



## Risk and Resilience

During 2022 we posted several blogs looking at risk and resilience and how organisations deal with these topics.



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## Digitalisation and resilience

Digitalisation is in the news. Recent topics include whether [Google's LaMDA system shows sentience](#), and on the legal and other issues raised when robots or AI systems have agency (defined as the ability to choose what action to take), that is make decisions which cannot be checked by humans. There have also been a flurry of articles on the lack of physical social interaction among children and the rise in mental health issues in children during the same period.

Our question is different: We ask whether digital systems are resilient enough **now** to be fit for purpose **now**. Here we define resilience as the ability of a system to deal with operational software or hardware failure in ways that do not destroy or corrupt data and, ideally, preserve some degree of functionality.

The [Consortium for Information and Software Quality](#) have estimated the costs of software failure to the US economy. Based on a comparison of the UK economy to the US economy, we estimate that the annual cost to the UK economy of software



2022 Blogs

failure could be about £30 bn. This compares with the cost of road accidents of about £15 bn.

How does this cost manifest itself? It is a cost borne by organisations, the public and private sector, and individuals, rather than the software or hardware supplier. It is manifested in one of three ways which are qualitatively different e.g.

- Interruptions that cause minutes of disruption such as those that require restarting a programme with few or no effects on data integrity, but inconvenience to the end user;
- System interruptions that halt operations for hours and that involve significant repair and restoration costs, with costs to the organisation and end user;
- System collapse that requires substantial rebuilding of data or other system elements or that creates substantial harm in other systems (such as power outages on an electrical grid).

From our own experience, the frequency of disruptions in the first category above appears to be increasing. This could be because organisations that have not historically provided digital services are now doing so. For instance:

- the NHS – GP's surgeries and other providers;
- schools and universities;
- local government council tax collection;
- travel ticket purchase.

These, among many others, have shifted to digital provision. This has often been without consideration for those without good internet access, a recent phone or computer, and a printer, which is raising many concerns about increasing inequality. But our concern here is the *level* of service to those who do have adequate personal IT.

We ask whether interruptions in service of the first category are not insidiously making our lives less convenient, also less productive and less safe? We certainly would not accept from our cars the level of resilience that digital systems currently provide to us.

One example of inconvenience from an interruption in digital service: Microsoft frequently down-loads updates to its software. These are not voluntary: the end user cannot refuse them. They can take so long to download that line faults on residential phone lines cause them to hang part way through and freeze the end user's system. The system then needs expert help to unlock. And other upgrades make printers obsolete, by not supporting them. The number of user hours lost in aggregate surely reaches many 1,000's. But it is difficult to measure impacts across end users.



2022 Blogs

The question we asked at the beginning – are digital systems fit for purpose – raises issues of system design and end user support as well as resilience. System design is the province of IT professionals. End user support is often the province of customer service or marketing. We think that resilience – the ability of digital systems to provide an ongoing service to users – will be of increasing concern to the board and owners of organisations, and to governments, as the economy moves towards recovery.

*Written by Patricia Lustig, SAMI Principal and Gill Ringland, SAMI Emeritus Fellow , published 28 Sept 2022*



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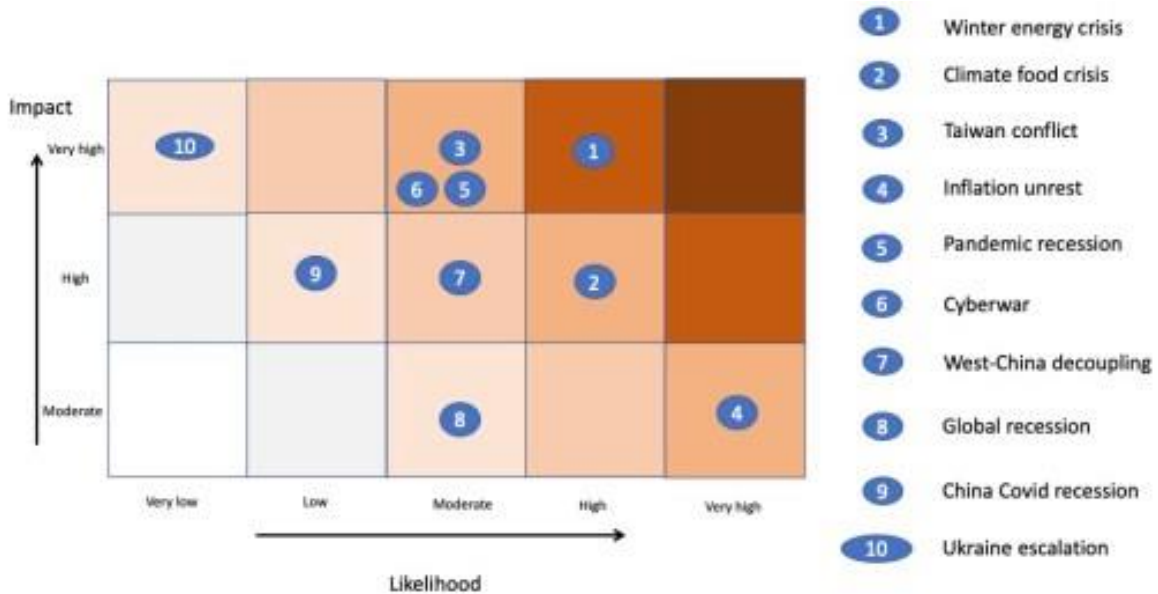
## Ten global risk scenarios

Each year the Economist Intelligence Unit (EIU) compiles a list of what it sees as the top ten global risk scenarios that could reshape the global economy in the coming year. As well as looking at economic and political issues, this year in particular they explore military and environmental risks.

The EIU also assesses each of the risks against the scales of likelihood and impact. Their overall matrix is shown below. Fortunately, none make it to the very high likelihood/very high impact category.



2022 Blogs



Their first risk, in the high likelihood/very high impact category is that a **cold winter exacerbates Europe's energy crisis**. They describe this as “political”. With Russia having cut off gas supplies, European countries are at risk of exhausting their reserves if the winter weather is particularly bad. This would lead to energy rationing bringing industry to a halt and creating a deeper recession, lasting into 2024. In the extreme, poverty would increase and EU solidarity could break down. Certainly there are extreme scenarios to explore here, but recent winters have tended to be milder, and countries are currently claiming that stocks are high. That said, the UK Government and energy industry have war-gamed rolling blackouts. Longer term this risk should diminish as reliance on gas declines.

In the high/high category, the EIU place **extreme weather adding to commodity price spikes, fuelling global food insecurity**. The droughts and heatwaves of 2022 and the effect of the Ukraine war on grain supplies have already raised prices. More extreme weather events are increasingly likely – inevitable – whatever the progress to Net Zero (which is not looking good). Despite these obvious threats, forward planning for this scenario seems sadly lacking – if not next year, then soon this scenario will soon become very likely and dangerous.

The only one assessed as “Very high” likelihood, **high global inflation fuelling social unrest** is perhaps a risk worth paying close attention to. Global inflation is higher than for many years. Governments are focussing on attempting to keep wage rises lower, concerned about a continuing spiral. This could easily lead to widespread protests from poorer people or at least a series of major strikes – even in the UK a General Strike has been mooted. The EIU have this down as only a “Moderate” impact. But surely it is a fundamental threat to the global economic model, requiring a major shift – say to a radical Keynesian approach – or economic breakdown, or authoritarian repression?



2022 Blogs

Three risks make it into the High Impact/Moderate Likelihood category:

- ***Direct conflict erupting between China and Taiwan, forcing US to intervene:*** even at the level of simple blockade, a China/Taiwan conflict would blow apart industry globally as semi-conductor supplies disappear. A full-blown military conflict, directly with the US and other allies is almost too dreadful to contemplate (US wargamers once concluded that Taiwan could not be defended) – which is perhaps why this is rated as only “moderate” likelihood.
- ***A new variant of coronavirus, or another infectious disease, sends global economy back into recession:*** maybe only “moderate” likelihood in 2023, this is certainly a much higher risk over a 10-year horizon. If current vaccines are inadequate to deal with the new outbreak, lockdowns and recession could well follow. SAMI’s risk analysis broadens this threat into a “Covid for crops” – widespread food shortages following a new disease.
- ***Inter-state cyberwar cripples state infrastructure in major economies:*** with the costs of direct conflict being too high, cyber-warfare becomes more likely. Attacks on critical infrastructure such as the National Grid would be devastating for the economy. Lower impact attacks probably have a higher likelihood.

Lower impact and likelihood risks identified include ***further deterioration in West-China ties forcing full decoupling of global economy, aggressive monetary tightening leading to global recession, and China’s zero-covid policy leading to severe recession.*** These variants on other risks seem more likely than the EIU assessment, simply because they don’t require major step changes, and are just continuations of current trends.

The final risk, although assessed as “very unlikely” is also “very high impact”: ***the Russia-Ukraine conflict turns into global war.*** Escalation of the war becomes more likely as Russian positions are more threatened. Already UK special forces are being accused in participating in an attack on the Russian fleet. Infiltrations in the Baltic states or Finland could easily cause over-reactions. Threats of – or “false flag” operations – nuclear “dirty bomb” attacks also raise the levels of tension. Whilst even tactical nuclear weapon use seems very unlikely, the risk remains that miscalculations occur.

Taken together, these risks suggest that “business as usual” or returning to a “new normal” are actually some of the least likely outcomes of the coming few years. Planning for tougher times ahead never seemed more essential.

*Written by Huw Williams, SAMI Principal, published 9 Nov 2022*





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## How ‘risk blindness’ threatens the effectiveness of board decisions

A board’s highly sophisticated procedure for making risk decisions can often be undermined by a failure to identify risk in the first place.

While behavioural economics aims to understand why we often make irrational decisions, risk management aims to mitigate against unfavourable or undesirable future outcomes through better risk decisions.

The success of risk management is based on the accuracy of prediction. Philip Tetlock and Dan Gardner examined the art and science of prediction in their seminal work *Superforecasting*, which followed the *Good Judgment project* in the US to determine how the quality of judgment can best be improved through data and analysis. Delivering “good judgment” is what behavioural economics and risk management have in common.

My own work on risk decisions with boards has found that a highly sophisticated procedure for risk management is often undermined by a failure to identify or recognise risk in the first place. In some cases, risk is seen but not recognised; in some it is recognised but ignored or deemed otherwise acceptable; in some cases, it



2022 Blogs

is seen but misinterpreted or recalibrated by a higher authority with different priorities.

There are many types of risk blindness, as indeed there are many types of sight impairment. Here are some possible diagnoses.

## Risk myopia

In the case of risk myopia, the threat is not seen because it isn't on the risk register; it lies beyond comprehension or consideration as a possible future outcome.

This short-sightedness prevents us from seeing the bigger picture because we are focused on risk types we know or have previously experienced. In heuristic terms this is familiarity or confirmation bias.

Within this category I also include long-sightedness of hyperopia, where some risks are not seen because they are so immediate or proximate that we don't see them. They are right under the nose, hidden in plain sight. These are what Michele Wucker would call Gray Rhinos from her book of the same name. These are risks we don't see because they are so obvious we look right through them.

Treatment for risk myopia and hyperopia requires an open mind and creative thinking, which are not always part of a risk manager's armoury. Imagination and envisioning a range of future outcomes would help, and tools are available such as scenario planning and futures modelling.

## Risk denial

In this case the risk is not seen because those defining risk within the organisation refuse to acknowledge it. This may be for cultural or ideological reasons, but there are definitely blinkers, which restrict a 360-degree view of possible risks. Those familiar with Margaret Heffernan's book Wilful Blindness will recognise this type of behaviour.

Treatment for risk denial requires a level of honesty and objectivity often lacking in those with an agenda. A cultural example can be found in the financial services market in the years leading up to the crash of 2008. The financial risk of selling loans to people who clearly could not afford them was not seen because the debt was repackaged and sold as an asset class to third parties. The sales revenue from the loans, plus that from the collateralised debt obligations (CDOs) meant that the risk of loan default was obscured.

An ideological example can be found in the UK government pursuit of the policy of leaving the EU for populist reasons, not economic ones. The financial risk of leaving





an established trading bloc was ignored, while there was political imperative to secure a mandate to govern for the next five years—albeit using the nebulous claim of taking back control and regaining sovereignty.

Treatment for risk denial requires a level of honesty and objectivity often lacking in those with an agenda or point to prove. As an estimated future outcome, and it is rare for two people to share the same vision of risk. Some are optimists who see the glass half full, others are pessimists who see the glass half empty.

## Risk inertia

Risk inertia occurs when the systems are so complex that there is a confidence that the risk must be manageable, i.e. “We have it on our radar so that’s OK because the systems are designed to cope.”

This hubris leads to a failure to even stress test. Examples of this type of failure to see risk can be found in industries awash with safety systems so that a risk is often obscured by too much information, so that those monitoring the dials or gauges cannot react to a warning signal.

Boeing developed the 737 Max as a fuel-efficient plane and sold it to many airlines before two fatal crashes halted all flights from March 2019. The flight control technology had the facility to override pilot commands, yet this vital function was poorly explained, and not all pilots knew how to switch it off or work with it. It cost the lives of 189 people on Lion Air flight 610 in October 2018 and 157 people on Ethiopian Airlines flight 302 in March 2019.

Other well documented examples of inertia in risk decisions include the Challenger space shuttle in 1986 and the Texas oil refinery fire in 2005—also detailed in *Willful Blindness*. The engineering industry has more examples of risk safety lessons from nuclear power plants such as Chernobyl and Fukushima.

Treatment for risk inertia requires clarity of communication: on a dashboard or control panel, where are the dials that are most important and which need to be taken most seriously? Are these located in the line of sight and calibrated so that danger is immediately obvious? It is the same with financial reporting and recognising danger signs in accounts, such as imminent insolvency.

## Risk compromise

Risk compromise sees a threat downgraded or underestimated due to conflicting priorities within the organisation.



This is quite often when the cost of prevention is calculated to be unacceptably high, so the risk probability is re-appraised to justify downgrading severity. This is common in government infrastructure projects like Crossrail or HS2 where once begun, costs overrun. In terms of cognitive bias this can lead to escalation of commitment or optimism bias.

Risk probability is re-appraised to justify downgrading severity. In 2016 the UK Department of Health ran a stress test to cope with a surge in demand for services due to a novel virus. Exercise Cygnus found that the NHS would be overwhelmed and needed substantial resource upgrades to meet public demand. In 2020 when Covid-19 struck it was found that the risk had subsequently been downgraded and investment reduced by the Treasury.

This month the Department of Transport finally decided to halt the roll out of Smart motorways for safety reasons. Since their introduction in 2014 a total of 38 people had been killed in their stationary vehicles on smart motorways, yet the data used to support the roads policy was selective. The safety risk was ignored by a cost-benefit of removing the hard shoulder to improve traffic flow.

Treatment for risk compromise is to agree the necessary cost for a project and ring-fence this so that no subsequent financial or political interference can reduce project effectiveness. Easier said than done, but compromising public health and safety will ultimately have a political cost.

### **Risk misunderstanding**

Some risks are unseen due to cognitive bias caused by the dynamics of the group and the environment in which risk decisions are made.

Time pressure can lead to patterning or availability bias, hierarchies and power politics can lead to dissonance reduction and groupthink. How many cognitive biases exist? One leading investment website lists 188 types.

Only by recognising and accepting bias can it ever hope to be neutralised

In their book Radical Uncertainty, the co-authors Mervyn King and John Kay draw attention to the importance of understanding the type of uncertainty you are trying to address in the boardroom. Is it a puzzle or a mystery? The former can be solved with information and effort, but the latter will always remain insoluble. Much time can be wasted trying to solve a mystery in risk assessment.



2022 Blogs

Cognitive bias comes from limited processing ability of the brain and its preference for seeking shortcuts to selecting information. Overlaid on these are emotional and moral motivations, social influence and our ability to store and retrieve memories. In short, these lead to irrational decisions boards call prejudices, preferences and politics. All boards have cognitive bias in risk perception.

Treatment for risk misunderstanding in the boardroom involves working with no more than 12 common biases, grouped according to how executives might meet them. For example, three personal ones like loss aversion or familiarity; three group ones like obedience to authority or dissonance reduction; three infrequent meeting ones like hindsight and patterning; three project progress ones like confirmation and over-optimism. Only by recognising and accepting bias can it ever hope to be neutralised.

In conclusion, I would urge anyone unfamiliar with it to read not only Daniel Kahneman's *Thinking, Fast and Slow*, but also Dan Gardner's *Risk: the Science and Politics of Fear*. The latter sets out the psychology of fear and how it underpins much of how we frame risk as a concept and toxic term.

*Written by Garry Honey, SAMI Associate and founder of Chiron Risk. First published Jan 2022 by Board Agenda and can be found here, published 7 Dec 2022*