CHAPTER 8

CONCLUSIONS AND RECOMMENDATIONS

8.1 INTRODUCTION

"To put it bluntly, if you're not a problem-solver, your career potential is limited" (Hoenig, 2002:338). According to Hoenig (2002:338), "improved problem-solving capability is the ultimate competitive advantage, and the best organisations are increasing the sophistication with which they systematise their problem-solving processes". Furthermore, a survey of 1 000 executives conducted by Caliper Associates, reported in the *Wall Street Journal* by Hal Lancaster, indicated that problem-solving ability is now the most sought-after trait in up-and-coming executives (Hoenig, 2002:338).

The main aim of this research was to develop a root cause analysis process that would assist managers and supervisors to uncover and solve the root causes of uncontrolled variations in human performance and thus become effective problem-solvers of human performance problems.

People do not purposefully attract negative attention, or arrive at work with the intention of performing poorly. The reality, however, is that people are human and make mistakes. Therefore, performance problems are likely to occur. A performance problem occurs when the performance is not what it should be; there is a performance variation from the norm or standard.

With straightforward, common performance problems – for example, issuing the wrong application form to customers – it is common sense to try a series of quick and tested solutions starting with the most simple and the most inexpensive before moving on to those that take longer and cost more. However, when performance problems of greater complexity occur – for example, a sudden increase in report mistakes – it may not be as simple or easy as applying a quick fix solution. In fact, the quick fix may do more harm

than good. In these instances, a systematic process – such as the Human Performance Variation Analysis (HPVA) process – is needed to analyse the human performance problem. Only once the root cause has been identified can the most appropriate solution to the problem be developed.

8.2 OVERVIEW OF THE RESEARCH

8.2.1 Overview of the thesis

Chapter 1 explained the difference between controlled and uncontrolled variations and argued that traditional problem-solving tools and techniques are not sufficient to uncover the root causes of uncontrolled human performance variations. The chapter also outlined the most suitable research methodology. The researcher used a qualitative approach; and an action research framework was applied in the study.

Chapter 2 was the first of three chapters devoted to the review of the relevant literature. This chapter covered the fundamentals of human performance. It discussed eight human performance models and also indicated that a vast number of variables influence human performance.

Chapter 3 explained the goals of analysing and managing human performance problems, as well as some of the methods and tools that are used. The chapter also gave an overview of techniques that could be used to manage performance problems pro-actively. Lastly, it discussed the role of human error in performance problems.

Chapter 4 was the last of the three chapters devoted to a review of the relevant literature. The chapter looked at the key concepts of root cause analysis as a systematic process that focuses on data collection, information analysis, the identification of root causes, and the development of a solution that would fix the problem.

Chapter 5 justified the choice of a qualitative research approach in general, and action research in particular, as the research approach to be used in this study. The chapter focused on the action research process and plan, as well as on the ethical considerations relevant to qualitative studies and action research.

Chapter 6 outlined the characteristics of action research as applied in this study. It discussed the three iterative cycles that were followed during testing – the process started with the identification of the research problem and then each cycle followed the same sequence, namely planning, action, feedback, reflection and revision. Finally, the chapter also outlined the ethical standards applied in this study.

Chapter 7 gave a detailed description of the phases and steps of the Human Performance Variation Analysis (HPVA) process, as well as of the Human Performance Management Model developed in this study. The main purpose of the HPVA process is to uncover the root causes of uncontrolled variations in human performance. The Human Performance Management Model helps to sustain the performance improvement and ultimately helps to create an environment and culture of continuous performance improvement.

8.2.2 Overview of the research methodology

The main objective of this study was to *develop a root cause analysis process that would uncover the root cause(s) of uncontrolled variation in human performance and prevent the recurrence of events causing the variation*. In addition to this main objective, the study aimed to use the root cause analysis process to *develop a human performance management model* that would help to sustain the new, improved performance; prevent the same or a similar performance problem in other areas of the organisation; and ultimately, create an environment and culture of continuous performance improvement.

The following research methodology (nine steps) was followed to achieve the above objectives (see Figure 1.2):

Step 1

This study involved two fields that are very different and are seldom integrated, namely human performance and root cause analysis. The first step was therefore to complete a literature review that covered the central concepts of both these fields to gain a better understanding of these two fields.

Step 2

Relevant information from the literature review was used to develop the following set of performance areas. These areas were used to develop a root cause analysis process for human performance problems:

- the performer's level of competence;
- the performer's capacity to perform;
- the performer's motives;
- the performer's suitability to perform the job/work;
- job design;
- job complexity;
- workload;
- workflow;
- availability and type of information;
- policies;
- procedures;
- supervision;
- expectations;
- consequences;
- feedback;
- physical working conditions;
- resources; and
- job aids.

A root cause analysis process was developed by incorporating the above elements into an “is-is not” matrix. The initial process was tested by applying it to two consultation sessions and a case study. Based on the feedback, the process was refined and subjected to further real-life testing.

Step 3

During Step 3 a feedback guide (see Table 6.2) was designed to gather the opinions and suggestions from participants who tested the root cause analysis process against real-life situations. This feedback played an important part in developing a quality root cause analysis process and in ensuring that the process is suitable to uncover the root causes of uncontrolled variations in human performance.

Step 4

The root cause analysis process was tested by 29 students who were completing their master’s degrees in Counselling Psychology at the Consortium Institute of Management and Business Analysis (CIMBA) in Asolo, Italy. Mr Scott B. Newton, a Managing Partner at CIMBA Business Advisement srl., led the session and coached students while they applied the process to their own real-life situations.

Step 5

The CIMBA students completed the feedback guide that was developed in Step 3. Based on this feedback, the root cause analysis was refined further.

Step 6

After the process had been tested against real-life situations, the next step was to have different people test the root cause analysis process by applying it to a case study, to compare their outcomes. A case study was sourced from Thinking Dimensions International, which specializes in root cause analysis.

Step 7

Five consultants from Thinking Dimensions Group (South Africa) tested the root cause analysis process by applying it to the case study. These five consultants' root cause analysis experience ranged between five months and 25 years.

Step 8

The consultants from Thinking Dimensions Group (South Africa) completed worksheets and the feedback guide that was developed in Step 3. This feedback, as well as feedback obtained through informal discussions with the consultants, was incorporated to finalize the root cause analysis process for the purposes of this study.

Step 9

In Step 9, the root cause analysis process was incorporated into a performance management model that was developed using relevant information from the literature review completed in Step 1. The model assists to continuously manage the human performance situation, so that any occurrence (or recurrence) of a performance variation can be detected and addressed.

8.3 CHALLENGES

The two greatest challenges that were faced during this study were the following:

- As indicated in Chapter 1, the roots of root cause analysis can be traced to the broader field of TQM. Therefore, root cause analysis is part of a more general problem-solving approach and is also an integral part of continuous improvement. Although root cause analysis originated in the field of engineering, it has expanded its reach into fields such as aerospace, transportation, nuclear power, chemical processing, pollution control, information technology, manufacturing and health care over the last three decades (Cheryl Gray Instructional Design, n.d.).

The first challenge in this study was to integrate root cause analysis into the field of Human Resources Management, since it has not yet been widely used in the management of human performance. However, based on the researcher's 13 years of experience in the field of root cause analysis, she believes that human performance requires the same level of scrutiny and attention as applied in the fields mentioned previously. This belief motivated the researcher to undertake the study.

This challenge was overcome by identifying all factors that affect human performance, grouping them into categories, and then incorporating them into the root cause analysis process. Table 8.1 outlines the categories of variables that influence human performance, as constructed by this study.

Table 8.1 Categories of human performance variables

Category	Human performance variables/factors
Variables related to the performer	• Performer's competence • Performer's capacity • Motives • Suitability for the job/task
Variables related to the job or task	• Job design • Complexity of the job/task • Workload • Workflow • Information • Policies • Procedures • Supervision
Variables related to the performer's behaviour	• Expectations • Consequences • Feedback
Variables related to the location	• Physical working conditions • Resources • Job aids

The categories outlined in Table 8.1 are unique to human performance and the incorporation of these categories into an "is-is not" matrix is what makes the HPVA process unique, compared to other root cause analysis tools and techniques.

- Because the variables that influence human performance were grouped into a few main categories, the second challenge in this study was to ensure that the specific variable that is causing the performance problem would be uncovered by the HPVA process. This challenge was overcome by searching for discrepancies and/or changes when comparing the following:
  - the performer to an exemplar;
  - the job/task in which undesirable behaviour is noticed to other jobs/tasks that the performer performs without any problems;
  - the undesired behaviour to the desired behaviour;
  - the location where the undesired behaviour is noticed to other locations where desired behaviour is noticed;
  - the date and time when the undesired behaviour was noticed for the first time to the dates and times before or after this time; and
  - the times or frequencies at which the undesired behaviour is displayed to other times or frequencies.

8.4 CONCLUSIONS

This research was conducted over a period of two and a half years. During this period, the HPVA process was tested in the following situations:

- a one-on-one consultation with the manager of a sales consultant who was not growing the business through existing and new customers;
- a one-on-one consultation with the supervisor of a front-line employee who was tardy at doing certain jobs and following work procedures;
- a case study of a repairman who was not following the company's sales lead programme;
- 29 master's degree students who applied the HPVA process to their own situations; and
- five root cause analysis consultants who applied the HPVA process to a case study.

The following conclusions can be made, based on the feedback from the above applications and testing:

8.4.1 The effectiveness of the HPVA process

- The HPVA process will successfully reveal the causes of poor performance.
- If different people apply the process using the same set of data, they will reach the same conclusion.
- The HPVA process assists organisations in analysing the performance situation effectively before identifying possible solutions, thus addressing the human performance problem in the most effective way.

8.4.2 The performance situations

There seem to be three potential situations in which the HPVA process can be applied, namely:

- *a friendly, cooperative and collaborative situation* ("let's sit down together and resolve this problem");
- *a neutral situation* ("one way or another, I have to solve this problem to keep things going"); and
- *a hostile situation* ("somebody messed up and heads are about to roll") – in this case, it can be expected that stakeholder involvement will be defensive with excuses and different kinds of evasive tactics. In this instance, using the HPVA process to prove the cause objectively will be vital.

8.4.3 Lessons learned

The following lessons were learned during the applications and testing:

- No two people share the same reality; they have different perspectives about the performance situation that must be respected.
- It is important that both the manager/supervisor and performer know the HPVA process, its purpose and structure.
- It is important that the performer be put at ease, so that he/she can freely share information. The HPVA session must be treated as an information-gathering session, not an interrogation.
- Good questioning and interviewing skills are crucial in gathering all the relevant information.
- It is crucial to develop a shared understanding about the performance situation. If necessary, pictures or diagrams must be used, or the work station must be visited to understand fully what is being described, or to help visualize the performance situation.
- Both the manager/supervisor and performer must stay on track, follow the HPVA process, and work together towards uncovering the root cause of the uncontrolled variation in human performance.

8.4.4 What the research outcomes offer

8.4.4.1 What the HPVA process offers

- It provides a systematic map to uncover and solve uncontrolled variations in human performance.
- It provides a tool that helps determine what information is relevant, how to make sense of all the information coming our way, and how to organise the information in a sensible manner.
- It does not solve human performance problems by fixing blame or pointing fingers, but by following a collaborative, cooperative process.

- It gives the performer a vehicle through which he/she can actively participate in his/her performance discussion in an open and honest way.
- It focuses on information-gathering and cause-identification, so that organisations can avoid the trap of being too solution-oriented.
- It provides a tool that creates a shared understanding and common reality based on all the available perspectives of the human performance problem.
- It brings together different people from different levels and/or areas to discuss human performance problems, learn, create a factual basis, and make progress in analysing a variation in human performance.
- It provides a testing base against which possible causes can be evaluated, to confirm which one is the root cause.
- It provides a tool to develop an action plan that would solve the root cause and prevent the source(s) of uncontrolled variation from recurring.
- It provides a tool to avoid any negative consequences due to the corrective actions taken.
- It could empower managers and supervisors and increase their confidence in dealing with human performance problems. During the author's 13 years of root cause analysis experience, she encountered many engineers who did not feel comfortable addressing human performance problems, because they did not have the same structure and process that they have when faced with a technical problem. The HPVA process eradicates this fear experienced by managers/supervisors in technical fields.

8.4.4.2 What the performance management model offers

- It helps organisations to focus only on the relevant human performance problems – the significant problems for which the standard is known and the cause is unknown.
- It focuses on the results of the solution, as well as on monitoring and sustaining the performance improvement.
- It can create an environment and culture of continuous human performance improvement that would benefit all.
- Instead of focusing on performance evaluation, the model focuses on performance improvement and developing the performer through well-prepared and open discussion.
- It will ensure that the intellectual capital around the HPVA process is captured, so that it is available for all to learn from. This will ensure that the intellectual capital of the organisation is optimized through the HPVA process.
- It promotes pro-active management, by identifying measures that would prevent the same or a similar human performance problems occurring in other areas of the organisation.

8.5 CONTRIBUTIONS OF THIS RESEARCH TO THE BODY OF KNOWLEDGE

8.5.1 At an individual level

- The research provides managers/supervisors with a tool to uncover the root causes of uncontrolled variations in human performance effectively and consistently.
- The research provides a root cause analysis tool that will, first, allow managers/supervisors and performers to formulate ideas and conclusions from not only the facts, but also their knowledge and experience (the process will lead them to apply their own thinking to find the cause and the best solution); and, second, bring different

people from different levels and/or areas together to discuss human performance problems and create a shared understanding and common reality based on their different perspectives of the performance problem (performers will become partners in sharing information, finding the cause, and developing the best solution).

- The research provides a root cause analysis tool and human performance management model that can be used to identify measures to solve the root cause, prevent it from recurring, and sustain the new, improved level of performance.
- Technical experts who have advanced to a managerial or supervisory level no longer need to fear or steer clear of human performance problems. The research provides them with a human performance management tool that has the same structure as the cause analysis techniques they apply to technical, machine-related problems.

8.5.2 At an organisational level

- The research provides a root cause analysis tool with which human performance management can be standardized throughout the organisation.
- The research provides a human performance management model that
  - will focus the organisation on only the relevant or significant human performance problems;
  - incorporates pro-active performance management, by identifying measures that would prevent the same or similar performance problems occurring in other areas of the organisation;
  - ensures that the intellectual capital around root cause analysis is captured and available for all to learn from;
  - could be used to create a culture of continuous performance improvement that would benefit all.

8.6 LIMITATIONS OF THE STUDY

As much as possible was done during the study to identify potential limitations and to do whatever was possible to compensate for them. The study did, however, suffer from the following limitations:

- The HPVA process was tested by 29 Master's degree students, five consultants, and two consultation sessions with clients. Although the process was tested using both real-life situations and case studies, it should be applied to many more situations before it can be regarded as truly reliable. Testing the process in as many real situations as possible will provide further teachings faster than any other method. "Experience can be the best teacher, if one wrings the meaning out of what has happened" (Kepner, 2008:2).
- While developing the HPVA process and the Human Performance Management Model, the researcher applied much of her own experience in root cause analysis, which has taught her over a 13-year period some of the weaknesses of many of the existing problem-solving techniques. This might, however, raise a question of objectivity towards certain root cause analysis tools and techniques. However, as indicated in Chapter 6, the rationale for including the "is-is not" matrix into the HPVA process was the fact that it is one of the few methods available to establish an objective data point that indicates the relevant information needed and against which the conclusions can be evaluated.
- In all instances, judgement sampling was used. When selecting the students, the researcher was looking for a group of people who would all have real-life situations to apply the HPVA process to. When selecting the group of consultants, the researcher was looking for people who have root cause analysis experience. In both instances, the aim was also to protect the confidentiality and uniqueness of the HPVA process. Because people were used who were conveniently available to test the process, this might affect the degree of generalizability of the HPVA process.
- When the group of 29 master's degree students tested the HPVA process, Mr Scott B. Newton, a Managing Partner at CIMBA Business Advisement srl., led the session and coached the students during their applications.

Although Mr Newton is a highly skilled and experienced consultant and root cause analysis facilitator, the researcher did not have direct access to the students. As a result, some information might have gone missing in the feedback.

8.7 RECOMMENDATIONS FOR FURTHER RESEARCH

Some people believe that action research generates more questions than answers (De Jager, 2002:14). Also, the development of a root cause analysis process such as the HPVA process evolves from continuous testing and refinement. Therefore, this study should not be regarded as the end of the road, but merely as the start of a lifelong journey.

The following may be regarded as further research opportunities:

- research on the degree of success the HPVA process would have as a performance improvement tool, by focusing on and solving causes of controlled variations in human performance;
- research on managers/supervisors' and performers' trust in the HPVA process as a fair and reliable root cause analysis tool;
- research on the success rate of the HPVA process – the number of human performance problems solved first time around;
- a scientific measurement of the benefits reaped from applying the HPVA process and the Human Performance Management Model;
- research to determine in which dimension(s) of the HPVA process – the performer, job/task, geographic location, or time – most of the root causes of performance variations fall;
- research on the extent to which the HPVA process adds credibility for fairness and increases loyalty and commitment to both the manager and company;
- research to determine whether the HPVA process would enhance positive future collaboration between the manager/supervisor and performer;
- research to determine whether the HPVA process with its openness and inclusion of broader sources of information would create trust and better

working relationships between the manager/supervisor and the performer; and

- research to determine whether the HPVA process would boost the performer's morale and motivation and enhance cooperation.

8.8 CONCLUDING REMARKS

Findings in evolutionary psychology have documented a strong predisposition in humans to cooperate and work together to accomplish a common purpose (Kepner & Iikubo, 1996:200).

According to Kepner and Iikubo (1996:200), the problems we face today are so complex that no one person can be sure of having all the answers. Therefore, if we want to solve human performance problems, the manager/supervisor and the performer need to pool their best knowledge and ideas to find the cause(s) of a problem and develop solutions to the performance problem. *The HPVA root cause analysis tool will facilitate the sharing of information between the manager/supervisor and performer and will make the analysis of the human performance problem more collaborative*.

Facing a problem requires us to find out more, ask the advice of others, and gather suggestions. The challenge is to think deeper and further ahead. *The HPVA root cause analysis tool is an advance in the management of human performance and is that much sought-after ability for problem-solving, namely the ability to solve human performance problems. It is supported by a model that encourages the realization of opportunities…a model that could improve human performance beyond expectation*.

> *"Each problem has hidden in it an opportunity so powerful that it literately dwarfs the problem.*
> *The greatest success stories were created by people who recognized a problem and turned it into an opportunity."*
>
> (Joseph Sugarman in Exley, 1993:13)