

We are, on average, all living longer than our parents, longer still than our grandparents. Just as globalization and technology changed how we live and work, so over the coming years increasing longevity will do the same. Our children and their children will live even longer. Life expectancy has expanded at a steady rate of more than 2 years every decade for some 200 years. It affects everyone and it's happening now. The right responses to greater longevity yield huge benefits. With foresight and planning, a long life is a gift, not a curse—the gift of time. How you choose to use and structure that time is at the heart of the response to living longer.

Over the 20th century a 3-stage view of life emerged: a first stage of education, followed by a career, and then retirement. There are real opportunities to move away from the constraints of a 3-stage life to a more flexible and more responsive way of living—a multi-stage life with a variety of careers, breaks, and transitions. The structuring and sequencing of time is effectively a social construct. In a longer life there will be different structures, alternative sequences and a redesigned social construct.

A 3-stage life stretched over time may become too hard, too exhausting and too boring. A multi-stage life will emerge. Imagine you have 2 or 3 different careers: one perhaps when you maximize your finances and work long hours and long weeks; at another stage you balance work with family, or want to position your life around jobs that make a strong social contribution.

There will be more transitions. This has happened before, in the 20th century, with the emergence of 2 new stages: teenagers and retirees. Right now a new stage of life is emerging for those ages 18–30. Using leisure time as an investment will be crucial in a longer life. A 3-stage life with education first, employment second, and then retirement can only be sequenced. When this lockstep disappears, so does much of the predictability of age. 'Age' is not 'stage' any longer, and new stages will be increasingly age-agnostic. Much of society is based on the implicit assumption that age and stage are one and the same; it is hardwired into much of corporate HR practice, marketing and legislation.

In long lives with greater change and more choices, options become more important. A new stage for those aged 18–30 is emerging where the traditional commitments of previous generations; marriage, families, house and car purchases are all being delayed.

Conventionally, living longer is seen as being older for longer. There is evidence that this convention will be reversed and people will be younger for longer. *Neoteny* is the retention into adulthood of adolescent features that help promote flexibility and adaptability and avoid being pinned down by habits. There will be more cross-age friendships as people from different age groups pursue similar life stages and help those who are older retain more youthful characteristics. Longer life with more years post the age of raising children has great potential to reduce gender inequality and transform personal relationships, marriage and child-rearing.

Traditionally the home was a place of specialization – men worked and women looked after the home and children.

However, while family roles have changed, the narrative of the 3-stage life as typical of the male career remains dominant and has led to institutional separation of the young, the middle-aged and the old. Now, as both partners embark on multi-stage lives, they will have to coordinate with each other as they enter different stages and support one another at different times. The variety of households that emerge will be far broader than the conventional family structure, and this will pressure corporations and government policy to respond. The 3 stage life underpins an inflexible attitude towards work and career. Demands for more flexible working patterns and career standards have been led primarily by women due to their role as primary carer.

Even more dramatic will be the emergence of 4 generations within a family living at the same time. There are few role models, as even those who live to 100 have rarely expected it. Everywhere companies are experimenting and eventually the individual's desire for flexibility and choice will overwhelm their need for systems and predictability. This promises to be a battleground akin to the battles about the length of the working week and working conditions that marked the Industrial Revolution.

Perhaps the biggest challenge is health inequality and ensuring that the poor will lead a long productive life. It is also clear that many options we explore to make the most of a 100-year life are most available to those with professional or technical backgrounds and a high income. The danger is that the gift of a long life will only open to those with the income and education to construct the changes and transitions required. It is unacceptable that a good long life should only be an option for a privileged minority. When lives are short, the concept of who you are develops without a great deal of insight or transformation. Issues of identity, choice and risk become central to questions of navigating a long life. The longer your life, the more your identity reflects what you craft rather than where you began.

The younger you are now, the longer you are likely to live. From the 1920s onwards, it was reductions in child and infant mortality that accounted for most improvements in life expectancy. The second increase came from tackling the chronic diseases of middle age and beyond – in particular cardiovascular problems and cancer. This epidemiological transition occurred as fatal diseases moved out of the bowels and chests of infants into the arteries of the elderly. The next substantial increase will come from tackling diseases of old age.

There are myriad causal factors behind this increase in life expectancy: better health, better nutrition, medical care, education, technology, sanitation and income. The major factors are new public health innovations around vector control, drugs and immunization. The same forces that have raised life expectancy in the developed countries now lead to rising life expectancy in developing countries. The 100-year life is becoming a global phenomenon, although the rich countries experienced it first.

There are 3 crucial bridges to a multi-century lifespan: Follow the best practice medical advice; the coming medical revolution in biotechnology; nanotechnological innovations where AI and robots rebuild aging bodies at a molecu-

lar level. Many economic estimates of life expectancy (developed for pension purposes) use period estimates. They effectively take future innovation in longevity out of the equation.

Greater life expectancy is only good if life itself is good. We are witnessing compression of morbidity--the health-related quality of life before death. People who regularly exercise, don't smoke and control their weight usually experience a significant compression of morbidity in activities of daily living (ADL). In the 20 years up to 2004, the number of people aged 85-89 classified as disabled fell from 22% to 12%, and for those over 95 from 52% to 31%. Some studies found evidence of continual long-term declines in disability for those over 65 and in recent decades the rate of decline has increased.

Public health, education and changes in behavior are key to achieving a healthy old age - it is not an automatic process. In rich countries dementia is becoming the major risk of ageing: 1% of 60-year-olds, 7% of 75-year-olds and 30% of 85-year-olds have it. Gerontology is moving rapidly from an eccentric and alchemy-like subject into the mainstream. Serious money is now entering the arena. It is cell ageing that underlies many of the diseases that contribute to mortality and morbidity. Research now considers the process of ageing itself by encouraging cells to live longer and repair themselves. When science, knowledge and significant funding focus on a challenge, much can be achieved.

Pay As You Go has operated as a form of elaborate pyramid scheme for Social Security. This can only continue as long as an ever-increasing number of new members enters the scheme. Reform tends to be slow and, as the voting population ages, increasingly resistance to pension reform. Reform principle increases retirement age so as to increase the number of years of tax paying; and target pensions more to those with low incomes and low assets. If state pension reform is slow, changes in corporations' occupational schemes have, in contrast, been rapid. The number of employees with access to defined benefit pensions declined from 62% in 1983 to 17% by 2013. The burden to save is shifting to the individual. State pensions in emerging markets tend to avoid using the Pay As You Go model. Nearly 1 in 4 US men over 64 work or seek work, compared to only 1 in 6 in 1984.

A household of 2 adults needs only 50% more income than a household of 1 adult to achieve the same standard of living. If both partners earn a high income, then the temptation is to develop lifestyle habits based on their current earning pattern. It is striking how strongly embedded the model of 3 stages is in much career planning and long-term financial planning. A long retirement is unlikely to provide the stimulation and camaraderie that people value and need. What worked for Jack (3 stage, now retiring, 3.0) will be difficult to make work for Jimmy (20 years younger, 2.0) and doesn't work at all for Jane (in her 20s). For most people the thread running through a long life will be work.

It is always wise to look ahead, but difficult to look further than you can see. The present-day centenarian has seen much in their lifetime: 2 world wars and a shift from soldiers on horseback to nuclear weapons; the Russian Revolution and the rise and fall of communism; an end to the first wave of globalization and the emergence of the second; the collapse and subsequent ascendance of China; the advent of electricity,

radio and television; the early days of the Model T; the first-ever commercial air flight; and, of course, the first manned flight to the moon, as well as the rise of the internet. The advent of automatic washing machines, the widespread adoption of indoor plumbing in the house, as well as the vacuum cleaner, not to mention the introduction of the zipper and the bra! Over time the structure of an economy goes through dramatic changes in response to the primitive economic forces of supply and demand. The agricultural sector, which in 1869 accounted for nearly 40% of US GDP and by 2013 was only 1%.

In the 1920s the average life of a company in the S&P 500 was 67 years. By 2013 this had reduced to 15 years. Large companies have scaling and mobilizing capabilities that enable them to deliver products into almost every corner of the world and we believe this will remain the case. However, in the future corporate landscape, large firms will be increasingly surrounded by an ecosystem of smaller businesses and start-ups. These have grown in number and are able to compete as technology has reduced the barriers of entry. We expect these ecosystems of small companies to flourish and become more valuable. The scale and managerial opportunities of large companies will still be there, but more focused and flexible employment in smaller entrepreneurial units will be added. The technology that connects an individual to companies who want to buy their skills is becoming more global, cheaper and sophisticated.

The 'gig economy' and the 'sharing economy' are proliferating. The gig economy refers to the rising number of people providing a series of specific tasks and commissions to multiple sequential buyers. The sharing economy provides the promise of a flexible source of income. We expect these ecosystems will help people better blend work, leisure and home. Before the rise of industrialization, production took place primarily in the family home where work and leisure were blended.

While distance may have become unimportant, proximity has become ever more important to ideas and high-level skills. At the center of creative clusters are often world-class universities. Every smart job creates 5 others and some of these are highly skilled too--such as lawyers, accountants or consultants. The last few decades have seen a striking rise in *assortative mating*--marriage partners are more alike in education and income than in the past. For these highly skilled partnerships, finding interesting work for 2 is more difficult than for 1. The move to home-based virtual working will always be balanced by the value of proximity.

If we construct a 2 x 2 classification of jobs: cognitive or manual and routine or non-routine, we find that routine tasks have been substantially substituted by technology. While technology acted as a substitute for medium-skill jobs, it also served as a complement for skilled workers. As the income of skilled workers has increased, so they have increased their demand for the services produced by low-skilled workers. The net effect is the hollowing out of the labor market. Driving and diagnosing medical conditions are both routine tasks which require knowledge and pattern recognition skills that have to date proved beyond computers--2 sets of uniquely human capabilities. However, one set involves capabilities associated with complex problem solving that relies upon expertise. The second set of capabilities involves interpersonal interactions

and situational adaptability. These are associated with more manual roles.

‘We know more than we can tell’—a significant amount of human knowledge is tacit and cannot be written instructions. It is easy to make computers exhibit adult-level performance on intelligence tests or playing checkers, and difficult or impossible to give them the skills of a 1-year-old when it comes to perception and mobility. A robot can perform complex analytical tasks with ease but finds it more difficult to pick up a cup or climb stairs. We should be delighted that robots are arriving just in time to boost a flagging working population and maintain output, productivity and living standards. Technological progress raises productivity, boosts living standards and encourages people to spend and consume more.

Consider 2 categories of jobs: those where they will have an absolute advantage, and where humans will have a comparative advantage. Humans have a comparative advantage over robotics and AI in creativity, empathy and problem solving, opening doors and much manual labor. These will be jobs that survive. There is also the issue of technology complementing human skills. Amateur chess players augmented by mid-level machines were able to beat both Grand Masters and supercomputers working separately.

As life elongates, periods of work become more extensive, savings more central, major transformations occur in industries and jobs. A good life would be one with a supportive family, great friends, strong skills and knowledge, and good physical and mental health. These are all intangible assets. Friendships and knowledge or health and fitness can provide a flow of benefits over several periods of time. They usually suffer from some form of depreciation – they diminish over time due to usage or neglect. This means that assets require careful maintenance and mindful investment. If you fail to invest by not keeping contact with a friend or not refreshing your knowledge, then they will eventually depreciate and mostly disappear. The fact that intangibles can’t be bought or sold makes planning and investing in them more complex. Decisions about investing in tangible assets are *reversible* and *substitutable*. Intangibles, however, are neither. Care must be taken when choices are made about investing in intangible assets and there must be concern about a sudden loss in value. Just as an earthquake can render a house worthless, so external shifts can make intangible assets lose value.

A Harvard Grant Study tracked 268 male Harvard undergraduates from 1938–40 for the following 75 years, concluding that there are 2 pillars to happiness: one is love; the other is finding a way of coping with life that doesn’t push love away. Earning more makes you happier, but love makes you happy. Easterlin’s Paradox states that while it is true that wealthier people tend to be happier, there is no direct relationship between happiness and income. As a country becomes richer, happiness doesn’t increase. Beauty is an important asset. Beautiful people get hired sooner, promoted quicker, and are paid 3–4% more than their more average looking colleagues. People who are taller get paid more. The same holds true for other characteristics such as a positive disposition, sociability, or low neuroticism. Excluding endowed intangibles still leaves a wide range of intangibles. Productive assets boost income. Vitality assets are mental and physical health and well-being. Transformational assets refer to self-

knowledge and our capacity to reach out into diverse networks and openness to new experiences.

A 22-year-old graduate in the US is on average likely to earn \$30,000 a year compared to \$18,000 for someone without a college education. The college graduate earns nearly \$80,000 on average compared to \$30,000 for the high school graduate. The implied average return to education is as high as 15% over inflation. Throughout the 20th century, average years of schooling in the US have risen from 7 to 14 years. The result is that today around 25-30% of the working population in the US have a degree. Either through boredom or technological obsolescence, the acquisition of new skills and specialisms will become a lifelong endeavor. They are difficult to imitate and hard to substitute. There are 3 key areas where education and learning and development can help support careers, given the shifts in technology: support the development of ideas and creativity; enable human skills and empathy; develop core portable general skills such as mental flexibility and agility.

The 19th century was about the Industrial Revolution and the power provided by physical capital. The 20th century was about the advantage of education and human capital. The 21st century will be about adding value by new ideas and innovations that can be replicated or purchased by others. This means that with diagnostic augmentation, the skill set for the medical profession will shift from information retrieval to deeper intuitive experience, more person-to-person skills and team motivation and judgement. Digital teaching will replace textbooks and classroom teaching and the valuable skills will move towards the intricate human skills of empathy, motivation and encouragement. People will specialize at one stage in their working life and then later re-specialize as they shift into other intellectual areas and activities.

Formal education will create opportunities to build foundational analytical abilities and principles. Building these foundations creates an opportunity to be flexible and innovative and to span disciplines. Having portable, credentialized knowledge and skills will be essential. The importance of human and empathic skills and judgement and the focus on creativity and innovation all suggest that an updated form of liberal arts education may be surprisingly valuable.

An education in science, technology, engineering or mathematics remains key and the most valuable productive asset. *Experiential learning* goes beyond textbooks or classroom learning and develops through action. What will separate people is not what they know, but what they have experienced using this knowledge--the increasing importance of tacit knowledge – that which cannot be codified. The basis of wisdom, insight and intuition is built through practice, repetition and observation. While there are many advantages of experiential learning, one challenge is that education-based learning is much easier to certify and credentialize.

Making knowledge productive is a team game. Highly productivity people want to be matched with other highly productivity people. There are clearly firm-specific aspects – proprietary resources, organizational culture. When an analyst’s performance remained the same or increased when they moved firms, it was almost always the case that their own team moved with them. These networks and relationships are an important aspect of productive assets and we term them

professional social capital. Close collaborative relationships, rich in trust and reputation, allow you to access much wider areas of knowledge and insight than your personal knowledge stocks. A *posse* is a network of close professional relationships with people who have mutual trust. A posse develops when you are prepared to devote extended periods of time to building relationships with people in your similar skill and knowledge set and to spend time in face-to-face conversations.

The brand 'Apple' is estimated to be worth substantially more than \$100 billion. This is, in part, reputation conferred by association. The social structure around you behaves like a broadcast system. Reputation is not an asset that you own, it is also a complex asset--a combination of portable skills, knowledge and a good reputation that will help bridge into new fields. As life elongates, the impact of reputation is felt over a longer period.

Vitality assets make us feel happy, fulfilled, motivated and positive. Following best practice advice on healthy living is a cornerstone of making the most of the gift of longevity. Perhaps the most important insight about wellbeing is awareness of maintaining a healthy and well-functioning brain. Genetic inheritance accounts for about 1/3 of the rate of mental decline, the rest is dependent on lifestyle.

Neoplasticity imagines the brain more as a muscle, where repeated use and practice can change how it operates and aid its recovery. After the age of 50 the brain starts to shrink, and after 80 it does so more substantially. Physical exercise is an important factor in avoiding mental decline. Low-fat diets, plenty of vegetables and fruit and oily fish, Omega 3 fatty acids and vitamin B12, and of course cognitive training and mental exercise help.

Stress at work is associated with a 20% increased risk of heart disease and a range of other mental and physical health issues. Building and sustaining vitality assets is in part about managing the triggers of stress. Regenerative relationships are often multi-stranded, in the sense that you know your friend across many different circumstances and in different roles – at home, with their family – and share common interests. These relationships tend to be emotionally laden in the sense that you are investing your feelings and emotions. Emotionality that brings support is crucial to vitality. When the supports reach back in time, they support the narrative and commentary about life and identity. Over 100 years, friendships will be both harder to keep and more valuable. Tracking intangible assets is more complicated than financial assets because they are so difficult to measure with any accuracy and therefore to value.

Jack's wife Jill tended to intangible assets while he built tangible assets by caring for the children and connecting the family to the community and friends. Marriage in the traditional sense is disappearing and what is emerging is a plurality of possible lifestyles. This reflects social justice and rising equality, as women claim the political right to a wider choice of roles than the 3-stage life. The first stage of education in a multi-stage life will last longer. Greater specialization will be important in the threat of technological obsolescence.

In the late 1980s employment patterns began shifting from relational to transactional and became more short-term and performance-based. If the old contract was with the organization, in the new career the contract is with the self and

one's work. Jane won't simply be changing employers but also probably sectors. Interrelated elements of transformation have come to the fore, Successful transformation only happens when people understand themselves, both as they are now, and how they might be in the future. This requires self-knowledge as they reach into new communities and those who had already created these *dynamic/diverse networks*. People do not think their way into change--they act their way into change. Openness to experience brings dynamism to the transformational asset.

What differentiates those who build transformational assets is that they do not simply add information, they change their sense of themselves and the way they see the world. The anthropologist Charlotte Linde found striking the energy people put into building a coherent life narrative. To shape this, there has to be both continuity (what is it about me that remains the same) and causality (what is it that has happened to me that explains the change). She discovered that deep self-knowledge plays a crucial role in shaping both these features.

You shift perspective when you interact in ever wider and more diverse networks. Since your identity is embedded in relationships and friendships, as you begin to transition you shift connections. It is within larger and more diverse networks of friendship and associates that variety is found. These big diverse networks are an important intangible asset because of the value they bring over time. The combination of self-knowledge and diverse networks creates foundations for transformation. But what brings dynamism are actions and a preparedness to be open to creative solutions.

Much of everyday life is routine. During transformation these routines are threatened and we often feel anxiety. It helps to mobilize our adaptive responses and preparedness to embrace novel initiatives. Routines are interrupted by triggers from self-knowledge or the environment, which can herald a conscious exploration of alternative ways of being. *Routine-busting* leads to new cycles of learning, which lead to changes in our behavior that we believe to be successful, which we integrate into our identity and may even explore and adapt.

A long life has so many exciting possibilities: more hours to be spent, opportunities to be grasped, and identities to be explored. Most of us have difficulty imagining ways of life that we have never experienced. That is why we can motivate of behavior, particularly, as we described earlier, if we connect with feelings of efficacy and agency. We first audited Jimmy's current tangible and intangible assets to assess his options and challenges: his *efficacy* ('I am competent to do this') and his *agency* ('I have the self-control and will to make this happen'). Investing in self-knowledge, building new and dynamic networks, and staying open to experience are what it takes for later scenarios to succeed.

For Jane, many high-skill and low-skill routine jobs will disappear. The 3-day weekend or the 4-day working week may emerge to help preserve vitality across longer working lives. Heavy investment in intangible assets will enable her to create options, build skills, establish networks, and build the reputation and the behavioral currencies she will need to navigate the long years ahead. Her productive assets form basic working skills and an online reputation. *Transformational assets* and a diverse network will be crucial as she flexes her

sense of identity. *Vitality assets*: she has made some incredible friends who she has worked with and got to know well. Rather than relying on internal fast-track talent, more and more companies will use broad external networks to find talented and innovative people.

Some changes would be about preserving reputation in a career that moves across sectors. Corporate careers are 'ladders' where people ascend upwards with age. Juvenescence boosts her vital assets and outlook on life and keeping herself younger. More people will decide to both rise and descend the corporate ladder. Stress testing different scenarios to these outcomes is an important part of life planning. Jimmy in his mid-40s is realizing the importance of transformational assets – the shift from the 3.0 scenario he thought he was embarking on. From the very beginning Jane is basing her future life on the concept of transformation. The 5.0 scenario realizes the challenge of maintaining vitality over such a long life. With a longer life we feel that blocks of time aimed at recreation will become a common way of achieving the replenishment of intangibles and the scale of transition required. Jane will have to use substantial amounts of her leisure as a form of investment rather than consumption and these transitions will require more savings to finance them. Identity shows why Jane's initial phase of exploring and travelling is so important. As she builds a stronger sense of who she is and what she values, this will bring continuity to the many transitions she makes by creating continuity to her narrative and reducing the risks involved in switching from stage to stage.

If we believe in long sweeps of time, we build cathedrals; if we operate from fiscal quarter to fiscal quarter, we build ugly shopping malls. In a long life, you have the potential to build a cathedral or a shopping mall. New stages: the Explorer, the Independent Producer and the Portfolio. For most of human history there were just 2 stages: child and adult. In the 20th century 2 new stages emerged: teenagers and retirees. These required substantial shifts in government regulation, corporate policy and social behavior. We are crafting new ways of living and taking many paths. This diversity is intrinsic to the 100-year life.

The traditional stages (education, work, retirement) will not become redundant and disappear from our choice set. The multi-stage life requires all ages to retain features previously associated with the young: youthfulness and plasticity; playfulness and improvisation; and the capacity to take novel action. Powerful forces will make us younger for longer. Adolescence is a time of flexibility, to discover options and keep them open rather than making commitments. With the lengthening of life, options become more valuable and the period over which we explore and create options also lengthens. Look at the pictures of 16- and 17-year-olds from your grandparents' generation. You will see serious faces full of life experiences and dressed in a way indistinguishable from their parents.

Juveniles tend to be more adaptive and flexible than adults. People today in their 50s and 60s tend also to look more youthful than pictures of your grandparents at that age. Modern Western societies institutionally segregate the young, the adults and the old through the mechanism of the 3-stage life. Changes lead, some argue, to a fall in respect for the old, denial of a traditional mentorship role for the old, and a lack of

social embeddedness in the young. As different ages begin to share activities and mix with ease, some stereotypes of age melt away. Play is not what you do, it is how you do it. *Galumphing* – the 'seemingly useless elaboration and ornamentation of activity'. We galumph when we hop instead of walk, when we take the scenic route rather than the efficient one, when we are interested in means rather than ends. Once you put a price on it, it is no longer play. We learn through doing and new stages are a wonderful opportunity to do, to act and then reflect on how it felt--the 'art of self-observation'. This is a process of self-questioning of how an individual handles the time of her lifespan.

We see explorers setting out with questions: what is really important to me, what do I care about, who am I? Explorers push the their boundaries, taking themselves out of the norm, confronting themselves with how others behave. They stand at 'the edge of the system', shining a light on their own assumptions and values. Their crucible experiences were episodes in their life when they viscerally experienced the lives of others: the pain and the anguish, the exhilaration and the joy. They were, in a sense, walking in the shoes of others. Long lives mean change and transformation – why transformational assets are such an important new asset category. There are 3 transitional periods of life – from 18 to 30, the mid-40s, and around 70 and 80. Periods that mark natural life transitions and exploration could serve a more directed role.

The value of finding an optimal match of a partner – either over lifestyle, career or marriage – is greater with a long life. 'Decide in haste, repent at leisure' becomes a powerful motto. Some would view a period of exploration as a distraction. Others may be risk-averse and keen to commit, achieve financial goals and pursue a conventional career straight after their education. It could be a life-changing stage. But only if it is a period of activity and discovery. The explorer stage is not a time for sitting around and doing nothing. It is a period that really gains from thought and planning, and without this momentum there is a risk of decay and depreciation of assets rather than investment and renewal.

A new stage of economic activity is emerging. It happens when a person forsakes a conventional career path to start up their own entrepreneurial activities. This will not be limited to any particular age group. These are job creators rather than job seekers. We refer to independent producers, a reflection of scale and aspiration. There are more transient structures; some will be pop-ups aimed at grabbing the moment. It is less about building a corporate entity and accumulating financial assets, and more about spending a block of time, at any stage in a working life, engaged in independent self-supporting productive work. It is rich in the development of intangible assets. These prototyping activities often take place in parallel with their day work. They generate constant feedback that helps develop their ideas about how they could make a project work. It is a period of curating a reputation that is made up of many different forms: what has been achieved or experienced, networks that have been created, and evidence of co-creation and working collaboratively with others. Those over 55 accounted for 26% of entrepreneurs in 2014 compared to 15% in 1996.

This focus on connectivity as both input and measure of success explains why smart cities are growing and attract-

ing clusters of independent producers. It cannot be easily achieved by living remotely and digitally. It is a place to meet partners in marriage and business, with a focus on experimentation and investing in intangible assets. Educational institutions will develop assessment formats that credentialize skills not tied to specific courses. It will be imperative to find ways to credentialize intangible assets. Airbnb, Simplest, Lyft or even Dogvacay are all examples of an emerging economy where people share assets they may have purchased or created.

Some senior executives, when asked to envisage their future lives, see building a portfolio as central to their long-term strategy. A portfolio is balanced by earning enough money to match outgoings and boost savings; and taking a part-time role that links to the past and maintains reputation, skills and mental stimulation. Alternatively, the portfolio stage has a range of motivations; in part it's about financial accumulation, exploring, vitality and stimulation, but also about learning and making a social contribution. As we live longer, there is the possibility of boredom and repeating the past, and so our taste for variety increases.

When someone successfully transitions to the portfolio stage, they do so because they are able to change gear and see their working career as the development of competencies rather than the accumulation of job titles. They experiment with projects that interest them and move towards role models of those with the sort of portfolio lives they envisage,

With their long lives and greater uncertainty, this is a generation for whom options have the potential to be incredibly valuable. Their response has been to marry later, start a family later, buy houses and cars later and in general postpone commitments. When viewed from the perspective of a multi-stage life, the behavior is not about lack of commitment but rather about relentless investment in intangibles – particularly those that create options. ‘Yahoos’ – Young Adults Holding OptiOnS.

Transitions tend to unfold one step at a time. We learn more by crafting experiments and side projects that allow us to get a better feeling for what is possible. *Recharge* is essential as intangible assets such as vitality are depleted. Health, family and friendships may need us to go back to our same sector and same type of role as before. *Re-creation* invests in productive intangibles – be that new sets of skills and knowledge, new networks, or new perspectives.

Many see the financing of a long life as a curse. Preparing for the future means transferring money from today to the future, and most find it tough to connect their current and future selves. Satisfaction derived from consumption depends not just on current levels, but also on past consumption. In our assumption of a 50% replacement rate for retirement, we assume that you own your own house. Housing is an unusual type of tangible asset. As well as being a store of value, it also provides a flow of consumption benefits. When people retire they are equally as likely to move into a larger house as a smaller one.

St Augustine as a young man said: ‘Lord make me chaste, but not yet.’ In general, people act impatiently in the short term, but exhibit greater patience in long-term planning. We show short-term impatience but plan to be patient. However, by the time the long-term happens and plans are implemented, choices become a short-term issue once more and

impatience kicks in again. The same problem reappears with the challenge of losing weight. Losing weight requires patience, but it takes a while for abstinence to pay dividends in terms of weight loss. At the heart of hyperbolic discounting are 3 ingredients: an inability to properly account for a future self; an ability to change plans through future decisions; and short-term impatience vs long-term patience.

Plan by creating a sense of identity over a long life. A savings plan for employees called Save More Tomorrow (SMarT plan) asked workers to increase the contribution from their salary that goes into their savings plan, but only in the future. The increase in savings will come after a scheduled pay rise; after each future pay rise the savings rate will ratchet upwards each time until it reaches a preset maximum. Workers may withdraw from the scheme at any point. By being fitter or having sounder finances, you protect your future self through your current actions. Financial literacy declines with old age, particularly with regard to analytic thinking. Good financial decision-making is made up of experience, knowledge, and analytic functioning. Financial decision-making in general peaks in the 40s and 50s when our experience and analytic ability are at a joint maximum. Contact between parents and children is higher in families where the elderly parent has a substantial amount of bequeathable wealth to offer. **Our intangible assets – family and friends, interests and passions – are ultimately the greatest source of lifetime happiness.**

Time is inherently egalitarian (everyone has 24 hours a day) and scarce (most say they don't have enough). Perceptions of time are a social convention. In general, people work fewer hours now than 50 or 100 years ago. In 1920, the average workweek by men was 50 hours; by 2005 it had reduced to 37 hours. The income effect: as people become richer, they want to consume more of most things, including leisure. Therefore, as productivity and wages rise, working hours fall-- a shorter working week, longer weekends and more holidays. It turns out that people want material possessions more than leisure time. People feel time-poor and under more pressure than before.

Around the 1990s those on lower wages worked fewer hours, and those on higher wages began to work a little longer than the low-paid. Moreover, the higher the pay, the more people worked. The substitution effect predicts that as wages rise, the cost of leisure (that is, of working less) also goes up. The greater the tax people pay, the cheaper it is to consume leisure. This is why in Europe, with its higher rates of tax, people tend to have shorter work weeks and longer holidays. Those at the top end of skill levels are under more pressure as they see the implications of a ‘winner takes all’ labor market. High wage jobs and the long hours they demand may also contain aspects that are enjoyable. Job satisfaction increases with the wage attached to a job.

In 1900 people had about 30 hours of leisure a week; by the 1950s this was 40 hours; and it increased again in the 1980s to 45 hours. Since then it has been decreasing and by 2000 was back to 40 hours. If people feel time-poor, what they think about is not discretionary time but spare time. People fill their discretionary time resulting in little spare time. Consuming takes time. As people get richer, they own more consumer goods, their leisure time becomes more hectic, as the rate of

accumulation of goods exceeds the increase in available leisure time. As a result people cram their leisure into ever shorter blocks of time. How do you squeeze in the theatre, Facebook, a party, a fishing trip and mainlining the latest Netflix mini-series? Jobs in the European Union come with at least 20 days' paid leave, although in many countries the reality is more: France and the UK have 25 days and Sweden has 33. In other countries, the provision is very short: in the US it is 12 days and in Japan 20. Setup costs make it better to work longer days with more days off. Currently those who want to build a fast-paced, highly remunerated career would be unwise to take time out or work flexibly. This will set up tensions as our need for flexibility clashes with the corporate need for long, unbroken, standardized hours of work.

During stages where accumulating money is important, people will still work long hours. The likely outcome will be a compromise, with firms offering different time packages and responsibilities to different workers. Skilled and senior leadership roles will always require long and intense hours of work. But this intensity creates a level of burnout that cannot be continued over a long second stage of 60 years of work. Factory work demanded the creation of a fixed working day and the separation of work and family. Leisure also became more sharply defined and no longer seasonal, as new blocks of leisure were invented: retirement, evenings and weekends, Christmas and summer holidays.

Before the Industrial Revolution, leisure occurred in public spaces in an ill-defined way. As the Industrial Revolution proceeded, it became privatized and regularized. Discretionary time is increasingly used for leisure activities. These all consume time rather than using it. Rather than consuming time, we may invest it in intangibles.

Every facet of life morphs as life extends. Marriage and partnerships become longer and experience more change, so they will need to be more flexible to avoid an increasing risk of fracture. Households have fewer children but more grandparents and great-grandparents. **The most profound impact of longevity on personal lives and families will be that, across a whole life, a smaller proportion of years will be focused on raising children.** In 1880, in 75% of families there were children living at home; by 2005 only 41% of families did. The 'transformation of intimacy' approximates the pure relationship sought only for what the relationship itself can bring to both partners. With the rise of dual income households, there is less focus on *production* complementarities as both people now work. Instead there is a greater focus on *consumption* complementarities. It is cheaper for 2 people to finance a large house, enjoy a holiday or run a household

There is also the advantage of risk pooling. This explains the significant shift to what has been termed assortative mating, where both partners are of similar age, education and income. Compared to 20 years ago, fewer young men and women plan to have children, and many put vitality and friends as being as important in their lives as long-term relationships and parenthood. In his 1992 survey, Friedman found 78% of students planned to have children; by 2012 this had declined to 42%. Many will have a smaller family later in their life. In 1980, the average proportion of women aged 25 to 54 who were employed or seeking was 54%; by 2010 this had risen to 71%. In the US in 1970, 70% of those with children

under the age of 5 were outside the paid economy. By 2007 this had reduced to 36% (women account for an average of 80% of all part-time work across the OECD). In many occupations, young women make up more than 50% of the entrants into work. In some occupations, such as medicine and education, it is more than 50%. The pay gap between men and women is narrowing. The ratio of annual earnings (working full-time aged 25 to 69) was 0.56 in 1980, 0.72 in 2010 and 0.77 by 2014.

Typically men work at the extreme end of all 5 work choices: significant time pressure; limited time autonomy; no flexibility around scheduling; a need to be constantly in touch with other team members; and limited opportunity for substitution. Knowledge-rich occupations (such as law, consultancy, investment banking) impose heavy penalties on those who want to work fewer hours and more flexible employment.

People over 65 are more likely to be married now than at any other time in the past. In the US in the 1950s, only 12% of white female college graduates' marriages ended in divorce. By the 1960s this had roughly doubled. By the 1970s around 48% of marriages ended in divorce within 25 years. These marriages that started with a high divorce rate reflected the following period of societal transition. For those who married after 1979, divorce rates have fallen.

By 2014, marriage was happening later, divorce was less likely and remarriage was less common. As the basis of marriage shifts from production to consumption complementarities, people choose on the basis of different criteria and the marriage lasts longer. A multi-stage life, where age is not a stage and more mature individuals display juvenescence, should lead to major changes in inter-generational dynamics. In Asia, particularly India, children, parents and grandparents often live together. The segregation of ages has been a major societal shift. Between 1910 and 1980 in the US, the proportion of people over the age of 65 living alone or with their spouse increased from 20% to 74%. Juvenescence could build a strong bridge between the generations. With few role models to act as guides, we can expect a period of experimentation as people negotiate complex multi-generational relationships. One impact of industrialization has been segregation of the ages. The state adopted rules that used chronological age to require children's school attendance while excluding them from the workplace, and to entitle older people to pensions. As the ages institutionally segregated, they became spatially segregated.

Distinct cultures often grow up around each age group. Sharing could positively impact both young and old. As life extends, child rearing is no longer the all-consuming event it once was, and in its place a phase of friendship could emerge. In the 3-stage life, age became a segmenter of life experiences.

As you encounter the flux of a long life, the single thread of identity connects the past to the present and then into the future. The plethora of new role models and the fading of lockstep will create social norms in which people will be forced to make their own choices. **At the center of building a productive 100-year life are plans and experiments.** Experimentation is required so that possible selves are considered and examined. You need to find what works for you, to understand what you enjoy and value, and to be insightful

about what resonates with your own character and personality. Experimentation is not just for the young – it will be crucial at all ages. Viewed from the perspective of a long journey, it is clear we invest more in a sense of self at the start of our journey, because we realize it is this identity that will be a crucial factor in structuring their stages and transitions.

Over a long life, dedication and focus are crucial. If mastery is to be achieved, there will be many occasions when you will have to determinedly put in hundreds, perhaps thousands, of hours of learning, rehearsal and repetition to acquire a level of mastery. People differ in self-control and these differences manifest themselves from an early age. Self-control is a learned behavior and we can be taught to defer immediate gratification in order to achieve personal mastery. Those who have a growth mindset are able to stick with future plans by pushing themselves out of their comfort zone and focusing on the path ahead. Those who don't, experience the 'tyranny of the now'. Those children who are taught and encouraged to attempt tasks that stretch them and that they find hard to complete are more likely to have this growth mindset.

Over a long life, learning and education are crucial. As an industry, education is conservative; it is, after all, based on teaching the current generation the ideas created by previous generations. And elitism and selectivity are seen to be crucial in bestowing an external market value on education. This reputational signalling feature of education – particularly by elite institutions – makes it hard for new institutions and new forms of certification to establish themselves.

Technology makes education ripe for 'disruptive innovation', We expect more MOOCs to become vocational, building portable, certified skills that can be taken from job to job. Age segregation will come under pressure from many angles. As people have more time available during the week and at different stages of life, there is sure to be an increase in the relative importance of part-time education. These forces will break down age homogeneity and usher in an era of cross-generational blending. An increasing proportion of employers report that the graduates they recruit do not have the skills they need, particularly with regard to creativity, innovation, humanity and empathy. From a curriculum perspective, there will be more emphasis on experiential learning whereby students experience first-hand to learn judgement and decision-making in conditions of ambiguity and uncertainty.

Firms must re-frame the practices and processes of corporate careers from 3 stages to multi-stages. One of the toughest challenges will be to change corporate attitudes to age and initiate a shift to age-agnosticism. Age in a 3-stage life is a simple proxy for experience, and this feeds directly into promotion and pay. Complexity often comes at a price. The war for talent and the growing importance of creativity and innovation all mean that many firms have strong interests in attracting and retaining good workers and will be prepared to listen and respond to their needs and requirements. For those jobs where man and machine work together, there may be more opportunity for flexibility, as the routine aspects of the work can be carried out by a machine. The scarcer your talents, the stronger your negotiation hand and therefore the more choices to structure your life and make the most of your 100 years.

Corporations create the context for work, while government policy builds much of the broad context for living. There are 2 ways of estimating life expectancy: period estimates and cohort estimates. Period estimates of life expectancy are, for rich nations, currently around 80 to 85 years. In contrast, cohort estimates, which factor in future increases in longevity, put life expectancy for the young at over 100.

The growth of sharing businesses, such as Uber and Airbnb, has already brought to the fore complex questions such as 'What is an employee?' and 'Who is responsible for benefits such as healthcare and pensions?' Differences in investment – in health, education, contacts and networks, savings – are what drives inequality, then over a longer life, where investment in a wider range of assets is more important, the danger is that inequality will increase. State investment in free education and infant health care were key periods of investment for the 3 stage life.

Social change takes a very long time. Increases in longevity accumulate slowly across each decade, rather than suddenly. When something accrues slowly, it is more difficult to take radical action. Costs of change are felt now while benefits accrue later. Young people are becoming increasingly disillusioned with politics. The larger, more politically active group of baby boomers focus government attention on retirement and ageing healthcare. If older voters have the ear of politicians, then reforms will take longer and are likely to be flawed. Firms and governments will want to persist with simple standardized models, but individuals will push for greater flexibility and individual discretion.

[Life expectancy has expanded at a steady rate of more than 2 years every decade for some 200 years. Our intangible assets – family and friends, interests and passions – are ultimately the greatest source of lifetime happiness. The most profound impact of longevity on personal lives and families will be that, across a whole life, a smaller proportion of years will be focused on raising children. People don't think their way into change--they act their way into change. At the center of building a productive 100-year life are plans and experiments.