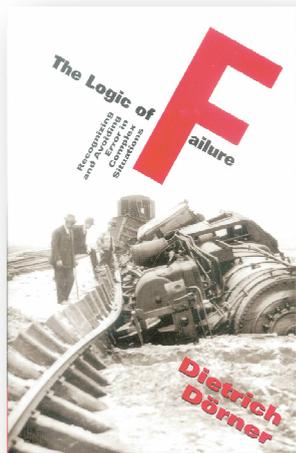


The Logic of Failure, by Dietrich Dörner

A book review by Ian Jay

Projects are about change, and frequently involve complex systems. There are time delays separating action and related effects. These are linkages which we often fail to recognize. The most recent and spectacular evidence of this failing was the accident at Chernobyl. In that instance skilled and experienced operators managed to convert an inherently safe power station into something quite lethal. The author of this book explains how normal thinking patterns lead us into situations that have negative outcomes like the one at Chernobyl.



When confronted with a situation or problem, our understanding of it is usually incomplete and wrong. This simple, if incorrect, perception allows us to confidently undertake changes to the underlying system. As our knowledge of the situation develops, we realize how little we really know. This realization leads to self doubt, and hesitancy in decision making sets in. Our minds undergo this transformation because we handle problems on an 'ad hoc' basis. In effect we perform a repair service on our surroundings. What we are not well equipped to deal with is situations requiring a clear knowledge of the underlying dynamics. These are things that come into play when changes are made. In particular we do not always understand events linked to causes with a time delay.

To illustrate this consider safety rules. These are usually formulated to avoid catastrophic failure when combinations of circumstances arise. Under normal conditions it is possible to violate a safety rule with no immediate negative result. Violation

is often directly linked to a positive reward. Over time people 'learn' that they can violate a number of safety rules routinely without any ill effect. At some point a variety of such violations are enacted in combination and the system interacts in unexpected ways. When this happens the person managing the system is trapped in a sequence of events the rules were intended to prevent. Such 'human errors' are not unusual; they do not arise from a single 'mistake' but from systematic rule violation. This is precisely what happened at Chernobyl; experienced operators thought they understood what they were doing. They were familiar with the conditions they had created in the system. Where they failed was in comprehending the overall system and its interactions.

The problem situations described in this book have four characteristics, they are complex, they are not transparent, they have internal dynamics, and there is a lack of understanding of how they work. Each of these is elaborated on in the text. Addressing complex situations requires a process of problem solving which is outlined by the author. This includes planning, and in particular the setting of explicit goals. In addition the author reports that experience provides greater chances of success in dealing with such situations. Learning from mistakes made in simulations is the suggested method of gaining the requisite skill. The main advantage of such simulations is that they can be repeated with different scenarios so that the learner can refine their intuition.

The main benefit of the insights of this text is that it facilitates reflective thinking. This is critical to understand the components of system. Components are explained in terms of positive and negative feedback processes. In addition it is important to understand buffering in the system and to differentiate which variables are indicators and which are critical. A planner or decision maker needs to have identified these components before they can be confident they understand a situation. The planning process, including appropriate methods of framing the situation, is explained.

The author draws extensively on experiments conducted using simulators. These were models of communities in the Sahel and England. Participants in the experiments are required to 'manage' these situations over simulated years or decades. Participant behaviour was observed and recorded over the course of the experiment. From these studies patterns of behaviour that differentiate successful from unsuccessful managers were identified. The main observation that arose from the studies was that good managers found new ways to influence the evolving situation. This caused the

number of decisions they made to increase over time. Managers that failed showed a lack of ability to track the evolving situation. Because they did not change their initial mental model, failing managers saw less opportunity to control the situation.

The key lesson of this book is that managers need to engage in deeper reflective thinking. This is particularly true about how they manage change. An understanding of systems thinking, which is woven into the text, is necessary to succeed at this. Project managers and consultants will find this text a useful guide. It will help to obtain an understanding of how projects and systems appear to take on a life of their own. In addition it will assist them in taking control of such situations.

The author is a professor in psychology at the University of Bamberg, and a director of the cognitive anthropology project at the Max Planck Institute in Berlin. The book is based on the results of several experimental programmes conducted to determine how humans respond to complex problems.

**'The Logic of Failure: Recognizing and Avoiding Error in Complex Situations' by Dietrich Dorner. (1996)
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