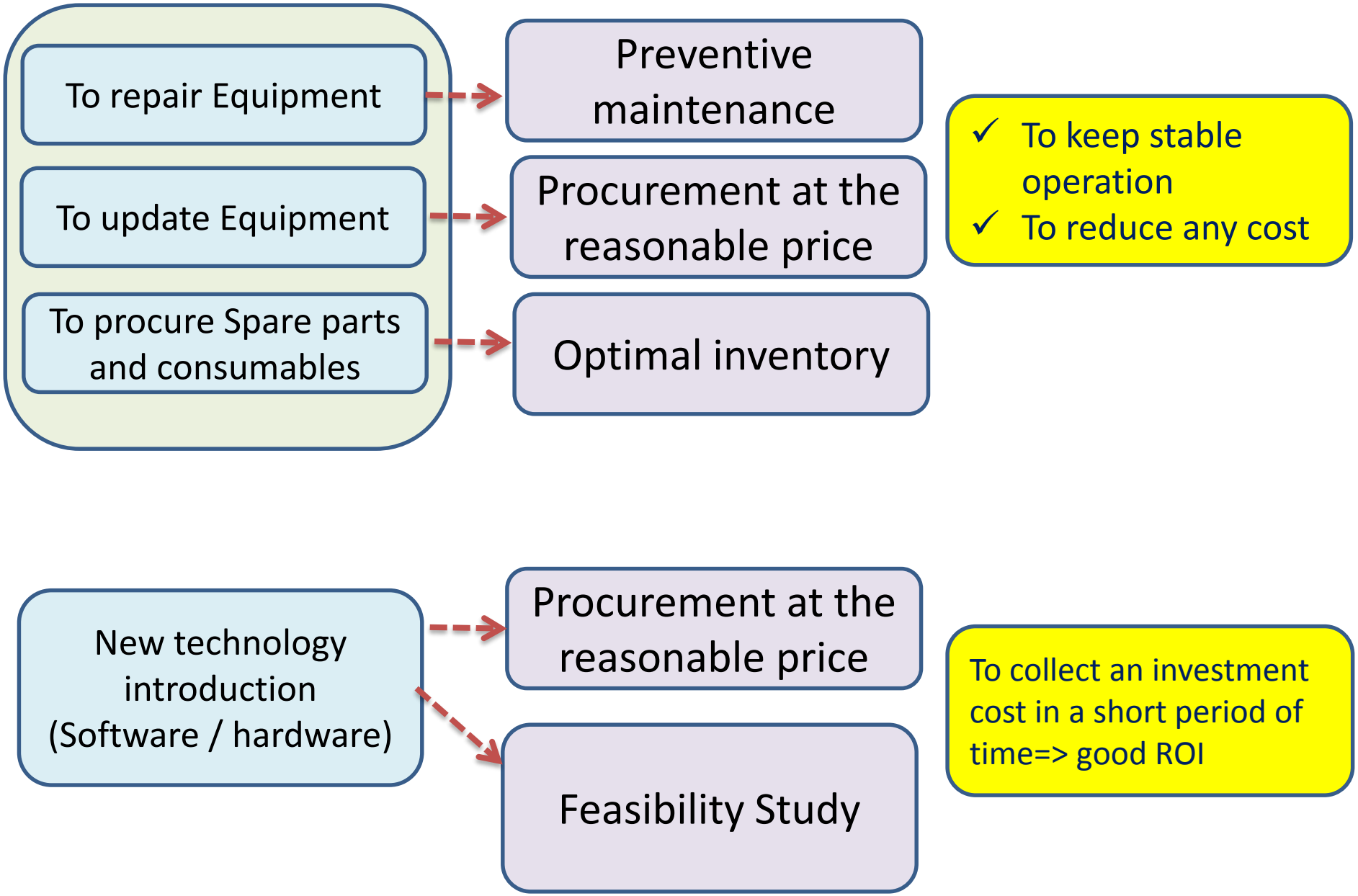
For Production Line to be maintained and updated

Procurement proposals

February 9, 2020

Proposal summary


To repair Equipment
To update Equipment
To procure Spare parts and consumables
Preventive maintenance
Procurement at the reasonable price
Optimal inventory
✓ To keep stable operation
✓ To reduce any cost
New technology introduction (Software / hardware)
Procurement at the reasonable price
Feasibility Study
To collect an investment cost in a short period of time=> good ROI

To solve Issues

To perform preventive maintenance based on failure analysis.
To estimate equipment life.

→ Optimal inventory of maintenance parts and consumables

To build a purchase price database for equipment and parts to perform price analysis.

→ Purchase at a reasonable price

To analyze past approval documents and verify the ROI (Return on Investment)

→ Quantitative evaluation of ROI

Optimal inventory of maintenance parts and consumables

Application of artificial intelligence

(Paper file)

Digitize

(server)

Data Cleansing

Data Analysis

to find a causal relationship between cause and failure

Implementation on the factory production line

What effects are expected?

Failure analysis (Analysis from maintenance data)

- Which part is critical in failure?
- What is the major cause of failure?
- Are there any idea for preventive maintenance ?

- ・to Increase yield
- ・to reduce inventory parts

Defective product analysis (Analysis from inspection results)

- Which process produces defective products ?
- What is the cause of defectives?
- Are there any idea for reducing defectives?

Life expectancy

Supplementary explanation

- It is necessary to build equipment maintenance information.
- By analyzing maintenance information, it is possible to predict the life of individual equipment and to analyze failures.
- Too much parts and consumables in stock cause inventory costs and these quantities should be reduced and optimized, within a range of continuous stable operation for production lines.
- The visualization of inventory parts is recommended not only for storage volume but also for delivery date.

Purchasing Equipment and Parts at the reasonable price

It is impossible to see what the person in charge has read and what kind of criterion is used to determine the price from the quoted price (negotiation for price reduction) and determine which supplier is the best.

To collect past data and store it in a database. To analyze it and find trends and characteristics

Seeking a reasonable price with artificial intelligence

Supplementary explanation

The purpose is to make a proper evaluation of the quoted price.

- A database of past purchase results is implemented to evaluate suppliers' quoted prices, using artificial intelligence, where "past purchase data" and " the tacit knowledge of the person in charge" have been incorporated.
- The appropriate price for supplier A (100) will be proposed at 150, assuming a reduction in purchasers. You can negotiate to get this to 100 (but any buyer does not know that it is 100 without data analysis). If you do not collect more than two quotations, you will negotiate the price with a single supplier, because you cannot compare with other quotations. In most cases, the amount to be reduced is up to the supplier in good faith (without any reasonable reduction policy).
- In fact, you might have been able to purchase a little cheaper, and this price reduction negotiation is a burden on the person in charge. (Because it is not a simple calculation but a negotiation based on intuition and experience) If so, you should create a mechanism that automatically analyzes the know-how of the person in charge and the past data on which it is based, and calculates the price automatically. This makes it easier to negotiate (because price negotiations are based on historical data).

Quantitative evaluation of ROI (return on investment)

To gather information on past requests for approval and to verify the return on investment. => A quantitative evaluation method of the return on investment will be established.

Request for approval information collection

Database conversion

Collect past data and store it in a database. Analyze it and find trends and characteristics

Establish an investment return evaluation method. Establish requirements for approval documents for each facility.

Supplementary explanation

- When introducing new equipment or technology, we usually collect quotes (price and technical superiority) from suppliers and prepare a draft decision. When the approval is obtained, the purchase procedure is completed, and the procurement department negotiates the price. (See the previous slide)
- In this case, the difference from the normal equipment replacement is that the old equipment is still used but is replaced because the production capacity or production efficiency are expected to be improved.
- Therefore, the return on investment for the new technology introduction is required, but the quantitative evaluation method is not generally defined. (Created by the person in charge each time)
- The solution is as follows:
  - Creates a database of past requests for approval and simultaneously verifies the return on investment.
  - At the same time, we will build a quantitative evaluation method of return on investment.
- If these are stored in the database, the person in charge can select similar equipment and technology from the database and explain it to the decision-maker in a rational manner.