

Belake CIC – Core Values

Belake's vision is of a society which is understood through mathematics and statistics, and where the development of society is guided by the application of this knowledge for the benefit of all.

However, such a vision is not without its dangers, such as attempts to "standardise" society, and treat only those individuals that fit the norm. Therefore, these are some core values which will guide us in delivering our objectives.

1. Variation and standardisation are equally important.

When studying society in these ways, it is tempting to think only in terms of averages and norms. However, such thought is dangerous, misleading, counterproductive and contrary to our aims. Darwin gives us the most common example of how this can happen. Evolutionary theory suggests that species are improved through natural selection to create a species that perfectly fits a particular "ecological niche." For example, lions are perfectly adapted predators of the African plains. However, what is the "ecological niche" that humans fill? Can we define this niche? If we can define this niche, we can define the human characteristics that are perfectly adapted to fill this niche. This will lead us eventually to fit the "ideal" human being, and we are on dangerous ground.

So what is wrong with this interpretation of evolutionary theory? Quite simply it fails to understand that the variation of species is as important as the normalisation of species. The variation of a species is what allows it to adapt to fill a particular ecological niche, and variation is what sustains a species. Failure to adapt to changing circumstances means certain extinction.

Another example is that our perception of wealth is dependent on our perception of the wealthiness of others. If we are poor in comparison to others we are more likely to be unhappy about our personal wealth.

Therefore, we must be guided by the principle that variation is as important as norms, standards and averages.

2. Environment is important

Circumstance and environment are key to understanding the rationality of individuals decisions. Our response to the same event or phenomena will vary depending on the particular circumstances or environment we find ourselves. By environment and circumstance we include things such as the rules, conventions and norms of society, as well as physical environment. A quick survey of history yields plentiful examples where society's reaction to the same phenomena has differed due to the norms of society at the time.

Therefore when making recommendations during projects, or undertaking research, we must be mindful of the importance of differing environments.

3. Feedback

People remember and learn, and so do groups, organisations and society as a whole. Therefore when developing our understanding, we must be mindful of the fact that reaction to a particular scenario will depend on whether the same scenario has been experienced in the past. This establishes a 'feedback' loop where previous events impact on current events.

Linked to these is the impact of learning. Learning can occur both as a society and as individuals. The accumulation of knowledge as individuals is well understood and documented, and not part of Belake's general work. However, societal learning is much more important and can have profound effect on society's well being.

As an example of recent road works demonstrates how societal learning and training can be more powerful than individuals own learning. In the UK, the construction of a new motorway required a new two lane roundabout. According to the UK Highway's Code, when approaching such a roundabout the left hand lane should be used for turning left or carrying straight on, and the right hand lane for turning right. However, during construction the roundabout was restricted to one lane only – the left hand lane. As a result, all traffic was required to use the left hand lane regardless of whether they were turning right or left. The interesting part occurs when the roadworks were completed and the roundabout returned to its two lane state. Drivers continued to use the left hand lane for turning right, ignoring everything they had learnt in the Highway Code. This 'convention' has become more marked over time, with drivers new to the area being influenced by the behaviour of others. This behaviour has continued for some years after construction.

Belake will therefore consider the impact of feedback, particularly that driven by learning, when developing models, research and conducting projects.

4. Non-predictable models

Just because we use mathematics or statistics to model social issues, it does not necessarily imply a predictable or deterministic world. When statisticians first started to apply statistics to society and found patterns emerging, they questioned whether this meant that ultimately human civilisation was entirely predictable, and what this meant for the individual's free will.

However, this view is clearly not true, and mathematics itself provides the answers. The most common example is the modern development of chaos theory. This theory, also known as complexity theory, studies those dynamical systems which small variations in the initial measurements of the system have profound effects on the final outcome of the system. So no matter how accurately we measure our starting point of a dynamical system, we will have difficulty predicting the final outcome. However, chaos theory does have a lot to say about the *qualitative* aspects of such a dynamical system.

A key example is the weather. Chaos theory is commonly misinterpreted as "a butterfly flapping its wings in the pacific causes a storm over Europe." Whilst this is a mis-interpretation of chaos theory, it does demonstrate that we have to know the precise location of every particle in the atmosphere, together with the precise measurement of the heating of the sun, in order to accurately predict the weather accurately. If there is any inaccuracy in our measurement (such as that caused by a butterfly flapping its wings) our models will predict incorrectly. Even though we can't predict with complete accuracy such models, we can extract some useful information from these models. In the UK, such models are used by the Met Office to provide short term predictions of weather.

Another key example is the movement of individuals along paths. Much modelling has been conducted to model movement of people, such as along the concourse at a train station. This can accurately predict the flow of people along such paths, even down to some of the detailed patterns that emerge and are seen in real life. However, they cannot predict accurately the path the single individual is likely to take.

Belake recognises that mathematical and statistical models do not necessarily require a deterministic or predictable world, and do not necessarily prohibit individual free will. They are purely models of behaviour, not models of thought.

5. The individuality of utility and probability

Mathematics and statistics commonly treats utility and probabilities as fixed constants (utility is the name that is given to the expected profit or loss that results from a particular decision or outcome). For example in a game of dice in a casino, the probability of rolling a particular value, and the winnings that might result, can be easily calculated. However in the decisions that people make

day to day, probability and utility cannot be so easily quantified. Our decisions are much more governed by our *perceived* probability of an event occurring, rather than the actual probability of the event occurring. Likewise, utility is not necessarily linear. That is £200 may not be perceived as twice as much as £100. Lets look at two examples which demonstrate these two points.

Firstly lets look at speeds on the UK Motorways. The speed chosen as appropriate on a dry day vary dramatically from around 60 mph up to 100mph. Given that we can calculate the probability quite accurately of having an accident at different speeds, even allowing for different driver groups, we would expect each driver to set their speed the same, given the same likelihood of an accident. However this is clearly not true – drivers from the same groups regularly set differing speeds. Clearly their perception of having an accident varies. Granted some of this might be due to other influences, such as getting to a meeting on time, but this just reinforces the utility point.

Secondly lets take the popular game show “Deal or no Deal” as an example. In the final stage of this game, the contestant can select either of two boxes, or he can take the ‘deal’ offered by the banker. The contestant knows the prizes in the two boxes, but does not know which is in which box. Lets say the prizes are £0 and £40,000. The ‘deal’ offered is £10,000. Typically mathematicians would argue that the utility from choosing a box is £20,000 (A 50% chance of winning £40,000) and because this is greater than £10,000 then the contestant should take one of the boxes. However, utility is relative. Leaving with zero when you could have had £10,000 is far worse than leaving with £10,000 when you could have had £40,000 but might also have left with nothing. The difference between zero and £10,000 is *more* significant than the difference between £10,000 and the £20,000 expected utility. Therefore utility is ‘elastic’ depending on an individual’s particular belief.

Utility cannot always be quantified in fiscal terms – it includes issues such and emotional well being.

Flexibility in utility and probability is another demonstration of why mathematics applied to the social sciences does not prevent free will.

6. Interpreting the Core Values

Because our Core Values are quite unique, we provide this section to explain them in terms of more traditional core values.

Variation and standardisation are equally important is equivalent to a statement on equality and diversity. **Environment is important** is self explanatory, in that it also requires us to consider the environment in which we operate and how we interact with it. **Feedback** demonstrates our commitment to being a learning organisation. The final two, **Non-predictable models** and **The individuality of utility and probability** are analogous to our customer focus, showing that we treat every customer as an individual, and not in a mechanistic way.