period of hand-stitching the pieces together to form a patchwork of the future of work. This book is the result of that long process.

I believe passionately that the scale of change we are going through in this decade puts into stark relief many of the assumptions we have held dear about what it takes for us to be successful. It is perilous and foolhardy to ignore these changes. It is also naive to imagine that what worked for the past will work for the future. To do so puts in jeopardy our own future and the future of those we care about. Predicting the future of work, and crafting a working life that brings happiness and value, are two of the most precious gifts you can give yourself and those you care about. Don't leave it too late to make the decision to think and to act.

Introduction
PREDICTING THE FUTURE OF WORK

Why now?

What we are witnessing now is a break with the past as significant as that in the late eighteenth and early nineteenth centuries when parts of the world began the long process of industrialisation. What we know as work – what we do, where we do it, how we work and when we work – has already changed fundamentally in the past when the Industrial Revolution transformed work, beginning in Britain between the late eighteenth (around 1760) and early nineteenth centuries (around 1830).[1] It seems likely that the period we are moving into will see as fundamental a transformation – although of course the outcome is much less clear.

To get an idea of the velocity of the changes that can sweep away so many assumptions, consider the period between 1760 and 1830. Within a period of less than 100 years – that's only four generations – there occurred a fundamental and irreversible shift which changed the experiences of every worker in the UK, and was to be felt across the world as industrialisation spread first to Europe and then to North America. Before that time work – whether it be ploughing the fields, weaving of wool, blowing of glass or throwing of pottery – was an artisanal activity engaged with largely in the home, using long-held and meticulously developed craft skills. From the late eighteenth century onwards these craft skills began to be transformed as the

manufacturing sector was developed and began to transcend the limits of artisanal production.

Looking back with hindsight and a gap of over 200 years, we can learn much from the trajectory and speed of revolutions in working lives. The Industrial Revolution began gradually and relatively slowly to change working lives. The economic growth throughout this period was little more than 0.5% per person per year, and while we now think of the 'dark satanic mills' as being the key motif of this time, in fact textile production often constituted less than 6% of total economic output within Britain. In reality, the growth in total productivity during this apparent revolution was in fact slow by modern standards.[2] This was an evolution rather than a revolution; gradual rather than progressing through breakthrough changes; and based on continual and small changes rather than a series of massive innovations. For those living through this period it would not have been seen as a time of immense change, and it is only when the broad sweep of history is viewed that the extent of change can be put into perspective.

The core of any revolution in the way that work gets done is inevitably changes in energy. When true innovations occur in the production of goods or services, they are the result of a capacity to unearth new sources of energy or to apply existing sources in a radically more efficient way. The first Industrial Revolution, although it had an impact on working lives, was not an energy revolution. The movement that took place at this time, from farming to fabrication, was not inherently innovative; the artisan remained the primary source of productive activity. That's reflected in the modest growth rates throughout the late eighteenth and early nineteenth centuries.

The real revolution in the working lives of people began to occur in the mid to late nineteenth century, when British scientists, unlike their European contemporaries, began to be experimental. It was this culture of innovation, with the ideas of organisational and technological restructuring rapidly picked up

by entrepreneurs and industrialists, that transformed working lives. It enabled a new class of practical scientists to emerge and to excel.

This was the emergence of the engineering class and of a culture of innovation.[3] The real shift in work came with a change in energy – the power of steam that was rapidly integrated into the embryonic factory system. This transformation came as the consequence of a new energy source in the shape of steam, with a new spirit of enterprise and innovation. It was only when engine science combined with an emerging engineering culture that a new source of energy – steam – integrated into the productive process.

In the fifty years that followed the closing decades of the nineteenth century, a true revolution in work had occurred. The emergence of an engineering class signalled the professionalisation of practical science and the institutional pursuit of innovation. This also saw the transformation of the working lives of people across Britain and later the developed world. Work became more regimented, more specialised. The workplace and the work schedule became more compartmentalised and hierarchical.

This was the embryonic stage of Fordism – the rise of the engineer as the organiser of economic activity, and the decline of the artisan. The layout of a factory was as important as the technology within it, embodying as it did the power structure of the organisation. In this second Industrial Revolution, engineers redesigned factories to make employees fit into the production line. By doing so workers lost their autonomy, becoming simply as interchangeable as the parts they created.

As we look to the world of work we now inhabit, and the decades to come, what we are seeing is the potential reverse of this trend, from hierarchy and interchangeable, general skills to the reinstatement of horizontal collaboration and more specialised mastery.

What is clear is that the current scale of transformation is as great as any witnessed in the past. Again it is powered by an

energy transformation (in this case computing power); again going through periods of slower and then more rapid change; and again depending on a new set of skills and an emerging class of skilled people.[4]

However, as we shall see, this time the impact of the Industrial Revolution is global rather than local, the speed ever more accelerated and the disconnect with the past likely to be as great. It is clear that our world is at the apex of an enormously creative and innovative shift that will result in profound changes to the everyday lives of people across the world.

Patching together the future

Faced with the magnitude of these changes, how do we both make sense of them, and indeed ensure that we and those we care about are able to do the very best they can over the coming decades? I've used the story of my mother's quilt-making as a metaphor for the task that we are all faced with as we prepare for the future. As I attempt to make sense of the future for myself – in a sense to stitch together the pieces that are important to me – I cannot help but be occasionally overwhelmed with the sheer complexity of this endeavour, very much as I suspect my mother must have felt at the beginning of her craft. I wonder if indeed it is worthwhile to try and make any predictions about our working life in 2020, 2025 or beyond, as far out as 2050? However, what has spurred me on is that, the more I have learnt, the more I have come to believe that while this endeavour is indeed complex it is also incredibly worthwhile. It is worthwhile because you and I, and those whom we care about, need some sort of realistic picture of what the future might bring in order to make choices and sound decisions.

Think about it this way: I am now 55 and could expect to live to my mid-eighties – perhaps even into my mid-nineties. My two sons are currently aged 16 and 19 and they could well live more than a century. If I work into my seventies, then that's 2025, and

if my sons do the same they will be working into 2060. Take a moment now to make the same time period calculations for yourself and others who are important to you.

Of course, all the decisions about your working life don't need to be made now. In the case of my children, for example, I expect they will adapt and change and morph over the next 50 years – just as I have done through my own working career. However, wouldn't it be useful to have some picture of the future, storylines of future lives, scenarios of choice to guide and give inspiration? We need these, not only for our personal or local near-term futures, but also for remoter global futures.

Just because my children, you and I 'need' realistic pictures of the future, it does not mean of course that we can have them. Predictions about future technical and social developments are notoriously unreliable – to an extent that has led some to propose that we do away altogether with prediction in our planning and preparation for the future. Yet, while the methodological problems of such forecasting are certainly very significant, I believe that doing away with prediction altogether is misguided.[5]

The reason it is so important now at least to attempt to paint a realistic picture of the future is that we can no longer imagine the future simply by extrapolating from the past. I cannot imagine my future working life by drawing a direct line with the working life of my father – any more than I could expect my sons to predict their working lives from mine. I am not suggesting that everything will shift. Of course some aspects of work will remain the same; one of the challenges, in fact, is actually knowing what will remain stable. As the science fiction writer William Gibson famously remarked, 'the future is here – just unevenly distributed'.[6]

It has not always been so difficult to simply extrapolate from the past. For much of the ages of mankind, perceptions of daily lives were envisaged – with very few exceptions – as changeless in their material, technological, and economic conditions. This transformed fundamentally from the eighteenth century with the

advent of the Industrial Revolution, when what was seen as hitherto untamable forces of nature could be controlled through the appliance of science and rationality.[7]

The past six generations have amounted to the most rapid and profound change mankind has experienced in its 5,000 years of recorded history.[8] If the world economy continues to grow at the same pace as in the last half-century, then by the time my children are the same age as me – in 2050 – the world will be seven times richer than it is today, world population could be over 9 billion, and average wealth would also increase dramatically.[9]

What is important about my sons' questions about their future work is that they are living in an age in which they face a schism with the past of the same magnitude as that previously seen in the late nineteenth century. The drivers of that change were the development of coal and steam power. This time round the change is not the result of a single force, but rather the subtle combination of five forces – the needs of a low-carbon economy, rapid advances in technology, increasing globalisation, profound changes in longevity and demography, and important societal changes that together will fundamentally transform much of what we take for granted about work.

It is not just our day-to-day working conditions and habits that will change so dramatically. What will also change is our working consciousness, just as the industrial age changed the working consciousness of our predecessors. The Industrial Revolution brought a mass market for goods, and with it a rewiring of the human brain towards an increasing desire for consumption, and the acquisition of wealth and property. The question we face now is how the working consciousness of current and future workers will be further transformed in the age of technology and globalisation we are entering.

What is inevitable is that, for younger people, their work will change perhaps unrecognisably – and those of us already in the workforce will be employed in ways we can hardly imagine. This new wave of change will, like those that have gone before them,

build on what has been accomplished in the past, made up of a gradual process with some possibly unpredictable major waves. It is about increasing globalisation, industry and technology. But, as in the past, these changes will also bring something that is qualitatively different – new industries based around renewable energy sources, new developments of the internet, and indeed new ways to think about work.[10]

The reality is that predicting the future is a matter of degree, and different aspects of the future of work can be predicted with varying degrees of reliability and precision. For example, I can predict with some accuracy that computers will become faster, materials will become stronger and medicine will cure more diseases so that we will live longer. Other aspects of the future, such as migration flows, global temperatures and government policy, are much less predictable. It's more difficult to predict, for example, how the way we will relate to each other will change, or how our aspirations will evolve.

If I think about my own future and that of my children, and factor in the uncertainty we face, then of course it's a good idea to develop plans that are flexible, and to pursue ideas that are robust under a wide range of contingencies. In other words, it is wise to develop coping strategies in the face of uncertainty. However, what is also important is to strive to improve the accuracy of our beliefs about the future. This is crucial because, as I will show, there might well be traps that we are walking towards that could by avoided with foresight, or opportunities we could reach much sooner if we could see them further in advance.

Knowing something about the future helps us to prepare for our future, it influences the advice we give others, and could have a fundamental impact on the choices that we, our family and friends, our community and our company decide to make; about the competencies we decide to develop, the communities and networks on which we focus our attention, or the companies and organisations with which we choose to be associated.

The Future of Work Research Consortium

The challenge is that even with my own three decades of knowledge about work I find the future of work still fiendishly difficult to predict. That's why, by way of preparation, I created a research consortium designed to tap into ideas and knowledge from across the world. The research takes place every year – beginning in 2009 and progressing to more global and diverse groups every subsequent year.

Each year, my research team and I begin by identifying the *five forces* that will most impact on the future of work (these are technology; globalisation; demography and longevity; society; and natural resources); we then go about amassing the *hard facts* for each of these five forces. These hard facts for each of the five forces are then presented to members of the research consortium. This consortium is perhaps one of the most fascinating experiments ever conducted between management, academics and executives. In a sense it creates a 'wise crowd' of people. In 2009, for example, more than 200 people participated. They were members of more than 21 companies from around the world including Absa (the South African bank), Nokia, Nomura, Tata Consulting Group (in India), Thomson Reuters and the Singapore Government's Ministry of Manpower, together with two not-for-profit organisations, Save the Children and World Vision. In 2010 the number of participating companies had risen to 45, with over 15 from Asia including SingTel in Singapore and Wipro, Infosys and Mahindra & Mahindra from India, and Cisco and Manpower from the USA.

The research began in earnest in November 2009, at the London Business School. At this point we presented the hard facts of the five forces and asked executives to construct *storylines* of a day-in-the-life of people working in 2025 on the basis of what they had heard. We then went on to repeat this exercise with many more people in Singapore and India. The storylines that began to emerge became the blueprints for the stories I will tell later in the book. These are important because, while they are works of fiction, it is through these descriptions of possible everyday life that we are able to imagine the interplay between different ideas and knowledge. These storylines of a day-in-the-life in 2025 are not, of course, forecasts. What they portray are ways of seeing the future, and of assembling different versions of the future. They are crucial because in them we can begin to see just how much the future is full of possibilities.

Once the research team and consortium members had developed the storylines, they took the initial conversations about the hard facts and storylines back to their own companies. Over the following months they brought back the thoughts from their wider community, and from more than 30 countries. At this point we were able to work together virtually in an elaborate shared portal, and also to discuss the emerging ideas in monthly virtual web-based seminars. We followed this up later with a series of workshops in Europe and Asia. At the same time I tested out some of my initial thoughts through a weekly blog, http://www.lyndagrattonfutureofwork. It is these ideas, insights and anxieties that became stitched into the storyline narratives and brought depth to the conversation. They are also the basis of the personal reflections that you will come across in the debate that follows.

The paths to the future

As we looked more closely at the future, what became increasingly clear was that in fact there is not one but many possible paths to the future. It is certainly possible for each one of us to construct a path into the future that simply accentuates the negatives of the five forces. This becomes a future of isolation, fragmentation, exclusion and narcissism. This is the *Default Future* in which the five forces have outpaced the possibilities of taking any action. In these storylines we see people who may have been

very successful in one aspect of their life, but who have failed to take positive action around an important issue or have only taken actions that are straightforward and seemed easy to take. In the Default Future no one is prepared to work together to take cohesive action or to change the status quo. In this future, dealing with the current problems takes place without consistency or cohesion, and events outpace actions.

There is also a future where the positive aspects of the five forces are harnessed to create a more crafted outcome. These are career and life stories in which collaboration plays a key role, where choice and wisdom are exercised, and actions create a more balanced way of working. In these stories of a *Crafted Future* people are experimenting with ways of working, learning fast from each other, and rapidly adopting good ideas. These are storylines where the forces that transform work could result in the possibility – the promise, even – of a better future. It is the future that can emerge when people actively make decisions and wise choices, and are able to face up to the consequences of these choices. It is a future in which people can work more harmoniously with others, where they can become more valued and masterful, and where the different parts of a working life can be integrated in a more authentic way.

The storylines within the two paths capture possibilities; they are a way for us to explore the future, and indeed construct our own future. A word of warning: these stories are not in any sense mechanical forecasts of what will be. Instead they are based on the recognition that each one of us holds beliefs and makes choices that can lead down different paths; they reveal different possible futures that are both plausible and challenging.

Taking the right path: the shifts

Each one of us would want to choose the Crafted Future rather than succumb to the Default Future. But how do we ensure we are on the right path? The journey that I went through, and the journey I am inviting you to take, will make you question your mental map of the future, just as it has for me. You and I already have a mental map of the future – that's what has been driving the decisions we have already taken, and the choices we have already made. The question is: is this the right mental map, and are you on the right path?

In understanding what is the right path, it is crucial to have as much information and knowledge as possible about how the future will emerge. My research team and I have understood this deeply and will present it to you as the stories unfold. It seems to me that the storylines, hard facts and scenarios demand that we re-examine our assumptions, and ask three key questions:

* What are the potential milestones or events that could particularly affect me and those around me?
* What are the most significant factors that will influence my working life, and how could these play out?
* Therefore, what should I be doing over the coming five years to ensure I am on the right path to creating a future-proofed career, particularly in view of the turbulent times ahead?

My aim in this book is clear. It is written to support you as you develop your own point of view about the future – and your own path to creating a future-proofed working life. To do this you will have to understand the hard facts with as much depth as possible; to play through the possible scenarios and storylines to understand what they mean to you; while at the same time really being aware of the aspects of your specific context that will shape the choices you have. Only then can you look hard at your mental models and assumptions of the future and construct a path that will ensure your working life is robust, purposeful and valuable.

So, in creating a future-proofed working life, what are the assumptions that will need to be questioned, and what are the

implications for how we live our future working lives? I am predicting that there are three shifts in assumptions which each one of us will have to make in order to craft a meaningful and valuable working life over the coming two decades.

First, our assumptions that general skills will be valuable has to be questioned. It seems clear to me that in a joined-up world where potentially 5 billion people have access to the worldwide Cloud, the age of the generalist is over. Instead, my prediction for the future is that you will need what I call 'serial mastery' to add real value. That has got crucial implications for understanding what will be valuable skills and competencies in the future, for developing deep mastery in these areas, and yet being able to move into other areas of mastery through sliding and morphing. It also has implications for an increasingly invisible world, where self-marketing and creating credentials will be key.

Second, our assumptions about the role of individualism and competitiveness as a foundation for creating great working lives and careers have to be questioned. In a world that could become increasingly fragmented and isolated, I believe that connectivity, collaboration and networks will be central. These networks could be the group that support you in complex tasks; it could be the crowd of diverse people who are able to be the basis of ideas and inspiration; it could even be the intimate, warm and loving relationships that will be at the heart of your capacity to regenerate and remain balanced. What is crucial here is that – in a world that becomes more and more virtual – strong, diverse, emotional relationships cannot be taken for granted, they have to be shaped and crafted.

Finally, as I consider the five forces that will shape our working lives over the coming two decades, and see how the storylines could play out, I am struck by the need to think hard about the type of working life to which we aspire. Do we follow the old assumptions of continuously going head first for consumption and quantity? Or is it now time to think hard about trade-offs

and to focus more on the production and quality of our experiences and the balance of our lives, rather than simply the voraciousness of our consumption?

It is possible for each one of us to construct a very clear view of the challenges we face, and many of the trade-offs we will have to consider. Of course, our own future, and indeed the future of those we care about, is essentially unknowable. But that does not mean that we leave it to chance. I am convinced that we can prepare for the future in a way that increases the possibilities of success. We can do this by really understanding the five forces that will change our world. We can prepare by constructing storylines of possible futures that we can use as a basis for making choices and understanding consequences. Finally, we can prepare for the future by acknowledging that some of our most dearly held assumptions are misplaced and that we will be required to make some fundamental shifts in how we think and act our way into our future working lives. By doing this we are ensuring we are better equipped to construct a working life that excites us, brings us pleasure and creates worth for others and ourselves.

PART I

THE FORCES THAT WILL SHAPE YOUR FUTURE

1
THE FIVE FORCES

If you want to understand the future, you need to start with the five forces that will shape your world over the coming decades. What's more, you need to understand these five forces in some detail, since it is often in the details that the really interesting stuff can be found. For me it has been an incredibly exciting journey to collect from around the world the 32 pieces about the forces. I cannot remember being so excited about getting up in the morning and researching and writing. I have been fascinated, surprised and intrigued by what I have found. I had no idea that in 2010 China was building 45 airports; or that the centre of innovation of handheld money devices is Kenya; or that by 2025 more than 5 billion people will be connected with each other through handheld devices. These are the hard facts that I will share with you in order to create a deeper and more accurate view of the way your working life will change. They are also the hard facts that will aid you as you begin to decide how you will construct your future working life, and indeed the advice you will give to others. In finding and putting these 32 pieces together, I have been influenced by the need to be global rather than local; historical rather than simply of the moment; and broad rather than narrow.

Taking a global focus

One of the challenges about understanding the future is that much of the contemporary research and books about technology, oil or globalisation tends to take a single-region focus – typically either the USA or Europe. This makes sense as the boundaries are well understood and so the context is agreed up front.

However, this local focus does not suit my purpose for this book. In the past, I have been delighted that people across the world have read my books, and my hope is that this book will resonate with people across the world. So it's really important to me that wherever you are reading this book you have some sense of inclusion. But it is not just you as a reader that creates the need for a global viewpoint. Perhaps more than at any time in the history of mankind, the story of the future is a 'joined-up' story that can only be told from a global perspective. For example, it is impossible to imagine future carbon usage and the impact it could have on work patterns without knowing something about China's likely industrial development. It is impossible to understand potential future consumption patterns without knowing something about the savings preferences of the average US worker.

So, for both these reasons, my mission is to create a global perspective. However, I am acutely aware that as I have developed the 32 pieces that follow there are many missing regions. The challenge is that if I wrote a sentence or two for every region, then what follows would become more like an encyclopaedia and lose the flow I believe to be crucial to a story that's worth reading. So, generally I have assumed a global vantage point, and focused on specific regions when I believe something particularly interesting is happening there.

Looking back to a historical focus

It is slightly odd in a book about the future to be often casting a glimpse back to the past. Of course there are books that are resolutely future focused. However, I believe that if we want to increase our ability to understand the future of work we also have to glimpse back to the past. Taking a historical perspective can be useful in both creating a sense of momentum and velocity, and also providing a view of historical precedence. This is important for, as we have seen, there are clues to the future of work in both the first Industrial Revolution of the 1870s and indeed in the changes in production that occurred around the 1930s. It also seems to me that knowing a little about the past can serve to bring deeper insight into the future. This is particularly the case when we come to think about societal trends, including family structures and consumerism.

Understanding the broad context

Over the following 32 pieces you will see that I range far from the confined space of work itself. We will take a look at how we have lived and might live in the future, our family structures, our modes of consumption, oil prices and institutional trust. I have chosen to take this broad brush because it is clear to me that work cannot be seen without acknowledging the broader context. Work takes place in the context of families, expectations and hopes; it takes place within the context of the community and in the context of economic and political structures.

As I put these pieces together I am reminded again of my mother's quilt-making. Over the years she collected scraps of material from many sources and then one day would sit down and work out a pattern from the pieces. I have to admit that one of the reasons the earlier metaphor of my mother's fabrics and the quilts appeals to me so much is that, although I am not a maker of quilts, I am a collector of fabrics. Almost any trip I go

on, I come back with tiny snippets of embroidery from Seoul or swathes of silk from Mumbai, or woven grasses from Tanzania. I even have a small woven Aboriginal basket made from pine needles. I've always patched together information in the same way. I like to travel and talk to people, and every year I make a point of visiting Asia, Africa and America.

Being a business professor is a huge advantage in this endeavour since I'm not trying to sell my ideas as I might in consulting, and I am not hiding my views as I might if I was an executive in a multinational company. I find that people tend to talk with me openly, sharing their hopes and confiding their fears. And, of course, perhaps the biggest advantage in being a professor is that I have the luxury that few have of extended periods of time to think and write. This has been crucial because, as you will discover, while this is an incredibly exciting journey, it is also very complex and it is only with time and reflection that I have been able to take a perspective and view of these pieces.

To help you find you own way through this maze of information, I have assembled the pieces of hard facts about the future under five broad headings: Technology; Globalisation; Demography and Longevity; Society; and Energy Resources. The truth is that these are rather superficial ways of categorising and the reality is that they can be re-sorted in many other ways. But it strikes me that this is a good place to start.

I have then created for each of these broad areas about five to eight smaller pieces. Each of these pieces has some kind of internal consistency and tells a story on its own: a story, for example, about how the West is ageing, or how the developing countries are becoming powerhouses of innovation, or how the population of the world is moving from the countryside to the city. I've chosen each of these pieces because I believe they could be important to your future, your children's future or the future of your community. It is up to you to decide what to do with the 32 pieces as you craft your personal point of view about the future.

So, let's take a closer look at the five broad forces that will shape the future of work, and the more detailed pieces that create a deeper understanding.

The force of technology

Technology has always played a key role in framing work and what happens in working lives. When we fast-forward to our working lives in 2025 and even out to 2050, we can only do so by knowing something about how technologies will develop in the near term – and by taking a guess at the possibilities for the long term.

Technology has been one of the main drivers of the long-term economic growth of countries; it has influenced the size of the world population, the life expectancy of the population and the education possibilities. Technological changes will continue to transform the everyday nature of our work and the way we communicate. Technology will also influence working lives in other deeper and more indirect ways – the way people engage with each other, their expectations of their colleagues, and even their views on morality and human nature. You don't have to be an out-and-out supporter of technological determinism to recognise that technological capability – through its complex interactions with people, institutions, cultures and environment – is a key determinant of the ground rules within which the games of human civilisation get played out.[1]

That's not to say, of course, that the experiences of technology of those living in 2025 will be similar across the world. There have been, and no doubt will continue to be, large variations and fluctuations in the deployment of technology. That's because technological developments do not happen in isolation but instead are dependent on context – be that cultural, economic or the values of people. What's more, the deployment of any particular aspect of technology is not inevitable and will not necessarily follow a particular growth pattern. It could be that some

technological developments will create revolutions in work while others will be a slower and steadier trickle of invention. It may be that in the future, as there has been in the past, there will be important inflexion points at which technologies divide and history will take either path with quite different results.

The Cloud, the technology net that creates the means by which people across the world can access resources, is a case in point. Technologically it will be feasible within the next decade for anyone with access to the Cloud around the world to access the World Wide Web and all the enormous information held in it. However, it could be that in certain countries and regions and at certain times, issues about security and access will severely limit the deployment of the Cloud. However, in spite of these likely variations in deployment, the impact of different growth patterns across the world, and contextual variations, what is clear is that technological developments will continue on a broad front.

For those of us on a journey to understand the future, the question is what might we expect this broad front to be – and how will it impact on day-to-day working lives in 2025 and beyond? Here are the ten pieces about technology that we will see played out in the storylines that follow.

1. **Technological capability increases exponentially:** one of the key drivers of technological development has been the rapid and continuous fall in the cost of computing. We can expect this to continue and it will make increasingly complex technology available in relatively inexpensive handheld devices.
2. **Five billion become connected:** this capability will be combined with billions of people across the world becoming connected. This will take place in both the megacities of the world and rural areas. The extent of this connectivity will create the possibility of a 'global consciousness' that has never before been seen.
3. **The Cloud becomes ubiquitous:** rapidly developing technology will create a global infrastructure upon which are available

services, applications and resources. This will allow anyone with a computer or handheld device to 'rent' these on a minute-by-minute basis. This has enormous potential to bring sophisticated technology to every corner of the world.

4. **Continuous productivity gains:** technology has boosted productivity from the mid-1990s onwards, and we can expect these productivity gains to continue with the possibility of advanced communications at near-zero cost. Interestingly, in this second wave of productivity the emphasis will be less on technology and more on organisational assets such as culture, cooperation and teamwork.
5. **Social participation increases:** a crucial question for understanding the future of work is predicting what people will actually do with this unprecedented level of connectivity, content and productive possibilities. Over the next two decades we can expect the knowledge of the world to be digitalised, with an exponential rise in user-generated content, 'wise crowd' applications and open innovation applications.
6. **The world's knowledge becomes digitalised:** there is a huge push from educational institutions, public companies and governments to make available the knowledge of the world in digital form. We can expect that this will have a profound impact, particularly on those who do not have access to formal educational institutions.
7. **Mega-companies and micro-entrepreneurs emerge:** these technological advances will lead to an increasingly complex working and business environment – with the emergence of mega-companies that span the globe. At the same time, millions of smaller groups of micro-entrepreneurs and partnerships will together create value in the many industrial ecosystems that will emerge.
8. **Ever-present avatars and virtual worlds:** increasingly work will be performed virtually as workers hook up with each other across the world. Their virtual representatives – avatars – will become central to the way virtual working occurs.

9. **The rise of cognitive assistants:** at the same time, bundling and priority mechanisms, such as cognitive assistants, will act as a buffer between ever-increasing content and the needs of workers to arrange their knowledge and tasks.
10. **Technology replaces jobs:** much of the productivity in the coming decades will come as robots play a crucial part in the world of work, from manufacturing to caring for an increasingly ageing population.

These are the ten pieces of the technology force that will shape the world you will live and work in. As we shall see in the stories that follow, technological developments will not only be at the heart of the Default Future's dark side of fragmentation and isolation but will also be a part of a Crafted Future where co-creation and social participation are the norm. Before we move on, take a moment to ask yourself which are the most important pieces for you, which you can discard, and also to consider those technological aspects that have not been considered, but which you believe you need to know more about.

The force of globalisation

The workplace that dominated most of the twentieth century allowed producers and sellers a fairly relaxed existence. Thinking back to my first real job – as a psychologist for British Airways – much of the world was broken into relatively stable markets. BA had a near monopoly on the UK travelling passenger, and if the company did not make its predicted revenue the UK Government, as the owner of the airline, was there to bail it out. I recall getting into the office at 9.00, taking a one-hour break in the staff canteen on the other side of the airport, and then leaving my desk at 5.30 for a leisurely trip home. No work was expected at the weekend, the holidays were good, and of course I had the pleasure of deeply discounted travel perks – oh, and did I tell you about the BA pension scheme?

Economies of scale and stable markets (often supported by monopolies, oligopolies and regulations) protected large companies like BA from competition. If you worked for a smaller company, then you only competed with other local services and industries. The focus of these companies was on the production of goods and services at a reasonable price and in a form that consumers would not reject out of hand. Research and development departments did exist, but they tended to change around the margin, and costs could be planned for, thanks to unions negotiating wage rates for entire industries.[2]

That's not to say, of course, that national economic activity took place in complete isolation. There has always been economic integration and trade within and between nations. We may have assumed that globalisation is a recent phenomenon because we tend to take a local view of history. In fact, for thousands of years there have been complex networks of trade across regions.[3] Putting a precise date on the origin of these global linkages is difficult, since it depends on factors such as human migration, improved transport links and ever more substantial trade. Whatever the answer, the important point is that the forces that transcend the local have been operating for a very long time.

However, globalisation, as distinct from global history, emerged in the wake of the Second World War, following the agreements reached in the Bretton Woods Conference in 1944 that led to the establishment of truly international trade institutions.[4] Before 1944, trade was constrained by the sheer cost of moving goods around the world, the difficulty of sharing information across countries, and defensive governmental protectionism. After 1944, moving goods around the world became increasingly cost effective; developing technologies enabled information to be rapidly shared across much of the world, and government barriers to trade began to dissolve. As the goods and services available began to globalise, so consumers transformed the way they thought about meeting their needs. Rather than simply buying from the local supplier, people in many countries

began to have a real choice. The result of this era of trade liberalisation was that the world volume of trade in the manufacturing sector rose 60-fold between 1950 and 2010.[5]

As we take a closer look at how the forces of globalisation will impact on work in the coming decades, I have selected eight pieces about globalisation that I believe to be crucial and which will become part of the future storylines.

1. **24/7 and the global world:** since the 1940s, the combination of political will and motivation and technological innovation has created the means to join up the world and, in so doing, has pushed ever greater globalisation.
2. **The emerging economies:** probably the biggest globalisation story since 1990 has been the emergence onto the world's manufacturing and trading stage of emerging markets from China and India in Asia, to Brazil in South America. With large domestic markets and increasing determination to export goods and services, these emerging markets have rewritten the rules of global trade.
3. **China and India's decades of growth:** since the Cultural Revolution in China, and the liberalisation of markets in India, both countries have experienced massive growth – fuelled by a joint domestic market of over 2 billion consumers, and the capacity to be the 'back office' and 'factory' of the world. As we shall see, as the goods and services created by workers in these countries move up the value chain, so too the global aspirations of local companies increase.
4. **Frugal innovation:** once seen primarily as the manufacturer of the West's innovations, the developing markets are increasingly leading the world in low-cost and frugal innovations that are now being exported to the developed markets of the West. This will have a profound impact on the globalisation of innovation over the coming decades.
5. **The global educational powerhouses:** it's a numbers game. With a joint population of 2.6 billion in 2010, predicted to rise to 2.8 billion in 2020 and 3 billion in 2050, India and China are rapidly becoming key to the talent pools of the world. Added to that, a propensity to study the 'hard' scientific subjects, and investment by local companies in talent development, will ensure that increasingly companies will look to India and China for their engineers and scientists.
6. **The world becomes urban:** from 2008, the proportion of the world's population living in urban centres outweighed those in rural centres, and the trend will continue. At the same time, innovative 'clusters' around the world are attracting a disproportionate number of the most talented and educated people. The mega-cities of the world, often ringed by gigantic slums, will become home to an ever-greater proportion of the population.
7. **Continued bubbles and crashes:** booms and busts have been features of economic life for centuries, and we can expect them to continue to rock the world in the coming decades. This is combined with a need for the populations of many developed countries to rein in their spending, and to substantially increase their savings.
8. **The regional underclass emerge:** we can expect that in an increasingly connected and globalising world the underclass, while still located in specific regions (such as sub-Saharan Africa), will also extend across the developed and developing worlds. This global underclass will be marked by their inability either to join the global market for skills or to have the skills and aspirations to become one of the army of service people who care for the needs of the growing ageing urban populations.

From the 1950s onwards globalisation has been one of the driving forces in the shaping of how we work. As we can see from these pieces, this is only likely to increase, bringing with it both positive aspects in terms of an ever-increasingly global marketplace for talent and work, and also a darker aspect of continuously growing competition and fragmentation.

The force of demography and longevity

This, above all other forces, was the topic that most fascinated the members of the research consortium. We quickly understood that technology is changing everything and will continue to do so, and that natural resources are depleted and carbon footprints must be reduced. However, it was demography and longevity that really captured the attention of many of those in the Future of Work Consortium. I guess the simple reason is that the force of demography and longevity, more than any other forces, is intimately about us, our friends and our children. It's about who is having babies, and how long these babies are going to live. It's about how many people are working, and for how long. It's about the four generations and how they are going to love and possibly hate each other. Demography and work are intertwined – and understanding the hard facts of demography is crucial to crafting a reasoned view of the future of work. There are three key aspects of demography that will influence work in the coming years – generational cohorts, birth rates and longevity.

Generational cohorts are people born at roughly the same time, who as a consequence tend to have rather similar attitudes and expectations. They are often brought up with the same child-rearing practices and have similar experiences as teenagers and young adults. This is a particularly sensitive period for acquiring a moral and political orientation. These shared experiences produce what has been termed 'generational markers'. These are important since they provide clues about how these generations will behave as they move into positions of decision-making at work and have increasing access to resources.

By 2010 there were four distinct generations in the workforce – the Traditionalists (born around 1928 to 1945), the Baby Boomers (born around 1945 to 1964); the Generation X (born around 1965 to 1979) and Gen Y (born around 1980 to 1995). Coming up are Gen Z (born after 1995). The Traditionalists had their main impact on organisational life between 1960 and 1980.

By 2010 they were already over 65, making up between 5% and 10% of the workforce. Between 2010 and 2025 the majority of this generation will have left the workforce. However, we can expect some part of their legacy to live on in organisational life since this generation were the initial architects of many organisational practices and processes which subsequently survived for decades.

In many ways, the coming decades will be defined by the actions of the largest demographic group the world has ever seen – the Baby Boomers. This period saw around 77 million babies born in the USA, while the birth rates of many European countries reached as high as 20 per thousand, nearly five times the rate in 2010. In 2010 they were in their 50s and 60s and by 2025 most will have left the workforce, taking with them a huge store of tactical knowledge and knowhow; and also, if some commentators are to be believed, much of the wealth of the next generations. More importantly, as this huge bulge leaves the workforce, the post-1960s reduction in birth rates across the developed and much of the developing world will see significantly fewer people taking their place. This has huge implications for the retention of knowledge in companies and the challenge of severe skill shortages.

The following generation – Generation X – is the generation that in 2010 are in their mid-40s and will be in their mid-60s by 2025 – so in 2010 they were entering the height of their earning power, beginning to see their children growing up. This is a generation that grew up in a time of economic uncertainty, the Vietnam War, the fall of the Berlin Wall, the 1973 oil crisis, the dotcom bubble, the Iran hostage crisis, all of which reduced their expectation of a long-term relationship between employee and employer.[6] They also increasingly witnessed their parents divorcing. In 1950, 26% of US marriages ended in divorce; by 1980 this had climbed to 48%.[7] They were there when computers came into the home, when video games began to be played and the nascent internet began to connect them.[8] While the Baby

Boomers believed the world to be a place of future positive growth, this was not the case for Gen X. In real terms, Gen X US men in 2004 made 12% less than their fathers at the same age in 1974.[9] This was on top of significant personal investments in education, joining a workforce behind a generation of Baby Boomers, and competing in a weak global economy.

By 2025 the Gen Y'ers (born around 1980 to 1995) will be aged between 30 and 45 and at a crucial stage of their working lives. This was the first generation to have grown up alongside the bulky embryonic forms of personal computers, the internet, social media and digital technologies. Many Gen Y'ers closely followed the rapid technological evolution of their time and now have an intimate knowledge of, and perhaps even admiration for, the devices and platforms they use. Their social habits and behaviours shifted as they increasingly used text, email, Facebook and Twitter to communicate. They talked to their friends online, and played with strangers in MMORPGs like World of Warcraft and Second Life.

Gen Z by 2005 had reached their first decade, and by 2025 will be around 35. From 2020 onwards they will be taking an increasing role in the business life of companies across the world. Called by some the Re-Generations and by others the Internet Generation, this group is often defined by their connectivity.[10] Although we cannot be sure how they will develop as a generational cohort, we know something of their early experiences. Generation Z will be the first generation to grow up surrounded by the trends we have discussed, and the challenges and opportunities that we have talked about will weigh heavily on their minds, helping to form who they are and what they do.

At the same time, with regard to birth rates, there are complex demographic patterns emerging across the world. The developed world is ageing fast and hardly reproducing itself. That's why by 2050 one in three people across the developed world will be drawing a pension. This has huge implications in many respects, particularly where a country decides to spend its money. In the

USA, for example, the Congressional Budget Office predicts that spending on entitlements will grow from 10% of GDP in 2010 to 16% in 2035.

The soon-to-be-retiring Baby Boomers are primarily a phenomena of post-World War birth rates. Since that time, birth rates in much of the developed world have been in decline, caused by a combination of increasing female education, personal choice and enhanced child medical provision. In China the 'one child per family' government regulation introduced in 1979 has drastically curtailed the growth of the population, from an average of 5.8 children per family to 1.7. However, lowering birth rates is not a worldwide phenomenon, and we can expect to see birth rates remaining high in many of the developing regions of the world such as sub-Saharan Africa and rural India. Clearly difference in birth rates will impact on the availability of labour and skills and also on the labour migration routes we can expect to see forming over the coming decades.

In Europe the working population is rapidly ageing due to low birth rates, longer life expectancies and in many countries low immigration. By 2050 it is estimated that the median age of Europeans will rise to 52.3 years from 37.7.[11] In some European countries this challenge is particularly pressing. In Italy, for example, 25% of Italian women are childless with another 25% having only one child.[12] Estimates indicate that Italy will either need to raise its retirement age to 77 or admit 2.2 million immigrants annually to maintain its current worker-to-retiree ratio.[13]

However, of all the forces, demography and longevity are the most situationally and contextually based, with contradictory aspects across the world. For example, birth rates are indeed falling in Italy – but they are soaring in Ethiopia. People are certainly living longer in Sweden – but across the border in the Soviet Union life expectancy has dropped. With regard to the demographic groups, it is clear for example that Gen Ys in Boston want meaningful work and the opportunity to develop – yet in Shanghai the most talented Gen Ys are leaving one

company to join another for an extra $1,000 a year. As a consequence of these contextual differences, the overriding proviso for the demographic force is 'Well, it depends', and so as you patch together the future of your work and that of others you need to keep this uppermost in your thinking.

Having said that, there are some basic rules of thumb that can be applied when understanding and predicting demographic and longevity trends.[14] With regard to the attributes of the generation, the greater the wealth and job security of Gen Y, the more similar their views are to the stereotype of Gen Y. That's why, for example, educated and professional Gen Y'ers in Mumbai are rather similar in their aspirations and goals to educated Gen Y'ers in Silicon Valley, but very unlike Gen Y'ers who are living in Mumbai's slums.[15] Here are the four specific pieces about demography that have been patched into the future storylines.

1. **The ascendance of Gen Y:** by 2025 this group will begin to make their needs and hopes felt in the workplace. We can expect that their aspirations for a work/life balance and for interesting work could well profoundly impact on the design of work and the development of organisations and working conditions.
2. **Increasing longevity:** perhaps one of the most important aspects of the coming decades is the extraordinary increase in productive life – which will allow millions of people over the age of 60 who want to continue to make a contribution to the workplace.
3. **Some Baby Boomers grow old poor:** longevity will enable millions of people across the world to continue to make a contribution to the workplace. The challenge will be creating work for them, and we can expect a significant proportion of them to join the ranks of the global poor.
4. **Global migration increases:** over the coming decades migration will increase both to the cities and across countries as people move to gain education or better-paid work. We can also expect to see an increase in the migration of carers and supporters from the emerging to the developed countries.

Demographic and longevity forces will influence our work in positive ways – allowing us to live longer, healthier lives and to work productively into our 80s. It could also be that the ascendance of Gen Y – brought up in a more cooperative and productive way – will have a positive impact on the collaborative context of work. We can also expect migration to allow the most talented to join others in the creative clusters of the world. However, there is also a dark side of demography: increased longevity means that many millions of people around the world do not have adequate provisions for 90 or 100 years of life and will struggle to find work. Migration may enable the most talented to move to creative clusters, but it will also break apart families and communities and lead to the isolation that could be such a crucial motif for the future.

The force of society

It would be a mistake to imagine that we humans remain the same as the forces of technology, globalisation and demography swirl around us – leaving us perhaps battered, but fundamentally unchanged. Mankind has changed in the past, and will continue to change in the future. The question is how these changes will manifest themselves. If we look back to the first Industrial Revolution, huge swathes of people moved from the countryside to the towns to work in factories. These experiences transformed the way that people saw their lives and their communities. They changed the way people thought about themselves, they changed the way they thought about others, and they changed their hopes and aspirations for work.[16]

But this process is not straightforward. The future will be elusive when it comes to predicting human behaviour and aspirations. Yes, we want to be ourselves and autonomous … but wait,

we also want to be part of a regenerative community. Yes, we are excited about technology and connectivity ... but we also yearn to be comforted and crave time on our own. These are important paradoxes, which those at work will be increasingly faced with in the coming decades.

However, the fascinating aspect of the past, the present and the future is that, while the trappings may have changed, the basic human plot remains essentially the same. As Maslow described all those years back, we want safety for ourselves and those we love; we like to be cherished and find a sense of belonging in the communities we live in; we need a sense of achievement and of a job well done; and for some, we also want a sense of what he called 'self-actualisation' – the feeling that we have done the best we could and have fulfilled our potential.[17] This is the basic plot that has defined the lives of people, their families and their communities from the very beginning. What has changed are the trappings, the trappings of technology and connectivity, and the trappings of the material goods that surround us.

I remember taking my young son Dominic to Tanzania to spend time with the Masai in the Masai Mara. Dominic and I were standing on top of a hill looking over the empty plains below, talking with a young Masai warrior about his life. As we talked we were interrupted by a sound very familiar to Dominic and me – the sound of a mobile phone ringing. From his pouch the warrior extracted his phone and talked in the excited way people across the world talk on their mobile phones. When he finished the conversation I asked him who he was talking to.

'My brother,' was his reply. 'He had taken the goats out to find pasture this morning, and he has just rung me to tell me that after three hours walking into the scrub they had found fresh grass for the goats to eat.'

The trappings may have changed – but essentially the warriors are still as concerned about feeding their goats as they were many centuries ago.

Here are the seven pieces about society that will play a central role in shaping the future of work.

1. **Families become rearranged:** across the world family groups will become smaller and increasingly 'rearranged' as stepparents, stepbrothers and sisters displace the traditional family structures of the past.
2. **The rise of reflexivity:** as families become rearranged, and work groups become increasingly diverse, so people begin to think more deeply about themselves, what is important to them and the lives they want to construct. This reflexivity becomes crucial to understanding choices and creating energy and courage to make the tough decisions and trade-offs that will be necessary.
3. **The role of powerful women:** over the coming decades we can expect women to play a more prominent role in the management and leadership of companies and entrepreneurial businesses as they join the top echelons of corporate life. This will have implications for women's expectations, the norms of work, and indeed the relationships between men and women in the home.
4. **The balanced man:** there is growing evidence that men's perception of their role and the choices they make are also changing. Faced with the consequences of their fathers' choices, it seems that there will be an increasing proportion of men who will decide to make a trade-off between wealth and spending time with their family and children.
5. **Growing distrust of institutions:** trust is about the relationships between the individual and their community and work. It is based on the perception of whether others can be trusted to deliver. Across the developed world it seems that levels of trust in leaders and corporations have fallen, and may well continue to fall over the coming decades.
6. **The decline of happiness:** perhaps one of the most surprising aspects of working life is that, in the main, increases in standards of living – beyond a certain level – have been

accompanied by decreases in happiness. If the trajectory of consumption continues, there is no evidence that this decline will be reversed.

7. **Passive leisure increases:** one of the headline stories from the industrialisation of work has been the significant increase in leisure time. Up until the 2010s much of that time was spent in passive television watching. It could be that in the coming decades the growth of virtual participation will create a significant 'cognitive surplus' which can be focused on more productive activities.

At first glance these piece about the societal forces look bleak: a future of dislocated families, ebbing trust, general unhappiness, ever more voracious consumption and little in the way of work/life balance. Certainly as we construct the storylines for the Default Future these pieces play a key role in the themes of isolation and fragmentation. However, it could also be that this force is the most positive of all in the sense that it is most dependent on personal actions and choices. So as we will see as we construct the storylines for the positive, Crafted Future, within these seemingly bleak forces are rays of hope as rearranged families create a greater openness to differences, as Gen Y exercise their choice for more collaboration in the workplace, and as women are able to have their voices heard with more vigour in the boardrooms of 2025.

The force of energy resources

The way we will work in the future is intimately wrapped up with our access to energy and the impact this access will have on our environment. Of all the five forces we considered in the Future of Work Consortium, people felt most concerned and yet powerless about this one. For many it felt that a spectre was haunting them – the spectre of ever-increasing energy costs and of a rapidly changing climate.

These are forces that began with the first Industrial Revolution and have been gathering pace ever since. It's clear to many governments, to businesses and to each one of us that the actions we are taking are having a detrimental impact on the environment. The central challenge is one of short term versus longer term – an issue we will encounter at various times in thinking through these five forces. Of course we care about the environment and the future of the planet – but these are all longer-term issues. In the short term, for many people and companies and even governments, there is no immediate stimulus to drastically reorganise their policies, companies or lifestyles to avoid some of the projections we will consider in the hard data. As many of those engaged in the conversation about the Future of Work remarked, the consequences of climate change seem like a distant fiction that currently has very little influence on their everyday decisions. Yet this is likely to change considerably by 2025, and we can expect issues of energy usage and climate change to be at the centre of the working agenda by 2030. By then, many of the outcomes of fossil fuel depletion and visible climate change will begin to impact on the daily working life of people across the world.

One of the members of the Future of Work Consortium was Shell Oil, and we found their resource scenarios for 2050 a very useful starting point from which to develop the more detailed pieces. For over 30 years the scenario team at Shell Oil have worked with experts from around the world to construct scenarios of the future use of energy, releasing these scenarios every few years. In 2008 they released the two scenarios they believe most accurately describe the paths into the next 50 years. These scenarios consider the effects of various levels of reform and progress in terms of policy, technology and commitment from governments, industry and society in order to provide a glimpse into the possible futures of energy. The interesting aspect of the Shell scenarios is that neither conclusion reached is infeasible. They display a cautious sense of optimism without forgetting the severity of the facts.

In both energy resource scenarios we are faced with an impending and necessary restructuring. We can either run the course of the present energy framework, adapting to emerging challenges as they arise, or alternatively, begin to construct a new energy framework that integrates local, regional and global networks into a new international architecture of sustainability. Whereas the first scenario (which they term Scramble) relies on the activities of national governments to secure their future energy supply, the second (termed Blueprint) emerges as a consequence of grassroots coalitions (recall those 5 billion joined-up people) that bring together individuals, companies and other institutions to construct a new foundation for energy and resource generation and control.

In the Scramble scenario, over the coming decades, governments around the world scramble to attempt to guarantee the maximum amount available to them of the dwindling resource pool. In asserting their autonomy rather than agreeing to cooperate, governments increasingly compete with each other to secure energy for their domestic consumers. This has the impact of preserving high-energy prices and putting increasing strain on the existing energy infrastructure. In this scenario, although prosperity persists throughout the 2010s and 2020s, this relentless scramble and competition for energy resources continues to increase the gap between the rich and the poor. Many of the resource gains that are made are due to the resurgence of the coal sector. In this scenario multilateral governmental institutions find themselves too weak to subsidise the creation of a global clean energy sector. To supplement the use of finite coal reserves, domestic investment is instead directed to the expansion of nuclear power and a modernised biofuel industry. In the short term they manage to sustain economic growth throughout the 2020s.

However, in the longer term (2020 and beyond) the scenario is increasingly negative. In the Scramble scenario governments increasingly have to react to the emerging constraints of the

traditional energy framework, imposing solutions that often have immediate benefits but long-term negative consequences. Coal is not without its environmental problems, while nuclear fuel produces nuclear waste, and the biofuel industry competes with the food industry, pushing up prices of food to unsustainable levels. As a consequence, by 2025 the uncoordinated efforts of governments to secure resources have ensured that the existing framework is stretched to its limit, eventually necessitating draconian measures on production, consumption and mobility. For the governments of China and India, still in the process of developing a modernised industrial economy, these constraints prove hard to enforce. In Europe and America the introduction of a carbon tax and the scrutiny of the carbon footprints of individuals and companies put pressure on people to work from home and live austere lives. It is only when governments, companies and individuals reach this impasse that substantial steps to create a new energy sector are taken. Having failed to cooperate sooner, instead insisting on competing to use what remained of traditional energy reserves, nations begin to realise the extent of this undertaking. Not only do they have to restructure their energy framework completely, but they also have to confront the oncoming consequences of their lack of restraint.

The second Blueprint scenario reveals the beneficial aspect of confronting climate change and energy problems sooner (that is, before 2020) rather than later. It is also a scenario that depends both on a sense of urgency and the flow of information. It relies on the practical actions of well-coordinated coalitions who have acknowledged the implications of climate change, and are quick in their efforts to secure a safe and sustainable future. These coalitions include companies with mutual energy interests, cities and regions conscious of their future energy requirements, and a whole host of other institutions that are united in formulating low-carbon ventures. In this scenario general awareness of the damaging effects of climate change, and the initial successes of creative and efficient experiments and practices in infrastructural

development, play key roles. Productive processes and lifestyle choices are quickly emulated by others on a national and regional scale. As more and more people come to accept the threats that a high-carbon economy poses to their environment and livelihood, pressure on governments, including those of developing countries, increases investment in emission-reduction projects. Emissions trading schemes offer incentives for the establishment of low-carbon ventures, while giving more traditional sectors the opportunity to adjust.

In this scenario, the Blueprints established by these multiple actors quickly create a culture of sustainability, helping to fuel a more effective international consensus. In turn, this consensus mitigates the inefficiencies and uncertainties that might otherwise continue to undermine a dis-integrated, bottom-up approach. In order to stay at the forefront of innovation, many technologically developed countries bring about an era of brave policy-making that incentivises the creation of new and efficient infrastructural foundations. This establishes the emergence of new and innovative firms that become global leaders in exportable carbon management technologies and systems. Meanwhile, China and India commit to various international frameworks that guarantee technology transfer and secure an energy-efficient future. In rural areas of Africa, cheap and efficient wind turbines and solar panels ensure cost-effective access to energy and help make electric transport increasingly viable. Energy prices, though initially reflecting the cost of infrastructural reorganisation, remain affordable in the long run and continue to fall as wind and solar technology become more efficient.

These two scenarios, Scramble and Blueprint, are not polar extremes – neither is unrealistic. Yet they do differ substantially. The first is one of denial and competition, while the second is of acknowledgement and cooperation. Both inevitably confront the hard truths of climate change without sacrificing economic growth. These are the three pieces of the energy force that will have the most profound implications on the future of work.

1. **Energy prices increase:** Over the coming decades the easily available energy resources of the world will be depleted. At the same time, countries such as China and India will increase their resource requirements significantly. One of the most immediate impacts of the rising cost of resources will be that the movement of goods and transportation of people will have to be significantly reduced.
2. **Environmental catastrophes displace people:** the correlation between carbon dioxide emissions and temperature increases was already causing concern by 2010. By this time, changes had begun to occur in the many ecosystems of the world, sea levels began rising, wind patterns had changed and heat waves and droughts had become more prevalent.
3. **A culture of sustainability begins to emerge:** one of the implications of the dwindling of easily accessed energy resources could be a renewed interest in sustainability and widespread adoption of more energy-efficient ways of living, with a brake on vicarious consumption. These cultures of sustainability could have a profound impact on the way that work gets done.

As we consider the dark and bright impact energy resources will have on the future of work, it is easy to become overwhelmed by the negative. However, as we will discover, it is possible to cast the task ahead in a positive light, one that can rejuvenate faltering economies, promote greater equality and foster innovation. It could constitute, to some extent at least, an energy revolution that echoes that of the late 1800s, with the culture of sustainability having as much impact as the engineering culture had on Victorian Britain. It is possible that the collaborative spirit will influence business ventures and government policy, creating greater transparency and integration even beyond the energy sector. There are already clues to these scenarios in the other forces. The technology force implies 5 billion people connected with each other, creating a 'cognitive surplus' that could well become the momentum and energy behind the grassroots-led

initiative of the Blueprint scenario. What's more, as the demographic force shows, the generation who will be leading the world in 2025 – Gen Y – are extremely aware of the energy and environmental challenges they are faced with. Perhaps more than any other generation before, they are capable of creating the cooperative and empathic skills that will be so crucial for the emergence of the Blueprint scenario.

Crafting your own working future

You have now taken a glance at the 32 pieces that make up the five forces that will shape the coming decades of your work life. Now the task is to begin to work with these pieces to craft the story of your own future of work, and from this begin to create a deeper understanding of your options and choices.

As you look at these pieces the challenge is to make them your own and from them to craft your own story. Just as my mother worked with her fabric pieces to craft her quilts, so you need to go through a process of filtering and selection. Right from the beginning, there will be some pieces you will want to discard, others that will surprise you and you'll want to know more about, and some you will fall in love with and want to understand more to make your own. Then, once you have initially sorted the pieces, you will want to look for patterns and begin to create a deeper structure that resonates with your own context and values. These are the actions you will want to take with the pieces:

* **Discard:** one of the most important aspects of creating a beautiful quilt is to know what to leave out. The same is true with crafting your own story about the future. As you look back on each of the pieces about the future, there will be some that you can immediately discard. It may be that you don't agree with the data, or that you know it's not going to be important to you, or that it is something that you cannot imagine resonating with your picture of the future. Feel free to discard as many of these pieces as you wish.

* **Embroider:** as you looked through the pieces, there will be some that intrigued you and created a sense of wanting to know more. As we take a closer look at the stories of the future, you will see that I provide more detail for each of the pieces and also have highlighted references and resources that you may find interesting.
* **Discover and collect:** as you begin to put these ideas together and look at them in a more holistic way, you may decide that there are bits completely missing that I have failed to find in my own quest. I've had this feeling with my own fabric collection. I can recall that for years I wanted to see the silks of Varanasi, which are legendary in their luminosity and beauty but which required a trip to the upper banks of the Ganges to find them. It took me years to actually make the trip – but as soon as I did my first priority was to take a closer look at the fabrics. I am sure that as you take a closer look at the pieces I have collected, there will be some that are missing and that you will want to devote energy to finding. That's wonderful – but do come to www.theshiftbylyndagratton.com to post what you have discovered – I'd love to take a closer look at what you have found.
* **Sort:** I have presented the pieces to you in the simplest of categories, by the impact they have on the five forces. But as you look closer you may find that for you there are other ways of categorising these pieces. For example, you may want to sort them in terms of how much you find them personally intriguing, or the extent to which they will impact on your own future, or by the way they will impact on the region of the world in which you live.
* **Look for patterns:** in a sense this is the most creative aspect of making a quilt. You have discarded the fragments that don't fit, embroidered those that you value highly, and sorted them in categories beyond the most obvious. Now is the time to

> stand back and see if you can find an emerging pattern. The challenge with these pieces about the future is to find a pattern that makes sense to you, and resonates with how you believe your future will emerge. It's only at this stage that you can move into the next phase of working out the shifts you will need to take to ensure that you have future-proofed your work and career.

You may recall that this was the task I set the members of the Future of Work Consortium. I asked them specifically to take the pieces and to construct a day in the life of someone working in 2025. Many of these initial storylines were negative. They reflected the anxiety and concern people felt as they thought about the forces. As you will see, the major themes to emerge from this initial task were themes of fragmentation, isolation and exclusion. It is these themes we will next explore in more detail. After presenting these storylines, I will then describe in more detail the specific pieces that seem to play a contributing factor in the creation of the storylines.

Once the negative, default storylines had been created, we went back to the original pieces with the task of re-sorting them to create more positive storylines – what I have called the Crafted Future. These show how the pieces from the five forces can also create work for the future, a future that has co-creation, social participation, micro-entrepreneurship and creative lives at its centre.

As you begin to think through your own future of work, do download the *Future of Work Workbook* I have created for you – it's available at my website, www.theshiftbylyndagratton.com, where you will also find a series of short videos in which I describe the forces and trends in a little more detail. By the way, whilst you are there do sign up for the monthly newsletter to stay in touch with developments.

PART II

THE DARK SIDE OF THE DEFAULT FUTURE