Dynamics of Quality Auditing for System Improvement
(The case of Pakistani Industries)

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Abstract

Experimenting with mental model, this paper attempts to highlight the dynamics of Quality Auditing in Quality Management System ISO 9001:2000 for System Improvement in Pakistani's Industries.

No one can deny the power of auditing and skills of auditor for identifying the areas of improvement for systems improvement. We usually talk about auditing methodology and auditing principles but ignore the role of auditor. Using feedback loops as the organizing principles, practical experience and elements of ISO 9001:2000 standards act as a guidelines for building the model structure on the basis of systems thinking.

The policies so created are on the basis of practical industrial experience and the empirical data. Feedback thoughts are the system structures that establish the role of quality auditing for continual improvement. The attributes of the auditor are the essential skills which play the vital role for system improvement. The independent audit and identification of non-conformities help to design the plausible policies that can create viable patterns for system improvement within the industry. While developing the feedback structure, care has been taken that policies identified for the model should be based on the principles of feedback thoughts rather than parametric change.

Systems Dynamics is a powerful management tool, which helps in analyzing industrial problems through constructing computer models of the underlying decision systems and experimenting with them.

Keywords: *ISO 9001:2000, Quality Auditing, Role of Auditor, Systems Thinking, System Dynamics, Policy Design*

Introduction

ISO 9001:2000 is a quality management system (QMS) standard that requires an organization to meet its own requirements and those of its customers and regulators. It is based on the plan-do-check-act methodology which help organizations establish, implement, monitor and measure their processes to deliver results that align with the organization‘s requirements and continually improve performance by taking appropriate actions which are auditable. It is a serious issue in Pakistani Industries that they do not have belief on certification of ISO 9001:2000 Quality Management Systems. More than 10,000 companies have been certified in Pakistan but there are very few which are renewing their certificates repeatedly. There are many reasons for the downfall of ISO 9001:2000 but one of the major ingredients is the easy audits either conducted by Internal Quality Auditors or the audits conducted by the third party auditors. It is the management perception that even the third party audits are not adding the value for system improvement. That is why there is a significant decline in the ISO 9001:2000 certification process. The objective of this paper is to understand the dynamics of the quality auditing using feedback structures and to find out plausible policies to enhance the image of ISO 9001:2000 Quality Management System. This is only possible if auditors do their role for the process and system improvement while conducting the value adding audits. It is the humble effort to highlight the importance that effective and efficient management is essential for companies striving for excellence and become world class. **(Moosa & Shariff 2007)**

What is An Audit?

The name derives from the LATIN for a “listener” or “one who listens judicially and tries cases” In quality management system, an auditor should not be seen as one who “tries” the company but rather as one who confirms that the company is carrying out its day to day activities in a manner that ensures that the quality of the product is

enhanced .**ISO 9000 vocabulary** states: " A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve objectives". **Kevin (1996**) says about quality Audit "a systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these are being implemented and are likely to achieve objectives." Internal auditing is the monitoring of the quality system by trained auditors. **(Kevin, 1996) BSI Training Services (1995)** Manual explains, **"**a systematic investigation of the intent, the implementation and the effectiveness of selected aspects of the Quality System of an organization or department." ISO 19011 states that an audit is systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the audit criteria are fulfilled. **(Moosa & Shariff, 2007)**

Classifications of Audits

Quality Audits can be carried out at four levels:

Product Audit

Process Audit

Personnel Audit

System Audit

Types of Audits

Audits are of following types:

First Party Audit

Second Party Audit

Third Party Audit

Accreditation Audits

Communicating the Audit and Establishing Performance Expectations

The effectiveness of the audit is greatly influenced by how management communicates the purpose and performance of the audit. Most people do not look forward to being audited internal auditing has been considered "as a police or security-guard role. Security checks are made to

confirm that procedures are being followed and recodes kept. **(Kevin 1996). Kevin (1996)** says," Internal Quality Auditing is a formal and mandatory requirement of ISO 9000'.This can lead to a conflict to the auditing process and an effort by an auditee to divert the auditor from observing the real conditions of the work process.

Auditor Skills

One of the measures to evaluating effectiveness of ISO 9001:2000 is an auditor re-certification process. A mandatory requirement of ISO 10011 and ISO 9000 is that the auditor should be formally trained and qualified **(Kevin 1996)**. An auditor is often viewed as the management instrument in developing procedures and system. **(BSI International Training 1995)** We should design first to test the knowledge of ISO 9001: 2000 requirements and their ability to properly apply their knowledge in a variety of given scenarios. Management may need a higher level approach to the ISO certification process and the selected conformance model. Selecting a handful of employees to attend ISO auditor Training may help provide a more thorough gap analysis. **(Gerard W Paradis 1996)**

In today's world, the change is one of the only constants, so it is critical for auditors and registrars to make concerted efforts to keep their knowledge and skills up-to-date. **Kevin (1996)** says, "Effective auditing requires a competent and credible auditor". To add value the auditors should be agents for the change. In addition to the requirement of bringing specific industry experience to the audit process, it is helpful if they are skilled in process engineering or reengineering.

Followings are the few prominent skills of the auditor which are usually expected:

1) Evaluating effectiveness

2) Know how to use effective listening and communication skill

3) Knowledge of Process Design that leads to process capability

4) Measurement System Analysis

5) Well conversant with SPC and SQC Tool

6) Go for potential Failure Mode Effect Analysis (FMEA) and Quality Function Deployment (QFD)

7) Ability to identify Opportunities for Improvement (OFI's)

Commecs Institute of Faculty Training (CIFT) Quality Assurance framework has an ingrained Auditors Code of Conduct, which is strictly followed. It requires all auditors to:

- Evaluate objectively and impartially
- Report honestly and fairly ensuring that observations are accurate and reliable, fully supported by evidence.
- Do all they can to minimize the stress on those involved in the audit and act with their best interests and well-being as priorities.
- Respect the confidentiality of information; and
- Respect the presence of the teachers, for example, when entering or leaving class rooms, wherever and whenever possible. **(Ambreen, 2008)**

Questioning Technique

The efficient use of questioning technique is something that the auditor develops over the years. The auditor will obviously tend to use the questioning technique that yields response and discard the less successful methods. Rudyard Kipling's poem "The Elephant's Child" includes the following lines:

I have six honest working men
They taught me all I knew
Their names are what and why and when
And How and Where and Who.

These six questions – what, why, when, how, where and who have become known as auditor's friends. They are powerful tool in the hands of auditor to establish the audit trail of questions.

Internal Quality Audits shall be scheduled on the basis of status and importance of the activity to be audited and shall be carried out by the personnel independent of those having direct responsibility for the activity being audited. (**Novack, 1995)**

Downfall of ISO 9001

1. Easy Audits due to incompetent auditors.
2. Shallow audit findings
3. Weak audit report without highlighting the potential issues.
4. Companies should take responsibility as well.
5. Missing management support and commitment
6. No time for internal audits.
7. Weak Auditors Personality
8. No action plan on second party audits as suggestions are poorly taken because customers always speak something for improvement.
9. Why work for OFI as we like status quo.
10. Keep our colleagues happy while hiding the non-conformities.

What is to be done is the question mark which helps us to review the auditing model and go for systems thinking to find the causes that make the system better behaved**.**

Methodology

Systems Thinking is widely considered essential in the effective management of complex dynamic systems at the core of the problems. **(Sweeney & Sterman, 2007)** System Dynamics is a methodology that starts with important problems comes to understand that structures that produce undesirable symptoms, and moves on to finding changes in structure and policy that will make a system better behaved **(Forrester, 1968)**. System Dynamics being a blend of knowledge of control engineering, cybernetics and organizational theory is a guiding philosophy to analyze the dynamic behavior of model in terms of its feed back mechanisms **(R. Geoffreycel, 1985)**. System Dynamics is a more one of philosophy than technique: a philosophy that the role of management is one of the controlling corporate behaviour by first understanding what causes that behaviour and then designing the policies to improve behaviour. **(Lyneis James M., 1980)**. System thinking, in practice, is a continuum

of activities which range from the conceptual to the technical **(Barry Richmond, 1987)**. This comprehensive definition of Barry Richmond describes the steps of modeling process.

The model building process involves the following phases **(Sajjad & Yusuf, 2007)**

	Problem Definition
Conceptual	System Conceptualization
	Model Representation
	Model Behavior
Technical	Model Evaluation
	Policy Analysis

The modeling process uses two important schemes to highlight the dynamics of system i.e. thinking about how the quantities vary through time and thinking about whether a substantial feedback relationship exists **(Richardson, 1981).**

Positive and Negative Causal Loops

A causal loop that characteristically tends to reinforce or amplify a change in any one of its elements is called a positive loop **(Richardson, 1995).** A positive loop is often defined by the fact that an initial change in any variable eventually brings self-change in the original direction. A causal loop that characteristically tends to diminish or counteract a change in any one of its elements is called a negative loop **(Richardson, 1995).** Causal loop diagrams are the powerful tool to capture the problem statement and conceive the problem properly. Causal loop is a closed sequence of causes and effects, a closed path of action and information. A decision is based on the observed state of the system. The decision produces action which alters the state of system and new state gives rise to new information as the input to further decisions. Behavior of the system is the result of interaction of positive and negative feedback control loops. The polarity of a circular causal loop reflects the loop's tendency either to reinforce or to counteract a change in any one of its elements. **(Richardson, 1995)** By strengthening polarity through inducing table functions during simulation process may help to

design the plausible and sustainable policies. Most often system dynamics is applied to dynamic complex problems of strategic importance **(Strohhecker, 2005)** The methodology, however, proved to be valuable and capable of supporting decisions on even short term scenarios and measures **(Strohhecker, 2005)**

Explanation and Interpretation of Loops

Fig 1 explains the need of Audit Planning and Assessment Loop, this loop explains the audit planning and assessment is only possible if the auditor is competent. Competent auditor is organized and well planned auditor he has better audit approach and on the basis of better approach he prepares the audit plan thoroughly. As a result audit is well prepared and then audit performance is enhanced. This enhanced audit performance helps to assess the system properly and comprehensively. Comprehensive and detailed assessment provides the opportunity to find the areas of improvement which ask for effective documented actions that ensure the system improvement. Against the identification of Opportunities of improvement (OFI) findings have been identified which demand the detailed investigation and documented actions, The root cause elimination will consequently affect the System improvement and improved system will be a source of motivation to ask for more competent auditor who adds the value in the system for audit purpose. As procedures are set up, regular Programme of system audits needs to be established, to ensure the systems are maintained, adjusted and improved**.(Hunt & Gilmour 1996)**

Fig 2 Explains the System Improvement Loops basically moves around the Opportunities for Improvement which may be result of corrective actions requests (CARs) against the non-conformance or the preventive action requests (PARs) as a preventive measure on the basis of best observation against the bench mark industries or it may be the suggestions (OFIs) for the system improvement which

may comprises new valuable inputs for system improvement which ask for detailed investigations and documented actions. If the documented actions are appropriate and dig out the root causes that bring the improvement in system then improvement is permanent in nature.

Fig 1: Audit Planning – Assessment Loop

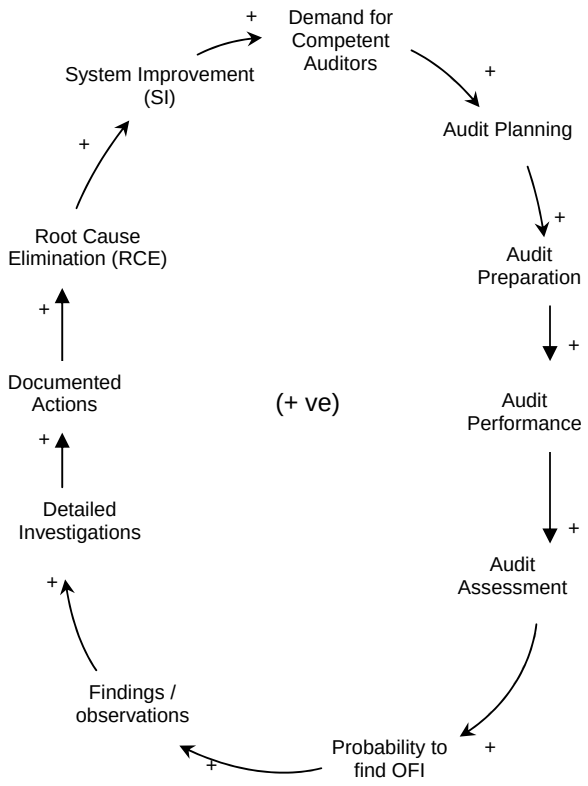


Fig 2: System Improvement Loop

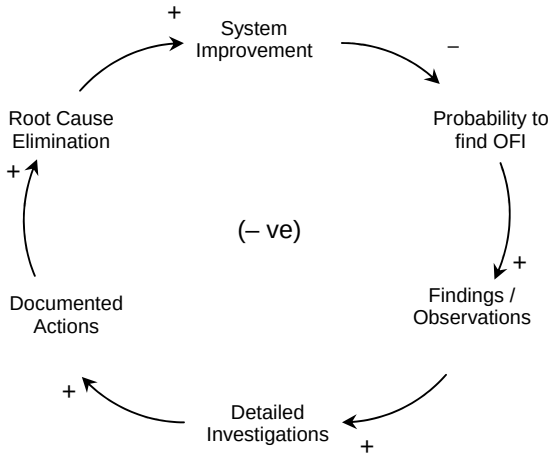
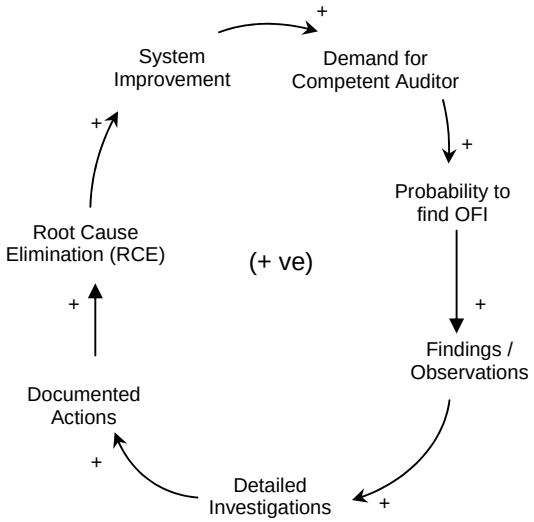


Fig 3 Loop of Competent Auditor Role portrays the picture for the demand of competent auditors along with the sector specialists. The processes are complex in nature and really demand the expertise in that area to add the value in the system. It has been observed in Pakistani industries, the certifying bodies those have competent auditors and sector specialists and may interpret the standards very well has good name in the market. The standard relies too much on people's interpretations of quality, particularly those of auditors**. (Rouzbeh,1999).**

The input of the auditor and sector specialists is warmly taken for value addition tool and implementation of their

recommendation have been considered as a positive step for system improvement. Opportunity to improve may relate with product, process, personnel and the system. It may happen the competent auditor is the sector specialist as well and has a good market image. No one can challenge his valuable input and system improvement as the result of his audit is more than 100 percent sure phenomena. **Tetra Pak, Packages, Pakistan Tobacco Company, Nestle Pakistan and Unilever Pakistan** are the organizations which always demand the competent auditors and there is no compromise on it.

Fig 3: Competent Auditor Role Loop



The audit date may be delayed and audit may be rescheduled but demand for competent auditor is never compromised.

Fig 4: Issuance of CARs / PARs Loop

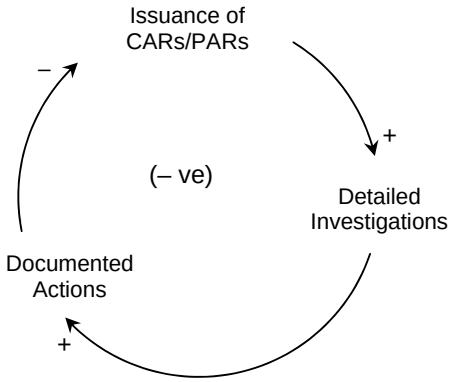


Fig 4 indicates the phenomena of the issuances of corrective action requests (CARs) and preventive action requests (PARs). It is reasonability of the management representative to issue the CARs and PARs for system improvement. The input to issue the CARs and PARs are as under:

1. Highlight non-conformance as the result of first party audit, second party audit and third party audit.
2. On the basis of any observation shared by the top management or anyone from the company.

3. On the basis of any improved practices that came into mind of the management representative
4. On the basis of the customer complaints
5. On the basis of some legal or regularity requirement of the government.
6. while implementing the best management practice for system improvement
7. On the basis of new method or tool that really reap the crop of benefits for the company.
8. Evaluating the results of actions taken.
9. Evaluating the needs for action to prevent occurrence of non-conformities.

CARs and PARs have been issued to concerned department heads or the process owners to improve the processes and their work methodology. Brain storming sessions have been conducted and detailed investigation have been carried out in the concerned departments under the supervision of the departmental head and concerned managers in order to ensure the effective management controls.

Management representative send one copy of CARs and PARs to Research Development & Control / Quality Control Laboratory for parallel investigation so that management representative may get the right input for system improvement. These investigation will be discussed in the customer complaints meetings if the CARs and PARs issued against the customer complaint otherwise it is being audited by the internal auditors or third party auditors to check the determination of root causes of the non-conformities encountered and effective control is in place to prevent recurrence.

Fig 5 In-Effective Action Loop

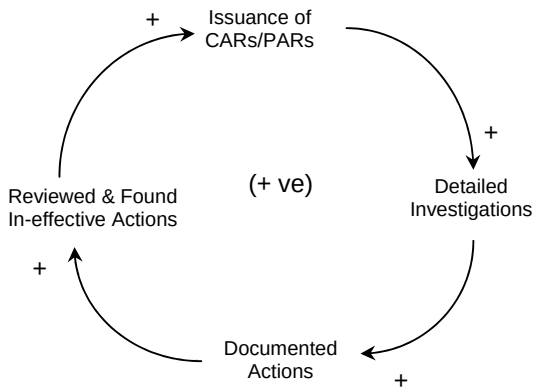


Fig 5 portrays the picture about the in-effective documented actions. It has been observed in most of the Pakistani industries the companies have taken the ISO 9001:2000 only for market purpose. They do not realize the power of ISO in its true sense. For them, it is just a piece of paper hang on the wall to get the competitive edge over competition and use it as marketing tool. It is really the need to consider ISO 9001:2000 as a process improvement tool to add the value in the system and generate a lot of savings for the company while reducing the rejects/reworks. As production people do not own this as a process improvement tool they avoid detailed investigation and that is why their documented actions are ineffective which do not create any impact on bottom line.

Fig 6 represents the the CARs and PARs must not be closed by the auditor if the documented action is not effective and it does not create any improvement in the system. It is ultimate responsibility of the auditor to verify the documented action and do not allow the any departmental head to close the CARs/ PARs with ineffective documented action. The role of fair and firm auditor is very much required in this scenario.

Fig 6: CARs / PARs Closed Loop

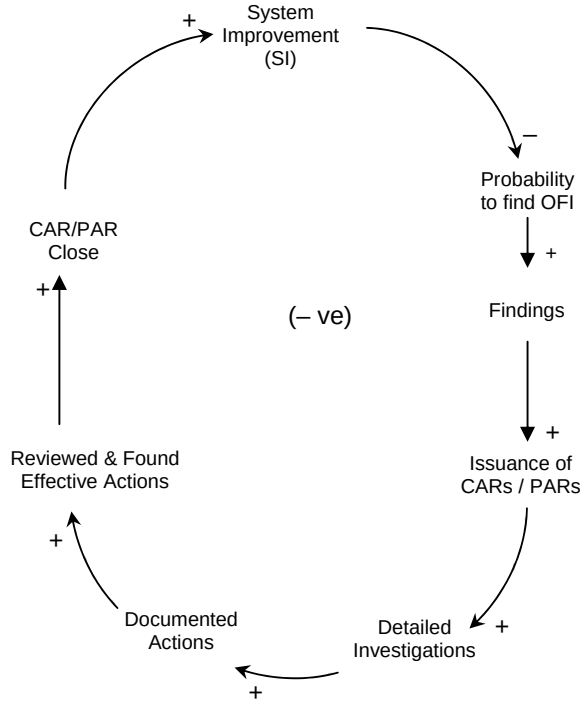


Fig 7: Investment for Improved Methods / Tools Loop

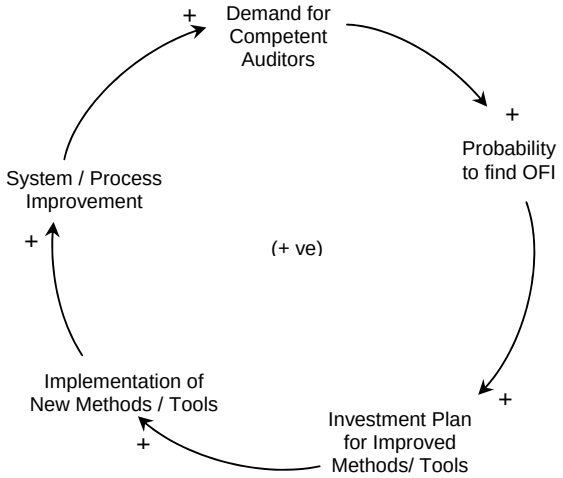


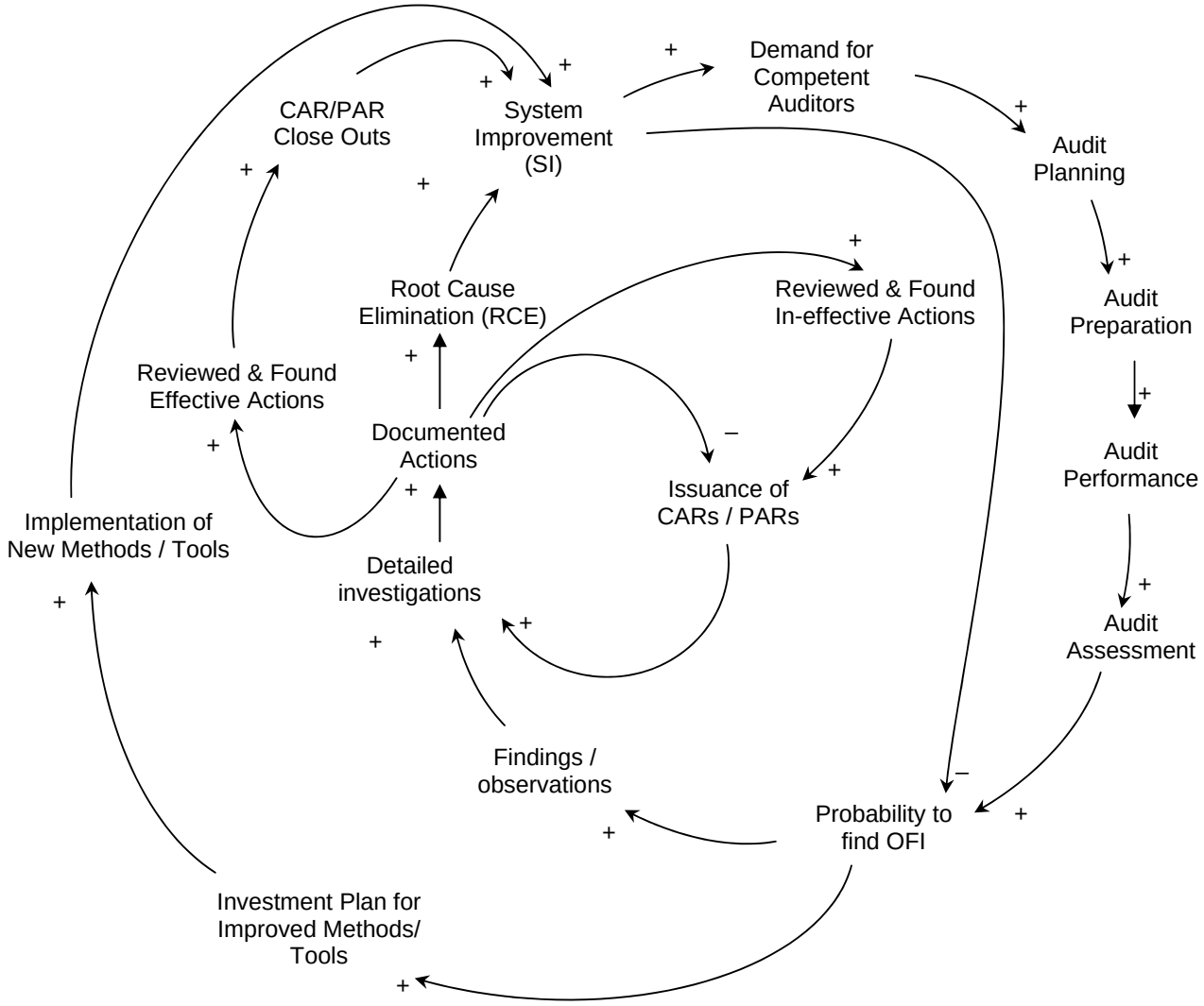
Fig 7 indicates the loop of investment for Improved Methods / Tools. Continuous improvement and passion for innovation is the winning strategy for the learning organization. It is key responsibility of the auditor to equip organization and systems with improved methods and tools for adding the value in the system. Initiatives like **Six Sigma, Quality Circles, Lean Manufacturing, Design for Experiments (DOEx) and Quality Function Deployment (QFD)** are the new methodologies that must be shared by the competent auditors with organizations and recommend management to invest money for these business strategies. **MINITAB** and **SPSS** are the tools which help for data analysis and stream line the decisions making process on the basis of scientific management instead of rule of thumb management. It is better if **CEO** or some other top executives be on the audit team to promote the idea that upper management is behind continuous process improvement and to encourage openness among the other Internal Quality Audit (IQA) members and act as moderator if there are disagreement**. (Paul Piplani, 2000)**

Fig 8 represents the complete model of Quality Auditing for System Improvement which is combination of all the loops. This mental model gives the input that downfall of ISO 9000 is because of incompetent auditors who compromise on the quality of audit and never add the value for system improvement. By introducing a requirement for continuous improvement, it is felt that organizations would direct more effort at overcoming causes of non-conformances **(Shackleton, 1998)** Auditors can play vital role to enhance the quality of audits but as well enhance the image of ISO 9001. Easy audits must be considered as crime and there must be the strong criteria to select the auditor. Lead auditor must be a candidate who should not only be competent with respect to knowledge and auditing skills but he must as well be equipped with best personal attributes. IEMA registered

training course proposed the personal attributes which are as under:

1. Open Minded
2. Observant
3. Diplomatic
4. Perspective
5. Versatile
6. Decisive
7. Self-reliant
8. Ethical (fair, truthful, sincere, honest and discreet)

Fig 8: Model of Quality Auditing for System Improvement



Value Adding Auditing Strategy

1. Design, Develop and Monitor implementation of continual improvement projects and programs to report progress and adequacy of resources.
2. Monitor the conformance to quality management system program requirements and report to management and extend the scope from conformance to performance.
3. Audit improvement projects to verify claimed benefits and ensure they add value to the organization and auditors must be competent to evaluate its effectiveness properly.
4. Listen and be the messenger to convey problems and opportunities to top management so that the organization can improve
5. Promote process performance auditing as well as conformance. Conformance must be focused in product, process, personnel and system.
6. Carefully scrutinize audit finding corrective actions that make the system-process more complex. Corrective actions must be effective and provide the permanent solutions.
7. Link findings with economic plan of the organization and carry out the action steps to go for it step by step
8. Audit process performance to identify inefficiency and processes that need to be optimized.
9. Ensure causes of findings are identified and eliminated on permanent basis.
10. Monitor the corrective action program to ensure there is added value
11. Provide assessment services against mature standards, award criteria and best practices, and benchmark against best in class organizations.
12. Audits or audit program managers should develop and conduct surveys' to test management policy and program deployment.

Plausible Policies

- Avoid the easy audits and be fair and firm while sharing the results of audits.
- Be strict to Adherence to National / International product regulations.
- Investigate the root causes that help to improve the performance of the processes.
- Always demand for competent auditors along with sector specialist and consider opportunities for improvement (OFIs)
- Invite quality professionals as subject specialists and guest speakers and give due consideration of their inputs.
- Keep on adding new methodologies and tools for continuous improvement highlighted by auditors.
- Never close the CARs/ PARs unless the effectiveness of the documented actions has been proven.
- Invest in people and institute auditing skills by ongoing training.
- Enhance the scope unto quality cost audits along with product, process, personnel and system audits.

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