To Main Proceedings Document

"Managing the Strategic Resources to Sustainably Achieve the Global Goal of the Mexican Light and Power Company"

Conrado García Madrid cong@sdsg.com
Annabel Membrillo annam@sdsg.com

The Strategic Decision Simulation Group
http://www.sdsg.com

Abstract: Historically, the Mexican Light and Power Company has faced a great challenge: how to decrease the huge number of failures in the generation, transmission, distribution and commercialization processes of electric power. There is an emerging need to find new methodologies to help the company design their strategy for the maintenance group, using the same resources they have being using so far.

During this continuous search, the reliability and quality of the service has improved due to several new ideas incorporated from different approaches. However, the fundamental objective is still very far from being accomplished. In a new attempt, a modified system dynamics approach, the "Managing from Clarity" framework, has been applied to the distribution and commercialization process, by creating a model that simulates maintenance decisions and analyses the impacts on the rest of the company. This framework has shed light on the global goal, the strategic resources and the action points to accumulate and maintain these resources, as well as the structure and the people's incentives that determine the overall maintenance group's performance.

Introduction

The Mexican Light and Power Company is responsible for the generation, transmission, distribution and commercialization of the electric power. During its century of existence since they obtained the concession to distribute electric power to the central area of the country, the company has faced a continuous problem; frequent service interruptions. These breaks in service have serious consequences for the many affected users. The service breaks are monitored by end-user's complaints. These complaints have increased steadily over time despite the improvements in reliability and quality mentioned above. This is even more critical given that 84% of the total electric power sold is purchased by the competition. This means that the company is basically a distribution firm. As such the main interest of the company, is to avoid the service failures, specifically failures from the substations to the end users.

How to Manage from Clarity?

To better understand how to manage the strategic resources of the Mexican Light and Power Company, the strategy needs to be "G.R.A.S.P.ed" in a new way. To do this we will

focus on understanding the Goal, Resources, Actions, Structure and People by answering the following 5 questions of the "Managing from Clarity" framework throughout the article:

1. **G**lobal Goal: Why do the Mexican Light and Power Company exists?
2. **R**esources: What resources do we need to achieve the global goal of the organization?
3. **A**ctions: What actions can I take to leverage and maintain these resources?
4. **S**tructure: How do the goal, resources and actions interrelate?
5. **P**eople: How do we bring to life the Mexican Light and Power Company?

G.R.A.S.P.ing Your Strategy: the 5 Questions to Manage from Clarity

1. Global Goal: Why do the Mexican Light and Power Company exist?

The *Global Goal* of the CEO of the Mexican Light and Power Company is to offer a reliable service to the users. The best indicator to monitor if the goal is being achieved is the Interruption Time to the User (ITU), which reflects the time the clients are not receiving the service due to system failures.

In the following graph, we can see the actual behavior pattern of the global goal through time, and the desired behavior we would like to see in the future. In this case, the number of failures in distribution has an oscillatory behavior. That is what drives the ITU accumulation. We will go into this explanation in more detail later.

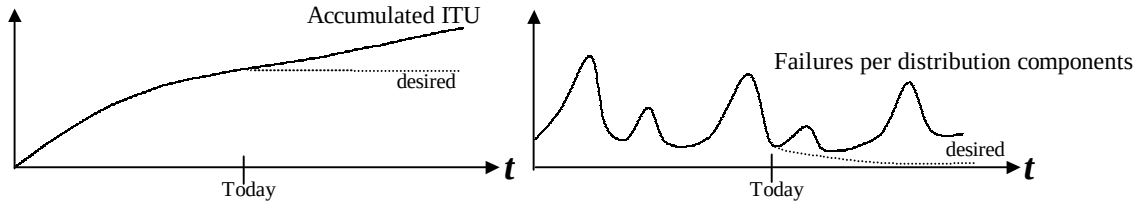

Figure 1. Global Goal behavior

2. Resources: What resources do we need to achieve the global goal of the company?

Making the global goal explicit helps us to identify what resources need to be managed by the person in charge of the maintenance sector. The following are the resources for this case: failures, distribution infrastructure (components, lines), work teams, complaints, budget, workers with relevant skills and vehicles.

3. Actions: What actions can I take to leverage and maintain these resources?

The resources can be accumulating through several actions. As maintenance manager, you need to decide which actions to implement in order to maintain and accumulate the strategic resources in a balanced manner to achieve the global goal. In the model, the actions are: executing preventive maintenance, executing corrective maintenance, hiring

and training people, buying, repairing and discarding vehicles, installing or removing distribution infrastructure components.

4. Structure: How do the goal, resources and actions interrelate?

To define the final model, the different dynamics of the model were analyzed with the experts to identify which ones better explained the general behavior of the structure. The diagram is arranged to present the actions on the bottom, the resources in the middle and the global goal on top.

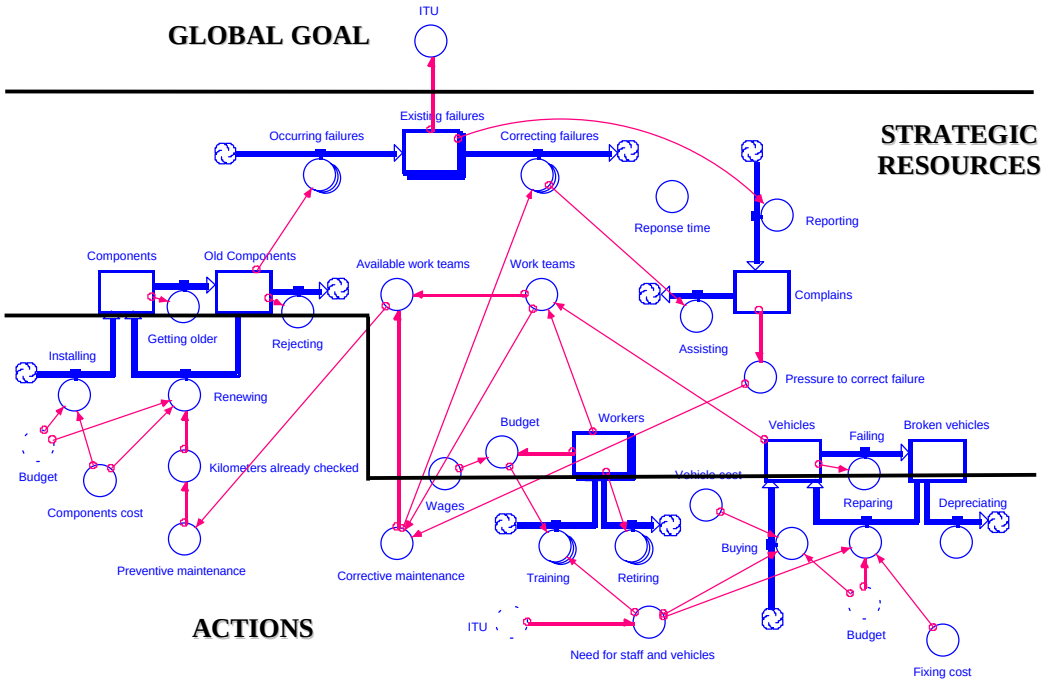

Figure 2. Structure for the Mexican Light and Power Company

Recapping the learning of the model dynamics, we can see the archetype "Shifting the Burden". Most of the resources are used to implement the symptomatic solution (corrective maintenance), rather than the fundamental solution attacking the causes of the problem (preventive maintenance). In consequence, there are increasingly recurring failures in the older infrastructure, which pressures management even more to apply the symptomatic solution.

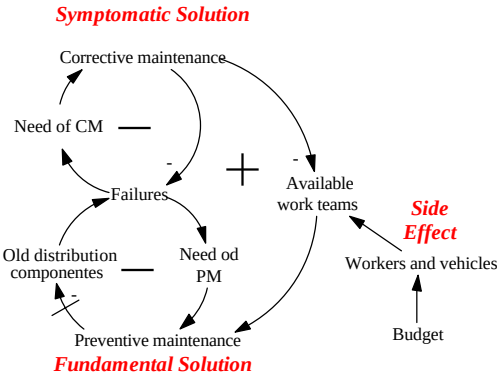

Figure 3. Archetype

It is necessary to implement both solutions in parallel. Though the components of the infrastructure are in bad shape, there is a high demand for their use and not enough budget for replacing them. It is important to be aware of the following, by doing preventive maintenance, the organization avoids service failure which eliminates the need for corrective maintenance. However, while focusing mostly on corrective maintenance, the

failures have already occurred and the problem is just being solved faster-but the problem is still there.

5. People: How do we bring to life the Mexican Light and Power Company?

In any group, people involved with the performance of the organization have different perspectives about what to do and when to do it. Usually the perspectives pull in different directions. In the following, we will make explicit and analyze the incentives and perspectives of the main participants involved with the maintenance of the Mexican Light and Power Company. In the diagram below the perspectives about the strategic resources of each participant is made explicit. The bold lines reflect the frontiers where the management and responsibility of the resources change.

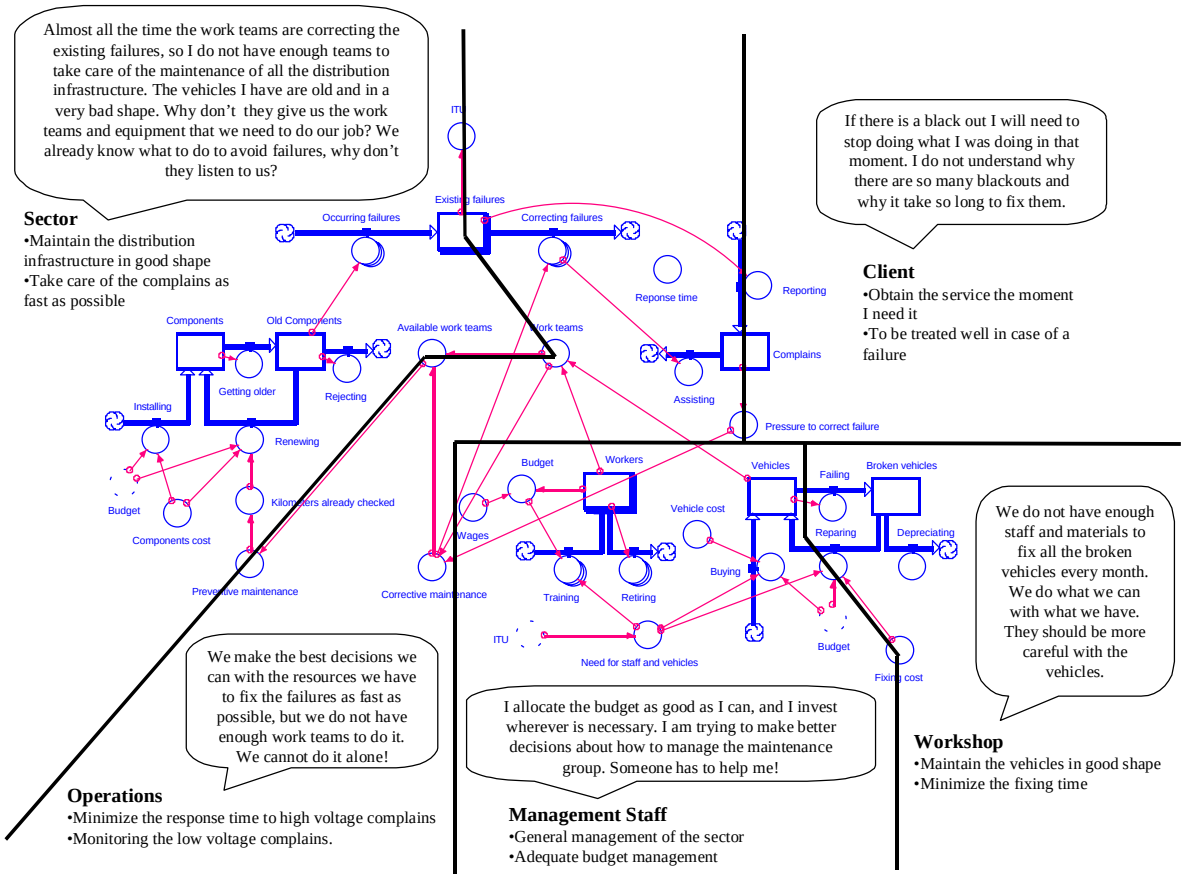

Figure 4. Systemic View of the Organization Map

In the diagram, we can see that everyone is responsible for the failures and ITU, and the authority to make important decisions is just in the hands of a few. Due to this situation, continual conflicts arise about how to manage strategic resources. Each group has valuable information that the others need to be aware of. Effective channels of communication should exist regarding each perspective's approach to solving this problem. In turn, each

one should then be analyzed to see if it helps or inhibits the maintenance group from achieving the global goal in a sustainable manner in the long term.

For example, looking at the diagram the resource *Vehicles,* the responsible of managing and maintaining the resource is the service station, but the authority to buy new pieces, spare parts or new units is on the hands of the Management staff. Having the authority separate from the responsibility provokes conflicts for resource management. Another example is team management; Sector analyzes and plans the essential actions to perform preventive maintenance on the infrastructure components. Sector is looking for achieving their local goal: "Maintain in good condition the distribution infrastructure components". However, the pressure to attend failures and customer complaints is so high that Operations, looking for achieving their local goal, put a lot of pressure on the Staff to allocate the resources that fixes the failures, disregarding preventive maintenance. In this case, we can see that more than one participant has authority and is responsible for the resource, deepening the conflict mention before.

Conclusions

The Mexican Light and Power Company

By using the resources for the distribution components with a higher failure rate occurrence, the other less conflicting or even with zero failures components are overlooked. Through time, the distribution components that were not conflicting start presenting a considerably increment of failures. Then is when the managers allocated the resources to correct that problem and ignored the others that have been already corrected. As a result of this, there is always a part of the distribution infrastructure presenting failures and the ITU accumulates along the year because the available resources are generally allocated to make corrective maintenance for the conflicting infrastructure components, instead of give preventive maintenance to the ones that are not presenting failures.

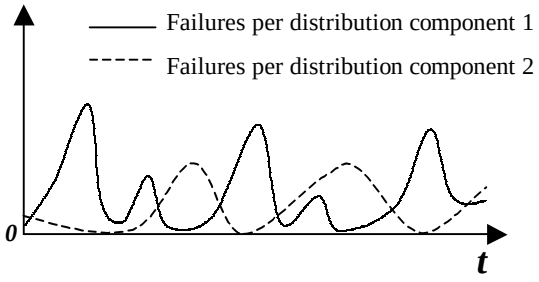

Figure 5. Failures per component

This behavior has two main reasons:

1. The pressure to correct failures is high.
2. The scarcity of the strategic resources (budget, skilled workers, vehicles). The limited budget and the pressure to correct failures obstruct the allocation of resources to preventive maintenance interfering with the Sector local goal and the global goal.

The different perspectives regarding what needs to be done and when affects considerably the decisions that are made along the way. These decisions directly affect the strategic direction of the organization. Making explicit the individual objectives of each participant helps to focus the efforts of the maintenance group in the same direction. This coherence leads to the alignment of the individual objectives with the global goal. Making everyone

responsible for their contribution to the infrastructure components' condition, the capital investment and operating actions to take will be more focused on preventing failures instead of correcting failures and attending to complaints.

The Framework

Focusing on the five elements of the "Managing from Clarity" framework the maintenance decision makers of the Mexican Light and Power Company were able to identified the overall goal (G), identified the strategic resources (R), understand the actions points (A), make the structure explicit (S), and understand people issues that drive results over time (P). This understanding enables the decision makers to G.R.A.S.P. the strategy, to achieve a shared vision, to move the organization in the desired direction and to clearly communicate why they choose a particular strategic path.

Bibliography

García Madrid, C. "*Pensamiento Sistémico Aplicado al Mantenimiento de las Redes de Distribución de Luz y Fuerza del Centro"*. Undécima Reunión de Verano de Potencia y Exposición Industrial, IEEE, Acapulco, México, Julio 1998.

Ritchie-Dunham, J and Rabbino, H. Managing from Clarity: The Art and Practice of Identify, Aligning and Leveraging Strategic Resources. Publishing by 2000.