

The Maintenance Service concept evolution

The Inspiring approach

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INTRODUCTION

The macroeconomic laws say that a good/service is placed on the market only if it satisfies a need. Today the companies have to contend on a market more large and open. This push the companies to the maximum excellence search, considering the manufacturing and service point of view.

A product will be competitive only if it's considered with a right value quantifiable in a right price from the customer. At the end, to be excellent means "to be perceived with a value" and to give to our product/service:

- ✓ A reputation
- ✓ Quality
- ✓ Performance
- ✓ Reliability (the probability to maintain its performance during the time)
- ✓ Availability (reduction of service interruptions without safety consequences).

Recently, to answer to new market needs, the companies consume goods producing, are passing from standard goods (with low production costs and large volume) to solutions more complex, with high quality and strong personalizations.

This change has consequences on supply companies with strong change in the customers needs. The famous "production chain" is more long and the customer needs enter in the company needs.



Source MIP-Milano – Prof. S ianesi

Customer is more careful respecting to the value expressed to the product. It sees over the structure or the performance. It want the quality of accessory activities, as services from the same supplier.

In this case the services are not as a new product proposed to the customer, but they're an important part of the product.

That is a product in a product, a "good that integrate the keys factor of a tangible product with a whole of services that help to value the product characteristics and to differentiate the market offers".

So, the post-sales business is not negligible yet...

In a Deloitte's dossier dated 2006... "it quantify in 46% the value of the services the importance of services related to the earning of companies panel with global dimension. In the manufacturing companies considered, the medium earning of service activities – that include sales and post-sales like maintenance and repair – is higher in 75% relating to earning from business activities. In fact, several companies will have a less earning without post-sales services."

It's clearly visible that companies don't have to consider the post-sales activities as a secondary activities – says Massimo Bianchi, Deloitte partner and Italian responsible for Industry Manufacturing. These activities have to be considered as a improving business and integrated in the core business strategy of manufacturing companies” “ Large part of companies – Bianchi says – concentrates its sources in products innovation and in product efficiency, with a low attention to the post-sales activities. These companies don't know that offering to their customers a complete packet product + customer care, can have a strong opportunity to increase the customer loyalty. This allows to improve the earning growth and to improve the loyalty of customer. Consequence is an increase of barrier against the competitors that could take advantage of possible “leaks” to get new customers.”

“Companies concentrated on post-sales services development, can take advantage on 3 fronts:

- *Major earning and market quotes*
- *Major customers loyalty*
- *Minor costs and better cash-flow”*

In this case the great development opportunities are clear. Today, for medium and small companies, there're a large space of improvement. In several cases the post-sales service is considered as a reality completely independent from production and independent from earn, even if it conditions “the image return in an indirect way”.

INSPIRING PROJECT

Considering the introduction, Inspiring Group, careful to new approaches, developed a methodology for the After Sales Global Service studied for OEM and production companies (machinery fields) and so with a focus (service post-sales service) in manufacturing B2B field.

For these companies it's not possible to design, build/assemble a machine/system without a complementary post-sales service. The strategic role of post-sale service can be considered in 3 fundamental concept:

- **Customer satisfaction**
 - ✓ To give to the customer a complete packet of support services, considering the product/service related.
- **Customer retention**
 - ✓ To conserve a relation between the logistic-production chain actors and the customer also after the purchase. This open the opportunity to major loyalty of customer.
- **Continuous improvement**
 - ✓ To have key-information on reliability level of product, deducing from assistance of post-sales centers and on quality perceived from customer.

The post-sales activities management between company and customer is very complicated, but focused on 2 fundamental points:

- 1 - Integrated Supply Chain i
- 2 – Integrated Maintenance Management (Engineering + Management)

The first point considers concepts and managerial themes (spare parts management, logistics, warehouse and assistance point localization, finance, invoice management, work order, etc...) very wide and not extensively treated in this article.

We want consider the themes of point 2 because, thanks to a growing path and development of join-venture with an important company leader for pharmaceutical machines, Inspiring is developing a new software for maintenance.

This approach (methodology + software) can support the reliability analysis and the maintenance management (failure analysis, KPI, preventive maintenance program, etc...) to contribute to:

1. **Operative costs optimization.** Thanks to a better know-how that guarantees efficiency in the design, construction and supplier choose phases related to criticality.

2. **Improvement of operative costs.** Identifying the plus for a new or better competitive advantage to realize on the market.
3. **Better results attended on Service Level Agreement and Maintenance contracts.** Thanks to a correct evaluation of maintenance activities and spare parts.

The core of this project is in the maintenance activities management. Everything is related to AVAILABILITY of machine/plant (system): more it's high, more the customer will be satisfied. But to have high value of availability it's necessary to know how works and the conditions of work (environment and use). It's important, therefore, to have a large number of data and with an high frequency of reading to justify the software installation on the system.

The methodologies used are RCM (Reliability Centered Maintenance) and Continuous Improvement.

For the RCM activities there're 2 kind of actions: the *proactive tasks*, that is every action to adopt before the failure (preventive interventions, on condition, etc...), and the *default actions*, that is every action to adopt after the failure that solves and restores the correct work of machine. RCM, thanks to the "Reliability theory" wants to define the better maintenance politics to adopt on the system as the better trade-off between costs and benefits. The target is maximize the availability minimizing the maintenance costs (management, operative,...) respecting the quality objective.

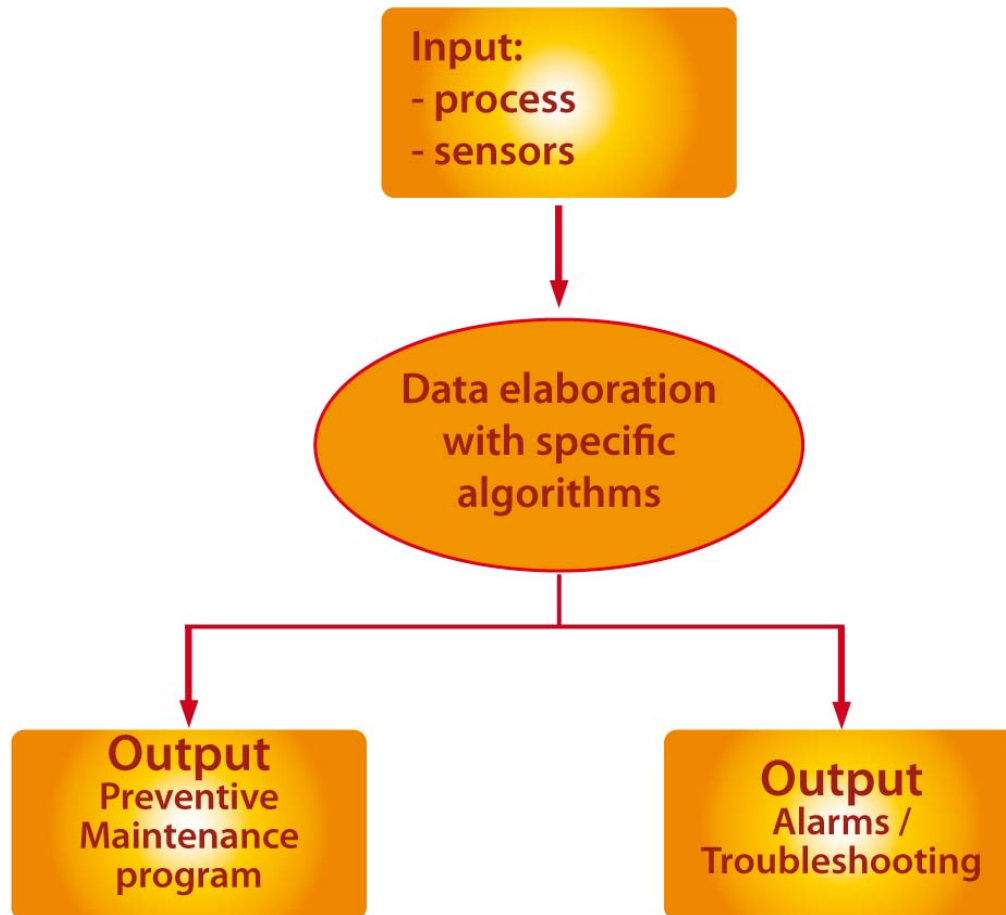
The Reliability theory (R) shows that every component has a defined behaviour after a failure and related to 3 principal conditions: work environmental, use conditions and time.

So, it's important to have a measure system to characterize the R function $R(A;CC;T)$.

After to understand the behaviour of asset in case of failure, it's possible to define the right maintenance politic to minimize the risk.

In every case, the risk of having a failure is possible ever and we have to forecast the failure management. This is possible thanks to Troubleshooting methodology implementation. For every kind of failure, is related one or more activity to solve the situation and to know the failure causes for a secure restore.

The RCM module of the software has to manage the methodological flow (Fig: 001):



Related to RCM must be the Continuous Improvement. This is important to increase the system performance considering the behaviour in case of failure and to reduce the probability of unexpected failure. Thanks to a software support is possible to analyze in real time the process and failure data (MTTF; MTTR; MTBF; component code; etc) in order to have a “variable” maintenance program.

This is a fundamental point because every system changes its failure behaviour during the time and relating to the way of use, maintain and new situations.

CONCLUSIONS



The software will be able to monitor the system to understand how it works, in which operative conditions, how it's maintained, how it's managed (time cycle, number of cycle, kind of cycles, temperature, etc...).

In this way (with some algorithm by Inspiring), the software can characterize the system thanks to a math model.

At ordinary work, every machine will have a personality with important differences relating the standard machine designed.

The software will be able to analyze the deviation respecting the ideal model in RAM analysis (starting project). When the software will record the deviations, it'll be able to give important information:

- Machine OEE;
- MTTR – MTTF;
- New maintenance program, based on machine behaviour;
- Critical spare parts list and its frequency;
- Operative Troubleshooting.

Only in this case we have an high availability, because the behaviour in case of failure of whole system is controlled in every moment and the availability is guaranteed. When there's a casual failure (but with FMECA Analysis the consequence are less critical) thanks to troubleshooting it'll be possible to solve the problem in real time. So. organized actions in unforeseen failure case too.

The software will be used as manager of maintenance activities with a library of every operation and technical manual, spare parts list and a module to recorder the maintenance works.

But the real solution strength is to have a large amount of real data that allows to engineering function to improve the design and reliability of the system, creating a virtuous circle.

So, the Inspiring project for post-sales thought by Inspiring, starts from the end: first is an available evaluation of machine, after there's a improvement of reliability.