

## Disruptive Technology and the Future of Financial Services: A Generational Analysis

Prepared for the FCA, Future Scenarios Conference

### 1. Introduction: the challenge of forecasting disruptive technologies and their impact

From the outset we should make clear that the subject matter of this paper is less certain than many of the others you will read in this series of papers for the FCA's Future Scenarios Conference. In our work we are asked to forecast a range of demographic, economic, social, political and technological phenomena. Technology is often the most difficult category to forecast accurately. This is especially true of disruptive technologies.

Each element of a traditional PEST (political, economic, social, technological) analysis has a slightly different evidence base with which to create forecasts. The nature of the evidence base influences the forecasting or futures methods used. Because disruptive technology is, almost by definition, new and unconventional, we have little (and often no) trend evidence to work with. This means that some of the more reliable futures methodologies are not available to us. For example, the lack of trend data makes statistical forecasting methods, such as econometric modelling, impossible or unreliable.

Put simply, if you encountered someone who claimed that they could tell you definitively the future impact of disruptive technologies on society and business, you would be rightly suspicious (and would perhaps wonder why the individual was not relaxing on their yacht in the Bahamas given their market anticipating prowess!).

In writing this paper we have developed a methodology for thinking about the future impact of disruptive technologies on financial services that combines demographic analysis and forecasts (about which we can have a high degree of confidence) with an audit of candidate disruptive technologies. By including more reliable socio-demographic factors, we increase our confidence in the forecasts and futures thinking beyond a purely technology-based analysis.

More specifically, our approach is based on three analytical strands:

- An analysis of each generation's relationship with technology (access, use, confidence in using, trust in technology etc.)
- An analysis of the financial needs of each generation
- An audit of candidate disruptive technologies and how the different generations might respond to them, considering the earlier analyses

This paper provides a summary for some key candidate disruptive technologies, but we believe that this framework could be applied to any new technology that your organisation may be considering. It should help you to think through which groups in society might have a need for the technology, allied with the access, skills, confidence and trust to embrace it. These should be key determinants of the potential of that technology.

### 2. Why Generational Analysis?

There is strong evidence for behaviour in relation to technology being determined by generational cohort. Indeed, generational cohorts are increasingly defined by their relationship with technology. For example, Generation Y (aka Millennials) are commonly described as 'Digital Natives'. Generation Z, the latest generation to receive a label, largely comprising of teenagers are being defined as the first generation who cannot remember life before broadband and mobile internet access.



Douglas Adams perhaps best encapsulated the impact of age and generational cohort on our relationship with technology when he observed:

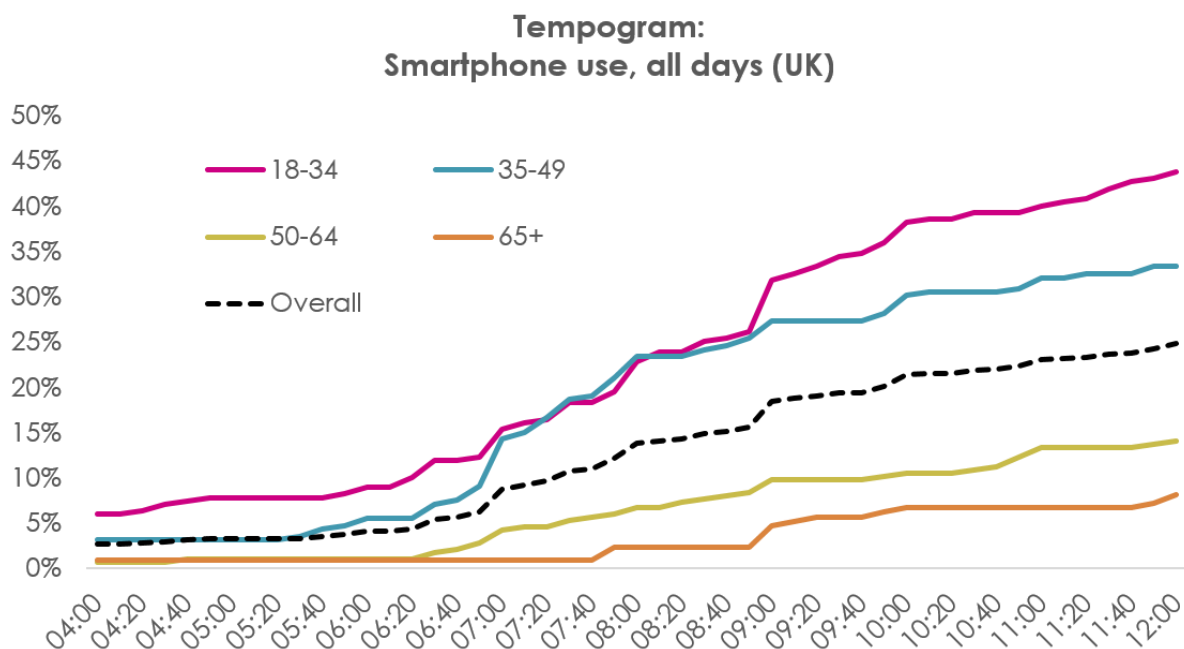
*"I've come up with a set of rules that describe our reactions to technologies:*

1. *Anything that is in the world when you're born is normal and ordinary and is just a natural part of the way the world works.*
2. *Anything that's invented between when you're fifteen and thirty-five is new and exciting and revolutionary and you can probably get a career in it.*
3. *Anything invented after you're thirty-five is against the natural order of things."*

Douglas Adams, 1999

Whilst not applying to absolutely everyone within each generation, there is more than a grain of truth to Adam's observation that our relationship with new technologies is determined by the point in our lives at which we first encounter them. Chart 1 below provides an illustration of this by comparing the use of Smartphones by age cohort. The data is taken from Trajectory's time use survey collaboration with the Centre for Time Use studies at Oxford University. The chart is a 'tempogram' that shows the cumulative proportion of the population, by age, that have used a Smartphone as we progress through the day.

**Chart 1: Differential use of Smartphones by age**



Source: Oxford University and Trajectory's Time Use Study 2016

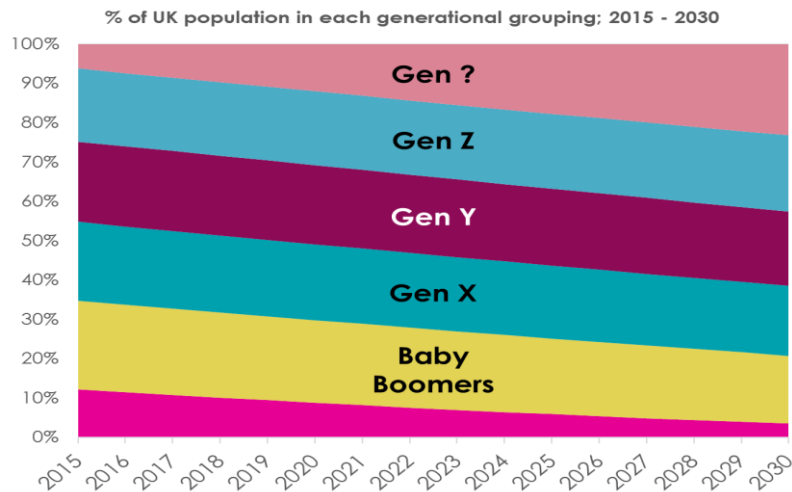
The chart shows that one in ten Gen Y's (18-34 year olds) have used their smartphone by 6am (presumably before they get out of bed in most cases). One in four Gen Ys have used their smartphone before 8-30am. By 8-30am only 2% of over 65s, the Pre-War generation, have used a smartphone. This is just one small illustration of how a relatively new technology is totally and seamlessly engrained within the life of one generational cohort and much less



so for others. Similar results would be found for the use of social media and other emerging digital technologies.

A generational perspective is increasingly important as we move into a future demographic situation in the UK that has been described as 'generational equipoise' - a position where there is no one dominant generation (see chart below). By 2025 the financial services sector will have to serve five adult generations (Pre-War, Boomers, plus Gens X, Y and Z) all having very different relationships with and needs from technology. Each of the four younger generations are roughly equal in size and none of them can be ignored by the sector.

**Chart 2: The UK's emerging 'Generational Equipoise'**



Source: Trajectory Analysis of ONS data

The current size of the generations is as follows:

- **Pre-War (aged 70+yrs.):** 7.5 million people or 11.5% of the population
- **Baby Boomers (52 to 69 yrs.):** 14.5 million people or 22% of the population
- **Generation X (37 to 51 yrs.):** 13.1 million people or 20% of the population
- **Generation Y (22 to 36 yrs.):** 13.3 million people or 20% of the population
- **Generation Z (6 to 21 yrs.):** 12.2 million people or 19% of the population

Children aged under 6 are excluded from the above analysis.

### 3. Generations and their use of technology

Each generation has a different profile in terms of their access and sophistication of technology use (all data quoted in this section from Ofcom 2016):

#### Pre-war

This is the generation with by far the least access to technology; 25% use a smartphone (49% below the figure for all UK adults), 68% use a laptop (15% below the average) and 30% use a tablet (21% below the average). This is also the generation whose use of technology is the least 'sophisticated', focussed mainly on communication and browsing. We should point out



that by sophistication we don't imply that using e-mail is less sophisticated than making online content, but rather than the ability to create content, disseminate them en masse, and communicate through them is virtually absent from this generation.

### **Baby Boomers**

Access remains well below the average for Boomers, but is significantly higher than that of the Pre-War generation. Just over half of Boomers use a smartphone, while 78% own laptops and 41% use tablets. While these figures for usership are far higher than that of the pre-war generation, they remain significantly below that of the UK average, particularly with smartphones which are a key device in more nuanced use of the internet. Social media use is more common for Boomers than the Pre-War generation, but remains a minority activity.

### **Generation X**

Generation X is the oldest Generation to have tech access above the UK average, and represent a significant departure from their older counterparts. Smartphone and Laptop use are both higher than 80%, with smartphones used by 83% of Gen X. In general tech use is much higher than for Boomers, particularly for smartphones. Sophistication also represents a significant departure from their older counterparts. For example, 54% of Gen X adults go online for work or studies. Their use of social media is more similar to Gen's Y and Z than that of Boomers or Pre-war.

### **Generation Y**

As you might expect, access among the original 'digital natives' is very high; 89% own a smartphone which is 15% above the UK average, while 61% own a tablet, 10% above the average for all adults. Interestingly while 82% own laptops, this is 1% below the UK average. While it could be that this points towards an overarching shift from PC to mobile, it is likely that the reality can be found in the way technology is being used by this generation relative to the one older and the one younger than them.

The increased use of social media as we go down the generations continues. As for Gen X social media is the third most frequent form of internet activity in Generation Y, however the proportion of respondents who use it increases. This generation is also more likely to use technology for entertainment and for transactions than the older ones.

### **Generation Z**

Despite their young age this generation (based on 16 to 20 year olds only) has the highest level of smartphone ownership of any generation at 94%. This reflects that mobile internet is their most natural method for accessing the internet, as they are the first generation to grow up with mobile internet access. In Gen Y are the digital natives then Gen Z are the 'mobile natives'. Almost everyone in this generation uses social media (93%).

These distinctive patterns of current technology use give us some useful clues to the likely take up and use of new disruptive technologies:

- The two older generations are more suspicious and less trusting of new digital technologies than the three younger ones
- Concerns about privacy and 'computer error' are inhibitors of technology use among the two older generations. Trajectory's own *Global Foresight* surveys show that 42% of those in the Pre War generation say that concerns about privacy limit their use of the internet. This figure falls gradually for each generational cohort with a low of 19% among Generation Z.
- The two older generations are less confident in their use of new technology, and need more support and guidance, even if they come to trust it. This is particularly true for using the internet for creative things rather than finding information. Ofcom data suggests that only 25% of the Pre War generation are confident in using the internet



for creative things. This figure rises through each generational cohort and peaks at 82% for Gen Z.

- Generation X is a pivotal generation, to this point it has had more in common with the younger generations in embracing new technology in terms of access, but they use it less instinctively and are less confident in their use
- Generations Y and Z are largely separated by the latter's instinctive use of mobile technology and all that means for 'always on' and 'real time' interactions as consumers

#### 4. Generational financial needs analysis

Our premise here is that the most successful technologies are those that meet a genuine consumer need – i.e. those that are demand led. Of course, some technologies can be supply led and 'imposed' on consumers because they offer efficiencies to the supplier or a social benefit (e.g. Smart Meters or credit card PIN numbers).

However, in the main part, our assumption is that the disruptive technologies that will really fly are those that are demand led or consumer 'need meeting'. So let us consider the key challenges and needs facing our generations.

##### **Pre-war**

This group are facing challenges related largely to their age; Isolation, Care, Health and End of Life Costs. When it comes to finances specifically they may want to simplify their affairs and are unlikely to be in expansive or speculative mode.

##### **Baby Boomers**

The Boomers are reaching a stage at which health and care become problems. While much of this generation is approaching retirement, if they haven't retired already. In addition, societal and economic contexts – namely the increased life expectancy of their parents and the extension of the end of life, and the struggle to rent, let alone own, faced by their children – mean that the Baby Boomers are often supporting themselves, their parents and their children financially.

##### **Generation X**

Many of the problems faced by Generation X will be the same as those faced by the Boomers. At the older end, many will be considering their upcoming retirement, ensuring that enough money is stored away for life after work. Many will still have mortgages to pay off, and, like the Boomers, many in this generation will be supporting parents, as well as children, who unlike the boomers children, will be either in, or approaching higher education with all the costs associated with it.

##### **Generation Y**

The challenges faced by Generation Y are probably some of the ones most widely reported in the media. This generation faces problems with housing, leading in turn to suspended adulthood and delayed financial commitments to traditional products like mortgages and pensions. Further, student debt and stagnant wage growth make solving these problems even more difficult.

##### **Generation Z**

Arguably, it is too soon to say what the financial needs of Gen Z are likely to be. At the older end (say 16+) they are likely to face many of the challenges of Gen Y, in particular, in relation to financing higher education and the challenges of housing costs and property ownership.



Clearly, if applying this approach within your own organisation you could use more finely calibrated assessments of consumers' financial needs based on your own customer data and segmentations. The above is only a rule of thumb for society wide analysis.

### Age and wealth distribution

Finally, for this section, it is important to acknowledge that when it comes to wealth, not all generations are equal. The ONS's Wealth and Assets survey suggests that 22% of Baby Boomers have wealth (assets and cash) of more than £1million (the highest of any generation) compared to only 3% of Gen Y. Gen X and Pre-War are the next best represented generations in the £1million plus category at 12% and 11% respectively.

This data reveals the dominance of the Boomers when it comes to many types of financial services requiring advice and portfolio management.

At the opposite end of the wealth spectrum Gen Y has the largest proportion (14%) of people in the lowest, less than £12,500 wealth category on the survey, compared to 4% of Boomers.

## 5. Implications for disruptive technologies

We hope that the analysis above usefully sets out the socio-demographic backdrop in which new disruptive technologies will operate and that this provides a framework for predicting their likely take up and success. Here we 'audit' some candidate disruptive technologies against these factors as examples, and to explore their likely success and take up in light of the generational analysis.

### Robo-advisors

A 2015 study from AT Kearny (The Coming Waves of Consumer Adoption) provides strong support for the framework set out here, when it comes to take of robo-advisor services. Robo advisor services are a highly-automated class of financial advisor that provides financial advice or portfolio management online with minimal human intervention. This study asked a representative sample about their likely take up of robo-advisors and created the following segmentation:

- |                                      |                  |
|--------------------------------------|------------------|
| • Pioneers (or first wave adopters)  | 6% of the sample |
| • Enthusiasts (second wave adopters) | 26%              |
| • Potential Late Adopters            | 15%              |
| • Unlikely Adopters                  | 52%              |

There was a striking correlation between the segments above and age. The Pioneers were the youngest group (50% under the age of 35). The Enthusiasts were slightly older than the Pioneers and the Potential Late Adopters were slightly older than the Enthusiasts. The Unlikely Adopters were the oldest group of all (45% over the age 55 with a high incidence of retirees). So, the survey suggests that over half of the current population are unlikely to use Robo-advisors, with the key determinant of this being age. Douglas Adams take a bow!

The survey does not go into this level of detail, but it seems highly likely to us that concerns about trust, privacy and 'computer' error were inhibitors to the take up of robo-advisors among the older groups. This is particularly unfortunate for robo-advisors as the generational groups with the types of financial portfolios that might benefit from their services are heavily skewed towards the older, less tech trusting generations.





Of course, this does not spell the end for robo-advisors. Rather, it suggests that their full disruptive potential might be delayed. Nor are we saying that the delay will be a 'generational' one, requiring decades to work through (or until the Pioneer and Enthusiast cohorts reach their peak wealth as 50 or 60-somethings).

Rather, we suggest the delay to full potential will be as long as it takes robo-advisors to prove themselves (or otherwise) to the sceptical older generations. A track record of successful market performance could well overcome the initial cool reaction of the older generations. Further, we can also imagine a scenario in which older generations invest lightly and 'dip a toe' in robo-advisor waters to test their performance and reliability. In the short term, somewhat paradoxically, there may be a big role for human advisors promoting the benefits of robo-advisors to their more technologically conservative customers.

### **Bitcoin, cryptocurrencies, and blockchain**

We can also imagine a similar scenario for the take up of Bit Coin and other cryptocurrencies. The concept of cryptocurrency, that exists solely online may be too 'alien' for older generations. Ironically, of course, one of the purported benefits of cryptocurrencies is the security they are meant to provide compared to conventional online transactions. The revolutionaries driving cryptocurrencies imagine benefits of increased privacy for their users too. But at this stage we imagine that privacy argument will be hard to win.

However, here we can also imagine a scenario in which the use of cryptocurrencies is accelerated. There are currently plans to evolve cryptocurrencies so that it is possible to store other assets such as gold in your electronic wallet that could be accessed via your mobile phone or computer. Furthermore, in theory this would allow you to spend your gold wherever you liked or transfer it to a third party in a fast, reliable and secure manner. One of the criticisms of gold as a safe asset during a crisis, is that you "can't buy a cup of coffee". This could be the answer. And, by providing older consumers with two familiar elements – gold and a credit card – might overcome resistance to more alien cryptocurrency concepts for the older generation.

Further, we imagine that the two younger generational cohorts will enthusiastically embrace cryptocurrencies. The issue here is that (generationally speaking) they do not have the wealth to invest in them. When that time comes, we may not see the apocalyptic 'Death of Banking' predicted by some commentators, but conventional banking will have a big new competitor on its hands.

### **The Internet of Things and The Quantified Self**

Here we turn to a class of technologies that are not specifically financial services oriented, but will nonetheless have huge implications for the sector. In this context, we believe it is appropriate to combine our analyses of the Internet of Things and The Quantified Self as both technologies have the capacity to add to the personal data that the financial services sector will have about its customers. This could be particularly revolutionary for insurance markets.

The Internet of Things is the development of the internet which sees everyday objects have network connectivity, allowing them to send and receive data. Current market examples tend to focus around home automation and smart homes. However, potential future applications are much wider and might encompass automation in nearly all fields, while also enabling advanced applications like smart grids and the creation of smart cities.

The Quantified Self, is often narrowly defined in health or medical terms as incorporating technology into data acquisition on aspects of a person's daily life in terms of inputs (food consumed, quality of surrounding air), states (mood, arousal, blood oxygen levels), and performance, both mental and physical. Data collection is through wearable sensors and wearable computing (Fitbits and Apple watches being early examples). We believe that this health-related definition could be usefully extended to incorporate wider phenomena such as real time quantification and analyses of leisure patterns, lifestyle and, indeed, finances.



Our generational analysis suggests more widespread generational appeal for both these developments. Yes, the older generations may have some latent concerns about privacy and the how the data being collected by the various devices and monitors is going to be used. However, we believe that these concerns will be trumped by the life enhancing utility that these devices will deliver, especially for older people. Crucially, they will address many of the generational needs around health, isolation, care and monitoring end of life cots identified in section 4 above.

This means that the financial services sector must prepare in the coming five to ten years for an era in which much more data is available about customer health and lifestyles. This offers huge opportunities, for example, to price insurance products more precisely on a customer by customer bases. But it will also present ethical challenges around the potential for financial exclusion and pricing the highest risk customers out of markets.

### A concluding thought...

*"Technology is stuff that doesn't work yet"*

**Brian Ferren**

Brian Ferren is a computer scientist whose patent for multi-touch gestures on screens led him to cross swords with Apple. The point of Ferren's quote is that technology is only technology until it's use becomes so intuitive that we no longer see the 'technology' that goes into it. A chair was once 'technology' until it's use became so pervasive that we no longer consider it as such.

While technology will continue to progress, much of this progress will be towards making existing technology more accessible, more effective and more efficient for more people. Though the leading edge of technological development may always be beyond the understanding of most of us, there will always be efforts to take these pioneering technologies and place them all in our homes, in our hands and in our cities. In this context, we can imagine a future in which the very notion of 'technology' disappears for all generations.

**Paul Flatters**  
**Co-Founder and Chief Executive**  
**Trajectory**

[paul@trajectorypartnership.com](mailto:paul@trajectorypartnership.com)  
020 8004 4861

Trajectory  
22 Upper Ground  
London  
SE1 9PD  
[trajectorypartnership.com](http://trajectorypartnership.com)  
[@TrajectoryTweet](https://twitter.com/TrajectoryTweet)

