CHAPTER 2
LITERATURE REVIEW

2.1 Six Sigma Management

The concept of Six Sigma (6σ) was proposed by Motorola's Bill Smith in 1986. This concept belongs to the category of quality management. Sigma (Σ, σ) is the Greek letter, which is a unit in statistics and represents the standard deviation from the mean value. The aim is to reduce the number of defects in products and processes during production, prevent product variation, and improve quality.

Six Sigma was started in the mid-nineties by GE to evolve from a Total Quality Management approach to a highly efficient technology for the design, improvement, and optimization of business processes, and to provide a series of technologies equally applicable to design, production, and Service New Product Development Tools. Then it goes hand-in-hand with GE's strategy of globalization, service, and e-commerce, and becomes the most important strategic measure for companies pursuing management excellence throughout the world. Six Sigma has gradually developed into a management philosophy that aims to determine the company’s strategic goals and product development design with customers as its main body, and pursues continuous improvement.

The theoretical core of the Six Sigma management law is the DMAIC process improvement model. DMAIC refers to a process improvement method that consists of defining, measuring, analyzing, improving, and controlling five phases. All activities are carried out around DMAIC. Every stage of DMAIC process improvement is supported by strong data statistics. Scientific methods are used to reduce process defect rate, eliminate deviation and improve process capability. Therefore, only by mastering the DMAIC process and improving the problem solving method can we better implement the six sigma quality improvement project, so as to create more value for the enterprise.

DMAIC is the most important and classic management model in Six Sigma management, focusing on the quality improvement of existing processes. All the professional statistical tools and methods involved in the management of Six Sigma management are in the process of every Six Sigma quality improvement project. The definition is to identify customer requirements and determine the key factors that affect customer satisfaction. Definition is to identify the customer requirements,

determine the key factors that affect customer satisfaction. Measurement makes it possible for quantitative management to make the application of statistical techniques and methods possible. Analysis is the use of a variety of statistical techniques to find out the root cause of the problem. Improvement is the key step to achieve the goal. Control is to control the deviation of major variables within the scope of license. The DMAIC model is a kind of operation method for implementing Six Sigma. It is operation procedure is closely combined with the cycle and working stage of the Six Sigma project. DMAIC model is not a one-time linear process from definition to control, and some techniques and methods are used repeatedly in the application. The application of DMAIC model is a circular process to realize the level of Six Sigma.

The Six Sigma management developed in the 1990s summarizes the successful experience of total quality management, refines the essence of the process management techniques and the most effective methods, and becomes a kind of management that improves the performance and competitiveness of the company. mode. The practice of the management law in Motorola, GM, Dell, Hewlett-Packard, Siemens, Sony, Toshiba and many multinational companies has proved to be effective. The Six Sigma system derived from Motorola has become one of the milestones in the development of quality management. Peter S. Pande., Robert P. Neuman., & Roland R. Cavanaugh (2014) point that Six Sigma is not a business fad tied to a single method or strategy, but rather a flexible system for improved business leadership and performance.

2.2 Project Management

Basically, the project management is not a mystery, organization and team activities to thousands of years of human behavior can be seen as Project management. Human activities can be divided into two categories: one is a repetitive, continuous, and cyclical activity called "operation", such as the mass production of certain products using automated assembly lines; the other is a unique, one-off activity called "project", such as any development activity, renovation activity, construction activity, and so on. OLAF PASSENHEIM (2009) pointed that it was just a few decades ago, in the 1950s, that modern project management was first seen as an individual within the area of economic sciences. Centurise back, so-called "projects" were finished successfully.

In this society, projects can be seen everywhere, from small gatherings to an

outing, a cultural performance, an educational activity, a construction project, and a development activity. Therefore, Project management is closely related to the development of society. HAROLD KERZNER (2009) believes that Project management is designed to make better use of existing resources by getting work to flow horizontally as well as vertically within the company.

The application of Project management methods has attracted the attention of many industries. The Project management discipline has constructed a relatively mature knowledge system and formed a series of methods. These theories and methods are applied in many fields. Since its development, Project management is a method and a tool. Project management provides a management idea and method. In companies that focus on repetitive day-to-day operations, if every job is viewed as a project, the use of project management is appropriate.

The main role of Project management in the organization is reflected in: ①The project manager alliance enhances the economic benefits of the project itself. Mainly through a series of professional project management activities such as controlling project costs, effectively allocating project resources, and enhancing the project team's production efficiency. ②Improve customer satisfaction. Through the successful implementation of the project, the customer's satisfaction with the project and even the company's overall service will be increased, thereby enhancing the company's market reputation and creating more potential business opportunities for the company. ③ Improve project personnel's comprehensive capabilities. In the project implementation process, the project members are effectively managed, and the potential and advantages of the members are fully utilized. In the project implementation process, opportunities are created for the development of the members' skills and the personal professional values of the members are enhanced. By enhancing the overall quality of members, the company’s overall strength and market competitiveness are enhanced.

2.3 Grounded theory

The grounded theory is a research method jointly developed by two scholars, Anselm Strauss and Barney Glaser of Columbia University. It is a qualitative research method that uses a systematic program to develop a guideline for a certain phenomenon and induce it to take root. The grounded theory is a qualitative research method whose main purpose is to establish a theory based on empirical data.

Researchers generally do not have theoretical assumptions before starting the study. They start with actual observations, sum up the experience summary from the original data, and then rise to the theory of the system. This is a method of building substantive theory from the bottom up, that is, to find the core concepts that reflect the essence of the phenomena of things on the basis of systematic collection of data, and then construct related social theories through the links between these concepts. The grounded theory must have the support of empirical evidence, but its main characteristic is not its empirical nature, but that it abstracts new concepts and ideas from empirical facts. In philosophical thinking, the grounded theory approach is based on the post-positivist paradigm, emphasizing falsification of the already constructed theory. The grounded theory emphasizes the promotion of theories from the data and believes that only a thorough analysis of the data can gradually form a theoretical framework. This is an inductive process.

The grounded theory's operating procedures generally include: 1) generating concepts from the data, and logging the data step by step: 2) continuously comparing data and concepts, systematically inquiring about generative theoretical issues related to concepts; 3) Develop theoretical concepts, establish connections between concepts and concepts; 4) theoretically sample and systematically encode data; 5) construct theories to achieve the integration of density, variability, and height of theoretical concepts.

As far as practical application cases are concerned, grounded theory research methods have been widely used in the fields of pedagogy, sociology, and psychology since their appearance. Richer (1975) criticized and questioned the studies on education made by sociologists at the time, and used grounded theory to explain elementary and junior high school students. Sahin T (2012) used procedural rooted theories to explore pupils' learning concepts and how they viewed them. The results of the study showed that students with a slightly worse family economic status thought that learning was a reason for employment, and the study data showed that learning was a passive one.

With the deepening of research, the applicability of grounded theory is continuously expanding. It is used to conceptualize the behavioral models that exist but are not easily noticed when they first appear, and form a difficult and relevant relationship with the research objects themselves. Explaining the theory of behavioral patterns, to dealing with some theoretical concepts whose connotations and extensions are not yet clear or still controversial, the rooting theory developed so far can also be used to deal with structures with very complex factor relationships. The charm of

grounded theoretical research lies in theoretical construction. Compared with quantitative research, it is more suitable to construct a larger scale theory that involves more concepts, more complex relationships between variables, and diverse forms.

2.4 Case Study

Case studies are the most commonly used qualitative research methods. Case studies have been produced and developed so far and have been widely recognized and applied in academia. Different scholars also defined it from different perspectives. Among them, Jennifer Platt (1992) pointed out abstractly that case studies are the logic of research design and must consider the fit of situations and research issues. Subsequently, Stake (1995) pointed out more concretely that the case study is a “boundary system”. The so-called bounded system refers to the time and space of the moving range. She may be an individual, a scenario, an event, an action, or a problem, but also is "an object" rather than "a process." Based on the previous definition, Yin, R.K. (2003) proposed a more operational definition of case studies. That is, when the boundary between the phenomenon and its background is not clear, an empirical study using multiple data sources to investigate the current phenomenon in the real world background.

Case studies generally include the following stages: 1. Preparatory stage; 2. Select the case and write the research plan; 3. Data collection; 4. Data analysis; 5. The formation of hypotheses; 6. Literature analysis; 7. Proposed research conclusions. Case studies help to create new theories, test theories with easier-to-acquire measurement tools and hypotheses that are easy to falsify, and case study conclusions may be more display-effective.

Case study is a very complete research method. It also includes unique design logic, specific data collection and unique data analysis methods. The research it takes is in real life, and phenomena and situations are often not clearly segmented or define. It can be divided into preparation phase, execution phase, and dialogue phase. Different phases have different work to solve different problems in the research process. In addition, the case study has its own unique "environment" for application. Its importance in academic research is no less than that of any other research method, and it shows its unique charm in various researches.

2.5 Lenovo Group

Founded in Beijing in 1984, Lenovo Group is a world-leading PC company engaged in computer development, manufacturing and sales of electronic products, diversification in the information industry, and global leadership. Lenovo is currently a conglomerate of the original Lenovo Group and the original IBM Personal Computer Division. It employs only 25,000 employees worldwide and has users in more than 150 countries around the world.

Currently Lenovo Group has become the world's fourth-largest personal computer manufacturer, and its customers have spread to approximately 150 countries worldwide. It is a company with a turnover of US$39 billion. Lenovo has become the most popular trademark on the global market with its diversified solutions, leading-edge computer products, its personalized design, and easy-to-use features.

Lenovo Group is China's first official company to introduce the Six Sigma Black Belt Training Consulting Project. Lenovo's understanding of Six Sigma management began in 1999 with the book "Jack Welch and General Motors." At that time, Lenovo was attracted by the immense changes that General Electric made in the book by implementing the Six Sigma Quality Program. In 2001, Lenovo introduced the Six Sigma method from Motorola, which was formally adopted as an important part of the continuous improvement system. After receiving the support from the senior management of Lenovo Group, assistant to the President and General Manager of the Quality Management Department, decided to introduce the Six Sigma Black Belt Project from Lenovo's internal agencies. At that time, the local trial of Six Sigma was set in five departments, namely, two factories, administrative logistics department, supply chain management department and customer service department, mainly manufacturing departments, and selected the first batch of black belt plans among the five departments. Train students and carry out a series of training.