Chapter 1

Introduction

1.1 Background

In recording head assembly process, it is contained of test operation, which test the performance of recording head units to ensure its quality before ship to customers. At this operation, it is the major impact of product cost according to poor quality of incoming material, low technical knowledge of human resources and complicate design of testers and recording head.

At the test operation, the productivity can be enhanced if rejects are reduced. It can be improved if fast action is taken to correct the root cause. However, sometimes it is slow and difficult to determine the root cause because of fluctuate performance of recording head tested. Especially, in a situation that low product capability is built in manufacturing.

This thesis is a study in a recording head assembly company, which has multiple electrical testers approximately 500 machines. These electrical testers are connected to network so that the electrical test performance of recording head tested is stored in database and manipulated into reports by engineering group later. Therefore, each tester was monitored without information system to support real time action taken. This caused low speed of taking actions, inefficient utilization of human resource and database, communication problems, and non-standardize reports established.

The proposed solution of this problem is a development of two information system models. The first model is an establishment of analysis standard reports of recording head test performance. These reports are designed based on users'

functions and requirement of users including management. This model has also supported communication among concern people into one direction.

The second solution is a diagnosis and monitoring model. It is a real time triggering model and determine a root cause if it is recording head assembly process including tester or raw material. Then, front line people can take action appropriately.

1.2 Problem Areas

1) Electric test data of products for timely monitoring and analysis is not available:

Database is a pool of data in providing product information for organization, which are engineering and quality groups who associate with product test analysis to identify the problem, improvement and quality issues. However, it is inappropriate to catch up information every time it is needed or may be collected from individual people while those issues are becoming the day-to-day activities and overcome times and responsibilities of either managers or non-managers levels. The specific knowledge base in analysis, presenting information and correct the problems is also constraint especially the front line people and engineers.

Standard reports and timely monitoring system are needed to aid engineers, technicians and management levels in improving product quality.

2) Slow feedback:

In analysis process to identify the root causes of problems, information searched from database may be processed several times. Sometimes, engineers repeat searching information from database until it is confirmed. Sometimes, there are

different results or information from different engineers. It results to time consumed longer in discussion due to back and forth manner. Besides, the magnetro-resistive recording head with additional parameters tested, which are sensitive to noise and vibration, can be affected from testers. As a result, it may lead to wrong decision making.

Appropriate tools establishing standard reports and monitoring system will assist engineers to work effectively especially the ones who respond for high volume products will more data processing times compared to the small volume ones.

3) Inefficient utilization of people:

To do data processing such as daily yield report, wafer yield analysis, tester yield analysis etc are time consuming excessively. It is overcoming the responsibilities of engineers and technicians while some other tasks must be done in parallel e.g. follow up and manage engineering evaluation purpose for long term product improvement, correct problems at production floor, technical development etc. Also, the skilled people are mostly assigned to handle report preparation.

The appropriate tool is, therefore, needed to develop to support unskilled people, engineers' time management and workforce allocation.

4) Data errors:

As time constraint plus skill of people, errors may occur easily while preparing report. As a result, there may be reprocessing or disaster in communication. So, part of management's time, especially managers, is to condense information from engineers.

5) Duplication of effort and inefficient access to database:
Upon to the various requirements, several formats obtained from different engineers. Some may be used commonly but some may not. However, it is unnecessary to duplicate task of processing data to get the common information or report. It affects to communications, confusion, overwhelm resources and management in digestion information.

1.3 Objective of Study

Develop an information system for HGA performance tests.

1.4 Outcome / Result of the study

The outcome from this study is an information system for performance tests of HGA. It consists of

1) Standard reports of the test results that will be suitable for use by all parties concerned in the quality control of HGA production.
2) An automatic quality monitoring and diagnosing system which analyses the text data to trigger warnings when problem occur or when there is likely that they will occur.
3) Suggestions of causes and remedies for identify problems so that corrective actions may be taken in timely manners. The suggestions will be based on past experiences and/or expert opinions.

1.5 Scopes of the development of an information system for HGA performance tests

1) This study was conducted on one HGA model tested on a tester as a pilot project.

2) The study supports process engineering, quality and test engineering departments, which are internal users in an area of recording head assembly manufacturing.

1.6 Expected Benefits

1) Timely electric test performance of recording head is available for users in easy-to-use forms.
2) Fast feed back due to availability of timely information on problems and causes.
3) Assistance is available to engineers to analyze recording head performance test.

1.7 Research Methodology

According to Raymond's assert, he present his idea that the information system development is an evolution of information system to obtain accuracy and current information to facilitate the people use information to perform their tasks. It involves the handling of data transactions. Then people who use information recognize that far greater potential existed in the form of information support for decision making.

This evolutionary process involves the users and information specialists, both parties work together to get appropriate information which consists of four phases as described and drawn in figure 2.1 below.

1) Planning: it is to define problem, interface user requirement and user function. The group areas are quality, test engineering and process engineering groups.
2) Analysis: it is to identify ways that people in an organization use information and information that users use.

3) Information development: determine data output to be displayed.
4) Evaluate: evaluate the developed models and analysis the come out result

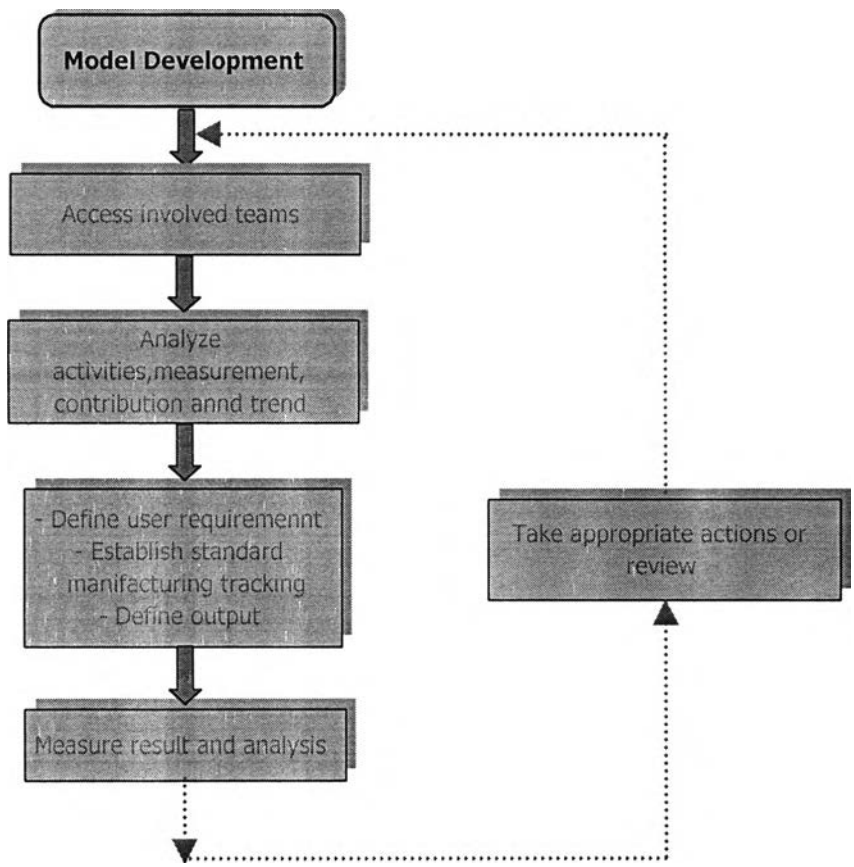

Figure 1.1 Research methodology (Raymond [13])