A Managing in Complexity Series Seminar on "Thinking about Thinking"

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Mr Lam started the lecture with the observation that we tend to think that everyone thinks alike, that we all perceive the same objective reality, even if from different angles. In fact, what we perceive depends as much on our mental furniture, our experiences and ideas, as on whatever we are looking at. Perception is a pattern-matching process — the mind sees only a small portion of what our eyes see, and identifies it based on the patterns it elicits in our minds.

If we cannot trust our own mind, how should we start thinking about thinking? Mr Lam suggested that we consider two dimensions of thought and decision making: the *time available* for making a decision, and the *complexity* of the environment we work in.

Thinking Depends on the Time Available

When confronted with decisions in a short time interval, we think in ways that are different than if we were given more time to make decisions. This is because there are two systems of thinking, which we can call the Automatic System and the Reflective System.[1] The Automatic System, as the name suggests, controls our intuitive, automatic responses. It is typically uncontrolled, effortless, associate, fast, unconscious and skilled. This is the system of thinking we tend to use in our day-to-day activities and when we have only a short time in which to make decisions.

Conversely, the Reflective System is controlled, effortful, deductive, slow, self-aware and rule-following. What we typically think of as reasoning and the rational method depend on the Reflective System. Mr Lam argued that our education system today and the kind of thinking generally found in the civil service, relies on the rational method, the development of which can be traced back to the Enlightenment and to Ancient Greece. The rational method has served us well so far, but is no longer sufficient in solving some of our current problems.

The Emergence of Complexity

There is growing interest from the scientific and public policy communities in complex systems. It used to be thought that if we could just collect enough data, if we had enough computing power, we could model any system, such as the weather or the economy. Chaos theory now teaches us that non-linear effects, when amplified over a sufficiently long period of time, can upset all our predictions. The weather and the economy are examples of *complex systems*, or but systems that exhibit regularity in behaviour without predictability.

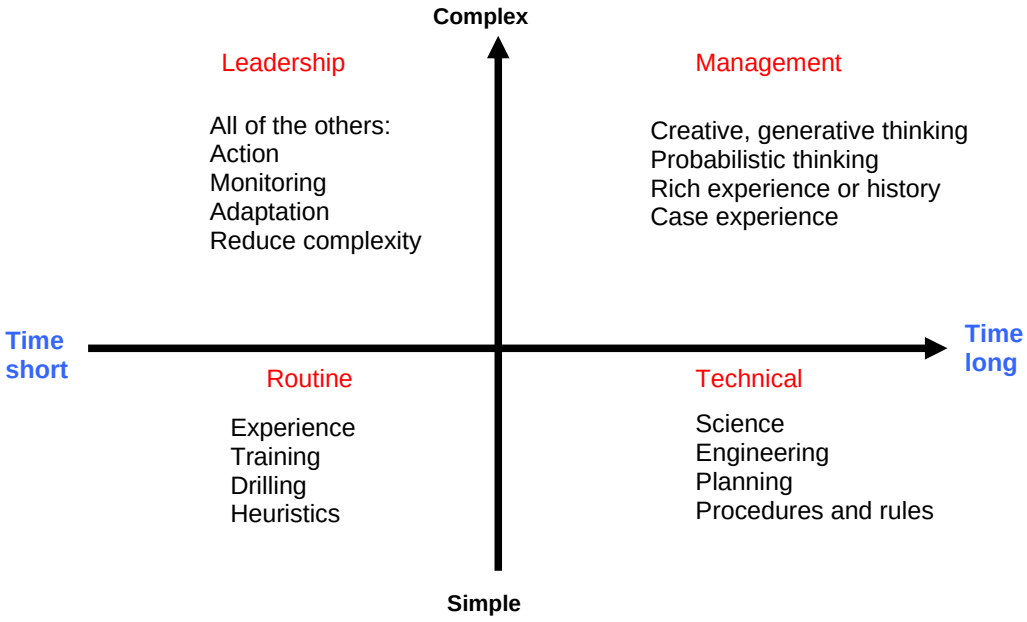
Working in a complex environment requires a different style of management and leadership from a simple environment. Mr Lam argued that we could think of the 1960s to the 1980s in Singapore as a relatively simple time, in that the characteristic problems of the

[1] Richard Thaler and Cass Sunstein, *Nudge*, Yale University Press, 2008

time were quite straightforward — to build roads and schools and housing, to create jobs. Singapore's transformation from a third-world to a first-world economy had been accompanied by a corresponding rise in the complexity of our society and the problems we now faced, such as demographic problems and the problem of rising healthcare costs. These were problems with no obvious or straightforward answers. Greater calls for consultation, participation and variation from Singaporeans today could be seen as both a symptom and cause of the complexity of our environment.

Different Management Styles for Different Contexts

If we combine the earlier discussions on the time available for decision making and the complexity of the environment we work in, we get derive four different contexts for management and leadership (see figure below).



The *routine* quadrant is where most simple tasks are and where the automatic system takes over. Our automatic responses are enhanced by experience, training, drills and heuristics.

The strength of the Singapore civil service is, arguably, in the *technical* quadrant. Simple environments are generally amenable to what are essentially engineering solutions — solutions which depend on repeatable causes and effects (or at most on probabilistic or stochastic models). The problems of the 1960s to 1980s in Singapore fall into this quadrant.

However, many of our most pressing policy problems now fall in the top right quadrant, the context of *management*. Take climate change, for example, and how governments should juggle the competing concerns of environmental sustainability, economic competitiveness and national welfare to arrive at the most appropriate policy responses for their country — there are few certainties here and no right answers. We have to

make sense of the problem by probing, experimenting, creating environments conducive to the generation of new ideas and new interactions, and responding to emerging patterns and behaviours.

The top left quadrant is the most challenging situation to manage — where the situation is complex and our time for decision-making very short. This is the quadrant in which crisis resides. Management and leadership in this context require all the skills and attributes needed in the other contexts as well as exceptional leadership skills.

Challenges and Obstacles

Challenges exist in all four contexts. For example, one challenge is management in an inherently uncertain and complex environment. Mr Lam suggested that there are in general two ways of looking for solutions to problems, or two "solution engines". The first way is through from prolonged study and observation, and the accumulation of expertise. The second way is to rely on collective wisdom, often through the aggregation of individual opinion without weighting the opinions. There is also a cultural dimension here: the first solution engine is premised on a belief in authority, while the second engine is premised on a belief in "challenge". Truth, on the first account, is to be sought in study and contemplation, and emerges on from the accumulation of expertise and knowledge; on the second account, it emerges from adversarial debate and argument. We can think of this as the difference between the East and West.

Singapore, like all countries, has a hybrid system — both solution engines have their advantages and disadvantages, and we employ both for different contexts. However, our mental models, our deep-seated cultural identify, is still relatively Eastern. The combination of a reliance on the rational method and a strong tradition of deference to authority is not conducive to the kind of creative and generative thinking needed to deal with uncertainty and complexity.

Another challenge lies in overcoming (or at least working with) the cognitive and behavioural biases that can skew our judgments of probability and uncertainty, especially when we rely on our Automatic System. Some of these biases are:

- *The great rationaliser.* Our left brain is the great "rationalizsr" or story teller. Emotions are needed for decision making, but we often invent stories to explain our decisions to ourselves and others — stories which may vary greatly from our actual deliberations.

- *Anchoring.* Experiments have demonstrated the importance of anchoring effects. For example, if a subject is exposed to a large number just before you make a purchase, he tends to be willing to pay a higher price — even if the number has nothing to do with the object of purchase.

- *Confirmation bias.* The mind tends to see what it wants to see, which means we often, perhaps unconsciously, ignore evidence that contradicts our beliefs.

- *Placebo effect.* This has been documented in experiments with pain alleviation, using surgery and pills (in separate experiments) — in both cases, patients who received the placebo experienced the same amount of pain alleviation as those who were given the actual treatment.

- *Framing effects.* How problems or options are framed can have different effects on people's responses. This is especially important to policy-making — for policymakers to avoid being misled by framing effects, and to frame problems carefully to elicit the desired responses in their target audience.

Conclusion

Given the necessity and the difficulty of management in complex environments, what can we do? One precept to live by may still be the motto of Delphi: ***know thyself***. This includes learning to make sense of the environment in which we operate and recognising its inherent uncertainty and complexity; understanding that we are less rational than we think we are, and the behavioural and cognitive biases we are subject to; and acknowledging that time constraints that we act under, and the system of thinking we rely on.

One way to deal with uncertainty and complexity is to cast our net as wide as possible, and accept and encourage a wide range of ideas, working styles, and kinds of interaction, to allow new behaviours and structures to emerge. This includes accepting "strange" ideas — the Eiffel Tower, the Sydney Opera House and the glass pyramid at the Louvre are all examples of buildings and structure that were heavily criticised when first unveiled but came to be accepted and embraced by the same people after a period of time. Accepting diversity may cause discomfort at the beginning, but that is a small price to pay to generate more innovative and imaginative solutions.

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