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The Theory of Post-Economics

Part II – Redefining the Elements and Values of Economics

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At present, we might think of economics as being the binding force that governs the creation and provision of – and regulation of access to – products and services. That might not sound like much, but these broad terms cover more or less every 'transactional' interaction we have with external businesses, governments, bodies and each other; whether that be taking out a subscription with Netflix, buying a sandwich, funding public services through our taxes or paying someone to clean your car. Economics 'sits' in-between everything that we access and do. Having a system in place to support this comprehensive range of interactions is absolutely central to the functioning of a modern society.

There are four necessary, interrelated and symbiotic elements involved in this process:

- Something to create / provide products and services;

- Some people to access / use those products and services;

- A means for regulating people's access to products and services; and

- A means for people to accrue those means.

Under a traditional economic system, these four elements are referred to as businesses, consumers, money and jobs respectively. These are all required elements and – economy or no economy – need to be fulfilled if any kind of system is to operate successfully. If one of those pillars is removed, the whole cycle breaks down and the only realistic option is for people to become far more self-sufficient – making their own food, clothes, homes etc.

So each of these still needs to be fulfilled if we want to avoid setting back the clock several hundred years, under the romantic pretence that everyone was really happy in the middle ages, living out a bucolic and stress-free existence. The necessity of fulfilling them is not ruptured by the introduction of widespread DCT. Instead it is the definitions for each element and what characterises them that are variable. The question here is not whether economics has been essential to how this system has been governed in the past, but whether the ways in which these elements are defined under an economic system have any relevance when DCT is overlaid, at great scale, onto the process.

The following four sub-sections look at these elements individually to illustrate why economics doesn't make logical sense anymore and outlines how digital connectivity and the four factors described in the previous chapter require them to have entirely different – and post-economic – definitions.

Money ('A means for regulating people's access to products and services')

Money, the means by which we assign and attribute economic value to things, determines people's capacity to access those things (products and services). For a society to function, the people in it need (and, indeed, want) to be able to have access to certain things and these things (physical ones at least) are finite so this has to be regulated in some way. Hence the requirement for some form of determiner will not change. There has to be some way to measure this or everyone could make equal claim to things for which there is insufficient supply (yachts, luxury breaks and diamonds, for example).

That determiner is essentially a calculation and expression of value. So, in a basic sense, under an economic (which is to say, monetary) system, if the supply of a product matches or exceeds demand, the value of it is not adjudged to be high and it can have a low price point making it possible for relatively high numbers of people to access it (assuming that the costs to build / manufacture / farm / distribute / replenish in the first place are not prohibitive in that respect). If the reverse is true – that demand outweighs supply, or it is expensive and resource-heavy to supply – then the price can rise accordingly. There are of course other factors that can increase the value of a product (such as it being fashionable, associated with a celebrity or conferring a sense of exclusivity) but this is the basic principle – that money serves as a bridge into things that typically have a predetermined, generic and fixed value assigned to them.

With money, a thing is said to be 'worth' something. Value has to be situated within that thing – it has to exist somewhere for it to be calculated consistently. Hence we say '*this car is valued at £5,999*'. That is what it is worth, based on the factors (and possibly others) mentioned above, and a consumer needs to be able to possess that amount of money (or be able to qualify for sufficient credit) to purchase it.

Value is the constant here, but that value being economic in nature (monetary, specifically) is not inevitable, neither is the location in which value exists and finds expression, which at the moment is within things. The 'means for regulating people's access to products and services' has traditionally made little connection between the person and thing being accessed. So a branded widescreen TV may retail at £1,999 and that price is the same for everyone who wants to buy it. There are caveats to that statement – currency variances may make it more or less expensive if purchased online by a customer in another country (paying in their local currency); people may get discount codes or it could be marked down for clearance, but still this is a generic price point available to multiple, typically all, prospective shoppers.

And this is the role that money has traditionally been required to fill – the provision of a generic means for enabling trade between two (potentially very diverse) entities. If someone bakes and sells cakes for a living, it would require a very complex calculation to work out how much of an investment banker's expertise could be logically traded in exchange for a single cake. Money simplifies this process by estimating the manufacturing and supply costs and adding some mark-up on top, which becomes its retail value, common to all prospective buyers, so disparate entities can use that common currency to transact.

Money loses its relevance in the digital age precisely because this idea of common-to-all generic qualifications for access (ie having enough money to buy something) doesn't translate to an infrastructure in which individuals can be known and understood on an individual and ongoing basis. Personalisation functions by eliminating the need for the non-specific; total personalisation is the eradication of the generic.

The widespread availability, and continual augmentation, of information on everything that happens makes the notion of generic, common-to-all pricing structures obsolete. We are now quickly moving past the point at which it makes sense for anything to have a single point of value, worked out in isolation, that is the same for every single individual who may wish to obtain or access it irrespective of want, need or circumstance – because these things can be known and factored into the calculation of value.

The process of someone paying for something based on a fixed cost approach is valid when little specific can be understood about the purpose of the transaction. As far as the provider of the product or service (ie a business) is concerned, the person making the purchase cannot be understood in detail in an efficient manner, therefore needs to be treated exactly the same as any other individual – shown a generic price, which they can either pay or they can't. If an individual has more money than someone else, they can buy more than them, it's as simple as that. This makes the concept of money itself generic – if one person has a pound, it's value is the same as in the hands of any other person when it comes to capacity for accessing products and services. The trick, of course, is to have lots of pounds.

Under a system of economic value, if you can't pay for something you don't get it, even if it makes sense in a given context for that person to have it. As already mentioned, in the digital age money is being replaced by data, which is what businesses collate on people in exchange for accessing services for 'free' (using a network, sending messages etc). Economics is then kept relevant by monetising that data behind the scenes – selling information on people to advertisers. Yet economic value here is an afterthought, as the transaction was completed as far as the individual is concerned when they accessed the (ostensibly) free service. It's a hangover from the old way of doing things as we haven't yet accepted that the way things work needs to be redefined. It seems apparent that we have to pay with data in some way in the new world, but this is being interpreted literally as money – and, as we saw in part one, data isn't the same as money.

A service, particularly a digital one, is different from a physical product. Facebook has two billion active users and its services are free to access (from the user perspective at least; businesses pay to gain insight on their potential audience and to promote themselves to them accordingly). Providing that service is a lot less complex from an operational perspective than providing two billion physical units of something around the globe, whether that be berries, cars or chairs. A digital service requires virtual capacity (space on a server) to deliver it (ok, development and maintenance too, but these still entail lower resource commitments than supporting something of a similar size physically); physical items need to be manufactured, stored, transported, fulfilled. The items may be perishable, which brings added complexity around storage and transportation. The recipient has rights around returning the item. In addition, digital services can be accessed repeatedly without realistic limits. Physical items may be 'buy once, use once', so the provision of two billion units may need to be done with regularity.

So 'free and physical' are not as straightforward (comparatively speaking) as 'free and virtual'. We need to have some means for connecting up the supply of thing (product or service) to an individual in such a manner as generates and / or confirms a measurement of value. Yet the nature of this relationship of business to person is no longer the same as it was in the previous unconnected age, where information was comparatively sparse. This changing nature relates to the linking of value to the purpose and outcome of a transaction or interaction, due to the fact that they can be outlined, tracked and updated by DCT on an ongoing basis.

To illustrate this, consider the current process of getting a product to market. Someone either has a clever idea (a new cut of clothing, a soup recipe, a new design of chair) or spots a gap in the market (colouring books for adults, web technology targeted at the elderly). They may come up with a prototype or, if the manufacturing costs and overheads

are relatively low may be able to get up and running themselves to a limited degree. When they get to a certain point, it might be possible to secure some investment, which makes upscaling possible due to funding being available for expanding production and marketing.

Competition then becomes a more significant consideration. This is a major part of how things currently work due to the nature of production being generic. The product brought to market might be a single recipe or design that is mass-manufactured. As lots of different products and services can exist in competition with each other for the same customers, businesses in a consumer economy often technically compete over attention – with each focusing on trying to capture and keep that attention while building up loyalty to their brands. As there is so much choice about – and some of the products and services do not have sharply defined differences between them – people can easily forget about a brand if it isn't continually reinforced through advertising and other means of exposure. People have to be told that they need something because, as clever or useful as the product may be, in truth it was created with no actual person in mind. It was built for no-one, so they have to 'find out' that they want it.

Money makes sense in this context, as it creates a trackable measure of value that specifically relates to how many units of a product or service have been shifted. Typically, the more the merrier. Money is performing the role of common standard that is necessary for efficiency when two people / companies / governments have limited means of communicating information about the long-term impact of a transaction or interaction. It just deals with what is exchanged in a single moment in time. The transaction or interaction is primarily serving an economic purpose, hence the measurement of what value has been *achieved* in the process is calculated using monetary criteria (so a business might say '*we ran a campaign, it generated £100,000*' and the consumer might say '*I bought this, it cost me £30*'; that is how value finds expression).

DCT changes the assessment of value because it greatly increases the speed and frequency with which information becomes available – so the idea of things happening in a seemingly unconnected, unpredictable and sporadic manner from the perspective of a business (as in someone might buy something from them if they decide they want it – a purchase is made and the transaction is complete) becomes connected, continual and real-time. Detail on the reasoning behind that decision to purchase can be known, as well as information on how that product is used post-purchase. The point of purchase, the stage at which money is currently situated, just becomes a single point in a highly complex calculation that includes every entity involved in the creation, distribution and fulfilment of the thing that finds its way into the hands of the end-user.

Upon initial consideration, this sounds like a highly inefficient process that has no logical start or end and that, consequently, means value is no longer static and in some cases may not really ever be fixed and complete. Money is a much more simple solution that can, ostensibly at least, fix value to enable transactions to be completed at a single moment in time. Money, in an unconnected sense, brings efficiency to transactional processes. Yet it is the very nature of DCT to create potentially meaningful insight at every point of interaction that an individual has with anything digital (which will become hard to avoid in the near-future, arguably is already), so the calculation of value has to extend and fragment into a far more complex form as the contributions made to it are traceable between multiple entities.

This is where the concept of purpose becomes important. If so much can be known about what is required, where it was used, in what way and by whom, value becomes linked to whether the thing (product or service) created was used either for the purpose for which it was intended, or in some other meaningful way. The calculation of value is then shared among all involved in the creation of the thing, how it is distributed, monitored, marketed and used.

To use an example, consider something fairly basic like an apple. If I want to buy an apple today, I go to the shop and pay for it with my money. That's the end of the transaction – the retailer gains a little bit of money, I have spent a little bit of money – I might eat it, I might throw it away, I might give it to someone else but none of this matters. From an economic perspective, the process was completed at the till – there is no further role for value to play in this scenario.

If we now fast-forward to a world in which total connectivity and total personalisation are not only possible but have been enacted to some extent, we now find ourselves in a position in which everything associated with the apple can be measured to understand how it demonstrates value – from its farming, processing, distribution, marketing, right through to who eventually consumes it.

Did it go to the right person at the right time, ie someone who benefited from that apple in some way at that moment? Was the overall process used to encourage certain groups or demographics to eat an apple (children or people who don't eat much fruit)? Were the processes involved in growing and distributing the apples sustainable? What is the purpose of farming and distributing an apple in the first place?

Value can be determined right throughout the process. It doesn't just start and end at a transaction as such – when you have an identified and stated purpose for an activity (which in this case is farming or creating a product), the determination of value is an ongoing concept because data is produced that enables the success of activities associated with it to be measured. This means the way in which the farmer, retailer, distributor etc work together to get the right thing into the hands of the right person at the right time can be assessed as part of the overall picture. If any area falls down, then value is lost – if the apples were successfully harvested but ended up in the hands of people who didn't really need them, perhaps even wasted them, then very little value can be said to have been achieved. What's the use in paying the supplier and distributor for such an outcome as that?

The question isn't how much the apple should cost an individual and how they will pay for it, but why it was made in the first place and whether it served its intended purpose. Information changes the relationship of business to individual, as the activities they undertake can be known and understood. The trade-off for allowing themselves to be known in this way is the provision of experiences that are relevant and personalised – specifically designed with a unique individual in mind. This is both the promise, and greatest strength, of the web.

An apple is consumable and has a relatively short timeframe within which it can be used. Its value is also relatively easy to calculate as the function that it serves is pretty basic – it has a degree of nutritional value and individuals have a need for nutrition. When it comes to items that potentially have far longer product lifecycles but that offer no clearly

trackable benefit like nutrition, the measurement around value becomes a bit more complex.

For this example, let's consider a shirt. At its most basic level, clothing could be assessed as something that provides warmth to its wearer. But obviously this is far too simplistic a measurement to make and would also be fairly uninformative for use in hot climates. Additionally, if this was the only purpose of clothing, every item would just look the same.

Clothing is often about the slightly more intangible factors – fashions and styles, expressions of individuality, how well it 'suits' an individual, how they feel when they dress in certain ways. Clearly these are not straightforward measurements so the assessment of value has to be different.

If we look at how fashion retail works at the moment, clothing often seems to be regarded as a highly disposable commodity. Every season has its 'ins' and 'outs' and people have multiple wardrobes and chests filled with clothes (most of which is worn once or twice then remains on the hanger for a year before being thrown out; by way of a personal anecdote, a friend recently cleared out her old clothes and filled ten – *ten* – boxes). And the whole time of course, the fashion retail industry works hard to cross-sell and upsell us into further increasing the pile. From an economic perspective, this is a functional model as the demand is there and competition is rife.

Just to quantify this point, the number of garments produced globally exceeded 100 billion in 2014[i] – which equates to almost 14 items of clothing per person on earth.

This is a perfectly logical outcome when people are defined as consumers. The purpose of that system is to constantly sell more things to more people, encouraging them to feed money into businesses to keep stimulating economic growth. Hence the culture of highly disposable fashion, as there is endless choice and opportunities to get new things, so to stick to the same wardrobe for long durations betrays a lack of fashion consciousness. Producing huge numbers of items is not a problem in itself, but the trend for throwing things away when they fall out of fashion, rather than returning and repurposing them, is hugely inefficient from an operational perspective. Items produced under consumerism are typically intended for a single recipient only, to be discarded after use.

The solution to dealing with such a huge volume of disposed garments has been to redistribute it through either domestic charity shops, which account for about 10-20% of donations[ii], or organisations in the developing world. However, some of the recipient countries, particularly in east Africa, have recently announced that they will stop accepting donations as they want to support local clothing manufacture industries. This means the current model for how to reuse and recycle clothing looks like it will require redefinition in the near future.

In a world of total connectivity and total personalisation, how are things different?

The first point to understand is that the concept of fashion is likely to become a lot more individual. So while at present designers set the framework for what is on-trend at any given time, which is then interpreted into clothing ranges to be distributed generically through retailers, when complete information is available on each individual it can be further interpreted into a fashion item that is specific to them – that suits them, that is in line with *their* particular character and style.

Yet this level of personalisation is unlikely to be required for each item of clothing produced – socks, dressing-gowns, football kits etc (although getting the size exactly right would become more possible).

Having a mass personalised (or 'tailored' if you'll excuse it) approach doesn't of course preclude the individual from being involved – it wouldn't make sense to create something for a specific individual and ship it to them without checking they actually like it – instead it enables people to become absolutely involved in the manufacture and design of everything that is created for them. In essence, we will all be designers in such a world, all involved in the creative process. This is not to say that things would not be designed in such a way as they could only ever be appropriate for one individual, it is just that it was created with them specifically in mind.

This means that almost anything that is created can be shared and reused, rather than needing to constantly create new things as the old ones have been discarded. Which, for the purposes of this example, is a shirt, but it could just as readily apply to a toothbrush, pen or bag. Items may be sent back to be modified after use, to be tweaked and personalised to suit either the same or a different individual, rather than ending up in a landfill mountain.

The value of something lies not in itself anymore, but in what it does, how it is used and what it enables someone to achieve. It is becoming possible to transfer the determination of value from within something (ie this apple costs 35p) to what that thing achieves due to the ability to measure everything as data, on an ongoing basis. It is only appropriate for things to have value in themselves under an unconnected system, as it is simply not possible to generate a sufficiently comprehensive understanding of where something goes and what it does past the point of purchase.

Moving from an economic system to one based upon value is quite a shift. Under an economic system, an individual can be incredibly rich – and therefore have access to high levels of resource to squander – for either no reason at all or without performing to a sufficient level to genuinely deserve it. Some inherit wealth, others win it on the lottery, others have lucrative bonus structures in place that pay out even if they fall well below their targets – it's just that the rate of bonus is less. The point with economics, and why it is so inappropriate in an age of total connectivity, is that money exists in pre-defined volumes that can be earned and fixed at a point in time – via salaries, welfare payments, currency exchanges etc. Value, by contrast, is specific yet changeable over time, accrued and measured alongside activity and shared between (and influenced by) multiple entities.

So value still exists as a highly important and necessary element of how we manage our interactions with each other, but how it is determined has to be specific to the context in which it is used. The more detailed the information that is available on everything associated with a product or service and its usage, the more complex the calculation and more accurate the eventual outcome. Value is the ongoing measurement of that, not just the cost of initial access at the point of interaction, which is then considered to be complete under an economic system.

How AI systems determine the quality of an outcome will always involve value, but there is no logic behind that value being monetary in nature.

Consumers ('Some people to access / use those products and services')

When analysts, journalists and other types of commentator want to refer to mass groups of people, they often use collective nouns to suit various contexts. If someone uses transport to get to work, they are commuters; when they visit a high street or online retail store, they become shoppers; when someone is in education, they are students. The important distinction to understand here is that all of these terms are context-specific – which is to say they often only apply to certain periods of these people's lives, statuses they occupy or experiences they have.

Consumers are different. When it comes to applying that label, it seems to have the capacity to override any more specific terms that could have been used given the context the people are in – buying a house, shopping, travelling abroad, dining out (or in), voting, walking down the street – 'consumer' acts as the catch-all term that can be used interchangeably to refer to groups of people wherever they are, and whatever they are doing.

There is, of course, a reason for this. A consumer is a classification of person that relates specifically to their capacity to feed the economy. It recognises that each individual's activities, behaviour, preferences and lifestyle relate in various way to their spending power – how much they have to spend, what they want to spend it on, their aspirations etc. As the idea of 'the economy' has become so ingrained in how we understand the world (and the success of our endeavours), there isn't really any situation in which its use would appear entirely irrelevant. We are consumers because the infrastructure of the world tells us we are. It is also enshrined in law; much of the legislation that governs the relationship of business to individual has been constructed around the idea that people are consumers – who need to be 'defended' against business malpractice – and that the character of this relationship is inherently sales-orientated rather than primarily symbiotic.

But – a consumer is, by definition, an unconnected entity. They stand apart (hence the common term 'end-consumer') from the range of things made available by businesses, at the end of the design, manufacture and distribution sequence. When a product gets into the hands of a consumer, that is typically the first engagement they have personally had in that process. As per the example in the previous section, things are generally designed and created with no-one specifically in mind. They are mass-manufactured to appeal to demographic segments (new parents, football fans, teenagers etc) and based on behavioural trends associated with those segments (eg new parents find their free time is under a lot more pressure suddenly, this product helps them to carry out some routine task more conveniently). It then has to be marketed to consumers in clever ways to stimulate demand for whatever it may be and they are then able to make choices about which of the many products and services available are best suited to them. They have no involvement in the supply of a product or service, merely the final consumption of it. Hence, 'consumer'.

Being a consumer is all about having access to unbridled choice and being able to keep the decisions we make – and much of the information connected to those decisions – private. Choice is probably the chief virtue of consumerism – we regard it as a human right that we shouldn't be pushed into selecting something because it is the only option, whether that be a brand of food, mobile phone tariff, mortgage contract or music-streaming service. Under consumerism, we conflate choice with freedom and it seems

logical enough – after all, the more choice you have the freer you are arguably. But choice and freedom here are explicitly concerned with the relationship between consumer and business, as opposed to a more social and political meaning of freedom from oppression, dictatorship or slavery.

The creation of a product or service usually doesn't involve a specific individual until the point at which it needs to be marketed and sold to them, but there are multiple businesses at any one time trying to catch their attention. Anyone in principle is able to launch a product or service to compete with those already available on the market, and fierce competition is typically good news from the consumer perspective as the supporting businesses then need to work hard to differentiate their offering and provide the best kind of experience for prospective customers. Which is to say that, ideally, consumers are free to choose from a wide, constantly diversifying, array of options.

Supermarkets provide a good example of this in practice, stocking tens or even hundreds of thousands of different products within a single physical location, all vying to capture the interest of a single visitor. Sometimes the drive for ever-increasing choice gets a bit silly. An example relates to when Dave Lewis took over as CEO of Tesco in 2014, following the accounting scandal in which the company were found to have overstated profits to the tune of £250m[iii]. Lewis' strategy to make up the subsequent hit to revenues was to find savings wherever possible, and one such approach was to tighten up some of the ranges it stocked with a mind to driving better deals with suppliers. The resulting itinerary revealed that Tesco stocked no less than *50 different brands of ketchup* alone – surely, even by a ketchup fan's standards, a somewhat excessive range.

Nevertheless, under an unconnected system, it can appear good sense to make choice a chief tenet of a company's product strategy if it is operating in a limited-information environment. As it is not possible to know very much about anyone entering the store, everyone who comes in has to be treated the same to an extent, as the business relationship is effectively starting from square-one each time. Hence by offering such a wide range, the chances of a match being made are increased.

Due to the way that the web connects disparate entities and objects together, it is no longer accurate to assume that people only have a place at the end of business processes, external to everything that happens during the planning, creation and distribution of the product or service that an individual eventually accesses. When data is available on all activities and engagements between businesses and individuals, each specific individual becomes indirectly involved in the supply of products and services through virtue of their continual connectedness to them. This does not begin at the point of access anymore (when someone buys a product in a shop and now owns it), but even before the thing in question has reached the design stage in its lifecycle. Most things need no longer just be created in bulk and to a generic design, but to fit the requirements of a specific and unique individual for a specific purpose.

That point alone is not sufficient to change the definition of connected individual from consumer to something else. Consumers are also, fundamentally, economic entities – they are so defined as they are measured by their capacity to feed the economy. Now, if we take economics and overlay it onto this model of ubiquitous connectivity (something like total connectivity and total personalisation), something very obvious – and, most likely, highly unappealing to people generally – has to happen. The digital connected age

will bring about the continual commercialisation of every data point that can be tracked and measured, as economics is primarily concerned with the ways in which money defines and applies to interactions between people and people, things and things, and people and things. If connectivity works by creating connections between all people and all things, it is logical to assume that the world will evolve into a never-ending series of price-points (whether overtly displayed and communicated or more secretive and behind-the-scenes – data sold to advertisers etc) and commercially-influenced incentives for every activity undertaken by anyone anywhere. We might look at the evolution of bloggers as evidence of this; while they may appear to be covering topics and things of interest to them in their posts, often there is some degree of brand influence behind the scenes, so they can get paid for driving traffic to a brand's website or endorsing something. What seems like genuine content often has a commercial backdrop to it, sometimes subtly so.

This 'commercialise everything' model is no longer appropriate, as it presents businesses with a significant advantage over consumers. As any sales person will tell you, if you want to sell something to someone your best bet is to understand them, their wants and desires, needs and preferences, what they will respond to (or not). It doesn't require a single business to know everything about an individual – it is possible for businesses to forge partnerships with each other that allow them to access and cross-reference disparate datasets and generate deeper understandings. This does not create the environment for a fair and reasonable relationship to exist between individual and business on this basis. If people continue to be interpreted as consumers by the surrounding infrastructure, the purpose of interactions between the two groups will be to find sustained economic growth – that will be the 'common sense' that underpins it – and the ever-growing range of datasets becoming available on consumers will throw up ample opportunities for identifying new markets. We are a lot more visible and trackable than we used to be – and in truth we are only just scratching the surface.

In a world defined by connectivity, the people in it are defined by that too. The idea of something happening without gaining a more complete, connected understanding of what it's really achieving becomes an absurd notion due to the inherent inefficiencies it brings. It is not just the production of products and services that can't happen independently of anything else anymore – it will soon extend to potentially include anything that can happen, any activity that anyone undertakes anywhere.

Identifying when the true age of the individual begins is something of a moot point. The start of mercantile capitalism, the Enlightenment age, the Industrial Revolution, the post-Second World War period, the 1960s – all of these and more can make a reasonable claim. Yet in these previous ages where a greater sense of individuality became possible, it only tended to allow a certain group of people to express themselves in more individual ways and it was one-way traffic – having a greater sense of their own individuality is not the same as being recognised by all the surrounding structures and systems as being so. The difference in the digital age is that every single crumb of data that is collected can be uniquely attributed to a unique individual, with the experience that the person gets adapted accordingly, so that no two people on Earth ever need to receive the same experiences and communication – in theory, at least.

This isn't just some people starting to feel a bit more like individuals; it means that each person can't help but be recognised on that level, by everything around them, in any number of contexts.

Indeed, if we break down what connectivity really means and address its core usefulness at its most fundamental level, it is simply about creating connections between people. So – if it is inaccurate for us to regard ourselves as consumers anymore, positioned almost exclusively at the end sequence of relationships with businesses, how should those people be defined by the surrounding infrastructure on that far more individual basis?

The 21st century, so far, is arguably being shaped most disruptively by connectivity, and this has particularly been the case over the past decade as both the range of connected things and the contexts in which people can access the web have increased exponentially. This new definition of person, then, has to be characterised by connectivity and the term consumer was not constructed around that kind of characteristic at all. Consumers are economic entities and the economy has always been this intangible concept that exists externally to people. The new individual is directly connected both to other individuals and the entities that provide products and services to them. We are, by our very nature, potentially able to influence disparate and remote things that happen just by carrying out any kind of activity that can be tracked. When we are providing unique information that can be used to inform the start, middle and end of any business process, we are involved in ways that are very distinct from the role a consumer has traditionally played.

In fact, it might be more useful to consider connectedness along the lines of involvement. If connectedness is the means, involvement is the result – after all, being connected doesn't actually achieve anything by itself, it is merely the enabler. Consumers, in an individual sense, are not involved until the end of a business process – when a product or service is marketed to them and they are presented with the option to buy (or, consume) it. Instead of focusing on mass producing and shifting as many units as possible – which can be what equates to business success under consumerism – the new type of individual is actively, though also indirectly, involved in the creation of products and services specific to them by the very nature of their connectedness to them before, during and after the design and creation phase. It means getting the right volumes of things into the hands of the right people at the right time to fit the right purpose, in the most efficient manner possible – which is actually just good business sense and, in retail at least, has already been an idealised mantra for some time.

Indeed, if we are to define the new type of connected person by their continual, indirect and multitudinous involvement in the processes that make up the supply of products and services, then it is that *participation* that every business is there to serve, support and enable; it would be more accurate to label such individuals 'participants'.

Business ('Something to create / provide products and services')

If we accept that the primary role of a business is to provide a service or create and distribute products, then in many ways the nature of a business is determined by scale.

If we go back a thousand (or even just a few hundred) years, a country's population tended to be far less urbanised – society was predominantly structured around agricultural labour and the majority of the population lived in small settlements; parishes, villages etc. When operating in an environment like that, businesses can be very focused and restricted to serving the local populace – someone working the land might produce enough food for their dependents and hopefully have some left over to sell on; a smith might create and fix things for use in the local area. In many of these cases, though they were operating what we might identify as their own 'businesses' (which is to say they

were acting as the means for the provision of products and services, even if doing so without the official documentation we might expect of a business today and without as much regulation), expanding and upscaling would not have seemed like a viable option. The communication and transport infrastructure, not to mention the regulatory framework, was just not in place to support it. Business was, most likely in many cases and by comparison with today, far more personal – the customers accessing the products and services created by a business would have been, to a large extent, familiar, known by name and dealt with face-to-face.

As populations have grown over time, the infrastructure has also evolved to enable upscaling to be more feasible on a widespread basis. An improved and expanded range of transport options, plus the road / rail / canal / shipping lane / flight path networks to carry them, has been a major factor in getting us toward the kind of global supply chain that characterises business operations today. A garment may be manufactured in China, put together using base materials and equipment sourced from multiple countries in Africa and South America, then sent across to the UK for processing before being shipped out to North America for distribution to an end-consumer – this kind of complex multinational supply arrangement is not uncommon at all.

Clearly, the nature of businesses in the modern age in many people's minds is the exact reverse of those from the pre-industrial age, as business has gone 'big' – faceless, distant, multinational and branded. As the personal touch has been subsumed beneath the sheer scale of operations, the importance of having a strong 'brand' has taken on a far greater significance. A brand is different from a company or business and there is nothing new about the concept itself (it's possible to argue that a king's emblem or a family's coat of arms is a brand of sorts). From the perspective of a company the brand serves to communicate to individuals that they can expect to receive a certain kind of experience when they engage with it – in part to make up for the lack of a personal element ('*I know that particular individual at the hairdressers gives a good cut, so I always go there*'). A brand might communicate a concept of price for example ('*they do good deals*'), quality ('*good produce*'), integrity ('*they don't screw you over*'), ethics ('*they source their products using sustainable methods*') or even something emotive ('*they produce funny content*'). Probably the most effective and recognisable device for communicating what the brand stands for is the company logo – a kind of 'face' for the business. As people are now, theoretically at least, connected all the time – through social networks, search engines, comparison sites, apps etc – the possibilities for communication are endless and brands need to create and sustain an image of themselves that can attract people toward them through a huge wall of noise from other brands. A brand stands apart, making the promise of a certain kind of experience for consumers who then ultimately have to make the decision that they are the right option for them – it presents a generic message that a given individual is either swayed by, or is not. A brand is about the company, not any specific individual who may be a target for its message.

The main limitation on the potential scale of a business is the enabling technology. The largest platforms – Facebook and Google et al (who can also be referred to accurately as brands, as can almost any business) – can have billions of concurrent, regular users, who are serviced using a skeleton staff, relatively speaking (Facebook, for example, has two billion users that it serves with a staff of less than 20,000). A person sat in their bedroom typing commands into a browser session could not be more impersonal – but that issue is

being overcome by the availability of data and its inherent ability to provide unique identification for the individuals to whom it pertains.

Which represents a full circle in terms of the nature of business and how personal businesses are able to be with their customers. It has gone from being predominantly local and face-to-face on first-name terms to global in scale, with companies having millions and even billions of customers about whom they know either nothing at all or the bare minimum. Now that knowing the customer has become possible again through DCT, even for the most global and remote company, there is a big difference in how deep that knowledge can be. The *personal* has become *personalisation* – it is not just having some information on them and their character, but potentially having real-time streams of information on any activity that they undertake. When that level of information can be known about an individual, using it in any way other than in their interests would appear remarkably impersonal.

Despite the importance (and, in some cases, effectiveness) of the brand, a business is also not a thing in itself as such – it doesn't really exist in any palpable sense as an entity. Broken down to its core elements, a business is a term that is registered with the relevant authorities in a territory so that it is recognised as an authentic business there to enable it to operate within a certain legal and regulatory framework. It further functions as a private holding to which finance can be assigned, so its purpose is to secure and make available resources – money, assets (equipment, property, vehicles etc) and employees.

This is an important point – while we often think of a business as being good at something or providing an excellent service in some area or other, in reality a business is just a banner under which a collection of people come together. Every individual has their own strengths and weaknesses and it is very common for business leaders to speak about how critical it is to get the right team in place to realise a project successfully. It is the most talented individuals in a business who come up with the ideas, strategies, campaigns and processes that shape how the business is able to provide services to a high standard of quality. A strong brand with weak employees will soon lose its sheen.

So businesses are also a kind of network, connecting people together to offer the appropriate mix of skills required in order to fulfil a service or purpose.

Now let's consider why businesses exist today and how the success of their endeavours is measured.

Each business has to fit into the current environment that is in place and, as that environment – both in a regulatory and a cultural sense – is economic in nature, every business has to play by the economic rules. These rules are different in some cases – not-for-profit organisations can benefit from different tax requirements for example – but they still all have to generate enough funds to pay non-volunteer staff, rent property and access services from profit organisations (phone lines, computers, office furniture). It is the ones that are able to cover their overheads, carry out their service to a standard that helps them both acquire new customers and retain existing ones, and have some revenue left at the end of the financial year that pushes them into profit. The measure of successful growth is ultimately an increasing profit margin year-on-year.

Each business belongs to a sector (eg retail) that may span several markets, which can either be top-level or more specific (fashion; fast fashion; mid-teen fast fashion; female

mid-teen fast fashion; female mid-teen fast fashion in China). Once a market becomes relatively mature, growth rates tend to become lower and may even fall into negative territory. This does not mean that there is no growth available within the overall sector, it is about identifying those opportunities for growth. So while fashion as a whole may be recording sluggish growth, it may be that the female mid-teen fast fashion market is booming, particularly online, while it is the more established areas of the overall market competing in the more traditional environments that are struggling to grow.

This will ever be the case, as the markets that have strong growth potential are being driven by demand, which in turn is usually being stimulated by some development – an innovative new business, a new technology or range of products, a celebrity or TV show.

So demand will always dictate the focus of businesses to some extent and the success or otherwise of a business needs to be measured. The question is how this translates into a system based on information. Money represents a fixed way of measuring value (ie 'this many pounds buys you this many items'), but value cannot be determined at single points when information is widely available and produced in ever-increasing volumes. Instead it becomes possible to continually measure what has been achieved by any given activity over a far longer time period, including multiple entities involved in the performance of that activity. Value is constantly shifting based upon a range of influencing factors, people, businesses and other entities – it cannot just be fixed anymore.

Shifting a certain volume of stock at a set price (or even variable, if discounting was used for some of it) just gives a set measurement of value stuck to a specific moment in time. Instead, profit has to relate to a sense of value in what was achieved – which the ability to measure provides through total connectivity, with AI systems processing the huge volumes of data constantly being produced to assess whether outcomes are adjudged to be successful or not. Non-monetary profit and deficit might be a recognition of whether the business achieved its stated aims. Those aims are always likely to be fluid rather than representing any complete goal – it is the contribution they make toward improving something or making it more efficient, since the ability to measure in real-time means things can never be said to be entirely finished.

Yet there is something more fundamental happening to businesses and the form they take. To strip it back to basics, anything that is connected to the web can be, in theory at least, connected to anything else that is on the web. As people have begun to identify ways in which more and more of our lives can be digitised, we see a clear trend away from the model of traditional private businesses, whose services are restricted to operating or being accessed in certain areas or locations, to peer-to-peer (P2P) networks that can provide a service to millions or billions concurrently, span multiple areas and geographies and work by connecting people together without any logical limit on user numbers.

Since we have so far been unable to break with the idea of framing everything with economics, P2P networks are typically referenced as sitting within 'the sharing economy' – which is forecast to be worth $335bn by 2025[iv]. This refers to a wide raft of services that have popped up that are broadly defined as being P2P – though, in truth, by applying economics to the sharing economy it actually seems a little more like the rental economy. Examples include Uber and Lyft (car transport and sharing), Air BnB (property rental),

Task Rabbit (employment), Eat With Me (dining and self-hosting) and Storemates (storage space).

There are many more examples across many more sectors, but the basic principle is always the same – using data and information to connect people together and making far better use of the infrastructure that exists than would be the case with the traditional, private business approach to providing services. An oft-cited statistic for congestion is that work journeys by car in the US have an average occupancy level of 1.1 people per vehicle mile[v] (it's higher for social or recreational journeys – 2.1 people). UK-focused studies have found results to be broadly the same. So the problem isn't lack of cars, it is utilisation of the space available in cars – a standard car will have five seats, 3.9 of which are frequently empty going by the above statistic while roads are congested and traffic jams common. By connecting people together, lift-sharing in common-sense ways would offer the potential to not only massively decrease the volume of cars on roads but could even lead to reductions in the required sizes of roads (ie reducing from three lanes to two or even one on carriageways).

Storemates extends this idea of utilising available space better into people's homes. Where people have a requirement to store infrequently-used items, until recently the main option has been big storage facilities such as those offered by the Big Yellow Storage company – basically a great block of locker rooms (the other option has, of course, been parents' homes or garages). What Storemates does is allow people to rent out space in their own homes for people to use. Without P2P networks – and taking the traditional private business approach – this concept, which is so obvious now that it actually exists as a model, would have been unthinkable.

P2P networks, in many ways, puncture the idea of the private and, in doing so, offer the potential for far more efficient management of various areas of our lives. This goes much farther than just revealing information on our general activities – checking into an airport, confirming you are going to an event or revealing your inner thoughts publicly on Facebook. Instead it opens up space previously regarded as private such as an individual's car, home or even dinner table (which is how Eat With Me's proposition works). It's hard to predict what will come next, but it does seem highly likely that we are only at the start of this process now – there will be far more networks to come, serving increasingly niche purposes as they are identified and become opportunities.

So the character of business in the modern age is changing, particularly in terms of the relationship between business and user. Businesses operating under an economic system have to be primarily focused on financial performance and profit – whatever they say in the public domain about their goals and aspirations, if they get that part wrong they go out of business. As we continue the transition over to a system that is based around connectedness and high and continuous levels of information on individuals, the focus switches over to the forging of connections between people and providing access to the relevant products and services at the right time in support of these relationships. Each business in this respect may be interpreted as being a node in a network whose primary role is to pick up and transmit information or act upon it. This is not to suggest that every business becomes a P2P network – things still need to be manufactured, transported, serviced etc which may require businesses that just have a singular focus, perhaps operating machinery and other equipment to achieve that. Instead it is to say a business can no longer function as a sole trader or independent entity, performing a dedicated role

and having little or no awareness of what happens at other parts of the lifecycle of their product or service, due to the nature of the connectedness of everyone and everything.

What this means in essence is that businesses have to become fundamentally customer-focused to a degree that hasn't been achievable in the past. Many, particularly in sectors such as retail and travel, would probably argue that they are already, but that tends to be interpreting 'customer' in a generic, segmented sense. Consider the McDonalds model that offers a customer promise of consistency – if someone goes into a restaurant in Hull, they will be able to rely on the same menu being available as in Southampton. The brand makes the promise to the 'customer', which could be anyone, then delivers on it. The same is true to an extent around the world, though some degree of localisation is sometimes required (the 'McAloo Tikki', from the McDonalds Indian menu, is one example of this). As the customer cannot be understood at the individual level, they have to be presented with this kind of promise to help steer them toward whatever it is the brand stands for in a generic, even when geographically segmented, way.

Under an information system, businesses have to become customer-focused in the *individual* sense. Businesses cannot just approach the provision of products and services with a faceless, mass production, pile-it-high-sell-it-cheap kind of mentality in this situation because the 'customer', in the blanket generic sense, *no longer exists* – each customer gets a name, identity and character that can be understood, hence they need to be engaged as that specific individual rather than in the umbrella 'customer' sense.

This requires the evolution of business structures to become multifaceted in nature – a shift made possible by DCT and AI systems – as the relationship businesses have, or involvement they have, with each individual on an individual basis will determine something specific about its role in the provision of products and services for that individual; and this will necessarily have to vary from person to person in order to support them with the personalised experiences that their unique personality and circumstances requires.

With the mass availability of data, unique identification of individuals becomes possible. At that level, the experiences can be personalised for that individual to an extent but it is not the same as total personalisation – the scope for miscomprehending what someone wants or needs is too great due to a business only being able to understand its own interactions with that person. For example, a retailer may try to promote a red jumper to an individual who had previously expressed an interest in it (eg viewed or added it to a checkout basket), but this may have subsequently become irrelevant information if that person has purchased something similar from another retailer in the interim period and no longer has any need for another red jumper.

For businesses to operate efficiently under an information system, they require a mechanism for being able to share data; both to inform their activities and provide feedback on the results of that activity. At present this is often enabled in a digital sense using 'plug-ins' – basically a bit of software that allows disparate systems to exchange information with each other in coherent and standardised formats, so they can both share data as well as utilise certain functionality contained within the respective systems. AI offers the potential to massively speed up the rate at which these disparate systems can be connected together, as it could produce the 'translation' code that sits between them much quicker than is currently possible using human resource (at present, the process

for this would be to assign a plug-in coding job to a technically-skilled employee, who are typically in high demand for all manner of tasks within organisations and it may be just one of many tasks on their to-do list).

While today we think of businesses as being private, independent entities competing for the attention of consumers (or other businesses indeed, depending on their proposition), the move toward total connectivity and total personalisation will necessitate such a flow of information between businesses, that they will not just become far more connected, but *integrated* as well.

When people are consumers, the role of business is to encourage consumption to stimulate economic growth – to compete for attention, secure a share of spend for the market in which a given business operates and find new opportunities for growth. When people, through virtue of their connectedness to everything, become characterised by their involvement or participation in the provision of products and services, the role of business shifts over toward enabling that participation – linking the measure of success, the metrics that they track and set targets for, to that participation in the products and services they provide rather than people's singular end-consumption of them.

Jobs ('A means for people to accrue those means')

A 'job' – the means through which people accrue the means (currently 'money') for gaining access to products and services – has traditionally referred to employment with a business, undertaking a specific role or function, one that is typically routine or focused on performing a certain task. Whether an individual is able to keep their job or find progression up the management hierarchy / pay scale is, in most cases, linked to their performance but ultimately it is business that decides who gets access to financially-rewarding opportunities, where and for what duration.

The traditional view under a system of economics is that jobs are tightly intertwined with the growth of the economy. If the economy is resilient businesses are more confident in expanding operations, find it easier to borrow money or secure investment, they create new jobs and sustain the security of existing ones, consumers benefit from that job security and in turn feel confident in spending their money, which helps build the economy and so the cycle continues.

Jobs also typically have a market rate, which might differ by region. So if the going rate for a marketing assistant in Leeds is £18,000, that is the benchmark employers will tend to offer although there may be some variation depending on the quality of candidate they are trying to attract and scope of the role. For the same position in London, that salary would probably be closer to £20,000 due to higher levels of competition and cost of living.

So businesses dictate the availability of jobs, the market sets the remuneration that an individual can expect to earn for a given role and the economy influences the extent to which businesses feel able to create and sustain jobs, as well as wage growth or stagnation within certain markets.

Of the four economic elements covered in this part (money, consumers, business and jobs) it is jobs – as per its current definition – that is most widely acknowledged to be approaching a potential state of crisis. As outlined earlier, we are currently undergoing a process of mass automation due to the way that DCT works, with AI systems being developed and finding public-facing implementations that make them already very much a

part of our everyday lives – through messaging apps, chatbots, the way website content is sorted and displayed etc – though in many cases we probably don't even realise it.

This doesn't just raise the possibility of blue-collar jobs being threatened (such as we already see in some factories, where robotic arms work on the production line with only supervision rather than assistance from people) but white-collar ones as well, as machines can process huge amounts of information in real-time and make intelligent decisions based on the data it has access to.

The general consensus is that any role that is routine or repetitive in nature is likely to be replaceable by automation, while doubt remains over the capacity for AI to deal with novel situations – things it has not encountered before and therefore has no prior stock of data on which to base its reaction. Total connectivity may go some way to overcoming this doubt as it would make much more data much more available, therefore reducing the likelihood that any situations AI systems have to deal with are genuinely novel (ie that no data exists on something similar somewhere), but in reality no-one really knows whether there will be less jobs or more (as new roles may be created by automation in ways that cannot be precisely predicted by academics and consultants at the moment). It also remains the case that some job roles remain relatively safe from automation – robots (as in physical expressions of AI) have found it difficult to undertake activities that are comparatively easy for humans, such as cutting hair, as each person's head is unique in subtle ways that make it difficult to programme for in advance. It's difficult to imagine a situation in which people would be comfortable for a robot to undertake unassisted root canal surgery on them, either.

Notwithstanding this, the forecasts for how employment is currently structured are stark. Without going into detail on each sector (see research by Deloitte[vi] for an example of more detailed analysis), I will just focus on retail by way of illustration. A British Retail Consortium report in 2016[vii] estimated that retail jobs will fall by a third over the next decade, reducing by 900,000 from the existing three million in the UK. They further anticipate that 74,000 of the existing 270,000 stores will close over the same period, though that is perhaps a different issue – the high street is going to have to get a new identity entirely due to the rise of ecommerce.

This does not mean that there won't be a requirement for humans to do anything anymore; it relates specifically to an anticipated decrease in the number of human employees businesses may need in the roles they currently occupy. This is highly problematic for governments operating under an economic system, because consumers need to have access to finance in order to participate in society. There are only a few main options for how an individual can actually secure this income. One is to find employment with an entity that has a stream of income itself and therefore possesses the capacity to pay them – a company, government, association etc. Another is to do this independently, by becoming self-employed. Or, if no work as defined under the current system can be found, they may be able to access welfare or some other form of funding, which puts the cost of enabling that individual to survive squarely on the shoulders of the state rather than allowing individuals to be self-sufficient.

Politicians and economists sometimes speak about 'full employment' (indeed in early 2015 BNP Paribas declared that the US economy had reached full employment[viii]), but this isn't the same as saying that no-one is unemployed. Instead it refers to the point at which

everyone who is actively looking for a job has one, so the supply of job opportunities is meeting demand for them. While that sounds like the job market is actually doing very well, it masks a deeper problem – a lot of the increases in employment are low-skilled jobs (such as retail checkout assistant) which are exactly the kind that are ripe for automation.

If then – and it remains an if – automation does happen on a mass scale without creating new job roles and opportunities, in the traditional understanding of those terms, that people actually want to fill in the process, the rate of employment with businesses is going to decrease dramatically, potentially over a short period, leaving many of those displaced without much alternative than relying on welfare. Should this happen rapidly and at scale, it would push up the financial deficits for many governments, perhaps to unsustainable levels, and create the right climate for significant unrest to unfold.

However, a focus on welfare is actually being touted as the potential solution to this issue. If jobs are to become scarcer, particularly for low-skilled workers, then Universal Basic Income (UBI) is being promoted as the answer, most prominently by left-leaning academics and politicians. As a concept, UBI refers to a policy of paying every citizen an equal guaranteed monthly income, irrespective of whether they are in employment or not and without any kind of means-testing necessary (clearly they have not been thinking about personalisation amidst all this – it's hard to think of any more generic a solution than giving everyone the exact same amount). The idea is that it would not be high enough to deter people from wanting to find work, but it would prevent them from slipping into poverty. UBI could then be supplementary to 'gig economy' roles (yes, another term that gets suffixed by economy) – which loosely defined includes the kind of work enabled by connectivity but that often provides opportunities to earn money on a more sporadic, and therefore unreliable, basis than traditional full-time employment. Being a driver for Uber or delivery cyclist for Deliveroo are examples of gig economy roles. Implementations of UBI are being trialled in in some form or other in multiple countries already such as Finland, the Netherlands and Canada. Politicians in Scotland have signalled an interest in trialling it and the UK's Labour party were understood to be considering it as a manifesto pledge in the run-up to the 2017 snap general election[ix].

UBI is like a utilitarian version of quantitative easing – circumventing the economic rules to ensure everyone possesses, to some extent, the means for accessing money; which is to say, the means for stimulating the economy. If jobs are going, consumers can't earn and spend money so economics suddenly finds itself to be in crisis – the financial system breaks down. But, as with online businesses using advertising so their services can be accessed for 'free', initiatives such as UBI are an attempt at keeping economics relevant in the digital age even when all these elements, that are so necessary for its operation, are breaking down.

Or, to be more accurate, require redefining. If the academics and consultants are right that there will be a sharp increase in jobs lost to automation, without replacing them with other reasonable employment opportunities at a similar scale in the process, then it will no longer be adequate to consider employment as being something that is primarily tied to – and generated by – businesses.

Instead of focusing debate on employment, it may actually be more revealing to place it on unemployment as, under a system based on information, it's possible to envision a situation in which unemployment would no longer actually exist as a concept.

When employment is primarily provided by businesses, the number of roles available is directly related to how much work businesses have to get through, how many staff they need to do it and how much money they can assign sustainably toward their payroll. People can be unemployed because there is not enough work to necessitate them being taken on, or there are roles available but businesses either don't have sufficient confidence to take on new staff or the people in search of work do not possess the required skills, knowledge or capacity to perform in the roles.

This, though, is due to the way that work is essentially approached by businesses in a 'private' manner – with businesses having access to, and ownership of, a certain share of resource (staff, assets, property, machinery etc) for undertaking activities or fulfilling contracts they have agreed. As P2P networks have already shown, this model is actually highly inefficient. These networks operate by involving people in the kind of work function that could previously only be done by private companies, restricted to the amount of resource that businesses in those areas can assign to it. So taking the Storemates network as an example, storage space used to be limited to the amount of square footage that businesses offering space as a service had to sell. By using a simple P2P network – which just connects people together within a certain context and, in truth, needs to do little else – any space that any individual has can potentially be included. The increase in available space that this offers is difficult to calculate, but the uplift must be profound.

Is someone who is renting out space in this way technically unemployed? In a business sense, yes, as they are not officially employed by anyone (they are not a Storemates 'employee'; though this is of course an issue that Uber and Deliveroo are being pressed on in a legal sense at the moment). Yet if we take this idea and extend it into multiple other areas of our daily lives, the boundaries of what constitutes employment become very blurred indeed.

Due to our connectedness to each other, DCT has placed the ability (employment) to accrue the means (money) for accessing products and services directly into the hands of individuals, without requiring the involvement of a business to select them for the role. Instead it is up to the individuals concerned to decide whom they want to work with to fulfil a specific need they have. This, in some instances, may be restricted to a role being performed by one individual at the request of another ('*I need to store something somewhere*' / '*I have sufficient space to accommodate it*'), but the nature of how the things people want and need are designed, manufactured and distributed is far more complex and, in reality, any work that needs to be done often actually involves a multitude of people and processes. So an initial request may start from a single individual ('*I need to fix a hole in my wall*'), but the fulfilment of that request would entail the connecting together of everyone necessary to source the materials, transport them, provide information on how to use the materials and tools needed to carry out the work, individuals with sufficient skills to actually complete the task etc.

Having high levels of information available on individuals and the activities they undertake, with AI systems processing that information and establishing the most relevant connections between people at the right time, makes that situation possible in theory. The

missing element is inclination – what is the motivation for people to participate in the opportunities that are communicated to them? Why would anyone supply the materials that person needs to fix that wall and why would anyone physically help them do it?

Under an economic system, the answer is money. Businesses would manufacture and supply the parts and equipment based on perceived demand for them and the opportunities for sales growth. And everything associated with it is also being done because the opportunity is there, which may involve multiple businesses – the packaging, transportation, marketing etc of the product or service.

Under a system based on information the core elements all have to be redefined – so money becomes value, consumers become participants, businesses become focused on the individual and employment becomes a connected concept rather than something offered primarily by businesses. For a participant to undertake an activity then, supported in doing so by businesses, the motivation has to be related to the accumulation of value.

As employment would no longer be primarily provided by businesses, the accumulation of value can actually be extended to almost any area of activity that can be tracked and measured. Neither is this restricted in other familiar forms of traditional unsalaried employment – charity work, volunteering, care in the community or parenting. Precisely because something can be measured, the amount of value that it contributes toward a goal or approach – which may be very short-term or very long-term – can be assessed using complex and personalised algorithms that are processed by AI systems.

This may include, but would certainly not be limited to, how many steps a specific individual takes in a day, the dietary choices they make, what exercise they undertake, how they use the resources they have available to them and the impact their activities have on other individuals connected to them.

People are always doing something – it's just that we have never been able to assess the influence that our activities may have either on other people to whom we are connected, or on certain targets that may have been set, at a highly personalised or collaborative level. So when the definition of employment switches to be technically applicable to anything we do, we are always employed to some extent – making unemployment an obsolete concept. *Being alive* is our job (more on this in chapter VII).

If the four elements described in the previous chapter (jobs, consumers, businesses and money) may be considered as structural economic concepts, then the values that underpin how they relate to each other are more behavioural. While values may be identified for a system before that system actually finds expression in a country or region, they are at that point assumed and aspirational – how appropriate they are to the functioning of that system can only become apparent once it gets up and running. As they are related to behaviour, they are also up for redefinition when that behaviour comes under huge systemic transformation.

Although this text is about economics generally, it typically finds expression today through capitalism – not the only system in operation in the world, but the most widespread and dominant. Even the largest countries that operate capitalism's main 20th century rival system, communism, have tended to ease some areas of their system to allow participation in international, capitalist markets – most notably China.

Hence this chapter analyses the values of capitalism to identify the reasons why digital connectivity means that they must now be considered obsolete and in need of redefinition – digital has changed both the behaviour of individuals and the fundamental nature of how things work. Each of these values is very deeply ingrained in our thinking, to the point where they seem like common sense. Yet they have been developed over the period during which total connectivity could not have been considered possible in the way that it is becoming so today.

The capitalist values that we will interrogate and start to redefine here are privacy, choice, opportunity and competition.

Privacy

Privacy applies to both people, in terms of our sense of personal privacy, and things – which tend to be owned and used primarily by a single individual or group. Under a system based around information, neither of these areas can be thought of as being entirely private in the traditional sense anymore.

Neither are there any logical borders around what can be tracked, when and where. According to Ben Wizner from the American Civil Liberties Union: "*It is now both technologically and financially feasible for corporations and governments to collect and store records of almost all of our activities, records that never would have existed in the past.*"[x] This is the new reality to which we have to adapt.

Under the existing system, information has until recently been relatively scarce. Money has filled the gap by offering a common standard to enable people to access things but, once an individual has secured access to something (ie bought it), it has not been possible for external entities to understand what they do with it afterwards to an extent and on a scale that would allow for most of those things to be shared by multiple individuals or groups in an efficient manner. The information is just not tracked and available to support it. Hence many things are intended to be purchased and privately owned exclusively by the buyer, with legislation and the regulatory environment constructed around that approach.

In the digital era privacy has, in a legislative sense, primarily come to refer to privacy of information. Two of the most prominent acts relevant to the UK are the Data Protection Act 1998 and the EU's General Data Protection Regulation (GDPR), which updates it and is being interpreted into member states' legal systems in 2018. Pieces of legislation such as these are deemed necessary due to the ways in which we have come to produce so much data on our activities through our interactions with DCT – first just using browsers on desktop computers, now through multiple devices and in multiple contexts. That information has to be stored somewhere, often on servers owned by a business, and it can be used by those businesses to inform their own activities in relation to both the individual user and groups of users in segments. Legislation such as the above is designed to prevent businesses from using it in ways that may be considered too intrusive, or from making assumptions that individuals have given their consent for it to be used. There are also clearly security risks associated with storing large volumes of data on millions, or even billions, of individuals.

There are a number of values, inherent to economics, that don't translate comfortably over to a world characterised by information but probably the most obvious of these is this idea of personal privacy. This is likely to be the most difficult shift for people to understand, but nothing we do can be realistically regarded as private anymore – at least not in any fundamental sense – as our increasing connectedness to everyone and everything creates digital records of our existence that can (and, from a functional perspective, must) interrelate in some way with the digital records created by others. Otherwise, processed in isolation, the usefulness of this information becomes severely limited.

The problem with privacy in a period of total connectivity is that it is *anti-personalisation*. We are moving from an unconnected world, where data tends to exist in 'siloes' – privately held and prevented from being shared with other datasets; this does not just mean different companies holding their own data, but sometimes even different departments within the *same* company, which poses a massive challenge given that customers frequently engage with businesses through multiple devices, channels and touch-points – to a connected one in which these data siloes prevent highly intelligent machines from functioning to their true potential.

This is a major change for people to understand and many will baulk at the idea of having everything known about them and shared widely between external, faceless agencies in a way they don't seem to have any control over. As Wizner further states about the huge and varied availability of information about us: "*Every single one of us has a database of ruin*."

It's hardly surprising that people feel this way. When the idea of big data (a term that refers to the fact that any engagement with DCT leaves a trail of data that can be used in some way) is used in relation to people, it tends to have negative connotations – thus far this ability to track in the digital age has at worst been used to usher in a new period of surveillance and spying that has stoked up Cold War tensions, and at best to bombard site visitors with unsolicited adverts and emails.

Concerns around this are unlikely to change unless people can be given genuine guarantees that their data will be used exclusively in their own interests, as opposed to the interests of the entities who store and use data on them.

It's tempting (though arguably rather cynical) to suggest that there is some kind of inevitability to how governments and companies use our personal data. After all, the primary role of any government is to protect its citizens, companies need to make money etc. Yet to think along these lines is to carry a number of assumptions into the future, ones that made sense in an unconnected world but that don't naturally fit into the principles of a connected one.

In the modern world, people are concerned about data privacy. We don't really know who has access to what, where it is stored, whether it's been hacked or sold to untrustworthy companies. The results of a YouGov survey commissioned by the Chartered Institute of Marketing[xi] illustrates just how badly companies are losing the battle for people's trust. In 2014, the survey found 20% of respondents had 'little or no trust' in Facebook, while for Twitter it was 15%, Instagram 11% and Pinterest 9%. The same question in 2016 revealed that the percentages had risen to 30% for Facebook, 25% for Twitter, 23% for Instagram and 21% for Pinterest. Quite what actually happens with our data is largely unknown from the perspective of the individual providing it, so it's difficult to have any trust in these platforms at all.

Any company response on this issue tends to point people toward the terms & conditions on their website where everything relating to data use is 'clearly' stated. There was also a legal requirement[xii] pushed through a few years back that forced sites to declare which cookies are used on a site and what they do (not that anyone reads those either, or would understand what cookies are even if they did).

Of course, these types of communication are filled with legal and technical jargon and often several thousand words in length. To demonstrate the absurdity of this, in March 2016 the Norwegian Consumer Council[xiii] streamed a live video of people reading out the terms & conditions from 33 apps (the average number a Norwegian has on their smartphone). Taken as one body of text, it was longer than the New Testament and took them 31 hours and 49 minutes to complete. If most people alive today haven't read the New Testament cover to cover, they most certainly haven't read even one of these highly intimidating, legalese tomes of terms & conditions – particularly given that they get updated from time to time, which would technically require regular reviews on the part of the individual.

Everyone accepts terms & conditions because they have to, but hardly anyone reads them in the real world and those that do rarely come away with a clear understanding of what happens to their data or how their privacy is respected. It's all a bit 'behind the scenes' – companies feel they have to obfuscate about what they know about individuals and how they use it, conveying the sense that if they did find out they would not react well, and this kind of approach threatens to completely derail the potential of DCT. If people don't trust external entities to manage their data – which some have in huge quantities – safely and exclusively within each individual's specific interests, then they will push back and protest against how it is being used – which may even result in complete refusal to have any data on them tracked at all.

We already see this process in operation through ad blocking, as mentioned in part one. An interesting and perhaps predictable reaction to ad blocking is the development of 'ad blocker blockers', notably by Facebook, which override the software to force ads to display. Even one of the main providers of ad blocking software, Adblock Plus, announced

the launch of an 'acceptable ads platform', which will let 'carefully selected ads' through – a decision met with perplexity by many of its users.

Yet refusing to allow data to be tracked is completely contrary to how DCT works. Data is the information that machines need in order to make decisions and perform actions – if they don't have anything to go on, their functional capabilities become severely limited. We would, in essence, reverse recent technological progress and head back toward being unconnected.

It's probably fair to say we have got off on the wrong foot with how businesses and other external entities look to manage data and what it's used to achieve. However, all it takes is a few seemingly small adjustments to some pretty fundamental concepts and this can all change – to put the interests of people wholly and incontrovertibly at the centre of everything that happens in relation to data use, which is the trade-off for the erosion of personal privacy.

On a personal level we tend to see the sheer breadth of data that we stream as something rather negative, intrusive even – something that can be used against our own interests for a commercial business to make money or, in the case of the authorities, to spy on us. Some of the high profile data usage exposures from recent years – through Wikileaks and Edward Snowden for example – provide plenty of evidence that a world based around privacy and secrecy, in spite of the fact that data exists on everything and can be tracked, does not function in the interests of individuals.

It's hardly surprising that this has happened, as it's perfectly aligned with the old way of doing things. But we have to understand and acknowledge that everything we do will become trackable as data – it's the nature of how this technology works and we have to ensure we don't pretend it's not happening, or hope it will sort itself out and everything will go back to 'normal', or assume that all the ways things used to work are still perfectly valid.

Consider just how different basic activities are in the connected world – whereas you probably used to read paperback books and listen to music on CDs and vinyl (which only you could know about unless you explicitly told someone or they saw / heard you do it), when these happen in a digital connected environment (and remember this will come to mean everywhere) not only is a record created of what you consumed but detail on it (page number reached, the order of songs played) and other contextual information such as location where you were doing so and how long you did it for. When you send a text or instant message it isn't a private connection between two people – an entry is created in a central database and a copy sent to the intended recipient. We are speaking directly to a database. There is nothing private in the traditional sense about any of this, but neither is it the same as being spied upon – it's not the same as someone sat there reading through everything you send.

This is an important distinction – data doesn't just refer to financial information such as bank details or passwords for website accounts; it means that a digital record can exist for almost any activity that anyone ever carries out in theory, which can then be scoured by algorithms to provide relevant information for that individual, which is why advertising has become the de facto expression of economic relevance in the digital space. And AI systems are getting smarter and smarter at using semantics to understand what is actually meant – it would not be practical to assume someone likes football just because

they talk about it. They may be saying '*I hate football*' or being sarcastic ('*oh great Man U won again*') for example[xiv].

Many things used to happen in private, now records of these things will exist in data format. The idea of restrictive geography has already been blown apart by the internet – a person sat in their home in Canada can purchase something from an online retailer based in the UK, thousands and thousands of miles away. The next illusion to be dispelled will be the idea of restricted information – that something recorded as data on someone can somehow be owned by an external entity and used exclusively within its own interests.

Of course, it can sound suspiciously like snooping. But, just because being connected challenges the very idea of privacy, how it works is completely different from something like the Stasi in East Germany – with taps set up in homes and teams of people assigned to painstakingly record and monitor everything that happened 24 hours a day. Or the CCTV network, which doesn't produce outputs that are cross-referenceable – merely video footage that has to be scanned through by people and is only useful when scouring for something that you know happened within a short timeframe (a crime, usually).

This isn't people sifting through your texts, or watching you have sex – obviously this would be an incredibly intrusive way to use data and things cannot be said to be helping people if they are intrusive. People would never accept that – but some level of 'intrusiveness' is just the way it is from now on.

Again, this is not the same as snooping or someone looking over your shoulder. This is a record existing in a database – in a machine, in machine-readable format – of everything that happens; and the only way information such as this can possibly be useful on the kind of scale we are talking about here is for algorithms (which enable AI to learn) to process, cross-reference and come to conclusions about how best to provide people with guidance on an individual basis based on everything that is known about them. Clearly an absolutely mammoth task that humans could never hope to manage themselves.

Privacy, in a world of total connectivity, where everything is linked to everything else and continually building up data trails on all activities, is a fiction. We cannot pretend any longer that we can somehow opt out of being tracked by DCT – by ad blocking or clearing cookies – as that prevents it from functioning to anything like its true potential. It's not any kind of long-term solution.

Instead we should think less in terms of privacy and more in terms of transparency. Doing something behind closed curtains doesn't stop a digital record of it being created potentially. It is also not the same as someone peeking through those curtains – it's a stream of data in a database, which algorithms can scan and cross-reference with other datasets to come to conclusions and decide what action to take.

Of course, the move away from privacy is not just being enforced on people entirely without their knowledge. We are fully engaged in the process of enabling it, both through our increasing interactions with DCT and the growing range of P2P networks that we use – opening up areas of our lives that were not just previously unknown to anyone else, but that we also could not have foreseen would be trackable one day. These networks are labelled as being part of the 'sharing' economy for a reason – they can only function through users making information about niche areas of our lives open and available.

Privacy is an unrealistic notion when we become defined by our connectedness to everything and everyone. But being 'known' is not the same as being tapped.

Choice

As mentioned previously, choice is considered a core value for an economic system, where businesses are servicing the needs of what we term 'end consumers' due to the fact that they are generally situated at the *end* of business processes. Products and services are created with little or no involvement from specific individuals, who then need to be targeted by marketing and advertising campaigns to pique their interest in purchasing or using the thing that forms the central element of those campaigns.

Obviously, if an individual has had no involvement in the creation of something that is being marketed to them, they cannot be said to be under any obligation to select it. Even in areas where a single business may enjoy a monopoly on providing access to something, choice still ultimately sits with the end consumer. Situations such as this do not tend to remain that way for very long – when only one solution exists, it has to be generic by its very nature to be applicable at such scale, which presents ample opportunities for other businesses to enter and diversify their offering by focusing on a dedicated segment or niche.

Where competition is better established, it increases the chances that a more relevant match can be found to suit an individual's requirements (such as where cheaper alternative versions of a product are created that serve a basic purpose, but do not offer all the advanced functionality of more expensive options). Still, this does not create a hierarchical system in which the businesses offering those cheaper options can gain some kind of exclusive access to a demographic, while the more expensive competition is removed entirely as an option for them – just because it might make sense on the surface for someone who belongs within a less affluent demographic to select that cheaper option, the one they eventually decide upon is their decision alone. We regard it as a (human) right that we are able to make decisions ourselves from the full range of available options, without having something external decide on our behalf that we should be exempt from making certain selections (ie '*we won't show you this because it's too old for you*' / '*red doesn't suit you, so you'll only be able to select blue*'). We would regard that as being patently unfair, discriminatory even, although this kind of refinement can make pragmatic sense. If, for example, someone only ever goes on budget flights to cheap holiday destinations, there would seem little logic in showing them adverts for 5* hotels in Monte Carlo. But to be exempt from being able to choose to go to Monte Carlo should they so wish would be in contravention of their rights as a consumer. We must have the final say on choice, and have that enshrined in all our interactions with external entities.

Total personalisation represents a challenge to the positioning of choice as a core value as, by its very definition, it works by reducing the need for individuals to have to make as many choices in their day-to-day lives by introducing a far more specific element to the design, manufacture and supply of products and services, plus the information we are shown and people to whom we are connected. The availability of information on all aspects of our lives will make any aspect of business processes that rely on generic approaches seem inefficient, with products and services that are characterised to be specific (at least to some extent) to a unique individual having a far greater chance that said individual will be satisfied it meets their needs – and who therefore doesn't need to

sift through a range of options and carry out research into all the solutions on the market themselves manually.

Despite this, the term 'personalisation' is often tightly intertwined with choice when it finds expression in a business context – it may be that choice has been so deeply woven into the way that things work (and indeed our perception of how they should work) that it remains an obvious element even when its application there makes little sense anymore. This is because the way that personalisation is marketed to us focuses on persuading the potential customer that they can have a greater sense of control over the thing being promoted to them – for example, a retailer selling bags may offer a range of 'personalised' options such as selecting a colour or pattern to suit. However, this is not actually personalisation but *customisation* – which is an entirely different concept.

Customisation works by enabling the customer to adapt elements of a product or service to suit their personal preferences. That may be the colour of a bag, the facial features of an avatar in a game or the toppings on a pizza. While this does arguably lend a degree of personalisation to the experience, the base element tends to be generic to all – the overall style of the bag, the figure of the avatar, the base of the pizza – and the options may be limited ('*choose from five colours*'). Although this is not the fundamental difference that sets customisation and personalisation apart – instead, this is related to the manner in which the customer is involved.

In order to customise something, that individual has to actively make a selection. They are presented with a number of options, from which they inform the business about how they would like their version of it to be refined. By contrast personalisation, in its truest sense, works by demonstrating a level of understanding of the individual that doesn't require them to manually provide information at every stage of the engagement.

So to give an example, a customised experience with an online retailer may mean having a series of options for personalising the product (colour, pattern), the payment method used (credit card, debit card, PayPal) and the delivery service (home, in-store click & collect, locker), from which the customer makes the selections manually. A personalised experience may involve having the site attempt to personalise the product for the customer in advance (based on previous behaviour), pre-selecting credit card as the payment option as that is how they have paid with them in the past and offering click & collect from a store located in the town in which they live (rather than offering them a drop-down box, listing every possible location in the UK). Personalisation might be best thought about as meaning '*I know you and I already understand what you want / need*'.

A degree of personalisation is possible today of course, along the lines just described. That alone is not sufficient to demote the importance of choice as a value however, as there is still a lot of scope for the options proffered to be irrelevant or inappropriate for the context of that specific interaction. The individual may have maxed out their usual credit card, moved house or need a product in a colour to match another garment they recently purchased. Something approaching total personalisation removes the risk of irrelevance in the options it presents an individual with, as any eventuality that may influence the individual's current circumstances (but that are not directly related to the entity with which they are currently interacting) exists as data that just needs to be cross-referenced in an intelligent way to inform AI decision-making. If someone just bought a black dress from a different site for example, they may come to another looking for black

shoes to match it – showing them red shoes, because that was what they searched for previously, has become irrelevant personalisation in the interim. The shopper is not continuing *their* experience, merely the experience they had previously with that specific retailer.

It's important to note that personalisation does not represent the end of choice – it's not conducive with restrictiveness, saying you can't turn left or are not allowed to wear that shirt today. It is concerned with knowing and understanding what an individual would benefit from in any given context. Rejecting options put forward would be an exercise in helping to hone the informing algorithms used by the AI systems, rather than being regarded as some form of disobedient behaviour that leads to the individual being penalised in some way.

As choice is a core value, it can also present a highly competitive landscape in some instances where, in truth, products and services are not sufficiently differentiated to enable a customer to make a clear and informed decision. When this is the case, it tends to be marketing that acts as the differentiator. Why, for example, should someone choose one food delivery app over another? Some may be able to boast a greater range of restaurants to choose from, but in reality many people probably have a small selection of preferred ones to which they gravitate. If there are only three that they would usually consider – and a number of apps cover all three – there would appear very little to set them apart from each other in that person's eyes.

One business may come out on top by having a better understanding of its customer base – their demographic profile, channels and networks used, preferred payment options, the dialect they respond to – giving them a clear advantage in reaching that type of customer in a way that appeals to them. Or it may be that they use a catchier jingle, more striking imagery or celebrity endorsement. Either way the match is not being made through the superior quality of the offering nor the appropriateness for a given individual, but through more effective communication.

Again, this need for marketing excellence is driven by the fact that products and services are not currently designed, created and distributed with any specific individual in mind (usually; there are naturally some situations where someone may require something to be custom-made from scratch, but this can hardly be considered the default). Food products provide an obvious example of this – when a consumer enters a supermarket, many of the products use brand names that are intended to appeal to trends and tastes that have been identified. In recent times, this has led to an increase in demand for foodstuffs marketed as 'superfoods' and 'ancient grains', both of which promise a form of healthier consumption more attuned to the contemporary mindset.

This, still, is entirely generic. The idea that someone is making healthier dietary choices generally doesn't necessarily mean that they are making the choices best suited to them. It is blast marketing, without taking into consideration the personal circumstances of an individual – what they have eaten today, the past week and past month, what nutrients they are lacking in their usual diet or any natural deficiencies they may have. Whether they are training for a marathon or going on a stag do, their nutritional requirements are different. Personalisation in the case of food would need to understand that (ie have cross-referenceable data on it) if AI systems are to make sensible suggestions for what the individual should have access to, which is poles apart from presenting them with ever-

expanding choices and ranges that were designed and manufactured in bulk – and need to be marketed cleverly to get around that lack of inherent logical matching.

And this is why choice does not make sense as a core value for a system based upon information – it is not as vital a part of the interactions between business and individual anymore. It is not that choice doesn't need to exist, it is that much of the inaccuracy, irrelevance and mismatching that characterised marketing in the unconnected age are issues that can be overcome far earlier in the process than the point of overt engagement between business and individual. The chances of marketing a pair of trousers to someone that are the wrong size, colour, style or shape for them is massively reduced when information about their previous purchases, diet (and any potential weight loss or gain), exercise and future plans (from their diary, perhaps an upcoming function that the new trousers may be intended for – the dress code and guest list for that function could further be cross-referenced, no two people ever turn up wearing the same dress again…) can be known; not to mention behavioural information that can provide clues about the kind of things that individual likes and responds to (an idea of character built up from as diverse a list as address, regular purchases, music listened to, books read, places attended, sentiment expressed toward macro and micro issues, photographs – there isn't really any real limit to what could be included). All of these provide the kind of insight that lessen the requirement for the end-recipient to make choices from a range of options. That work can be done upfront, with the algorithms making those decisions constantly being honed and updated by responses to the matches being made between individual and product or service, as well as how that product or service is subsequently used (ie how value is accrued based on what they do with it) if a match is found to be a good one initially.

The nature of mass consumerism is to create a 'throwaway' culture, characterised by consumers purchasing products, often at low price-points, which are then used a low number of times before being cast aside as other things to replace them can be found, accessed and purchased quickly and conveniently. For a system based on information the nature is far more 'made to order' (though this is not to say the individual actively orders the thing in the way we would currently understand this process to happen, as much of the decision-making can be undertaken by AI systems before being communicated to the individual). This is not the case for everything that people want or need – some things can be generic without needing to be personalised for a specific individual as the required variation would be so minimal that it wouldn't be worth the work (toilet paper, socks, clingfilm, tinfoil or shoe polish). For other products, variations may be problematic – such as equipment used for sports that have to conform to a certain size, shape or weight (a cricket or tennis ball).

The point is that, by having individuals both directly and indirectly involved in the design and manufacturing process by default, it makes more sense for many things to be created with a specific end-user in mind. This is positive for both individual (who gets something that, whether they asked for it in the first place or not, they will probably find to be very useful for some purpose they have to fulfil) and business, as it increases efficiency, reduces the chance of something being returned (which is, arguably, the same as having been mis-sold originally), makes better use of resource and prevents warehouses from becoming overstretched by surplus stock that could not be shifted. Having the intended recipient involved in those early stages – and indeed throughout the entire lifecycle of a

product – makes it possible to create the right amount of things which have been matched to an individual far in advance of being stored, distributed or even made.

Consumerism works by empowering each consumer to make informed decisions on the choices they make, relating to all areas of our lives, whether that be who supplies the energy to our homes, the mobile network we use, the brand name emblazoned across our clothing or the shampoo that cleans our hair. Personalisation does not strip the individual of all agency – it is always the individual who has to have the inclination and desire to access and use the products and services that are presented to them, without that the whole process produces no value. Instead it creates relationships with external entities that can be genuinely one-on-one, with the experiences each person gets highly tailored to their individual circumstances.

That end-user, formerly consumer, still exercises choice in everything that they decide to do and always will. The purpose of business is to guide them toward the products and services that they need to undertake whatever activity it is that they choose to focus on. It is this shift toward a relationship based on *reciprocal guidance* that reduces the importance of choice as a core virtue under a system based on information.

Opportunity

A common cliché in business is that anything that brings challenges also produces opportunities. It is how businesses manage to persevere during periods of rapid evolution or turbulence in their sectors. It may be that a challenge relates to a previously profitable area of a business, which represented a growth market for it for a sustained period, suddenly experiencing an upturn in competition (perhaps from abroad, a new entrant with strong venture capitalist (VC) backing or a start-up that has used technology to do things more efficiently) or a falling away of demand from its traditional customer base (either due to a change in tastes, the economic fortunes of a demographic or some new technology making something the established business does suddenly seem outdated).

When things are going comfortably for a business, which is to say all the lines on reporting graphs are going in the right direction, the need for innovation is comparatively low. When things become more challenging for whatever reason, it forces affected businesses to either adapt their offering or look for additional revenue streams, potentially both at the same time. This is not always the case, some businesses may be doing very well with their core offering but actively seek out new revenue opportunities anyway as they become apparent. An example of this would be modern tech companies, such as platform providers. These enable businesses to host and access the back-end of their websites through a managed service – a software interface through which content can be moved around, updated and restructured. The main revenue stream will probably come through selling access to that platform and managed service, but other revenue opportunities can be explored in the process. They might run paid training sessions on beginner / intermediate / advanced usage of their system, add plug-ins that require a package upgrade to use, or aggregate the data from multiple users to benchmark a single business' performance within its sector. The depth of information reported within that benchmark may vary depending on the package the business signs up to. None of these are core to their service, but can provide useful additional revenue streams, some of which may offer up further sub-opportunities for pursuing growth.

As propositions become stale, they can be overhauled to suit the changing dynamic, always bringing the potential for new markets to be identified and entered. Digital technology is a particular driver for the discovery of new emerging markets, as it connects things together and starts to produce information in a vast, ever-increasing number of areas that it was not possible to understand before. These areas can then be commercialised to open up new revenue streams that help to stimulate economic performance. The way that Facebook has converted knowing our likes and dislikes into a global advertising proposition is just the start of this – the number of steps we take in a day, where we go, who we are with, what we say; all this can be tracked and have to be viewed as opportunities under a capitalist system. Companies like Google and Facebook are dominant in this space currently, but that's not to say someone with a clever bit of code couldn't muscle in on an area they have overlooked and start to challenge them.

Whatever the driving force for opportunity happens to be – and however it finds expression – the constant relates to the desired outcome. Opportunity is connected to revenue under an economic system, so any opportunity that is pursued has that chief aim in mind. There may be other associated goals for these activities of course, such as expanding capacity in an operational area, growing a database for marketing purposes or developing new technology. But all of these are done primarily with the overall eventual aim of increasing or protecting revenue streams for the business.

And a further virtue about opportunity – why it is considered such a core value to capitalism – is that opportunity begets opportunity. It is capitalism's version of hope. Even though things can change rapidly in some business sectors, the uncertainty and operational challenges that come with this are balanced out by the opening up of new opportunities in the process.

Neither does it always require new technology to make something possible. Sometimes it is driven by research instead, where businesses are found to not be catering sufficiently for a demographic group that possesses considerable spending power. In recent times some of these demographics have been given colours to denote their grouping – the pink pound for the LGBT (lesbian, gay, bisexual or transgender) community, the purple pound for people with disabilities (estimated to be worth £80bn or even £212bn depending on how it is calculated[xv]) and the grey or silver pound for the elderly (worth a whopping £320bn[xvi]).

So there isn't really any logical limit as to what constitutes a market – whether that be something entirely new or just an area that has not been properly recognised and exploited yet. It stands to reason then that, as we continue to move toward a system based around information, the greater the range and variety of that information that is available (not to mention how trackable it is and how quickly it can be processed to be useable) the greater the number of markets and opportunities that will abound.

Many wouldn't think of their feet, voices or faces as markets, but the infrastructure and the business world are not ignorant of the potential new revenue streams that could be offered up by using the data that DCT can collect on all of our activities. While it may sound overly exploitative and intrusive, the fact is that a lot of this data collection and processing would happen without the individual having any idea about it (much as is the case already, indeed).

Our consciousness (or otherwise) of how exactly data on us is being used is not necessarily the issue here. As AI systems penetrate deeper into areas of our lives, they will need to process huge amounts of information at pace and at scale (their capabilities are directly linked to how much information they have to base decisions on), so for individuals to expect to have a comprehensive understanding of everything that is going on in the background is unrealistic. A certain degree of agency has to be entrusted to these systems to process that information and make decisions without constantly needing to rely on the manual intervention and consent of an individual, or even multiple people if more than one is involved.

For this to be undertaken – behind the scenes and only ever with limited knowledge about what is happening and why – in such a way that people can accept it, a balance in the relationship of business to individual has to be struck, so that they feel they are a genuine beneficiary of making so much of their lives known to an external entity.

Opportunity, under its current definition as a value of capitalism, does not pursue that aspiration. Where new opportunity abounds, it is common for multiple businesses to launch rival propositions to compete over establishing a foothold in, and share of, that emerging market. Sometimes, as in the cases of businesses such as Amazon and Deliveroo, they are willing to sacrifice profit to ensure that they can offer the cheapest possible price-points, maximise convenience for customers and become dominant in an area (or a multiple and growing range of areas, indeed). If the potential is sufficiently attractive, some of those competing for share may be strongly VC-backed, which of course brings the expectation that the returns will be worth the initial investment and associated risk (eventually). Opportunity, in the capitalist context, is very tightly aligned with economic growth. Hence any new market that emerges has to bring the promise of financial – and preferably sustained – gain for those who are able to enter it successfully. That is what opportunity means.

This is problematic due to the intrusive nature of DCT – which can make even the most personal activity eminently trackable – as it converts every part of an individual's body into a future market to be exploited. The existing relationship of business to consumer is not characterised as being based upon trust and mutual benefit, which is proven by the long list of scandals in recent years – those related to PPI mis-selling, fake emissions tests, horsemeat and global tax avoidance to name but four. This is further attested by the stated purpose of major legislation pertaining to the relationship of business to individual. The Consumer Protection Act 1987, for example, was introduced to '*make provision with respect to the liability of persons for damage caused by defective products*'[xvii]. Obviously not every business is negligent or purposefully misleads its customers, but the message of the need for the existence of such legislation is clear – people (or, to give them their proper title, 'consumers') need to be *protected* from businesses.

A central role that DCT performs is to remove the natural protective shield of privacy that people could formerly rely upon, which is to say most of the things they did were not trackable or measurable in any realistic or external way. Some businesses may still conduct themselves in rogue or negligent ways or fail to deliver on reasonable expectation through incompetence, but at least an individual's exposure to such practices in many cases was limited. If someone pays for a holiday that turns out to be bogus, or buys a product that doesn't prove to live up to the claims made in the accompanying marketing collateral, often they have wasted some money but lost little else (provided they were not

physically harmed by a defective electrical problem or contracted illness through ingesting unsanitary produce). Continual access to streams of data on such a vast range of datasets appertaining to almost anything an individual does amplifies their exposure exponentially and, potentially, continually.

Yet if we accept that it is no longer accurate to define ourselves as consumers anymore, then the model of businesses needing to target consumers – sometimes in underhand ways or to an excessive extent – is no longer a practice that needs to be defended against. People are no longer consumers positioned at the end of business processes, who need to be targeted and 'convinced', but involved right the way through due to their connectedness and the streams of information they provide about themselves. As the relationship is restructured, the purpose of the relationship also needs to be redefined.

As already stated in part I of this text, technological progress is primarily concerned with making something function more efficiently. It is businesses who take advances in technology and incorporate them into products and services so that people can access its benefits in a convenient or clever way. By extension, businesses themselves are often focused on increasing efficiency in their processes as it helps them improve areas of their offering and can help to give them an advantage over their competitors. Under a system based on information, it is improvements in efficiency that constitute successful outcomes for the opportunities pursued. With the present model businesses create things that they want to sell, which may be based on sensible trends, but they then still have to go through the marketing process to actually shift any of the stock they produce (to make the connection between individual and unit, basically). This is a highly inefficient model not only because it requires additional time and resource to make those connections after the early phases of design, manufacture and distribution have been completed, but it also leads to excess stock that cannot be shifted and ends up taking up warehouse space. Some may even have to be disposed of having never been used which, when you really consider it, is the utmost expression of inefficiency.

Information provides the opportunity to hone this process so that the right amount of the right thing can be created and moved around to the right location. This means that the connections forged by AI systems work both ways – with businesses helping to provide people with the things they want and need to achieve things, and people providing the information that businesses need to do that in an efficient manner. It is the establishment and maintenance of a relationship of mutual benefit – rather than one requiring a legal framework designed around the defence of consumers against businesses in pursuit of financially-rewarding opportunities (for them).

And the greater the volume and granularity of data that is available, the better the opportunity to increase efficiency in the relationship and, consequently, the stronger the sense of value built for both parties.

Competition

Competition is the value that ensures consumers have access to a reasonable range of options, in any given area, from which they can exercise their right to choose the best suited to their circumstances. It also forces businesses to work harder to secure their customers' spend and loyalty, driving the need for innovation and diversification to retain an advantage of some kind over competitors, which in turn prevents the risk of sectors

becoming stale. Competition is often held up as one of the drivers of technological progress for this very reason.

From the consumer perspective, this can work in their favour. Prices can be pushed down as businesses seek out efficiencies in processes that enable them to cut costs, while they may also pursue competitive advantage through exceeding expectation in various areas of the customer experience.

Competition, in some ways, represents a segmented version of personalisation – the product or service offered by multiple businesses within the same sector cannot be exactly identical or there is no reason for them all to exist. Instead variations on a central concept are brought to market, which may be slightly adapted to suit a specific demographic group where gaps are identified. If a product exists at a mid-range price point, there may be an opportunity for businesses to compete to launch a budget, low-range, high-range or luxury equivalent. Competition does not just revolve around price though; multiple variations can exist within the same price bracket that offer something slightly different. That variation may be related to style or functionality and, where there is little to choose between one product and another, the quality of the marketing message may provide the point of differentiation.

Capitalism flourishes when the potential for competition is increased across new or dormant markets, as it produces new opportunities for economic growth and employment. In recent decades we have seen a relaxation of regulation in a number of sectors as well as privatisation of previously nationalised areas (such as energy and various transport sectors), which served to convert them into market opportunities. Highly successful companies such as Virgin even made a point of specifically targeting markets where there was little or no competition – such as air travel and trains.

Capitalism is, of course, no stranger to boom and bust cycles[xviii]. There are today more businesses competing in more sectors and markets than ever before (a company can be registered and have a functional website live within hours), yet economic growth has stagnated and is struggling to return to anything like the pre-2008 forecasts for many western countries. When the trading environment enables and encourages competition among businesses, it performs its role as a core value of capitalism, but the macro political, social and technological conditions don't always seem to be supporting the approach presently. Particularly in the tech sector, competition is incredibly lopsided with a handful of major businesses being utterly dominant and a very long-tail made up of 'everyone else'.

Be that as it may, we have to assess whether competition still has relevance as a core value under a system based on information. Under capitalism, businesses tend to primarily compete over concepts that can be made irrelevant by total connectivity – consumer attention and share of available money. If people can no longer be accurately defined as consumers, and the determination of value is far more complex than used to be the case when anything could be said to have a single and generic price assigned to it, what do businesses compete over in a system based on information?

In order for AI systems to be able to function to anywhere near their potential, they require access to a huge and disparate range of datasets from which to continually learn and update the algorithms that inform decision-making. This necessitates an approach to the overall web based around information-sharing between data sources that are neither

directly connected nor particularly important to each other for their day-to-day functioning, in addition to those that are.

This is typically done through use of plug-ins between software programs to enable them to communicate information in a way that they can both easily process and understand. As mentioned in the previous section on privacy, businesses have traditionally been structured and managed along the lines of having ownership of various assets (people, property, vehicles etc) and information (data, in the modern sense) is included in that. Data might refer to personal information on customers such as email addresses or contact details, but also extends to cover behavioural and profile information – purchase history, on-site search terms used or pages viewed, preference indicators ('responds well to football-related content') or segments to which they belong ('pet-owner'; 'allergy to pollen').

The upshot of this traditional model of business is that data often exists in siloes, where it cannot be accessed or referenced by other datasets (whether internal to the business or external to it). This data is usually valuable to the business in some way, indeed in some cases data might provide its primary or even sole source of income (social networks or online news sites, for example), so the idea of opening it up for other entities to utilise would seem counterintuitive under current thinking.

Yet information dictates how far AI can go. An oft-cited moment in the history of AI – and one that is generally considered to be a landmark event – occurred in 2011, when IBM's supercomputer Watson went on the popular US quiz show *Jeopardy!* to take on the most successful contestant in the show's history, Ken Jennings, who had won it 74 times consecutively in 2004[xix]. *Jeopardy!* posed a particular challenge to Watson due to the cryptic structuring of the questions, requiring Watson to do more than simply look up information but to take all manner of nuance into account too. Nevertheless, Watson emerged victorious.

This outcome would not have been possible if Watson had not been able to access and process huge volumes of information across a broad range of categories – history, science, pop trivia, general knowledge, sport, geography – not to mention being able to build up an in-depth understanding of how people use communication in non-standard formats that bear little resemblance to what can be learned from endlessly ingesting dictionaries and encyclopaedias. It would have had to study speech, idiom, humour and all other possible kinds of very human idiosyncrasy to be able to compete at that level and win. Not to mention all previous editions of *Jeopardy!* and the questions asked.

At a generic level – which we might loosely define as general knowledge information that it is possible to come across in the public domain – AI has been proven capable. It's not perfect (Watson didn't get every question right or always buzz in before its human opponent) but it does seem likely that it's performance in such situations has immeasurable scope to improve, contingent on the amount of information it can digest, process and produce results from quickly.

Yet we have to put the achievements to date in perspective. A computer winning a game show may be impressive in a number of ways and, in terms of the precedent set, suggests it could be scaled up to function in a more important area of human experience and be depended upon to make decisions that are logical, safe and lead to desired outcomes. Of course, in many areas of our lives we already interact with AI, we just don't

always realise it (air travel, stock exchanges, banking etc). Still, in these cases, it is operating on limited information streams. An auto-pilot system needs to know about the factors that could affect its flight path, such as air traffic, weather conditions and wind speeds, but it isn't currently required to know anything specific about the passengers it is carrying (other than collective weight perhaps). A bank fraud-screening system would analyse spending patterns and behaviour, location data and network information (such as IP address of the device used) – it would also need to have a certain level of understanding about recipient of any funds being transferred, but that wouldn't currently extend to what that person had for lunch or whom they dined with.

With everything becoming trackable, information to this kind of depth exists. If AI systems are to operate within multiple areas of our daily lives and provide experiences that are relevant and accurate, they need to have access to encyclopaedic information on individuals in the same way that Watson did on general knowledge for *Jeopardy!*. It is inefficient from the perspective of business to ignore that this information does exist, or simply accept that it belongs to another business, when it could be used through a collaborative approach to hone and improve the kind of experiences that they can all provide, resulting in better outcomes for their customers overall. Relevance is what the web enables; competition under its current definition, with information stores being exclusively owned and commercialised either by a single or small number of businesses, means AI systems will constantly present content and make matches that are irrelevant or inaccurate due to its inability to access the full range of datasets it needs to optimise every decision that it makes.

In essence, the performance of AI systems is directly linked to their capacity to access diverse datasets from disparate sources and cross-reference them to produce logical and meaningful outputs. Blind spots in that process increase the potential for errors and inaccuracies – and they need to be restricted as much as possible if AI is to provide experiences for people that are good enough to seem valid recompense for the huge volumes of information that they enable external entities to know about them.

The big change to competition as a value here is that it can no longer be based around secrecy and privacy – this company owning this data exclusively, that company owning that data. Competition would need to evolve into a far more collaborative model, which may seem like a paradox at first; however, this specifically refers to the requirement for sharing (or, collaborating on sharing) data to enable the building of value through the activities that businesses undertake. If the measurement of the value accrued is influenced by the relevancy and accuracy of the outcomes these activities produce, as well as the level of efficiency achieved by the associated business infrastructure, then competition remains an important element of the process. The fundamental shift is that businesses would still be competing around how to use the available data to achieve better performance in terms of relevancy and accuracy, as the ones that contribute the most to this process are the ones that would build the greatest value.

Now, before identifying a potential new set of values more appropriate for the digital age, that could replace the existing capitalist-specific ones, the next part looks at how these shifts in technology have already impacted contemporary business, using retail as an example, and why the values outlined in this section are no longer suitable for the kind of relationships that businesses within that sector (or, by extension, many others) have with their customers.

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[ii] BBC, *Used clothes: Why is worldwide demand declining?*, 31 January 2018, http://www.bbc.co.uk/news/business-42777804

[iii] The Guardian, *Tesco faces £100m claim from investors over accounting scandal*, 31 October 2016, https://www.theguardian.com/business/2016/oct/31/tesco-100m-pound-claim-investors-accounting-scandal

[iv] PwC, *The Sharing Economy*, 2015, https://www.pwc.com/us/en/technology/publications/assets/pwc-consumer-intelligence-series-the-sharing-economy.pdf

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[xii] Europa, *Directive 2002/58/EC - Directive on privacy and electronic communications*, 12 July, 2002, http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32002L0058

[xiii] Forbruker Radet, *The Consumer Council and friends read app terms for 32 hours*, 25 May 2016, https://www.forbrukerradet.no/side/the-consumer-council-and-friends-read-app-terms-for-32-hours/

[xiv] My favourite personal experience of failure here was on the Independent website, reading an article about Adolf Hitler – the algorithms obviously picked up on the most basic contextual information and surrounded the article with holidays to Austria. Not the greatest association for those travel companies, perhaps.

[xv] Gov.uk, *High street could be boosted by £212 billion 'purple pound' by attracting disabled people and their families*, 27 August 2014, https://www.gov.uk/government/news/high-street-could-be-boosted-by-212-billion-purple-pound-by-attracting-disabled-people-and-their-families

[xvi] Saga / CEBR, *Saga generations lift UK out of recession*, 7 February 2014, https://www.saga.co.uk/newsroom/press-releases/2014/february/saga-generations-lift-uk-out-of-recession

[xvii] legislation.gov.uk, *Consumer Protection Act 1987*, http://www.legislation.gov.uk/ukpga/1987/43

[xviii] See Paul Mason, *PostCapitalism: A Guide to Our Future*, 30 July 2015, Penguin, ISBN 978-0141975290

[xix] In 2016 another landmark was reached when Google's AlphaGo AI system won a Go (a popular game in South Korea where players attempt to control territory by placing stones on a 19-by-19 grid) competition against one of the world's leading players, Lee Se-dol. Go is considered to represent a far more complex challenge for AI than many other games, such as chess.