

# Research on Progress Management and Optimization of Gluing Project in G Automobile Manufactory

Guodong Zhang

School of management, Shanghai University, Shanghai, China

## Abstract

The continuous increase in automobile output has improved the convenience of national transportation, and is also of great significance for promoting the country's economic development. The glue factory project of the automobile factory is a systematic project, and the specific work of project management needs to be carried out from the perspective of the integrity of the project. In this paper, a targeted analysis is made on the progress management of the G car factory's rubber coating project as a research object. Through the practice of some basic theories and knowledge of project progress management, a reasonable analysis and science of the progress plan of the G car factory rubber project is proposed.

## Keywords

Gluing project of automobile manufactory, project schedule management; critical chain method.

## 1. Background

The gluing process is one of the key links of automobile final assembly. It has high standards for process technology, and it also plays an important role in the cost investment and production cycle of automobile production projects. At present, the automotive industry has begun to apply robotics in a wide range to realize unmanned fully automatic robot operations in the automotive industry, making production more accurate and efficient, and increasing production efficiency.

With the continuous progress of science and technology and the globalization of the economy, China's automobile manufacturing industry has gradually occupied a place in the world's automobile industry. But at the same time, consumers' market demand for cars is constantly changing. To gain an advantage in the fierce market competition, automobile manufacturers are required to be able to respond to changing needs in a timely manner, maintain high-volume production, and improve operational efficiency. The G-coating project of G Automobile Factory came into being under this background. At this time, how to use modern project management theory to supervise and control the glued project is of great significance to the realization of project operation efficiency.

## 2. Introduction

This article takes the progress management of the G automobile factory coating project as the research object, introduces the construction background and construction goals of the project, and specifically analyzes the characteristics of the project, from system and method factors, personnel behavior factors, and resource factors. From the perspectives of external factors and external environmental factors, research and analyze the problems in the project's time planning and schedule management. Based on this, the traditional network planning technology method is used to analyze the progress control of the project, and then the time schedule of each link of the project is analyzed and adjusted according to the key chain

method, and the buffer area is designed. Through additional analysis of project resources, Adjust the relevant links that may affect the project duration. In the specific implementation process, specific control measures were formulated to ensure the actual progress of the project, and the implementation effect of the project schedule was analyzed.

### 3. Project Status

#### 3.1. Background of the Project

The gluing project run by G automobile factory includes the installation and construction of the gluing workbench and the gluing equipment. The purpose is to enable the gluing system to locate the gluing to meet the standby production, and by selecting a reasonable robot form and installation method, To ensure sufficient space for the equipment, at the same time, it is also convenient for workers to perform operations such as feeding, glass cleaning, and applying primer. The automation technology and robot technology applied in this glue project can improve the high-precision quality requirements of glue, meanwhile, it can reduce labor intensity, improve production efficiency and intelligent automation level, which is very important for improving the operation efficiency of G automobile factories. significance. However, at the same time, the project involves high technical level requirements and a large number of equipment. How to make scientific and reasonable project progress management decisions and ensure effective implementation and modification on the premise of ensuring project quality and cost control? Important issues to consider.

G Automobile Factory was established on June 6, 1997. It has been committed to the production and sales of internationally advanced vehicles, engines, parts, and automotive supplies, as well as research and development of automotive engineering technology. It is a national high-tech enterprise. Its main business is the design and manufacture of automotive vehicles and parts for domestic and foreign markets, automotive sales and logistics, automotive finance, insurance and related services. It has an independent and complete production, supply, sales and research and development system. Its sales markets include Domestic and foreign parts.

Company A was established in 1999 and is one of the important local companies of Company A. It is responsible for the company's industrial robot and system business in China (robot and motion control division), instrumentation (industrial automation division), and substation automation systems (Grid Division) and the main production engineering base of integrated analysis system (Industrial Automation Division). Since 2008, it has been ranked among the "Top 100 Industrial Electrical Enterprises in China" for nine consecutive years. It has an advanced robot production line, which can provide comprehensive solutions for the automotive, foundry, metal processing, plastics, packaging and stacking, electrical and electronic equipment industries to ensure users to produce high-quality products safely and sustainably. Company A also provides various robot technologies and applications, such as commissioning and final assembly, process automation, welding, handling, machining, packaging and stacking.

In response to the requirements of the G automobile factory renovation project, this project entrusted Company A to construct the assembly workshop coating equipment project in the final assembly workshop of G automobile factory. . Specific equipment includes four items: front windshield gluing machine, rear windshield gluing machine, side window gluing machine, and door gluing machine.

The rubber coating project of G automobile factory was contracted by Company A for project construction. After the design and procurement process, pre-acceptance of the project was carried out in Shanghai. After the installation, commissioning and rectification steps were completed, the mechanical equipment was packed and shipped to Hangzhou G In the final

assembly workshop of the automobile factory, on-site installation is performed. After the mechanical installation, electrical installation, and mechanical electrical commissioning steps, the final acceptance of the project is performed.

### **3.2. Project Characteristics Analysis**

According to the analysis of the overall situation of the G car factory gumming project, it can be obtained that the G car factory gumming project has the following characteristics:

#### **3.2.1. The Project Cycle is Long and the amount of Investment is Large.**

The G automotive plant coating project is expected to take 300 days, with a long cycle span, and an investment amount of nearly seven million Yuan, which is a large amount. It is easily affected by various factors during the project implementation stage. Once an unexpected situation occurs, it may The losses caused will also be high, with high risks and uncertainties.

#### **3.2.2. The Project has High Technical Requirements and Requires Many Resources.**

G automobile factory coating project involves many specific process designs and original parts assembly links, requires a lot of precision instruments, and has high standards for the technical level of them. In the actual project construction process, there are higher Difficulty of operation.

#### **3.2.3. The Project Links are Complicated and Involve Many Departments.**

The management structure of G automobile factory coating project involves five departments including electrical system department, automation control department, mechanical equipment department, quality and safety department, and finance department, and is managed by project managers, construction managers, design managers, and safety engineers. There are many departments and the management situation is relatively complicated. It is necessary to coordinate the relations between various parties and achieve reasonable cooperation to ensure the normal progress of the project.

#### **3.2.4. There are Many Factors Affecting the Project.**

The normal implementation of the G automotive plant coating project is affected by various factors, such as the arrival time of the supplier, the level of project management, the real-time feedback of the project, and the technical level. These factors will have a certain impact on the project. During the specific construction process, multiple resources may need to be deployed, which is difficult.

### **3.3. Problems**

#### **3.3.1. There are Many Uncertain Factors Affecting the Project, and it is Easy to Cause Project Delay.**

The progress management of the project involves the coordinated deployment of various resources, the organization and management of various personnel, and it is easily affected by factors such as natural, social, and human factors. There are many project links and more control aspects are involved. For example, it has high correlation with multiple levels of supplier selection, quality control and cost control, and has a high probability of progress control risk.

#### **3.3.2. The Project Schedule Management Concept and Method are Single.**

At present, the progress management of glue-coated projects still mainly adopts the horizontal map method as the schedule, but it lacks the reflection of the logic and resources of the project, and does not consider the calculation of the actual completion time and buffer time It is not enough to do the task decomposition of the project to achieve effective management of the project progress. At the same time, some project leaders are easily misled by the crossbar chart in the process of managing the project progress, and do not pay

attention to the logical relationship between the various links. They only calculate the completion time and start time of the project based on personal subjective estimates. It is more effective without using Tools and more scientific methods.

### **3.3.3. The Project Duration is too Long and Lacks Practical Guidance.**

The project of G automobile factory coating project spans a long time and involves a lot of project procedures. Many sub-projects need to reserve more safety space between the task duration, but with the continuous increase of task levels, the planned duration of the project duration It will be much larger than the planned time value of the project, and it will not give full play to the guiding significance of the project schedule, resulting in a waste of time.

### **3.3.4. The Number of Scarce Resources is Limited and the Degree of Sharing is High.**

There are many types of elements such as personnel and resources used in the G car factory coating project, but the number of resources is limited, and sometimes conflicts of resources may occur, but the supply of resources cannot be increased anymore. The resources can only be coordinated by waiting for the extension of the construction period. The deployment situation has a great impact on the scheduled completion of the project.

### **3.3.5. Lack of Effective Coordination among Multiple Entities in the Project.**

The G automobile factory coating project was outsourced by G automobile factory to Company A for equipment design and installation, which involved a large number of participants, adding a certain degree of difficulty to the overall coordination of the project. The main bodies are prone to contradictions and conflicts in the course of the project. However, due to the different management specifications of the teams, unified coordination cannot be performed, which may affect the progress of the project and delay the construction progress of the project.

### **3.3.6. Insufficient Implementation, Supervision, and Revision of the Project Schedule.**

In order to ensure the reasonable progress of the project progress management, it is necessary to continuously feedback the project progress during the implementation of the project, and measure and compare it, and then update and adjust the project schedule instead of a fixed short-term activity. At the beginning of the project, the project of the G car factory has prepared a project schedule and implemented it in accordance with the plan. However, in the process, there is still a lack of specific tracking of the actual implementation of the project. After completing the original plan, the implementation of supervision was not enough. Often the gap between the original plan and the original plan was discovered during the progress of the project, and in order to ensure the completion of the original plan, a large amount of resources were required to be invested, resulting in waste.

### **3.3.7. The Project Process does not Specify the Output and Review of Each Stage.**

The glue project is a long-covering project with many process links, and it has uncertainties and risks in the project time. However, in the process of the project's specific progress management, there is no set staged goal to carry out the project. Review and measure to achieve the control and management of the project task process. There is no subdivision of different task phases to help rational planning and control of the project. Failure to avoid the impact of problems at one stage on later tasks.

## **3.4. Critical Chain Method**

In the analysis, considering that the traditional critical path method lacks the analysis of the resource requirements of the project, and does not take into account the human factors of the project execution process, the key chain method can integrate the resource constraints of the project and the project. The logical relationship between the sub-tasks, based on the bottleneck tasks that restrict the completion time of the project, determine the critical chain tasks and non-critical chain tasks. Therefore, this article chooses to set up a resource buffer to

prevent possible delays due to resource problems; set up a project buffer to ensure the advantages of key chain tasks, thereby clarifying management priorities, and being able to allocate time to key tasks more efficiently; setting Import buffers to alleviate frictional conflicts that may exist between non-critical chain tasks and critical chain tasks, and ensure that non-critical chain tasks will not affect the project's normal execution period. For projects such as the G car factory coating project with many processes, long construction periods, and large amounts of money, the project completion efficiency can be greatly increased.

At the same time, in order to more intuitively highlight the differences in the results of the project's progress design of the critical path method and the critical chain method, and to verify the scientific and applicability of the critical chain method, this chapter introduces the critical chain method to the progress management of the G automotive plant coating project. In the design, by comparing the two theoretical methods, the traditional critical path method is used to make specific schedules. On this basis, a critical chain method is applied to optimize the schedule design of the G car factory coating project. The analysis and evaluation are calculated. The results of the schedule plan are implemented in the actual project execution process, so that the differences and advantages of the two methods are compared and analyzed, and it is verified that the key chain method can be more suitable for the progress management of the G automotive plant coating project. , To provide a more reasonable schedule for the G automotive plant coating project.

By using the key chain technology to optimize the progress of the G car factory coating project, it not only improves the accuracy of the estimation of the task time, but also solves the problem of resource conflicts during the project, and can respond to external changes in a timely manner and improve the project. Level of progress management. At the same time, in order to ensure that the project can be completely executed in accordance with the expected progress, it is also necessary to formulate corresponding safeguard measures to achieve the specific requirements of each task and complete the management of the project buffer zone.

#### 4. Conclusion

The continuous increase in automobile output has improved the convenience of national transportation, and is also of great significance for promoting the country's economic development. The glue factory project of the automobile factory is a systematic project, and the specific work of project management needs to be carried out from the perspective of the integrity of the project.

The prerequisite for schedule control is the schedule plan. The project schedule control is the scientific management and control of the implementation of the project duration plan and the change of the project duration plan. For the entire automobile manufacturing industry, the implementation and application of relevant theories and methods of project schedule management can improve the project's operating efficiency, and at the same time, it can provide corresponding guarantees for the safe operation and cost control of the project.

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