

## Organisational Effectiveness:

### A driver for sustainable safety and financial performance

#### Abstract

*Organisations that rely too heavily on proceduralisation to improve safety may struggle to deliver sustained safety and financial performance. Organisations operating in high-hazard industries are highly regulated, and increased proceduralisation has tended to be the obvious response to flaws identified by accident investigations. Such proceduralisation tends to assume that it is possible to anticipate every situation or condition and apply rules to control behaviour. However complex socio-technical systems are constantly adapting to multiple objectives, changing priorities and conditions, situational differences and new information. In this world of dynamic interactions, it is necessary to go beyond individual system components and the blind application of rules in order to achieve the goals of the organisation. A different approach, defined as adaptive or resilient, focuses instead on the overall culture and leadership of an organisation and its intrinsic ability to produce required outputs under both expected and unexpected conditions. Understanding and focusing on systemic drivers, common to both safety and financial performance, will improve organisational effectiveness in the delivery of both. This adaptive or resilient approach is characterised by a shift from determinism to craftsmanship and the exercise of greater behavioural complexity on the part of leaders to achieve an appropriate balance between proceduralisation and adaptability.*

#### 1) Introduction

Human cognitive biases toward saliency, certainty and immediacy often translate to organisational responses that address proximal causes of safety incidents rather than underlying systemic factors. This can often lead to a 'pendulum effect' or shift in the organisation's collective focus back and forth between safety (protection) and financial (production) performance. The initial period of high vigilance that follows a major accident eventually gives way to increasing pressures to perform, gradually opening up new and different types of risk exposure. In order to break this cycle, organisations must look for management techniques that simultaneously address safety and financial performance because both are ultimately required for the long-term sustainability of a business. Based on the review of the literature, this paper examines the underlying causes of this 'pendulum effect' and outlines how, by focusing on organisational effectiveness, organisations can transcend this paradigm of safety (protection) vs financial (production).

The following sections introduce elements that can complement the limitations of traditional proceduralisation approaches to managing safety and articulate how proceduralisation and adaptability can be combined to increase organizational effectiveness and support sustainable safety and financial performance in complex socio-technical systems.

#### 2) Organisational Culture

Culture is an important concept in any socio-technical analysis of organisational performance. Culture is best defined as 'what a group has learned throughout its own history in solving its problems of external survival and internal integration' (Schein, 2010). Organisational culture is a broad concept that includes the shared norms, values and mind-sets that characterise 'the way things are done around here'. Every organisation or group develops a culture that can act as a powerful social-environmental cue for how people think, feel and behave. Organisational culture is an emerging property of a group, and it continuously evolves over time as members interact with each other and make sense of their reality (Schein, 2014).

In the last 20 years, significant progress has been made toward understanding the influence of organisational culture on specific organisational outcomes. Although researchers and practitioners have recast cultural frameworks in numerous ways to address more directly specific organisational outcomes, such as innovation, service and quality (e.g., Detert & Schroeder, 2000), the underlying elements of these domain-specific conceptualisations have much in common (Denison, 1996; Xenikou & Furnham, 1996). Moreover, an increasing amount of evidence illustrates the generalised importance of organisational culture in a range of organisational outcomes, including safety and financial performance (Sackmann, 2011).

A common set of cultural factors emerge as fundamental to the safety *and* financial performance of organisations. A systematic review and analysis of these strands of research reveals a high degree of overlap across the majority of models and approaches that have been developed separately in these domains. Over two decades of research shows convergence on four elements of organisational culture that are consistently related to organisational effectiveness: (a) a sense of mission and direction; (b) adaptability; (c) involvement and (d) consistency, all strongly rooted in a set of core values (see Figure 1). Organisations whose employees have greater clarity and alignment in these four areas tend to outperform the competition (Denison, Nieminen, & Kotrba, 2012).



Figure 1: Denison's (1996) Organisational Culture Model Specifying Key Elements and Dynamics

### 3) The importance of leadership 'behavioural complexity'.

Leadership is one of the most critical influences on the culture. The effectiveness of a leader depends on an ability to simultaneously support the domains of organisational effectiveness. This means finding ways to carry out competing roles in a highly integrated way. This concerns distinctions in leadership roles and the associated behaviours in which the leadership skills are applied.

In their study of 176 public utilities executives, Denison and his colleagues (1995) found that effective leaders exhibit a greater variety of leadership roles than their less effective counterparts. Hart and Quinn (1993), in their study of 916 top leaders, tested the relationship between leadership roles and organizational performance. They found that the highest levels of performance were achieved by leaders with high levels of behavioural complexity -- those who were able to play all primary leadership roles. Similarly, in his study of 282 leaders from a large Fortune 50 manufacturing company and 252 managers from the public utility industry, Hooijberg (1996) found that leaders who were perceived to provide behavioural complexity in competing roles were seen as more effective by their subordinates, peers and bosses.

Effective leadership requires a simultaneous mastery of, or balance, of seemingly contradictory or paradoxical capabilities - decisiveness and reflectiveness, broad vision and attention to detail, bold moves and incremental adjustment, task performance and people orientation (Hart & Quinn, 1993).

#### 4) Proceduralisation

Proceduralisation has tended to be the obvious response to the flaws identified by accident investigations. Rules and procedures are '*a priori*' safe and validated courses of action in a given situation. They seek to embody the knowledge of an organisation with respect to safe operations (Taylor, 1991; Gulick & Urwick, 2003). The underlying logic of proceduralisation is based on the belief that rules and processes can be used to control operators' behaviour (Gilbert et al., 2007; Schulman, 2004). It assumes that consistent, error-free outcomes will be produced if the operators repeat the actions that have worked in the past (Grote, 2011). This perspective views error-free performance as feasible (Grote, 2011).

However, in complex socio-technical systems there are limits to the proceduralisation approach in handling novel and unexpected events (Grube, 2011). Uncertainty is an inherent aspect of complex socio-technical systems and error-free performance is an illusory concept (Clarke, 1999). No matter how diligently organisations prepare, unexpected events will happen (Weick & Sutcliffe, 2007). Excessive use of rules and procedures can increase complexity, rigidify behaviour and encourage mindless routines (Langer, 1990) and undermine effective responses to unexpected conditions (Edmondson, Bohmer, & Pisano, 2001; Staw, Sandelands, & Dutton, 1981).

Schulman (2013) and Rasmussen (1997) use the example of the 'work-to-rule' labour tactic employed in disputes with management at British Rail, in which all safety procedures were scrupulously observed by train operators and engineers, and trains were delayed and timetables became unreliable. Lamvik et al. (2009) point out how the expansion of proceduralisation decreases the amount of time managers interact with their team because of administrative paperwork.

Examples abound of operators preventing accidents by deviating from procedures (Leveson, 1995; Perrow & Charles, 1999). Accidents have occurred precisely because the operators followed the specified procedure in unexpected situations, such as in the Three Mile Island disaster. As James Reason argued, ruled-based errors, even if they are few in number, can produce more serious accidents than lapses in execution (Reason, 1990; Dien, 1998; Perrin, 2006). Leveson (2009) points out that when the results of deviating from procedures were positive, operators were commended for their competency and initiative, but when the results were negative, they were disciplined for being unreliable (Leveson, 2009).

#### 5) Safety and complex socio-technical systems

The insights that have been derived from twenty years of accumulated research on major accidents highlight organizational factors as the most critical background mechanisms in the generation of accidents and disasters across a wide variety of settings. Major accidents reveal critical divergence between the organisations assumptions and beliefs and the 'true' state of affairs (often accompanied by considerable surprise).

Safety can be defined as the absence of accidents, where an accident is defined as an event involving an unplanned and unacceptable loss (Leveson, 1995). Safety, unlike reliability, is a system property, not a component property (Leveson, 2011). Leveson argues that major accidents caused by unexpected interactions among reliable system components are becoming more common as the complexity of our systems increase. Each local decision might be 'correct' or 'reliable' within a limited local context but could lead to an accident when these independent 'reliable' decisions and organisational behaviours interact in unexpected and dysfunctional ways.

In his seminal 1997 paper, Rasmussen argues that large safety systems are more than the sum of their parts and requires a systems-oriented approach controlled at the system level, not at the component level. This requires not only ensuring individual reliability with respect to following specified procedures, but also managing complexity and uncertainty at the system level.

Abstractions and simplifications can be useful in dealing with complex systems, but they can hinder progress. An alternative to the proceduralisation approach in safety management involves acknowledging that safety is an emerging property of complex socio-technical systems and that the associated uncertainty is irreducible (Rasmussen, 1997; Bourrier & Bieder, 2013).

Compliance-driven approaches are insufficient in preventing incidents involving process safety because many are not the result of individual non-compliance behaviour (Leveson, 2007; Rasmussen, 1997; Bourrier & Bieder, 2013; Reason, 1990). Acknowledging that human errors are inevitable and learning to live with them as safely as possible helps to enhance safety. A similar paradigm shift in our approach to uncertainty and the integration of this dimension could further enhance safety management (Grote, 2011).

## **6) Context and Craftsmanship**

The logic of proceduralisation is based on the premise of certainty or stability. Procedures and processes reflect intentions that are both rational and context-free. They can be implemented only if 'context-sensitive experiential rationality' is applied to them by discovering ways to transform the intentions into actions that are meaningful in a specific context (Weick & Sutcliffe, 2007). This is implicitly recognised through the training and competency imparted to operators.

In complex socio-technical systems, gaps emerge between actual work practices and recommended procedures. Safety rules and procedures are necessary but insufficient. Introducing and enforcing more rules and regulations is ineffective without careful attention to the human and cultural factors required to develop the required level of adaptability in their application.

Highly reliable outcomes require constant adaptation in the process. Achieving low output variance in the face of high operating and input variance requires higher process variance, which precludes an exclusive use of procedures because they significantly hinder the level of adaptability required to produce consistent outputs (Bourrier & Bieder, 2013; Weick & Sutcliffe, 2007; Hollnagel, 2011). The knowledge to perform this kind of adaptive task may be rooted in experience and cannot necessarily be abstracted into a series of specific steps, which therefore defines it as a craft (Perrow, 1967).

## **7) From Reliability of Components to Resilience of the System**

The common understanding of safety is 'freedom from unacceptable risk' (Leveson, 2011). In contrast, resilience views safety as the ability to succeed under varying conditions. Here it is equally important to understand why things go right (succeed) as well as why they go wrong (fail). No fundamental differences exist between activities that lead to failure and those that lead to success. The 'things that go wrong' are the other side of the 'things that go right', and they result from the same systemic factors. Regardless of whether we focus on individual or organisational performance, we should try to understand the operation of, and influences on, the entire system, not just its failures (Hollnagel, 2011).

The goal of resilience is to increase the number of things that go right instead of reducing the number of things that go wrong. The latter will be a consequence of the former (see Figure 2) (Hollnagel, 2011).



Figure 2: Resilience View of Safety (Hollnagel, 2011)

Resilience is the intrinsic ability of a system to adapt prior to, during or following variations so that it can produce the required output under both expected and unexpected conditions. This definition includes safety as ‘freedom from unacceptable risk’, but it also makes clear that safety cannot be decoupled from the core business process of the system. Resilience aims to make systems both safe and efficient (Hollnagel, 2011). This approach is comparable to the conceptualisation of the adaptability trait in the field of organisational effectiveness.

## 8) Balancing Proceduralisation and Adaptability

Wildavsky (1991) and Grote (2011) contrast these two orientations: proceduralisation and adaptability. A proceduralisation and prevention perspective assumes that errors can be controlled, prevented or even eradicated, that uncertainty can be significantly reduced and that a ‘zero tolerance’ approach to error is an achievable organisational objective. In contrast, the underlying logic in the resilience approach focuses on an organisation’s ability to mitigate instead of prevent errors by adapting knowledge and resources to catch and correct problems in the making, before they can produce negative consequences (Grote, 2011).

The resilience approach also suggests opportunities for managerial action in advance of organisational errors. Wildavsky (1991, p. 220) suggested that organisations have to choose between anticipation and prevention, which is understood as ‘sinking resources into specific defences against particular anticipated risks,’ and resilience, which is characterised by ‘retaining resources in a form sufficiently flexible—storable, convertible, malleable—to cope with whatever anticipated harms might emerge.’ Wildavsky argued that anticipation (prevention) is appropriate when organisations can predict and verify risks with a high degree of certainty. When risks are uncertain, resilience makes more sense (Wildavsky, 1991).

The resilience approach relies on organisations expanding people’s general knowledge, technical capabilities and decision-making skills so they can adapt and effectively respond to disturbances (Weick & Sutcliffe, 2007). Complex socio-technical systems call for resilience because, in such environments, people’s understanding is never perfect, and they are under pressure to make wise decisions with limited information, multiple objectives and changing priorities. In short, complex socio-technical systems are ‘filled with errors waiting to happen’ (Weick & Sutcliffe, 2007).

In complex socio-technical systems, the combination of proceduralisation (prevention) with resilient practices creates connections that ultimately result in more effective organisation (Vogus & Sutcliffe, 2007). In combination, the two approaches can reduce both errors and their consequences. Thus, the challenge for any high-hazard organisation is to find the right balance between proceduralisation and adaptability (see Figure 3).

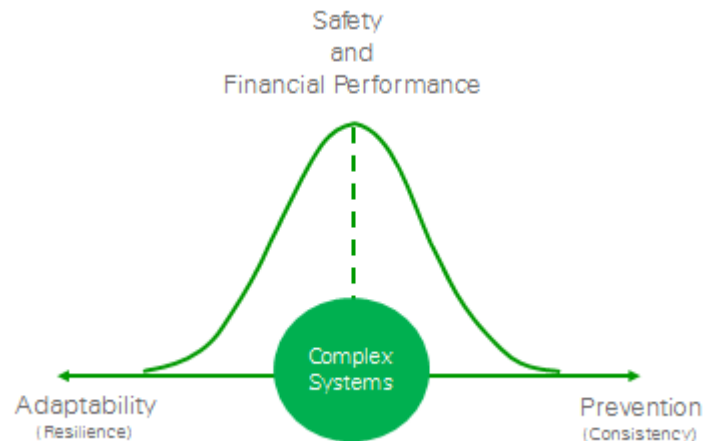


Figure 3: Optimisation of Adaptability and Prevention

Hale and Swuste (1998) introduced a useful distinction among three types of rules that differ in the degree of adaptability they give to the individuals following them: (a) *action rules* specify rules in terms of “if–then” statements that define exactly how operators shall behave; (b) *process rules* outline the processes by which operators should arrive at the way they will behave, but leave considerable freedom about how to get there; and (c) *performance goals* define only what has to be achieved, but not how it must be done. Prescriptive rules and procedures favour action rules, performance goals support adaptability and process rules balance prevention and adaptability. Even in complex socio-technical systems, one size does not fit all, and the level of adaptability and types of rules will depend on the activity or situation. For instance, action rules tend to be more appropriate to personal protective equipment (PPE) whatever the environment.

Process rules and performance goals represent a constructivist view of rules as dynamic and situated constructions of operators as experts, where competence is seen to a great extent as the ability to adapt rules to the diversity of reality. Rules are supports, not strait jackets. They can never be complete and are essentially underspecified, requiring a process of adaptation before application to any specific situation, which depends on the competence, motivation and trustworthiness of the rule users (Hale & Borys, 2013). Rules imposed from above, must be adapted from below to meet the diversity of reality. Rules need to be formulated as support for expertise and not as a replacement for it, and those using the rules at an operational level should be specifically trained and competent as to when and how to adapt the rules (Bourrier, 1996).

## 9) Conclusions

Although prescriptive rules and procedures based on a prevention approach may be relatively easy to implement, and provide a highly visible symbol of management action, increased proceduralisation has only limited applicability in complex and non-linear socio-technical systems. Furthermore, excessive bureaucratisation and proceduralisation can have a negative impact on both safety and financial performance and lead to the ‘pendulum effect’, which is, shifting between safety and financial performance.

Sustainable safety and financial performance is supported by focusing on systemic organisational factors and improving organisational effectiveness. Extensive literature is available on how to foster organisational effectiveness which is relevant to high-hazard organisations. By retaining organizational effectiveness at the heart of the work culture, the organisation can focus on continuous, positive improvement instead of only trying to avoid errors and incidents. Efficiency and simplicity can be created using one approach to manage culture instead of many disparate ones (e.g., safety culture, innovation culture, production culture, etc.). If the mission of the organisation is clear, such as sustained safety and financial performance, then focusing on organisational effectiveness will help practitioners determine what is fundamentally healthy and unhealthy in the management of an organisation.

In high-hazard environments, balancing consistency (prevention) with adaptability (resilience) is especially critical to foster organizational safety and effectiveness. People are not a problem to control, but a solution to be harnessed. Once we accept that rules cannot cover all eventualities, we have to rely on competent and motivated people to cope with local diversity, and adapt rules and protocols to the local environment. How we do this, and provide the right kind of leadership, is the key to sustained safety and financial performance.



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