

Safety and Security Decisions in times of Economic Crisis: Establishing a Competitive Advantage

Genserik L.L. Reniers^{*a,b}

^aSafety and Security Science Group, Faculty TPM, Delft University of Technology, Jaffalaan 5, 2628 BX Delft, The Netherlands

^bCEDON, Faculty of Economics and Management, KULeuven, Campus Brussels, Warmoesberg 26, 1000 Brussels, Belgium
genserik.reniers@kuleuven.be

The paper argues that organisations who invest intelligently in safety and security, regardless the macro-economic situation, will have a competitive advantage over their competitors not doing so. Establishing and maintaining a competitive advantage is all about excellence. Excellent results actually require seven domains to be focussed upon: 'quality', 'effectiveness', 'productivity', 'safety & security', 'efficiency', 'ergonomics', and 'ecology'. The paper explains each of these domains and shows that safety and security indeed is a very important sub-domain, as part of the 'value processing' fundamental process in any organisation, reflecting the ability of organisations to adequately make profits in the long run and independent of economic crisis.

1. Introduction

Every organization faces the possibility to encounter unexpected events leading to accidents and disasters that can shake its very foundations. These accidents and disasters can furthermore have a huge effect on society, as everything is connected in a systemic way.

As long as organizations have a purpose and objectives, they will be prone to risk. In our present industrial world, the complexity of society and organisations is high, which may cause high uncertainty on the achievement of objectives. This translates into risk being possibly high as well in a fast changing world.

Corporate decisions in large-, but also in small- and medium-sized organisations, can indeed lead to disasters with a massive and global impact. Events such as the combination of an earthquake and a tsunami in Japan resulted in the disaster we all know as the nuclear fallout of the Fukushima Daiichi Nuclear Power Station. Drilling in deep water caused an accident on a BP oilrig, resulting in an environmental disaster of what is known under the name of the "Deepwater Horizon explosion and oil spill". But how can a management approach help to avoid such disasters by ensuring an improved perception of the complex reality, and by consequently make the right decisions, also with respect to safety and security?"

The complexity of society and of today's organisations, increase the level of uncertainty and its effect on achieving societal or organizational objectives. Operating nuclear reactors in an earthquake and tsunami sensitive area or drilling for oil in deep sea, are highly complex operations in an uncertain environment. One could think these are exceptional cases, however, ever more complex operations are taking place in a gradually more uncertain environment.

Furthermore, the world has become an increasingly more connected place in many different ways. This implies that the effects of accidents and disasters can create ripple effects going around the world, increasing the impact on society. An example of this global effect is the knock-on effect of the real-estate crisis in the United States of America, resulting in a worldwide financial and economic crisis.

Often these disasters result from short term and closed-mind thinking and from a lack of systemic oversight. Decisions are taken in isolation with a lack of knowledge, and assuming very specific conditions.

Complex issues are treated in a view of simple cause-effect relationships, without the comprehension of the larger webs of interdependences and non-linearities that exist.

A systemic approach that aims at creating optimized value for all stakeholders, both in short and long term, should thus be used by organizations. Such an approach leads to so-called 'conscious contributing companies' being aware of the interconnectedness present in today's world and societies. The processes and domains that such an approach should consist of, is explained and elaborated further in the paper.

2. Seven fundamental processes in any organization

The three pillars of a company's success, that is, leadership, management and excellence, are three of the fundamental processes you can discern in any organisation. We will not go deeper into detail about these three processes because they are out of the scope of this paper, but it is evident and obvious that they are very important indeed for creating the right conditions and for making sustainable profits. Three other fundamental processes are the input of value in the organisation, the processing of this value to create added value and finally the distribution of the total value between all stakeholders. The next sections will elaborate on these three processes. The seventh process is communication.

Each of the seven processes represents a possible viewpoint of looking at an organisation and an opportunity to further optimize an organisation. Each process in itself has seven sub-domains, which makes it possible to find the potential threats/flaws and opportunities, and act upon them using the organization's weaknesses and strengths. Safety and security come into the picture to create a competitive advantage over the competitors, as one of the sub-domains in the 'Value Processing' fundamental process.

2.1 Value Input

One can't add value if there is nothing to add it to. This is why organisations have to start with a certain value input first. Consequently, bringing in value is a fundamental process in relation to organisations. The way value is introduced in organisations and to what extent, is often a hidden and more implicit process, a necessity that has to be fulfilled. However, how organisations deal with this process will largely influence the results the organisation will obtain.

Looking at the Value Input perspective will also indicate possible shortcomings, certainly when combining this process with the other fundamental processes in the organisation. Seven sub-domains can be discerned in the Value Input process: Financial assets – Production assets – Manpower – Raw material and energy – Education and Research & Development – Marketing & Publicity – Insurances and Intellectual Property.

All these areas need to be in concert with the ambitions of the organisation and have to provide sufficient value to build upon. When there are flaws at the level of financial assets in financial institutions or as production assets are not fully operational, these are possible flaws, creating an opportunity for accidents and disasters to take place. The same goes for the other domains. When insufficient value is introduced, results will fail. There needs to be balance of focus on the different sub-domains.

As everything is connected, amongst others, the way organisations add value is linked with their culture, vision and mission. It sets the priorities. As an example, the pressure to drill for oil and start making a profit as quick as possible, was a priority for the head of the oil platform, clearly at least more important than adding the right amount of value and create the perfect working conditions for BP at the time of the Deepwater accident.

2.2 Value Processing

When value has been added to the organisation, it needs to be processed in order to add the desired amount of value. This is done by any process that creates the organisation's results. Instead of focussing on the many different processes involved in creating this result and which are specific to the organisation, one needs to consider the partial and end results of these processes. It is by aiming at excellent results that accidents and disasters can be avoided. Excellence as a result is a yardstick by which every service or product within and also outside organisations can and should be measured. Such management aimed at excellence, also called "Total Respect Management" (see also Blokland & Reniers, 2013), defines seven characteristics or domains to be reached in order to arrive at excellence in products and services. Again this is how one can uncover potential flaws in the organisation. These characteristics are: Quality – Effectiveness – Productivity – Safety & Security – Efficiency – Ergonomics – Ecology

The characteristics are defined as follows:

- (i) *Quality*: Quality is the level to which a result is free from variability;
- (ii) *Effectiveness*: Effectiveness is the level to which a result satisfies the expectation;
- (iii) *Productivity*: Productivity is the level to which a certain result can be achieved and can be repeated within a certain period of time;
- (iv) *Safety & Security*: Safety & Security is the level to which someone or something is safeguarded from harm, damage and/or loss;
- (v) *Efficiency*: Efficiency is the level to which means (broadly conceptualized) are needed to arrive at a certain result;
- (vi) *Ergonomics*: Ergonomics is the level to which a solution, method, product or service is easily applicable and maintainable;
- (vii) *Ecology*: Ecology is the level to which a solution, method, product, or service is acceptable and can be upheld.

The first three characteristics determine performance, whereas the latter four determine sustainability. However, these seven elements depend on each other to reach their effect. It is important to respect all seven at the same time if excellent results have to be achieved.

Many organisations discovered the adverse effects of focussing too much on one item at the time, disregarding the other elements. For example Toyota was confronted with unexpected quality and safety problems at a time they focused too intensely on efficiency and cut expenses on safety programs. They lost the number one constructor position as a result. However they understood the importance of excellence and today they reclaimed the number one position.

Many organisations are struggling to become more efficient, but forget to increase the overall excellence. It means they will be less resilient to accidents or disasters than organisations that respect all seven elements in equal ways. How one does things in an organisation, directly reflects in the end result and in the level of the excellence attained. This should be clear – also in times of economic crisis!

2.3 Value Distribution

The increased value serves a purpose. Conscious contributing companies understand added value is necessary to create a better world. The best way to generate a reinforcing loop of value creation is to distribute the added value wisely and decide on a fair share for all stakeholders. According to Total Respect Management this starts with increasing the value of the organisation itself by the process of adding value to the organisation. Next, it is important to valorise the people in the organisation, as they make things happen. Then it is absolutely important to give the customers value for their money, as they pay the created value.

Less obvious is providing value to your competitors and colleagues. However, today, in the age of collaboration, it is becoming increasingly important to co-operate with others in order to achieve excellent results. Likewise it is important to respect the suppliers and grant them their fair share of value in due time. Shareholders will profit from the above mentioned value distribution, as it will increase the value of their shares. On the other hand it is also important to award shareholders for their financial efforts although one should be careful to keep this part in balance with the other stakeholders.

Finally there is a fraction of the value created that has to go to the society. Partially this is organised by the government in the form of taxes and legally mandatory contributions. But there is also a part that can be distributed directly towards projects that help in developing the world and make it a better place to live in.

Respecting all stakeholders and giving them all a fair share of added value will come back in many different ways. When done correctly, this will also help in preventing accidents and disasters from happening, as all stakeholders will contribute in the efforts to do so. However, when value is distributed unevenly or unjust, it could lead to disasters or accidents. Organisations lack the value needed to operate safely or co-workers go on strike, clients can stay away, colleagues and competitors won't work together, suppliers won't provide their best quality products in due time, shareholders sell their stocks, tax inspectors will fine and penalise and society will not develop itself, bringing about all kinds of nasty consequences as a result.

3. The importance of Safety & Security in economic crisis

3.1 Preventing accidents and disasters

One could question if accidents and disasters could have been prevented if Total Respect Management would have been applied in the concerned organisations.

In the Fukushima accident for example, soon after the earthquake and tsunami, it became apparent there were severe problems with the operational reactors. Initially, emergency reactions to the earthquake had

their desired effect, shutting down the reactors immediately. However, the cooling down of the reactors didn't occur as should have been the case, as the pumps needed for cooling the reactors were flooded by the tsunami and failed. At that moment, only prompt flooding of the reactors with seawater could have cooled the reactors sufficiently and quickly enough to prevent the melting down of the reactors. The Tokyo Electric Power Company (TEPCO) decided otherwise. Flooding the reactors with salt water was delayed because it would ruin them permanently. Action was taken too late and only when ordered by the government.

Obviously, the quality of perception of the TEPCO engineers and decision makers was lacking. They didn't take the right decisions when designing the plant, with inadequate defences against a devastating combination of heavy earthquake and subsequent tsunami happening. This in spite of the fact Fukushima is actually an area where this combination was rather likely to happen. Again they didn't take the right decisions when short-term thinking made them choose to save the reactors instead of making sure society was kept safe.

What would have happened if TEPCO engineers had considered all the weaknesses, threats and vulnerabilities in this plant at the moment of design and at the moment of the disastrous situation right after the earthquake and tsunami? What would have been the decisions taken and measures employed? If value for society as a whole would have been the driving factor instead of profit for the shareholders? One can never be sure, but chances are the outcome could have been different, and huge losses to the organization and to society could have been averted.

In the same way one could think about what has happened before and after the Deepwater tragedy or the financial crisis. How short-term and mechanistic thinking has led towards the accidents and let them develop in large scale disasters. History is full of examples where a lack of oversight and absence of systemic thinking produced accidents that led to disasters. A higher quality of the perception of the people involved could have made a huge difference and Total Respect Management could have provided for that quality of perception.

To improve the quality of perception and to have the right focus on all processes and domains, an integrated management approach is needed.

3.2 From a mechanistic approach to an integrated management approach

When looking at the evolution of how organisations are managed, one can see that management has evolved over time and still develops into new areas of progress. In the beginning, industrial organisations worked on becoming more effective in doing what needed to be done. Products were developed to fulfill specific needs. For example, people started to make cars to fulfill the increasing needs of transportation. It was important to develop the right product, able to transport more at higher speeds over longer distances.

Soon, management also incorporated knowledge and techniques to increase productivity. As needs grow, more production is required. From this stage forward, one can say management became important to organisations. To increase productivity, planning and organisation of efforts is necessary. Instead of being more of an artist's work, cars became the results of production lines and specialized workers. At that time, it became important to produce more cars in the same timeframe to fulfill the increasing needs of society.

With the increase of productivity and mass production, issues of safety and quality emerged. To increase productivity, a silo approach to production was applied. This resulted in more specialization and dedicated tasks.

In the early days of mass production, difficult working conditions produced dangerous and unhealthy situations, giving rise to the need of occupational health and safety measures. Furthermore, workers only produced parts of the product. Workers were detached from the final product and therefore small errors remained unnoticed, as they only had meaning in the larger context of the end product. This resulted in below standards quality, giving cause for quality management to emerge.

These days, cars need high standards of quality and safety. Nobody wants to buy a car that is not safe to drive and that spends too much time in maintenance or repair shops. Cars that are safe and excellent sell better than cars with a lesser reputation and they get a better price too, because it is highly valued by the customers.

In recent years, growth for industrial organisations became more and more difficult, leading to more consideration for efficiency. Resources are becoming more and more in short supply and the associated costs are constantly rising. Management responded with 5S, Kaizen, Lean Six Sigma and all kind of specialist methods aiming for more efficiency, still considering people in a mechanistic way.

Today, cars need to be excellent, giving high value at a low cost. It means they need to be reliable, safe, comfortable, fast, ... but also with a low ecological footprint, made of sustainable resources and having a minimal fuel consumption.

Effective, efficient, qualitative, productive, safe, ergonomic and ecological solutions, products and services are what people want. These factors are thus the benchmarks for excellence and it is what the industrial world needs today. Often these characteristics are treated in separate ways. Safety is the domain of safety specialists, efficiency is for efficiency experts, quality is in the hands of the quality manager, etc... resulting in a silo approach, missing the synergy of integrated solutions.

An integrated management approach requires integrated risk management.

3.3 Integrated risk management to maximize profit

Without profit there is no point in having an organisation. Profit has to be understood as the creation of added value in all possible forms. When an organisation is incapable of adding value to society in some way, it has no real purpose and its existence can be questioned. However, when an organisation provides value to society, it has the moral obligation to increase this value to the maximum extent possible.

Risk, according to ISO 31000, is the effect of uncertainty on objectives (ISO 31000, 2009). This means things can happen in such ways that results can deviate from what is expected. One can either remain short of the objective, achieve the objective or even surpass the organisation's objective. Understanding this, allows (risk) management to act and determine what needs to be done to achieve or even surpass the objective(s) and make sure the results don't fall short.

ISO 31000 is a standard which provides principles, guidelines, a process and a framework to manage risk in organisations. Unlike traditional risk management, ISO 31000 doesn't solely look at threats and weaknesses. On the contrary, it also studies the positive effects of uncertainty on objectives, which means also looking at opportunities and strengths.

When organisations are fully aware of the overall objective, when they understand what the weaknesses and strengths are, but also when they look at opportunities and threats, it becomes clear what can be done or even what needs to be done to achieve the overall objective.

For each level within the organisation the answers to the "what" questions can be determined and fine-tuned by applying the ISO 31000 guidelines, framework and process. In essence it boils down to determining what needs to be done to maximise the positive outcome of seizing opportunities and using strengths and also what else needs to be done to minimise the effects of threats and weaknesses. In other words it is about understanding how to take more risk, while risking less.

Understanding context and engaging in stakeholder dialogue are the starting point to discover risks related to the organisations objectives. Communication and consultation, help in establishing and understanding of the context and discover related risks. When objectives are clear, one can start with optimising the achievement of these objectives, by identifying risk, analysing the possible effects of uncertainty on the objectives and evaluate what these effects can bring about. When this process is followed, one can determine what to do and also what not to do.

For example, when context and stakeholders indicate cars need to be environmentally acceptable, this opens up opportunities to start producing electrical cars. However, producing electrical cars brings about a whole set of threats and vulnerabilities that need to be addressed. Seizing the opportunity means also doing what is needed to tackle issues on batteries, range, availability of charging capacity and so on.

When action finally is planned, the last step is to monitor and review what has been decided. However, this needs to be done always with an open mind and with risk mindfulness and an eye for safety psychology.

3.4 The psychology of safety and security decisions

Due to the psychological principle of 'loss aversion' (Tversky & Kahneman, 2004), the fact that people hate to lose, safety investments to manage and control all types of accidents, but especially precautionary investments to deal with highly unlikely events, are not at all evident. Risk managers, being human beings like all other people, also may let their decision judgment be influenced by this psychological principle.

To have a clear idea of 'loss aversion', the following example can be given (see also Meyer & Reniers, 2013). Suppose you are offered two options: (A) You receive 5,000€ from me (with certainty); and (B) We toss a coin. You receive 10,000€ from me if it is heads, otherwise (if it is tails), you receive nothing.

What will you choose? By far most of the people will choose option (A). They go for the certainty, and prefer 5,000€ for certain than to gamble and to have nothing in case the coin would turn up tails.

Let's now consider two different options: (C) You have to pay me 5,000€ (with certainty); and (D) We toss a coin. You need to pay me 10,000€ if the coin turns up heads, otherwise (in case of tails), you don't need to pay me anything.

What option will you prefer this time? By far most people in this case will prefer option (D). Hence, they go for taking the gamble, and risking to pay 10,000€ with a level of uncertainty (there is a 50% probability that they will not have to pay anything) instead of paying 5,000€ for certain.

From this example, it is clear that people hate to lose and that they love certain gains. People are more inclined to take risks to avoid certain losses than they are inclined to take risks to gain uncertain gains.

Translating this psychological principle into safety terminology, it is clear that company management would be more inclined to invest in production ('certain (real) gains') than to invest in prevention ('uncertain (hypothetical) gains'). Also, management is more inclined to risk highly improbable accidents ('uncertain (gamble-worth) losses') than to make large investments ('certain (investment) losses') in dealing with such accidents.

Therefore, management should be well aware of this basic psychological principle, and when making prevention investment decisions, also, and maybe especially in times of economic crisis, they should take this into account in the decision. The fact that we, as human beings, are prejudiced and that we have some predetermined preferences in our minds, should thus really consciously be considered in the decision-making process of risk managers.

By not having sufficient focus on safety and security in times of prosperity as well as in times of economic crisis, and not investing adequately, small and large accidents may occur, always going hand in hand with large and huge losses respectively. On the contrary, adequate safety investments lead to large and huge hypothetical benefits due to 'non-occurring accidents'. Safety and security should never be for sale. Safety and security are always good investments.

4. Conclusions

Total Respect Management is a systemic method to manage and to lead organisations towards better results and an increased contribution to society. It is based on a specific understanding of the value and concept of respect. It respects the human factor, the economic reality and the environment, by having a dedicated and positive attention for leadership, (risk) management and excellence.

Respect management works through an increased quality of perception through the right and balanced focus on different fundamental processes and their sub-domains within an organisation. It is a systemic method that provides insight in the whole, the relationships that exist between its elements.

Such an approach allows for excellent and sustainable results, produced by conscious contributing companies, making short-term as well as long-term profits. Ultimately it also prevents accidents and disasters from happening.

Acknowledgements

The author would like to express his deep gratitude to Peter Blokland, co-author of "Total Respect Management" (Blokland & Reniers, 2013), for his inspiration and help with respect to the ideas and concepts expressed and explained in this paper.

References

- Blokland P., Reniers G. (2013). Total Respect management: An innovative engineering management practice to deal with the complexities and society's expectations of today's industrial activities. *Engineering Management Reviews*, 2(1), p. 1-7.
- Blokland P., Reniers G. (2013). Total Respect Management. Excellent management for the future. LannooCampus: Leuven, Belgium. (in Dutch)
- ISO 31000:2009 Risk Management Standard - Principles and guidelines. International Organization for Standardization, 2009.
- Meyer T., Reniers G. (2013). *Engineering Risk Management*. De Gruyter: Berlin, Germany.
- Tversky A., Kahneman D. (2004), Loss Aversion in Riskless Choice: A Reference-Dependent Model. In: *Preference, Belief, and Similarity: Selected Writings, Shafir (Editor)*. MIT Press: Cambridge, Massachusetts, USA.