

# Error Management Systems Australia

***Red Flag***®

Error & Risk Management

## **The Tools**

Abbreviated Version

Doug Edwards

The full version is available to *Red Flag* subscribers. See:

<http://www.linklearn.com.au/redflag/gettingstarted.htm>

## The Tools – Short

### Being Practical

**Red Flag** aims to deliver consistently reliable decision. If you are already there, it will be as well to know why so you can keep it up. If improved decision is an objective, the means to achieve it will be central to your planning. Either way, practical steps that toughen decision and related skills need to be described. **The Tools** will give you insights into the cognitive processes informing and operating decision.

For **Red Flag** to be effective you must exercise both body and mind. **The Tools** contains arguments to support the exercise requirement and allow you to design/maintain your own.

This is the very briefest of introductions to the principal Tools. You'll need to purchase a **Red Flag** value-added product to receive the larger booklet.

<http://www.linklearn.com.au/redflag/products.htm>

### Case Studies

The principle that **Red Flag** holds most sacred is *no-nonsense*. The need for decision arises in sense of situation. An uncompromising attitude to reality – as it is and not as you'd prefer it to be – is vital to dependable decision. Get reality wrong and the decision can't be any good. Reality is disclosed by actual events. That's why Case Studies are used throughout. They are generic. You should use whatever sources are available to you – incident/accident reports, the media, your own powers of observation – to take note of what is going wrong out there.

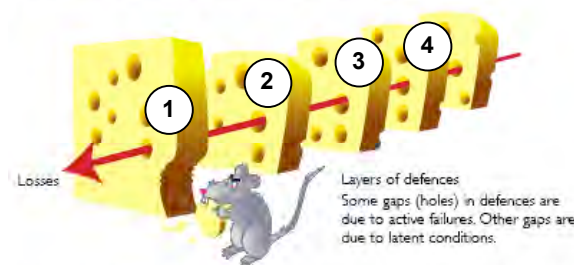
### Diagnosis

Getting the facts is just the beginning. The next question (after *what went wrong?*) is why? Professor James Reason has written extensively on accident cause analysis. Amongst the things he's famous for is this Model:

It shows Reason's main ideas – multiple layers of *defence* arrayed against accident causes. (He calls them *Pathogens*.) The defensive shields might comprise:

1. *The person's safety skills.*
2. *The Company safety program.*
3. *Professional Institute safety system*
4. *State Government OH&S law, etc.*

Illustration: Breach of safety defences [Reason]



The diagram is from the Civil Aviation Safety Authority's magazine, *Flight Safety Australia*

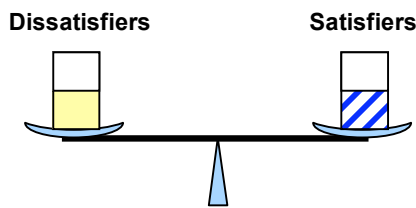
James Reason discusses his safety and behavioural ideas at:

<http://www.linklearn.com.au/redflag/papers.htm>

The interview with professor Reason confirms that the fundamental design criteria match his authoritative view of Error Management needs.

## Decision

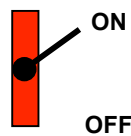
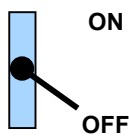
The decision model is an important tool.



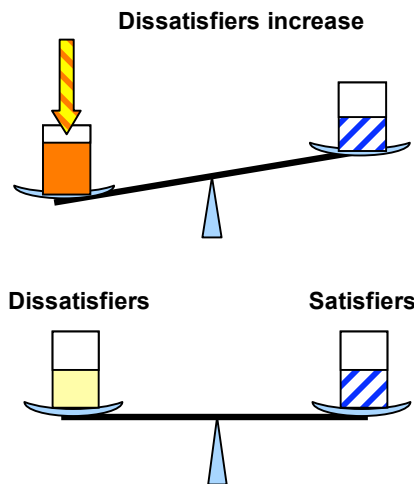
It starts with the psychologists' idea that decision is related to "emotional balance".

Tipping the balance activates a "Change Switch".

Change Switch



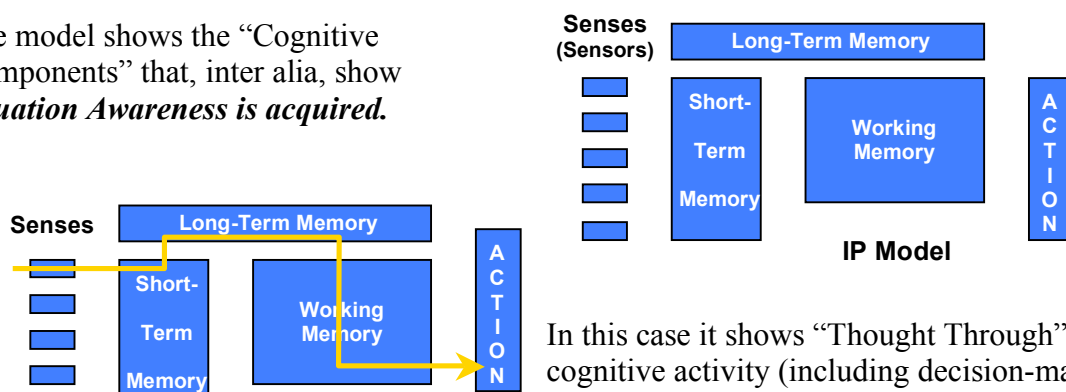
Action restores the balance.



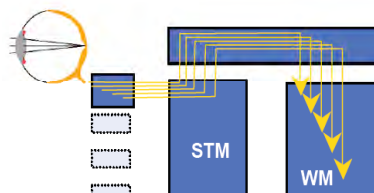
The decision model is fed by information – how you make sense of the outside world. An Information Processing (IP) model is commonly used to describe the associated processes.

## The IP Model

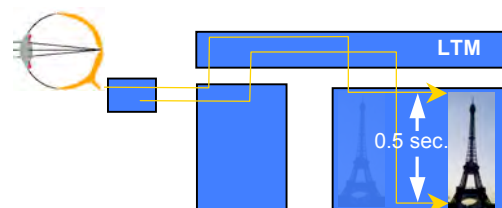
The model shows the "Cognitive Components" that, inter alia, show *Situation Awareness is acquired*.



In this case it shows "Thought Through" cognitive activity (including decision-making) at work.



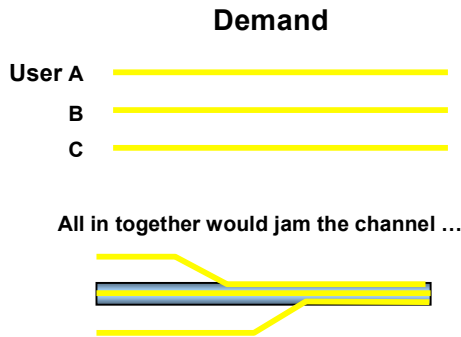
Acquiring "A Picture" as the basis for decision can take finite time.



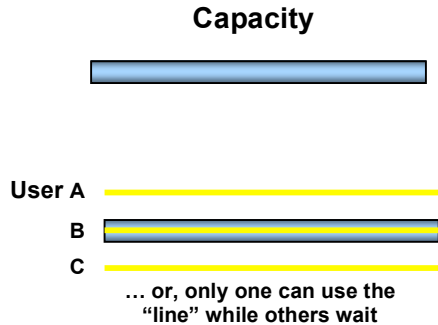
The next model shows an essential Situation Awareness skill – Time-to-Attention-Management – operating.

## Time-to-Attention

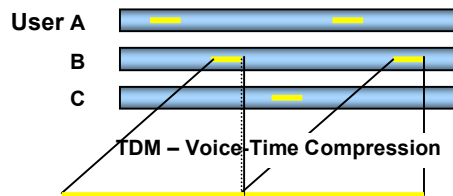
The human mind is single channel. You track different *streams* of information, but you do it by creating *Virtual Channels*. The skill is known as *Time Distributed Multiplexing (TDM)*.



The term is from communications technology.

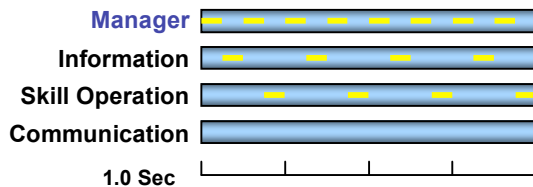


*Spectrum sharing according to time – TDM – crams segments of voice into packets for transmission – and decompresses them to reproduce normal voice in the handset.*



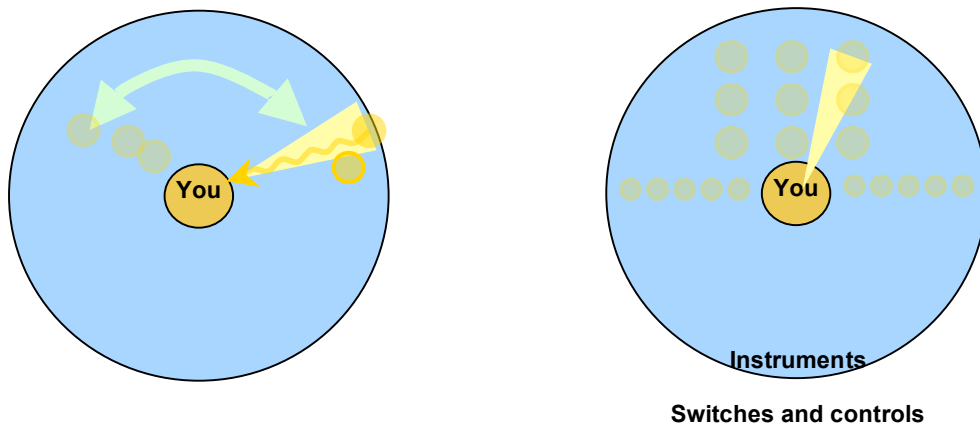
## Managing Time-to-Attention

A pilot flying an approach to landing shows the aviation TDM model at very high information and skill operation rates.



## Channels Within Channels

The attention scan is depicted as being operated in the fashion of a sweeping radar



The aircraft cockpit is a bit more organised than the randomly-assembled outside world.



Protracted information gathering can be hazardous (for someone).



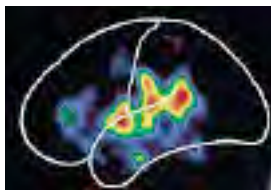
Intent on gathering information on an unfamiliar object, this brain is no longer operating skills (driving).

More importantly, the Manager function is disabled. That's really the intelligent part of the cognitive system – The Controller. It is most called upon in selecting *information feeds* as it's just done, though perhaps not intelligently.

Of course, the main Controller is the human brain. A number of conclusions can be drawn from observing brain function in decision-making.

## The Brain

Situation Awareness – the basis of decision – is the product of two cognitive skills, Attention Management and Perception/Recognition. Skills are *learned behaviours*. Learning is stored in different areas.



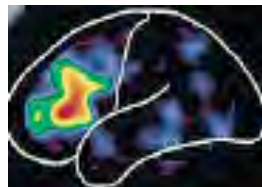
Hearing



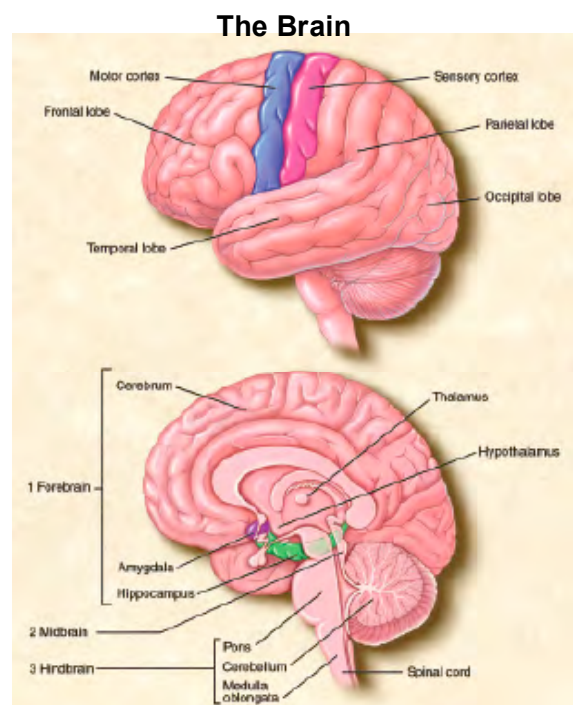
Reading



Speaking



Thinking

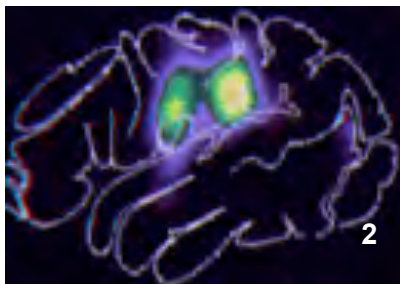
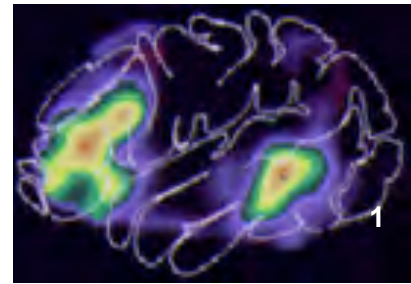
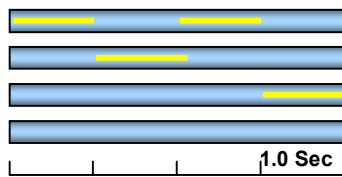


The process of synaptic modification (how the physical change happens) is dealt with in the full version of The Tools. PET scan diagrams from the Society for Neuroscience website are once of assistance in visualising essential elements of the learning process.

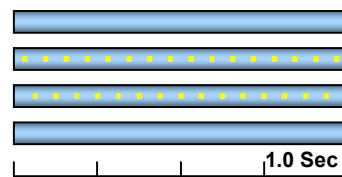
See: <http://web.sfn.org/Template.cfm?Section=PublicResources>

## Neural Learning

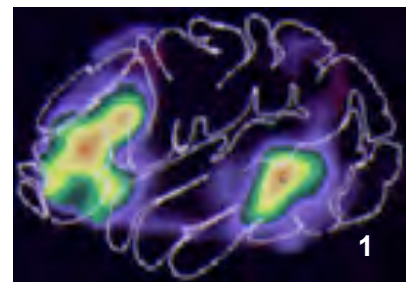
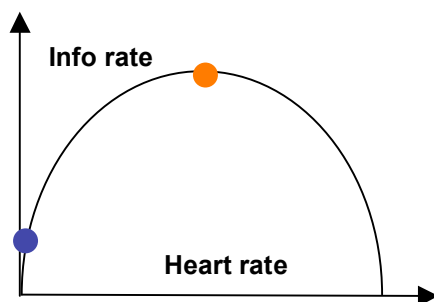
The *thinking through* stage of learning is shown. Two areas of the brain are in action; the Frontal Lobes and the region around the Hippocampus used for knowledge memory. These are skill practice attempts ...



... and now, *the skill is learned.*



The learning situation has much more neural activity going on, which means more blood flow – and therefore more stress.



As a major issue in *Red Flag* is coping – and making good decisions – under intense stress, the stress model is elaborated on substantially in *The Tools* (full version).

*In The Naked and the Dead, Norman Mailer recounts his experience after an artillery shell explodes near him, on the beach at Iwo Jima. He feels the heat and concussion, the ears are ringing, he moves a bit, begins to realise he's still alive, then notes the warm mass in his trousers and the wet crutch. That's peak stress, and few of us get there. It's as well to know about it, though, as the occasion may happen unexpectedly.*

There's a lot in *Fit to Fly* on stress effects, and especially for self-evaluating your stress tolerance. Indeed, it is a complete self-help Manual for developing your *stress fitness*.