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Research Article

Root cause analysis – what do we know?

Wendy Groot

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Abstract

Root cause analysis (RCA) provides audit firms, regulators, policy makers and practitioners the opportunity to learn from past adverse events and prevent them from reoccurring in the future, leading to better audit quality. Recently approved regulations (ISQM1) make RCA mandatory for certain adverse events, making it essential to learn how to properly conduct an RCA. Building on the findings and recommendations from the RCA literature from other industries where RCA practice is more established such as the aviation and healthcare industries, audit firms can implement an adequate and effective RCA process. Based on the RCA literature, I argue that audit firms would benefit from a systems-based approach and establishing a no-blame culture.

Relevance to practice

Audit firms can use the insights from other professions to effectively establish an RCA process. Furthermore, the paper informs the audit profession on the developments regarding RCA.

Keywords

root cause analysis; audit firms; systems thinking; no blame culture

1. Introduction

Root cause analysis (RCA) is the process of identifying the causes of adverse events (e.g. inspection findings, audit failures, restatements, litigation) and preventing these root causes from happening again in the future (e.g. Leveson et al. 2020; Percarpio et al. 2008; Wu et al. 2008). Recently adopted regulations mandate that audit firms establish RCA procedures and identify remedial action to prevent the root causes from reoccurring (ISQM1, IAASB 2020).[1] The standard will come into effect on December 15, 2022. ISQM1 describes the main objective of RCA as understanding the underlying circumstances[2] or attributes causing the adverse event. These attributes can be linked to prior research on audit quality through the audit quality indicators (AQI's) (DeFond and Zhang 2014; Francis 2011; Knechel et al. 2013). The AQI's may lead to relevant areas where root causes can be examined and, vice versa, identified root causes might lead to AQI's (AFM 2017; PCAOB 2014). Several audit firms review AQI's as part of the RCA, such as the number of audit hours, partner tenure, and percentage of partner time, as these aspects are known to influence audit quality and may help to identify the root cause (FRC 2016). When root causes are identified, the current literature on AQI's can help identify proper remedial action (Nolder and Sunderland 2020). For example, prior research shows that critical thinking can be improved by prompting a deliberative mindset (Griffith et al. 2015) or a systems-thinking perspective (Bucaro 2019). Literature from other professions, such as healthcare and aviation, show that linking safety or quality indicators to the RCA also benefits system-wide learning (Chang et al. 2005; O'Connor and O'Dea, 2007; Taitz et al. 2010; Wiegmann and Shappell 2001).

The purpose of this article is to provide insight in the background of RCA and RCA practice in the audit profession. It is important to gain more insight, as RCA provides audit firms the opportunity to learn from past adverse events and prevent them in the future. Regulators

find that in investigating adverse events audit firms do not reach the level of depth needed to identify the root cause (AFM 2020; FRC 2016; Nolder and Sunderland 2020). Gaining more insight in the context, or system, in which the root causes emerged would provide a more in-depth understanding. Organizations form complex systems, consisting of underlying relationships between humans, technology and their surroundings (Grant et al. 2018). If the system in which the adverse events emerged is not altered, more adverse events are likely to occur (Dien et al. 2014; Labib 2015).

Furthermore, to conduct a valuable RCA, a safe environment is needed, where those involved with the adverse event feel free to speak up (Iedema et al. 2006; Wu et al. 2008). I find that audit firms should provide more clarity on how RCA findings could impact the individuals involved in the adverse event, to encourage a safe environment and no-blame culture. Those involved might be reluctant to be open about their experience when their openness could lead to disciplinary, legal or institutional actions, resulting in possibly missing essential insights.

In the second section of this paper I describe the RCA process. In the third section, I elaborate on the use of RCA in other professions, after which I reflect on the current situation of the audit profession. In the fourth section, I conclude with a summary.

2. RCA process

The RCA process aims to understand why an adverse event came about (e.g. Bagian et al. 2002; Benner 1975; Percarpio et al. 2008). As noted, examples of adverse events in the audit profession are litigation, audit failures, inspection findings, or restatements. Generally, the RCA process consists of five separate steps: defining the problem; collecting the data; analyzing the data; identifying root causes; and identifying remedial action (Mahto and Kumar 2008; Percarpio et al. 2008; Rooney and Vanden Heuvel 2004). To conduct these steps, the audit firm needs to appoint an investigation team, to which I refer as the RCA team.

Using an example from audit practice, I illustrate the steps outlined above, starting with what happened – ***defining the problem***. A regulatory inspection finds that the auditor failed to sufficiently assess and challenge the assumptions in the cash flow forecasts of X's management for the audit of the goodwill impairment.[3] The problem definition for the ensuing RCA could be formulated as: the audit of the goodwill at X failed to meet the standards (obtaining sufficient appropriate audit evidence – ISA 200.17 and ISA 540). To investigate how this happened, the RCA team could review the working papers regarding goodwill, to gain insight on the work done or, to be more accurate, the work documented – ***collecting the data***. Data on the planning on the engagement (planned and worked hours) provides information about the audit team's capacity and helps to contextualize the issue. Furthermore, the RCA team conducts interviews with the engagement team and involved specialists, to learn about the adverse event's circumstances and the perceptions of those involved. After the data is gathered and the interviews are conducted, the RCA team analyzes the observations - ***analyzing the data***. There are several (qualitative and quantitative) tools that can be used to analyze the data and formulate causal factors (possible contributors to the adverse event).[4] In the case of the goodwill impairment, identified causal factors can be, for example: high workload, no coaching on the job, insufficient training, or lack of professional skepticism. After the data are analyzed and visualized, the RCA team drills the causal factors down to the underlying roots of the adverse event – ***identifying root causes***. The main objective of this step is to distinguish the symptoms from the actual root causes, since merely addressing the symptoms would not prevent the problem from happening again (Mahto and Kumar 2008). Let's assume that the engagement team failed to gather counter evidence on the management assumptions. The root cause of this problem could be a 'check the box' mentality triggered by the use of extensive checklists in the audit guidance.[5] When the root causes are properly identified, measures are formulated to prevent the adverse event from reoccurring (Percarpio et al. 2008; Wu et al. 2008) – ***identifying remedial action***. The literature on AQI's can help with formulating appropriate remedial measures. For example, measures to trigger a deliberative mindset, leading to a considerate or skeptical state (Griffith et al. 2015) or decision aids prompting a systems-thinking perspective, leading to a more holistic approach of an organization's business processes (Bucaro 2019).

3. Promising practices regarding the RCA

This section explores the RCA literature from other industries where RCA is a more established phenomenon, aviation and healthcare. This review reveals two promising practices which are relevant for the audit profession, namely systems thinking and a no-blame culture.

3.1 Systems thinking

Although it is important to gain an in-depth understanding to identify the root causes, audit firms do not seem to have reached this level (AFM 2020; FRC 2016; Nolder and Sunderland 2020). For example, audit firms commonly identify the lack of professional skepticism as a root cause (AFM 2020; FRC 2016; Nolder and Sunderland 2020). However, the lack of professional skepticism is not a root cause, as it is merely a description (a symptom) of the auditor's behavior (Nolder and Sunderland 2020). To identify the root cause, the RCA team has to understand the context in which the auditor lacked professional skepticism, to explain why this occurred. This understanding requires systems thinking

(Dien et al. 2014; Leveson 2020). Organizations, such as audit firms, form a complex system, consisting of underlying relationships between humans, technology and their surroundings (Grant et al. 2018). When the systems in which the adverse events emerged continue to exist, this setting could be expected to cause more adverse events (Dien et al. 2014; Labib 2015). It is, therefore, essential that the RCA focusses on the system in which the adverse event has occurred (Besnard and Hollnagel 2014; Leveson et al. 2020).

3.1.1 System-based RCA tools

Prior literature from other professions finds that the tools used in RCA to analyze the data and identify root causes are often based on linear models (Besnard and Hollnagel 2014; Peerally et al. 2016). Linear models imply a causal chain of events, leading to the root cause which induced the adverse event. Such a chain of events leaves no room for the impact of interdependencies between technical, human, and organizational components. The complex reality does not fit well with linear models (Leveson et al. 2020), as they simplify reality to an extent that they might paint an incomplete, or even untrue, picture. The linear narrative leads to a reductionist view[6] of reality, with the risk of focusing on the apparent issues and not addressing flaws in the system as a whole (Dien et al. 2004; Peerally et al. 2016).

Furthermore, the RCA practice tends to emphasize the search for 'the' root cause (Wu et al. 2008). This tendency is simply implied by the singular form of the name root cause analysis, but it is also facilitated by some RCA tools[7] (Peerally et al. 2016). Both the simplistic perspective of reality and 'the one root cause' lead to a view in which the system is not adequately addressed. When the systems in which the adverse events emerged continue to exist, it could be expected to cause more adverse events (Labib 2015). It is, therefore, essential that the RCA focusses on the broader system in which the adverse event has occurred (Besnard and Hollnagel 2014; Leveson et al. 2020).

The ISQM1 does emphasize the non-linear nature of the RCA process, but does not provide further guidance (ISQM1, IAASB 2020). The use of system-based RCA tools could help with gaining an in-depth understanding of the system needed to properly identify the root causes. However, (transparency[8]) reports show that tools such as the 5 Why method and the cause-and-effect diagram (or the fishbone)[9] are used most often in the audit profession (CAANZ 2019; FRC 2016; NBA 2019; PCAOB 2014). Although these tools might prove helpful in analyzing the data and identifying the root causes, they carry the risk of creating a linear narrative and a reductionist view, leading to incorrect root causes or insufficient levels of depth (Dien et al. 2004; Muir et al. 2016; PCAOB 2014; Peerally et al. 2016). The RCA practice in the audit profession would benefit from system-based RCA tools, which are emerging in other professions.[10]

3.1.2 Collaborative systems

The audit profession does not exist in a vacuum, but functions in an interdependent environment. The profession consists of audit firms, global networks, clients (including audit committees, several layers of management and/or internal audit), regulators, professional bodies for auditors and educational institutions. Each of these components is a system onto itself, with (a certain) managerial and operational independence – the components are collaborative systems (Maier 1998).

The importance of addressing the collaborative systems in RCA is acknowledged in healthcare (Leveson 2020) and illustrated by the RCA practices in the aviation industry. Aviation consists of airlines, airports, the Federal Aviation Administration, aircraft manufacturers, and so on (Maier 1998). When adverse events occur in aviation, all the components are investigated and the entire industry is informed about these investigations. This method allows the aviation industry to make changes in the system as a whole, instead of an isolated component of the industry (Leveson et al. 2020). This broad systems approach contributes significantly to the industry's low accident rates (Leveson 2011). If the collaborative systems are not considered, recommendations might be aimed at the wrong level of the system (Wu et al. 2008)

The Commission examining the future of the audit profession, installed by the Ministry of Finance in the Netherlands, emphasizes the significance of the broader system in which the audit firm operates, to acquire high quality audits (CTA 2020). Although the importance of corroborative systems is acknowledged in the Dutch audit profession, it is not fully adopted in RCA practices. The regulator finds that audit firms have developed from focusing on identifying root causes at individual and engagement team levels (AFM 2017), to including the organization-wide impact (AFM 2019; 2020). However, this analysis does not include the level of collaborative systems, nor is there a way of informing the entire audit profession about RCA findings for system-wide learning. For both the inclusion of the collaborative systems in the RCA as well as the reporting on the findings of the RCA, a common vocabulary is needed. The AQI's could help establish this common vocabulary and with learning on the level of the audit profession (system-wide instead of organization-wide), similarly as for example in aviation (O'Connor and O'Dea 2007; Wiegmann and Shappell 2001) and healthcare (Chang et al. 2005; Taitz et al. 2010).

3.2 Establishing no-blame culture

The RCA's focus on systems as a whole, also implies that the investigation does not focus on the individuals involved (Dien et al. 2004; Macrae 2014; Wu et al. 2008). The investigations are to be conducted without blaming the individuals involved, in order to avoid a blame culture and optimize learning (Bik 2019; Iedema et al. 2006). To effectively conduct an RCA, the involved individuals

need to share their experiences uninhibitedly. Blaming the individuals risks creating an unsafe learning environment and creates difficulties for speaking up (Andiola et al. 2020; Gold et al. 2014; Kadous et al. 2019; Nelson et al. 2016). Also, when the RCA targets the individuals rather than the system in which the adverse events occurred, deficiencies in the system are not addressed (e.g. Besnard and Hollnagel 2014; Rasmussen 1997).

The RCA practice, however, does not always reflect this no-blame culture. First, the investigation is conducted after an adverse event has occurred, leading to hindsight bias, risking the investigation teams being overly critical of those involved (Fischhoff 1975). This effect can be reinforced by using local teams, and not including RCA experts, to conduct RCA (Peerally et al. 2016). Second, some RCA tools seem to encourage blame seeking. For example, a tool[11] might entail a checklist which explicitly asks about the individuals sloppy work habits (Livingston et al. 2001). Third, RCA can have consequences for those involved in the form of disciplinary, legal or institutional actions, when that individual bears any fault (Dempsey 2010; Peerally et al. 2016). Prior research, discussed next, provides some measures on how to overcome these three challenges, to support a no-blame culture when conducting RCA.

Overly critical: To prevent the RCA team from being overly critical to those involved in the adverse event, it is important that the RCA team is multidisciplinary, skilled, and properly trained (Macrae 2014; Peerally et al. 2016). In aviation, the safety investigators usually have extensive operational experience, as this experience is seen as essential for the RCA (Macrae 2014). Also, investigations into accidents in aviation have been formally assigned to an independent accident investigation body (Dempsey 2010; Sweeney 1950). This investigation team is likely to be less susceptible to interpersonal relations within the organization or negative hierarchical influences (Percarpio et al. 2008). Also, the investigation team is specifically trained to conduct RCA, increasing the expertise of the RCA team.

Blame seeking RCA tools: The use of system-based RCA tools helps prevent blaming the individuals, as they focus on improving the system instead of focusing on human error (Peerally et al. 2016), as elaborated in section 3.1.

Consequences for those involved in adverse events: Besides assuring an independent expert investigation team, an investigation body can also provide clarity on the distribution of responsibilities between the bodies that investigate the adverse events and the bodies that impose disciplinary, legal or institutional actions (Dempsey 2010; Kooijmans et al. 2014; Peerally et al. 2016). The sole objective of the body's investigation is to prevent future events from happening and any proceedings regarding blame are to be conducted separately (Dempsey 2010; Macrae 2014). The same applies to the Dutch Safety Board, which also studies accidents other than in aviation, such as railway, chemical and military incidents (Kooijmans et al. 2014).

Regulatory and transparency reports show that RCA in the audit profession are conducted by internal RCA teams, in most cases (partly) independent from the audit practice (CAANZ 2019; FRC 2020; NBA 2019). Although often organized as an independent team, the RCA is conducted internally within the audit firm, possibly leading to a higher susceptibility to negative effects from interpersonal relationships or hierarchy. Furthermore, although the AFM reports progress in recent years regarding an open error climate, they also conclude that creating an open error climate is still challenging for audit firms, as there is a lack of clarity on the possible consequences of the RCA on the individuals involved (AFM 2020). To further improve the open error climate, the AFM suggests distinguishing between permissible and inadmissible mistakes. Although such a distinction would make individual impact more explicit, it does not clarify the allocation of responsibilities regarding legal, disciplinary or institutional actions. Confusion regarding the distribution of responsibilities might lead to conducting RCA to allocate blame (Dempsey 2010; Peerally et al. 2016).

A possible solution for the independence of RCA teams and the confusion regarding personal consequences is to place the responsibility for proceedings regarding blame elsewhere, outside the RCA team, in line with aviation and the Dutch Safety Board, as proposed earlier by a study from TNO, commissioned by the NBA (TNO 2014). The audit profession at large (e.g. the practitioners, regulators, academics) needs to consider whether enough measures are taken to assure the autonomous functioning of the RCA team and if not, how to develop those measures.

4. Conclusion

RCA aims to answer the questions of why an adverse event occurred and how to prevent re-occurrence (e.g. Leveson et al. 2020; Percarpio et al. 2008; Wu et al. 2008). RCA also helps in determining the drivers of the quality of the audit (ISQM1, IAASB 2020), and strengthening the AQI's in doing so. RCA is conducted by defining the problem; collecting the data; analyzing the data; identifying root causes; and identifying remedial actions (Mahto and Kumar 2008; NBA 2019; Rooney and Vanden Heuvel 2004).

Literature from other professions with more established RCA practices argue the importance of a systems approach and the need to comprehend the complex system in which adverse events occur in order to acquire the level of depth needed to understand the root cause and to be able to properly identify remedial actions (e.g. Besnard and Hollnagel 2014; Leveson 2004; Peerally 2016; Rasmussen 1997). RCA tools tend to be based on linear models, which can lead to a reductionist view, where the reality is more complex and system failures remain unaddressed. The linear narrative could also lead to the search for 'the one fundamental root cause' (Wu et al. 2008). Since RCA in audit practice often does not acquire the level of depth needed (AFM 2020; Nolder and Sunderland 2020), the use of system-based RCA tools

might prove beneficial. Furthermore, within the audit profession, RCA focuses on a single organization, rather than the collaborative system (e.g. global networks, clients and regulators). Without addressing the collaborative systems, system-wide learning for the auditing profession is not established. Furthermore, the root cause and remedial action might be insufficient or aimed at the wrong level of the system (Wu et al. 2008).

Avoiding blame is important for the RCA process, as it prompts those involved to speak up during the RCA, optimize learning, and create a safe learning environment (Iedema et al. 2006). However, several factors promote a blame environment: hindsight bias, leading to being overly critical to those involved (Fischhoff 1975); possible disciplinary, legal or institutional actions (Dempsey 2010; Peerally et al. 2016); and blame seeking tools (Livingston et al. 2001). In this regard it is important to establish independent, multi-disciplinary expert teams, with a clear distribution of responsibilities regarding disciplinary, legal or institutional actions. The RCA practice in the audit profession is internally organized within each audit firm, leading to risks regarding its independence. Furthermore, there is a lack of clarity regarding the possible concurrence with the RCA and disciplinary, legal and institutional actions. The audit profession needs to further investigate how the possible independence issue, and the confusion regarding personal consequences for those involved with the adverse event, can be mitigated.

■ **W. Groot MSc RA** is manager in the PwC National Office and an external PhD candidate at the Vrije Universiteit Amsterdam, School of Business and Economics - Department of Accounting.

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Notes

1. The IAASB accepted an International Standard on Quality Management for all firms providing financial audits or reviews, or other assurance engagements. The standard requires audit firms to conduct RCA when deficiencies are identified (IAASB 2020). The audit firms are responsible for establishing procedures regarding the nature, timing and extent of the RCA process. Furthermore, the firms need to evaluate the severity and pervasiveness of the deficiencies (art. 41, ISQM1, IAASB 2020), allowing for different types of investigations. When the root causes are identified, the firms must take remedial actions to prevent these from reoccurring (art. 42, ISQM1, IAASB 2020). The IAASB also suggests that audit firms conduct RCA of good practices (art. A169, ISQM1, IAASB 2020).
2. Such as the appropriate involvement of the partner (art. A167, ISQM1, IAASB 2020), or sufficient supervision and review of conducted work (art. A169, ISQM1, IAASB 2020).
3. The insufficient challenging of management in complex estimates and forward-looking estimates, such as goodwill impairments, is used as example as it is a regularly reoccurring finding in the audit quality inspection reports (July 2020) of the FRC.
4. See Livingston's et al. (2001) book on accident investigation techniques for a comprehensive overview of different methods.
5. Adverse events often have multiple root causes, as the adverse events emerge in systems with interdependent components (Peerally et al. 2016). To illustrate the complexity – it might be that in the case of the goodwill impairment there was not only the beforementioned 'check the box' mentality, but also a high workload, which led to the engagement team's reluctance to gather counter evidence on management's assumptions. Subsequently, the root cause of high workload could be due to a lack of time management skills of the engagement manager or an understaffed engagement team because the audit firm has difficulties attracting sufficient suitable staff members.
6. A reductionist view means that complex entities are reduced to more fundamental and simpler entities or terms.
7. Peerally et al. (2016) argue that the linear narrative is exacerbated by RCA techniques such as timelines and the 5 Whys, as they tend to encourage a reductionist view.
8. From 2014 up to and including 2018, nine firms provided statutory audits for PIE's: Deloitte, EY, KPMG, PwC (the Big 4) and Accon avm, Baker Tilly, BDO, Grant Thornton and Mazars (the Next 5). Accon avm, Baker Tilly, and Grant Thornton handed in their permit to conduct statutory audits at PIE's, in 2019. At the moment of analyzing the transparency reports (September 2020) the 2020 reports are not yet available. I reviewed the transparency reports quite extensively, however, the paper has developed in such a way that the results of the review do not fit the current scope of this paper. The discussion of the transparency reports in this paper is, therefore, limited. For a comprehensive discussion of the transparency reports of the Dutch audit firms, see Dick de Waard and Peter Brouwer's paper in this issue of MAB. De Waard and Brouwer study to what extent the transparency reports give insight in the audit firm's audit quality.

9. Once the RCA team grasps an idea of the most likely causes for the adverse event, the 5 Why method can be used to drill down to the root cause (Muir et al. 2016). The cause-and-effect diagram is visualized as a fishbone, in which the bones form categories (e.g., procedures and people) and the possible causes are lined along these bones (Doggett 2006). Examples of those bones are procedures, people and culture.
10. Examples of system-based RCA tools are the System Theoretic Accident Model and Processes (Leveson 2004) and the Functional Resonance Analysis Method (Hollnagel 2012), as used in several industries (Dutch Safety Board 2020 and Patriarca et al. 2017); or Causal Analysis based on Systems Theory (Leveson 2011), as demonstrated for use in healthcare (Leveson 2020).
11. This specific example regards the Systematic Accident Cause Analysis - developed for incidents on offshore installations (Livingston et al. 2001).

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