitch Mob playing in the background – Nick preferred to give me a bear hug rather than the more traditional handshake. He then proceeded to be the life and soul of the party, dancing on stage, rallying the troops with a speech and leading rousing chants supporting the company.

"He's a rock star, he hugs everybody," says board member Marks. "He's one of those bigger-than-life characters – a warm, authentic person who everyone wants to be in the room with."

Woodman has also developed a close working relationship with Terry Gou, founder and chief executive of Foxconn, the world's largest contract manufacturer, whose clients include Apple and Microsoft.

When the two met last year, Gou was immediately impressed with Woodman's personality and entrepreneurial skills. The GoPro chief later flew to Taiwan, where the pair enjoyed playing golf together.

Less than a week later, Foxconn wanted to invest $200m in the company for an 8.8 per cent stake that valued it at $2.25bn. Foxconn is developing its display technology skills and is expected to contribute to future products.

With Sony having failed to dent GoPro's market share thus far, the company is confident it can continue to grow. "Nick's been very good at building the brand – it's tough to knock a brand leader off the top," Marks says.

"We have created a new category and we've got fantastic new products coming for the next few years now." ■

Caught on film

Extraordinary events drive GoPro publicity

From the edge of space to the bottom of the earth, GoPro cameras have captured unique moments.

When Felix Baumgartner, the Austrian skydiver, made his world record jump from the stratosphere last year, he had five GoPro cameras strapped to his body. A GoPro was also fixed to the capsule that rescued a group of Chilean miners trapped underground in 2010.

Such spectacular footage represents publicity that money cannot buy. Yet the quality of the camera makes such video possible.

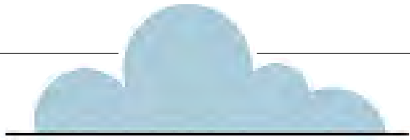
George Lucas, director of the *Star Wars* movies, fixed them to fighter planes to record footage for his film *Red Tails*, while tyremaker Pirelli used them to create the "GoPro look" for its most recent advertisement.

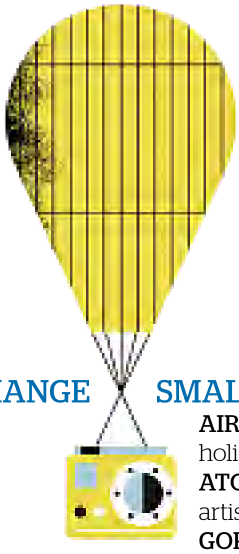
The latest model, the tiny Hero3, weighs just 2.6 ounces and is almost a third smaller but with double the image-processing power of its predecessor. It can shoot in slow motion and ultra-high definition – four times the resolution of full HD.

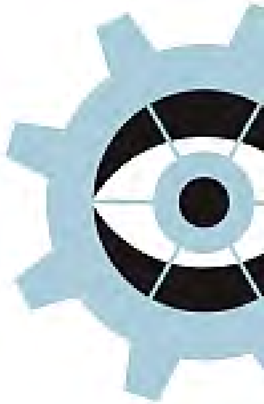
"We go all out for maximum impact, putting on a big show, whether it's the product's features or the marketing," says Nick Woodman, chief executive and founder. "We are the first image-capture company that has built a media company around itself, shot exclusively on its own technology in order to promote its products."

While extreme sports have been the focus up to now, Woodman sees future growth in the cameras being modified for more general use by consumers. In one example, he shot the birth of his own son with a GoPro strapped to his head – a highly personal souvenir. **CN**

CATEGORIES
SHORTLIST







The nominations

DRIVERS OF CHANGE

AXEL SPRINGER, a German media group
CONTINENTAL RESOURCES, a US energy company
MONDRAGON CORPORATION, a Spanish co-operative
SANY HEAVY INDUSTRY, a Chinese machinery group
SQUARE, a US mobile payments company
TATA GROUP, an Indian conglomerate

TECHNOLOGY

BIO-ON, an Italian biotechnology company
GENUS, a UK animal genetics company
PAGA, a Nigerian mobile payments company
RASPBERRY PI FOUNDATION, a UK computer company
SPACEX, a US space transport company
3D SYSTEMS, a US three-dimensional printing group

CORPORATE RESPONSIBILITY/ ENVIRONMENT

ABDUL LATIF JAMEEL GROUP, a Saudi Arabian auto, finance and media company
COMMUNITY COOKER FOUNDATION, a Kenyan recycling initiative
NARAYANA HRUDAYALAYA HOSPITALS, an Indian hospital company
PATAGONIA, a US outdoor sportswear company
TESLA MOTORS, a US electric carmaker
THE COCA-COLA COMPANY, a US beverage group

SMALLER COMPANY

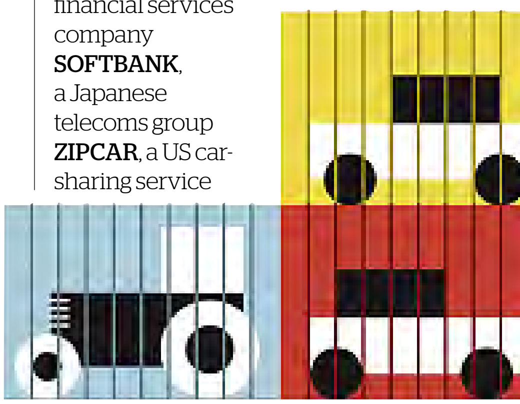
AIRBNB, a US online holiday room rental service
ATOM FACTORY, a US artist-management company
GOPRO, a US camera company
REDBUS, an Indian travel company
SKYONIC, a US carbon-capture technology company
UDACITY, a UK education company

EMERGING MARKETS

BTG PACTUAL, a Brazilian investment bank
CNOOC, a Chinese energy company
FLIPKART, an Indian online retailer
MAHINDRA & MAHINDRA, an Indian vehicle manufacturer
MICROMAX, an Indian mobile handset manufacturer
SBERBANK, a Russian bank

ENTREPRENEURSHIP

AEREO, a US technology company
EVERYTHING EVERYWHERE, a UK telecommunications group
KICKSTARTER, a US crowdfunding company
KROLL BOND RATINGS, a US financial services company
SOFTBANK, a Japanese telecoms group
ZIPCAR, a US car-sharing service



ArcelorMittal

Hi-tech steel is an essential component in wind power generation, supplying material for the foundations, towers and many of the moving parts of wind turbines and generators. Around 85% of the world's wind turbines are installed in tubular steel structures, and up to 95% of the total weight of a turbine is steel. Each tubular tower is made of steel plates using up to 26 different kinds of steel plate.

Steel also plays a crucial role in the power supply chain, from the electrical steel used in the wind turbines' motors, to transformer stations and overhead power lines.

Our R&D centres are working on new techniques that could allow turbines to be installed on towers that are more than 160m high, which would increase the performance of higher-capacity wind generators.

In the energy industry as a whole, from offshore oil and gas exploration, to production platforms and refineries, our steel heavy plates play a key role.

Steel – the fabric of life

Picture: Jeroen Op de Beeck


ArcelorMittal
Steel - the fabric of life
The ArcelorMittal Orbit, the UK's tallest sculpture, is made from 2,000 tonnes of steel – all manufactured at ArcelorMittal plants around the world.
If the twisted steel structure, which was at the heart of the Olympic Park in 2012, was stretched into one long piece it would be 560m long.
Every single piece of the 114.5m structure was lifted and bolted into place without using scaffolding. And 19,000 litres of paint were used to paint the ArcelorMittal Orbit its distinctive red, which visitors will see when the site reopens as the Queen Elizabeth Olympic Park.
Picture: Stephen Hird