



Exploration of Full Data Audit Path for Tool Management in Manufacturing Enterprises

Yangpeng Zhu¹(✉) and Hairong Zhang²

¹ School of Economic and Management, Xi'an Shiyou University, Xi'an, China
22642999@qq.com

² Design and Legal Department, AECC Aviation Power Co., Ltd., Xi'an, China

Abstract. Under the severe situation that the group promotes reform through cases, how audit supervision can play a more in-depth supervision role in the field of tool management, prevent micro corruption and find possible micro corruption clues in daily management is another important research content of audit work. Among them, tooling tools are the necessary guarantee for parts production. They are “small assets” for recycling and involve the whole process management of high-value tools. They are one of the important contents of the economic responsibility audit business of enterprise leaders leaving office. This paper starts with the whole life cycle management of tools, analyzes the data structure of important forms in the process, explores the establishment of a full data retrieval path for audit doubts, finds problems and puts forward suggestions for improvement. The tool management audit review has inspired the thinking of the risk oriented audit paradigm based on the big data environment, and has a good reference value for the same type of audit projects.

Keywords: component · full life cycle · full data audit · manufacturing enterprises

1 Introduction

Tool management audit is the routine and frequent work of internal audit of aviation manufacturing enterprises, and it is a necessary part of the economic responsibility audit of the head of the manufacturing center when he leaves office. Economic responsibility audit is an important part of the audit supervision system of socialism with Chinese characteristics. In July 2019, the general office of the CPC Central Committee and the general office of the State Council revised and issued the provisions on economic responsibility audit of key leading cadres of the party and government and key leaders of state-owned enterprises and institutions, requiring comprehensive, accurate, objective and fair supervision, evaluation and verification of the performance of duties and responsibilities of leading cadres. However, there is a risk of micro corruption in tool management audit due to tool procurement and related business with suppliers. In August, 2020, caojuguo, Secretary of the party leading group and chairman of the group, stressed at the special warning education conference of “promoting reform with

cases” of China Aero Engine Group Co., Ltd, “The procurement field has always been a serious corruption disaster area. To carry out continuous governance in the procurement field is an important starting point for the group to promote reform through cases and establish a long-term anti-corruption mechanism. The audit department should take the initiative to target the national audit, find more problems, plug loopholes and strengthen internal control. Major special projects, scientific research, production and other departments should, in combination with AEOs and the construction of risk internal control system, clarify supervision responsibilities and implement supervision in the key links and processes of daily management Supervise the work, so that the supervision always exists and forms a normal state”.

2 Related Woks

In the early tool management audit, the company usually adopts sampling audit. The implementation steps of the audit work vary from person to person. The auditors judge according to their personal work experience and carry out audit problem finding from different links [1]. There is no fixed law. The main problems found in the audit focused on the inconsistency between the account and the actual, the inconsistency between the account and the account, and the non-standard management of the tool borrowing foundation [2]. It was found that there were many problems in the management of “points”, and there was less analysis and mining of the problems behind the data phenomenon. In addition to the inherent characteristics of sampling audit, the selection of audit samples depends on the work experience of auditors, and the audit results are related to the luck of auditors, resulting in low hit rate and insufficient depth of audit discovery problems, and some potential micro corruption problems can not be found in time [3]. The tool management audit of the company has not formed a system, which is unable to supervise and manage the whole process of high-value cutting tools, and the audit points and audit doubt search paths of each link have not been systematically summarized and summarized, so the advantages and disadvantages of audit planning and operation implementation cannot be reproduced, and the later audit projects cannot be implemented [4].

In order to change this situation, taking the informatization and digitalization of enterprise operation process as an opportunity, according to the characteristics of big data environment, we explored the full data audit mode, summarized the audit points and audit rules in the frequent areas of audit business, formed the audit doubt search path, conducted carpet search on the data of business domain operation, and promoted the standardization of internal audit operations by means of online audit and on-site audit Digital transformation, promote the transformation of business data from “manual verification” to “radar capture”, combine point, line and plane, strengthen audit supervision, improve the hit rate of problem discovery, and realize the digital transformation and development of audit practice in the era of big data [5].

Through the practice of tool management audit projects, AEOs management tools are applied to perform tool management audit review, forming an audit operation problem retrieval paradigm based on business process, which combines audit points with audit problem retrieval path “point, line and surface” [6]. Under the risk orientation, carry out

the construction of key risk indicator system, rely on the daily operation data resources of the enterprise in each link of audit project implementation, take the creation of audit value as the goal, move forward the management gateway, give play to the risk early warning function, promote online full data audit, and explore and form the risk oriented audit paradigm under the big data environment.

3 Audit Process Analysis

The audit process analysis mainly analyzes the tool management audit from six aspects: tool management process, key points and basis of tool life-cycle audit, key risk point analysis, data source analysis, important form data structure of tool life-cycle audit, and the search path of tool management audit doubts, and defines the working ideas and process of full data audit in the big data environment.

3.1 Tool Management Process Analysis

It can be seen from Fig. 1 that the tool plan and tool and tooling scrap recovery are the entry and exit of the tool management business. In the plan preparation phase, a scientific and reasonable tool purchase plan or tooling manufacturing application plan should be prepared according to the periodic quantity standard. When collecting, it should be collected according to the planned quantity. When counting, it should ensure that the accounts, materials and cards are consistent. During the use of tools, the single lending quantity of tools shall be controlled to reduce the number of tools held by on-site workers and ensure the supply of tools under reasonable safety stock. In the process of tool and tooling scrapping, establish scrapping standards and form a normal tool and tooling inventory and reuse mechanism to effectively reduce costs.

Define abbreviations and acronyms the first time they are used in the text, even after they have been defined in the abstract. Abbreviations such as IEEE, SI, MKS, CGS, sc, dc, and rms do not have to be defined. Do not use abbreviations in the title or heads unless they are unavoidable.

3.2 Analysis of Key Risk Points

After brainstorming and brainstorming by the project team, combined with the group's current management requirements of promoting reform through cases, the frequent points of problems found in previous years' audits and internal control defects, the risk points in the whole life cycle management process of tool management are summarized, namely, nine audit doubts:

- The number of tool purchase plan declarations is more than the demand forecast, resulting in excessive tool plan quantity, excessive inventory tools, large consumption quota exceeding, and increased cost;
- Improper selection of tool purchase method may cause the problem of false and high tool purchase price and micro corruption;

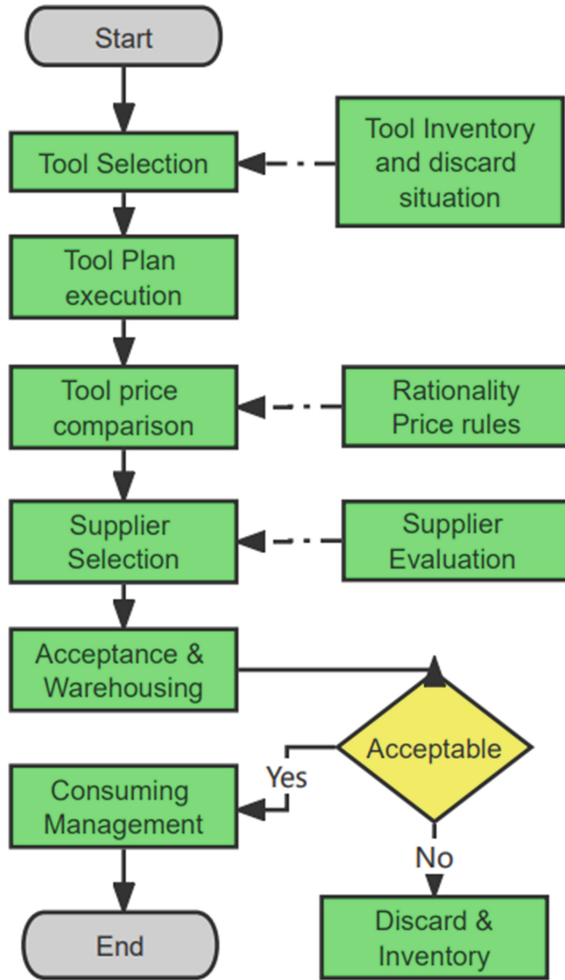


Fig. 1. Tool management process

- The purchase price of tools is greater than 10% of the historical purchase price, but there is no relevant approval. The purchase price is higher than the market research price. The purchase price of tools is falsely high, which may lead to potential micro corruption;
- The number of tool purchase contracts or stock in quantity is more than the planned number, and the purchase price is greater than the market research price, which may have potential micro corruption problems;
- After the tools are received from the general tool warehouse of the company into the center, the physical part of the quantity is warehoused or not, which may have potential micro corruption problems;
- Asset loss caused by improper management of tool borrowing;

- There may be a potential micro corruption problem if the tool is scrapped with excessive or false delivery;
- The specification of the settlement tool is different from that of the actually received tool or the material is different, which causes the settlement price of the tool to be greater than the price of the actually received tool, and there may be a potential micro corruption problem;
- The tool settlement quantity is greater than the physical warehousing quantity, which may have a potential micro corruption problem.

3.3 Data Source Analysis

When carrying out full data audit, we should start with data and pay attention to electronic data sources and paper data sources. The electronic data source of tool management is distributed in seven business systems of the company.

1) *ERP information system*

Main management contents involved Tool planning, procurement, warehousing and delivery.

2) *MES*

Main management contents involved Tools warehousing, borrowing, allocation, inventory, grinding and scrapping.

3) *Financial management system*

Main management contents involved Tool purchase expense payment information.

4) *Contract management system*

Main management contents involved Tool purchase contract and tooling outsourcing contract.

5) *Production preparation information system*

Main management contents involved Special tooling scheduling plan and production warehousing information.

6) *General tool management system*

Main management contents involved General tools arrival, warehousing and collecting information.

7) *Digital Archives*

Main management contents involved Part consumption.

3.4 Tool Management Audit Doubt Search Path

As shown in Fig. 2, Taking the company's existing information system as the audit data pool, combined with the analysis of nine risk points, we carried out the data search practice of tool management doubt points under the big data environment, summarized the typical search paths of nine tool management audit doubt points, and realized the verification and troubleshooting of nine doubt points through logical reasoning. It also makes an extended analysis of the seriousness of the problem. For the links that may involve micro corruption, it can be considered to include the clues and doubtful points of discipline inspection.

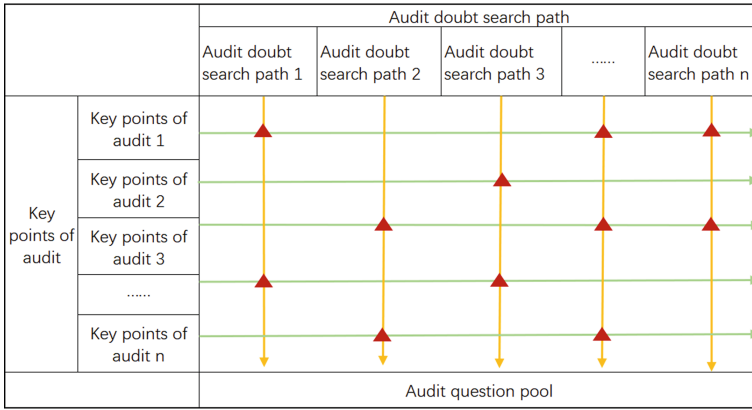


Fig. 2. Audit question pool

4 Some Management Suggestions

Through data analysis, personnel interview, audit investigation, walkthrough test, verification method, consulting method, query method, analysis method, clustering, causal analysis, physical identification, VBA macro programming, multi-function linkage and other data analysis and verification methods, the project audit of tool management audit is completed, problems are found and improvement suggestions are put forward.

4.1 System Thinking, Strengthening Top-Level Planning of Tool Management System and Process

Think systematically from the perspective of the whole process of tool management, strengthen top-level planning, systematically sort out and clarify responsibilities with the management system and management process as the carrier, improve various tool management requirements at the company level, and ensure that the contents of various systems are complete and coordinated. According to the management needs, establish a two-level management system applicable to grass-roots units in terms of tool borrowing. At the level of overall management of tools and tooling, strengthen the plan management and scrap management of tools and tooling, and control the entrance and exit. Establish a budget implementation analysis and early warning mechanism, strengthen the rigid implementation of the budget, perform the approval procedures for those exceeding the budget, and strengthen the assessment of budget management.

4.2 Quantitative Management of Data Analysis and Continuous Improvement of Tool Management Period and Quantity Standards

On the basis of data statistics and analysis, gradually establish and improve periodic quantity standards such as tool and tooling consumption quota, safety stock, economic batch, procurement or manufacturing cycle, continuously improve the accuracy of tool

and tooling demand plan and improve the audit process in combination with production operation plan, tools in stock, in transit and repair tools and tooling.

Refine and optimize tool management related systems in accordance with internal and external business management requirements and various requirements for audit problem rectification. For the management requirements that are difficult to implement at present, the phased implementation method shall be adopted to gradually approach the management objectives. When revising the system, fully consider the management requirements and the rationality of business process design, quantify the management requirements as much as possible, achieve clear management objectives, accurate management system, standardized process, clear job responsibilities, and strong operability of management requirements, and achieve scientific and reasonable management of the whole process of tools and tooling without blank points or breakpoints.

4.3 Strengthen the Supervision of Tool Management Process, and Build a Strong Anti-corruption Defense Line

The leading department of tool management and the technology, procurement and other business departments have increased collaboration to formulate quantitative inspection standards with strong operability under the AEOs management system for the planning, receiving, storage, borrowing, grinding, scrapping and reuse of tools and tooling, and form a joint inspection team from time to time to supervise and inspect the reality of tool management and the implementation of the management system, and regularly reward and evaluate them.

Strengthen supervision on management links involving the interests of the company. For tooling borrowing involving outsourcing business, specific requirements shall be specified in the management system, and the requirement that general tools are not allowed to be lent in outsourcing business shall be emphasized. For the situations involving the cost settlement between tooling outsourcing and suppliers, clear requirements shall be made in the system, the settlement shall be carried out in strict accordance with the qualified delivery quantity, and the claim recovery management shall be implemented to ensure the maintenance of the company's interests.

4.4 Strengthen Information Construction, Seamlessly Connect Data and Reduce Management Loopholes

In combination with the tool management business process and the internal control evaluation elements of the group's tool management, implement the risk points and key control points of tool management into the information system and embed them into the daily links of process implementation, so as to form a risk early warning and control mechanism such as over financial budget, over tool and tooling planned purchase or manufacturing, over planned collection, over borrowed, over inspected regularly, and long-term backlog, Form a seamless connection between tool purchase contract data and warehousing data, and data between the manufacturing center's collecting tools, so as to reduce management loopholes. Form a layered audit and

supervision mechanism with clear responsibilities, use information-based means to promote the improvement of management business level, and promote cost reduction and efficiency increase.

5 Conclusion

6 Some Management Suggestions

After summary, it is found that although the business objects of audit are different, the implementation path of audit has common characteristics. That is, the organic combination of business processes, audit points and audit problem retrieval paths can achieve twice the result with half the effort.

As shown in the figure, the audit points are similar to the green “points” in the figure. The audit doubt search path is a process “line” for the promotion of a business. Different audit points are distributed on different audit doubt search paths.

Taking the full data and business process of the business operation information system as the carrier, taking the search path of audit points and audit doubts as the x-axis and y-axis, “point, line and surface” are combined to form a matrix audit operation problem retrieval paradigm. Through the practice of tool management audit, this method is feasible and efficient.

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