Journal of Business Research xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Journal of Business Research

Creating high reliability organizations using mindfulness

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ARTICLE INFO

Article history:
Received 15 February 2015
Received in revised form 17 December 2015
Accepted 18 December 2015
Available online xxxx

Keywords:
High Reliability Organizations
Mindfulness
Soft Systems Methods
Healthcare

ABSTRACT

High Reliability Organizations (HROs) are organizations with processes that have extremely low failure rates, because the costs of failures are extremely high. According to Weick, Sutcliffe, and Obstfeld (2008) the key aspects of HROs are: preoccupation with failure, reluctance to simplify, and sensitivity to operations, among others. While we understand *What* the aspects of HROs are, we lack the understanding of *How* to implement HROs and *Why* they work. Using a soft research methods approach with Mindfulness techniques, this study demonstrates implementation of HRO in healthcare. In doing so, this research finds that Mindfulness techniques used with Soft Systems Methods provide an effective framework to create HROs. In doing so, this study also discovers a sixth aspect of HROs.

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1. Introduction

High Reliability Organizations (HROs) refer to organizations that typically operate in hazardous environments where the consequences of process failures are extremely high (Baker, Day, & Salas, 2006). They are very costly to create and manage, and usually involve large technical systems like utilities, military institutions, and healthcare. Overtime however, HRO investment pays off by preventing the high costs of process failure (Hales, Kroes, Chen, & Kang, 2012) which according to Deming (1986) are the highest costs of all. One recent example is the failed launch of the Affordable Healthcare Act website (HealthCare.Gov) in November 2013. Blamed on an incompetent contractor (CGI Group), and over-site failures of the U.S. Department of Health and Human Services (HHS), this single failure threatened to destroy a key accomplishment of U.S. President Barrack Obama. Several researchers (e.g., Weick, Sutcliffe, & Obstfeld, 2008) have identified key aspects of HROs: (1) a preoccupation with failure, (2) a reluctance to simplify interpretations, (3) sensitivity to operations, (4) underspecification of structures, and (5) a commitment to resilience. Despite their value, there is a paucity of management research on HROs, specifically on *how* they are created and *why* they work. In fact, Weick et al. (2008, p. 32) state that important features of HRO implementations still "remain unarticulated". While we understand *what* the aspects of HROs are, we lack the understanding of *how* to systematically create HROs and *why* they work to improve reliability.

The purpose of this research is to show *how* to systematically implement HROs using a Soft Research Methods approach moderated with Mindfulness techniques. Soft Research Methods are qualitative techniques used when formal experimentation and quantification of the variables are difficult or impossible (Liu, Meng, Mingers, Tang, & Wang, 2012). The activities of Mindfulness fit into the Soft Research Methods framework because they are qualitative techniques as described by Chakravorty and Hales (2013). This study describes *how* an HRO implementation improved the reliability of patient care in a critical care unit (CCU). In doing so, this research contributes in two ways. First, for practitioners this research suggests *how* to create HRO organizations through systematic implementation of the HRO aspects using Mindfulness techniques. Second, it answers the question of w*hy* the aspects work to improve reliability. This is important because developing and operating an HRO is challenging due to the extraordinary reliability demanded by its clients and the high costs of failure (LaPorte & Consolini, 1999; Hales et al., 2012). In doing so, a sixth HRO aspect was discovered; the aspect of "fast, accurate, and robust information systems". Second, for academicians, this study suggests future research in the impacts of failures can benefit the management literature, as they have done in engineering (e.g., Beer, Johnston, DeWolf, & Mazurek, 2012).

2. Literature review

2.1. Highly reliability organizations (HROs)

HROs focus on delivering high reliability outcomes to clients through very low failure rates (Issel, Michele, & Narasimha, 2007; Kaplan, 2002). Since reliability is a key dimension of quality (Garvin, 1987) greater reliability can lead to greater organizational competitiveness. Since most

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http://dx.doi.org/10.1016/j.jbusres.2015.12.056
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HRO studies are conducted in large technical systems, i.e. the Military, public utilities, and healthcare, it's assumed that these contexts benefit the most from HRO implementations. A few organizations that successfully compete on reliability demonstrate this (i.e. Schulman, 1996). While several researchers worked on HROs over the years (e.g., Seaman & Williams, 2012; Chassin & Loeb, 2011), Weick and Sutcliffe's work is considered seminal (Weick et al., 2008; Weick & Sutcliffe, 2007, 2006; Weick, Sutcliffe, & Obstfeld, 1999). Their collective work identifies five aspects that are present in all HRO implementations.

1. (5A1) *A preoccupation with failure* suggests that to prevent failures an organization must preoccupy itself with discovering potential failures and their causes. Preoccupation with failure focuses on points of failure by increasing alertness, fighting inertia, looking for new alternatives, identifying errors, and developing processes to prevent mistakes.
2. (5A2) *A reluctance to simplify interpretations* promotes a thoughtful, data-driven process that considers the uniqueness of a problem before applying a solution. It discourages the form-fitting application or popular 'best practice' solutions to problems without thorough consideration of the problem's unique context.
3. (5A3) *A sensitivity to operations* recognizes that a solution to one problem may create another and therefore process-wide measurement is essential. Sensitivity to operations is similar to the concept of a "bubble" in Navy terminology that refers to the awareness of a ship's overall condition in the moment. This is accomplished through sharing real time data, shifting problems to experts, and engaging in face to face communication.
4. (5A4) *An under-specification of structures* refers to using the highest level of recognized expertise in improving reliability, not necessarily the higher-ranking "boss". Under-specification of structures discourages excessive formal ranks because the ranking individual may not be in the proximity when the event occurs, may be too detached from the event to quickly respond, or may not possess the requisite knowledge, instead it relies on the lowest-level possible.
5. (5A5) A commitment to resilience encourages the use of individual initiative to maintain process improvements long-term. It encourages activities to prevent failures and relies on the expertise of front-line workers to reduce response time and counter immediate, evolving threats or "absorb" as much of the threat as possible.

Weick and Sutcliffe identified aspects of HROs but not a method for implementing them or why they improve reliability. In addition, they don't identify how they measured reliability or how reliability increased. The purpose of this study is to examine a measured increase in reliability through a successful HRO implementation using Soft Research Methods moderated by Mindfulness techniques. In doing so, a sixth aspect of HROs was discovered.

2.2. Soft Research Methods

Soft Research Methods such as Case Studies, Action Research, and Soft Systems Methodology (SSM) are formal methods appropriate when examining *How* and *Why* questions because the variables are ill-defined, the causal links in real-life interventions are poorly understood or too complex for surveys or experimental designs (Yin, 2014). This makes soft methods appropriate for exploratory research addressing problems that are difficult to quantify, and involve multiple objectives inappropriate for traditional analytical techniques (e.g., Checkland, 2011, 2000). Soft methods are appropriate for this study since the knowledge of *How* and *Why* real-world HRO implementations work is lacking in the literature (Ackermann, 2012). Soft methods, have been applied to initiate problem-solving and research in many studies (Ormerod, 1998; Paucar-Caceres, 2010; Mingers, 2011). Over the years authors have discussed varying types and stages of soft methods (e.g., Rodriguez-Ulloa & Paucar-Caceres, 2005; Creswell, 2002). Checkland's work on soft methods, which he refers to as SSM, utilizes seven steps and they are:

1. (SSM1) Confronting/identifying the problem situation (or Event)
2. (SSM2) Identifying the people, culture, or norms involved (i.e. the stakeholder's and context)
3. (SSM3) Developing root definitions that describe the ideal system
4. (SSM4) Building a conceptual model or a diagram of the system
5. (SSM5) Comparing models to the real world which questions each relationship in the model
6. (SSM6) Identifying changes that are needed to the current system related to the problem
7. (SSM7) Taking action or using an action plan to implement the changes previously identified

While this study uses the seven steps of SSM described above, it does not use Checkland's 5 E's (Checkland, 2011) which suggest that SSM outcomes should include measures of efficacy, efficiency, elegance, effectiveness, and ethicality. But HROs are primarily concerned with reliability so therefore 'reliability" is the key measure. Because of this, a full use of SSM is not claimed.

2.3. Mindfulness

Mindfulness practices are qualitative techniques that encourage high levels of alertness to a task (Weick & Sutcliffe, 2006). It promotes understanding among the players in how their actions contribute to improving process performance. Mindfulness techniques have improved reliability in healthcare (Matook & Kautz, 2008; Hales et al., 2012; Weick & Sutcliffe, 2006). Mindfulness is often operationalized through three activities; a) the use of frequent meditation, b) a willingness on the part of providers to objectively solve problems using context-specific solutions, and c) time to meaningfully communicate with others on the problem at-hand. This is important because it challenges the "best practice" approach suggesting that solutions in one context will automatically work in a different context; which practitioners know is not always true (Brown & Duguid, 1999; Szulanski, 1996).

2.4. Integration of HRO–SSM with Mindfulness

In this case, Mindfulness improved the implementation of SSM stages 1, 2, and 6 because it encourages a high level of alertness to a task, and an understanding of how the players' activities contribute to improve reliability for customers (Weick & Sutcliffe, 2006). The first step in Mindfulness, frequent meditation, clears the mind of random thoughts so that full attention can be given to identify an immediate threat to a patient, a problem, or its causes (SSM Step 1). The second step encourages objective understanding of the context and stakeholders affected by an action (SSM — Step 2), and develops solutions that are more effective because they are context specific (SSM — Step 6). The objectivity encourages data-driven analysis of a situation so that the best solution is applied. In this case, healthcare workers are encouraged to meditate 5–10 min every few hours, and then to clear their mind for 1–2 min before treating each patient. To prevent superficially reacting to an issue, providers are taught to (third step in Mindfulness) communicate with other providers frequently on patient condition and briefly evaluate how a treatment affects each patient. Fig. 1, the implementation model, shows the relationship among the seven SSM steps, HRO five aspects, three practices of Mindfulness, and their effects on reliability. It shows that Mindfulness supports the SSM steps and implementation of the HRO aspects (SSM steps *1, *2, and *6 were found later to be most affected by Mindfulness). The SSM steps supported the HRO aspects, leading to improvement in patient care reliability.

Please cite this article as: Hales, D.N., & Chakravorty, S.S., Creating high reliability organizations using mindfulness, *Journal of Business Research* (2015), http://dx.doi.org/10.1016/j.jbusres.2015.12.056

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