

A Response to the Discussion of the Community of Systems Thinkers and Cyberneticians

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As systems thinkers we can render a great service in the wake of the recent terrorist attacks if we can get a handful of basic concepts into the public debate. The dominant paradigm needs to be challenged with new arguments whether or not we are thanked for asking questions instead of offering unqualified support. I've chosen five of them - following the notion of the magic number seven plus or minus two - the number of distinctions most people can make most of the time.

System

Number one has to be the notion of systems itself. A whole system, like the planet, is made up of parts or subsystems interacting with each other. What happens in one part affects the others whether anyone wants it to or not. It has just about been accepted that global warming exists and that opting out of its effects is not an option. We are told that the globalization of trade is an unalterable fact, but a great error is made if we think that it is possible to limit the aspects of globalization that concern people to those that the WTO agrees to acknowledge.

It is not possible for the United States and the West to take what they want from less developed countries in terms of resources, labor and freedom from troublesome environmental regulations or impose their own terms on other countries without paying the costs one way or another. One way is to do something about helping them meet their basic needs. Another is trying to put up barriers to terrorists, anti-biotic resistant TB, boatloads of refugees and local civil wars with the knowledge that they will not always be effective. The West cannot accept ownership of some of its actions and disavow others. The statement 'What goes around comes around' reflects this. It should not be seen to be saying that the United States, still less the unfortunate people killed or injured, deserved what happened. Rather it asks policy makers to think long and hard about the potential for collateral damage and unintended effects of their actions around the world.

This isn't limited to governments. The trend of marketing a corporation's image rather than its products leads to increased visibility of everything that it does. Companies may be able to control the use of their brands but they cannot control being held accountable for whatever is done in their name. So Starbucks is pressured to buy coffee beans from markets that pay farmers a decent rate and Nike's use of child labor gives them a public relations black eye.

Requisite Variety

The second is variety and requisite variety. Pioneer cybernetician Ross Ashby said that a situation can only be controlled if the variety of the controller matches the variety of the situation to be controlled. A simple system with one variable, like the water level in a reservoir, can be kept under control with a simple machine that automatically opens or closes a gate when the desired level is reached. Of course, even mechanical systems are much more complicated. Really complex systems look different from different perspectives and operate on sequential probabilities. It is impossible to control for every variable so most variety is absorbed through relationships with other systems. Where controls are necessary, they may be designed into the system, distributed locally or generated by alignment with common goals.

Every society generates tremendous variety and tries to control it in its own way through laws and customs. In the West, much of our personal variety is absorbed by engagement in consumer pastimes including spending many hours a day in front of commercially sponsored television. Religions, especially fundamentalist religions, are another way to constrain individual variety. Internationally, powerful countries amplify their own variety using their political and economic power to dominate weaker ones.

Sometimes this is done directly; at other times through institutions like the WTO, the IMF and the World Bank. If individuals and groups in a culture find that it is difficult to express their variety through standard economic and political avenues, they will find other ways including crime and ideologies that can engage in terrorism. This is where subtle understanding and adaptation are required. Yet even universities in the United States provide meager funding for subjects like modern languages, anthropology and cultural studies.

International controls are mostly directed to governments on the assumption that they can contain the variety of their populations. That assumption is dangerously wrong. Many governments have factions they cannot afford to oppose and pockets outside the reach of their laws. In Iraq, there was a territory invaded by an army that could be opposed by another armed force. In this situation, there is no army and no real territory. It is a battle for hearts and minds, and that battle could be lost even if our armed forces meet little resistance and succeed in capturing bin Laden.

When the President said you are with us or you are with the terrorists, he reduced the variety of other countries' responses to a binary choice and left no maneuvering room for those whose populations are not unanimous in their support. He also left little space for dissenting voices here or abroad regarding even the means he may choose.

Models

The third is the notion of a model. A series of models usually begins with a metaphor to frame a situation and then becomes more elaborate; selecting some aspects and ignoring others. Its final form might be a rigorous interactive graphic depiction or a set of equations. The metaphor of war is a misleading one to guide a response to terrorist actions. "War" implies a contest between identifiable forces, a tangible goal and a definitive solution. Forces have a chain of command and someone who can negotiate a surrender or a truce. When a war is over, everyone knows it and can go home. Even resistance fighters have a tangible goal - to harass a stronger party such as an occupying army or an unpopular regime until they abandon the field or come to new terms. The type of terrorism we have just witnessed is not like that. It was aimed at individuals and at the symbols of American economic and military power. We run big risks if we assume a chain of command or someone who has the authority to negotiate. It may be convenient to characterize Osama bin Laden as a diabolical mastermind like a villain in a James Bond movie. But that might miss the point. We know he is wealthy enough to sponsor training camps, that he has raised money from sympathizers with fat wallets and that he has been willing to publicly denounce the West and call for murder and mayhem. We do not know that he is irreplaceable.

Our model of a war on terrorism will be no more helpful than our model of a war on cancer, or drugs or poverty. All of them overlook the complexity surrounding those situations and emphasize doing something after the fact rather than taking actions to reduce the chances that they will occur. Couldn't anyone tell the Bush team that 'Infinite Justice' is an oxymoron? Human justice exists to set boundaries and provide closure and to replace vengeance with judgement. God's justice is something else but that is not up to humans to impose.

Stability and Equilibrium

Historically, one of the foreign policy aims of the United States and other imperial powers has been to promote 'stability' in their client states. But it is not kind associated with stable systems that adapt to change and shift to maintain their equilibrium. It is more the kind that presses harder on the lid rather than turning down the heat. Many countries have seen traditional leaders bought off or elected leaders overthrown in favor of more compliant rulers. A century ago Europe drew the map of the Middle East and Africa to set tribes against each other and to maximize the accessibility and minimize the price of their

resources. China and the former Soviet Union got into the act as well. Successive governments seem to have decided that tyranny was preferable to anarchy - or even to messy young democracies that wanted to run things in their own interests. The other side of this version of stability is destabilization: if a country is not compliant or is the client state of a competing power, money, arms and training were provided to replace its government or render it ungovernable regardless of the misery forced on the populace.

Now, technology and mobility have amplified everyone's variety and it isn't possible to simply send the gunboats when situations start to simmer. Lids work reasonably well for official actions undertaken by governments but they are very porous when it comes to containing determined private groups who operate underground.

The kind of stability that systems people talk about keeps essential variables within prescribed limits. It is flexible, adaptive and robust against disturbances. In a country, it would be to make sure that everyone had enough to survive and that competing interests could interact and solve their own problems. Troubled waters and squeaky wheels would get oiled and low key responses would be favored. Infrastructure would be developed to move more and more sources of disagreement into agreed means of resolution.

Feedback

The most effective way to operate in a complex environment is through error controlled negative feedback. This is the dynamic that turns a furnace on and off through a thermostat. In more complex situations, measures are devised to report on whether a goal is getting closer or further away and give the operator time to adjust the input or the actions accordingly. Its results tend toward stability. When you have a conflict situation or an outburst, it is interpreted as an error signal in a negative feedback environment. Questions are asked about what kind of input led to the unwelcome output. Means are put in place to adjust the input and deal with the unwelcome output.

Its opposite is positive feedback. That isn't praising someone for a good job. It is doing more of whatever you were doing to increase the effect. Positive feedback in a conflict situation escalates the conflict rather than settling it. Increasing levels of retaliation can go on until one or another of the parties is beaten down or until exhaustion sets in.

The dynamics of conflict escalation are usually worked out between parties that are similar in kind if not in scale. This is not the case here. We have people willing to die in terrorist attacks from different countries who have been living quietly all over the world. If part of a network of hearts and minds is destroyed, it may become stronger rather than weaker. It can be more effectively combated using forms of negative feedback, such as shrinking its access to funds; prosecuting individuals and increasing security. This is not the sort of response that will balance the anger and the grief. But, directing the anger and grief of a powerful country against such a target is like fighting germs with a hammer. It inflicts most of its damage on bystanders to the conflict and risks producing martyrs.

In conclusion, Geoffrey Vickers said " The trap is a function of the nature of the trapped." He gave an example of a lobster trap that takes into account the nature of the lobster's limitations in movement and thinking. A man would never be caught in a lobster trap because he would see how to escape. We may hope that we are not charging into a trap because of the limits of our thinking but I very much fear that we may do so and compound the tragedy. I cannot comprehend living a normal life for years and then getting on a plane and using it as a weapon to kill myself and others. But I suspect that until some of the people setting policy learn to comprehend such actions that we will not be able to respond in a way that removes

them from the world stage.