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is for
uncertainty

A blurred background image of a business meeting. Several people in business attire are seated around a table, looking at documents and charts. A white pen lies on a document in the foreground, which features various data visualizations including bar charts and a pie chart. The overall scene is brightly lit, suggesting an office environment.

“Back then(2010) about 60% of our business was in the predictable area where we were able to use statistical forecasts to predict the future and it was a relatively low effort in those days to be able to demand plan. In a VUCA world, we are in an unpredictable world and our strategy has moved so that there is less use of statistical forecast to predict the future and we are having to really rely heavily on business intelligence which requires a totally new level of effort” - James Lennon, Procter & Gamble

A woman with brown hair and blue eyes is looking upwards. The background is a green chalkboard filled with numerous white question marks. The right side of the image transitions into a light grey area containing text.

Sources of uncertainty

Uncertainty is a fundamental feature of complex systems, we have already discussed a number of reasons why this is so, such as the very large number of elements we are typically dealing with and the often unknown nonlinear interconnections and interdependencies. But beyond this is the uncertainty owing to the fact that we are not dealing with a deterministic machine, complex systems are more like living organisms they evolve overtime and this is a key source of inherent uncertainty.

Determinism

Determinism - the idea that events and actions are already predetermined and to know the future we just need to discover the rules by which they operate is the default assumption within many economic and business theories. Determinism does not allow for individual agency to create the future. In contrast the idea that the autonomous actions of agents within the system create its overall state is a key assumption within complexity theory, thus the future is not determined it is created through the local actions and interactions of elements.





The elements within a complex system are capable of autonomous adaptation, this means whether we are dealing with traders within a financial market, voters within an election or employees within a business we cannot fully control their behaviour, their behaviour is a product of their adaptation to events within their local environment, every time they adapt they change the environment that other elements are responding to, this is called co-evolution.



Co-evolution

Co-evolution describes the interconnected and interdependent development of an agent and its environment. The actions the agents take effect their environment and this in turn feeds back to affect the actions of the agents. Co-evolution leads to a very rapid growth in the number of possible future state to a system that are very hard to determine.



There are many examples of co-evolution within ecosystems such as between the honey bee and the plants they pollinate which in turn provide them with nectar, each is dependent upon the other, a change in one will trigger an change within the other. Computer software and hardware can be considered as two separate components but tied intrinsically by coevolution. these systems depend upon each other and advance step by step through a kind of evolutionary process. Changes in hardware or operating system may introduce new features that are then incorporated into the corresponding applications running alongside and vice versa.



Under the paradigm of determinism, the future can be predicted and known for certain. This will inevitably lead to an approach that invest heavily in data, information and statistical analysis. The net result will be a future represented as a set of probabilities upon which we can apply our traditional calculations (risk based analysis, ROIs etc) in order to determine which is the optimal strategy.

The illusion of predictability

If the organisation and environment are truly stable, nonvolatile and deterministic - as some are - then this method works well, but in more complex environments it can be no less than dangerous and delusional as it can blind us to the underlining complexity that is really governing how the system functions.





Uncertainty means there is no one optimal solution as there may be many different states to the future environment (or even the present environment) the main way to respond to this is to develop a diverse system that is capable of operating within as many different environments as possible, resilient and robust through its multi-functionality.

Thus our strategy shifts from defining one environment in the future that is most probable and creating a single focused strategy in response to this projection, to one of investing more in understanding the major trends that shape the environment and developing projects and organisations that will be able to operate within a wide set of parameters by maintaining diversity within the system.



Our aversion to uncertainty is deep and primordial it implies the lack of control that is required for our survival, it signals danger. Our strategies and organisations are traditionally designed to function within one well structured and relatively ordered environments - so as to be able to maintain control -outside of this their capacity to operate often diminishes very rapidly.



Uncertainty and volatile environments require us to develop organisations that are less dependent upon a single structured and ordered environment but are better able to operate within multiple - even semi chaotic - environments. Diversity allows systems to maintain operations outside of their usual operating parameters and to fail gracefully.



Summary

- **Uncertainty is the inability to know everything fully. It is a fundamental property of complex systems primarily due to; the large number of elements; high interconnectivity and interdependency; Nonlinear interactions and co-evolution.**
- **Co-evolution means events feedback on themselves making the space of possible future states to the system grow at an exponential rate.**
- **Within complex environments our traditional analytical methods for modelling the future -that depends upon probability and statistics- break down.**
- **In response we need to invest more in understanding the broader trends, creating diversified projects and organisations that can respond and function within a wider range of possible states.**



Complexity Lab



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