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Re-engineering a Helping Hand

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Abstract

Re engineering is a system or process or methodology developed to maintain / improve the performance of a product or service or an organization.

Re engineering refers to:

Troubleshooting / problem solving which is a systematic search for the source of a problem so that it can be solved in order to make a product or process operational again.

Business process reengineering which focuses on the analysis and design of workflows and processes within an organization to improve customer service, cut operational costs, and become world-class competitors.

Re engineering software is a disciplined technique for restructuring an existing body of code, altering its internal structure without changing its external behavior, undertaken in order to improve code readability, to reduce complexity and to improve the maintainability of the source code etc.

Reengineering (manufacturing) is a continuous effort in engineering design and analysis of processes to increase productivity by improving communication, structure of manufacturing systems, to enhance the performance of the product and to reduce the fatigue of the workers.

Index Terms: Business process, Maintenance, Planning.

1. Introduction

To operate and stay competitive in this dynamic environment, Aerospace manufacturers and suppliers will have to ramp up production quickly to meet the expected growth, be globally effective, control costs, and manage supply chains

effectively. Re-engineering–an "Organizational Diagnosis" which is always be the ongoing part of development. The results of this diagnosis provides a basis for change. The changes are made and their impact is measured, evaluated and fine tuned. The performance of an organization can be continuously improved by restructuring the organizational structure, centralization of activities like consolidation of inventories at one place instead of staggering at many places, delivering the goods to customers as per the agreed delivery schedule, meeting the production target by maintaining the machineries in a planned way etc. The goal is to achieve a dramatic performance advances incritical areas such as cost, quality, service, and speed. Re-engineering focuses on core business of processes, such as the new product development, order fulfillment, and maintenance management.

2. Process Re- engineering

2.1 System architecture

The system architecture for quantum leaps in benefits from leadership, control and continuous improvement is shown in Fig. 1

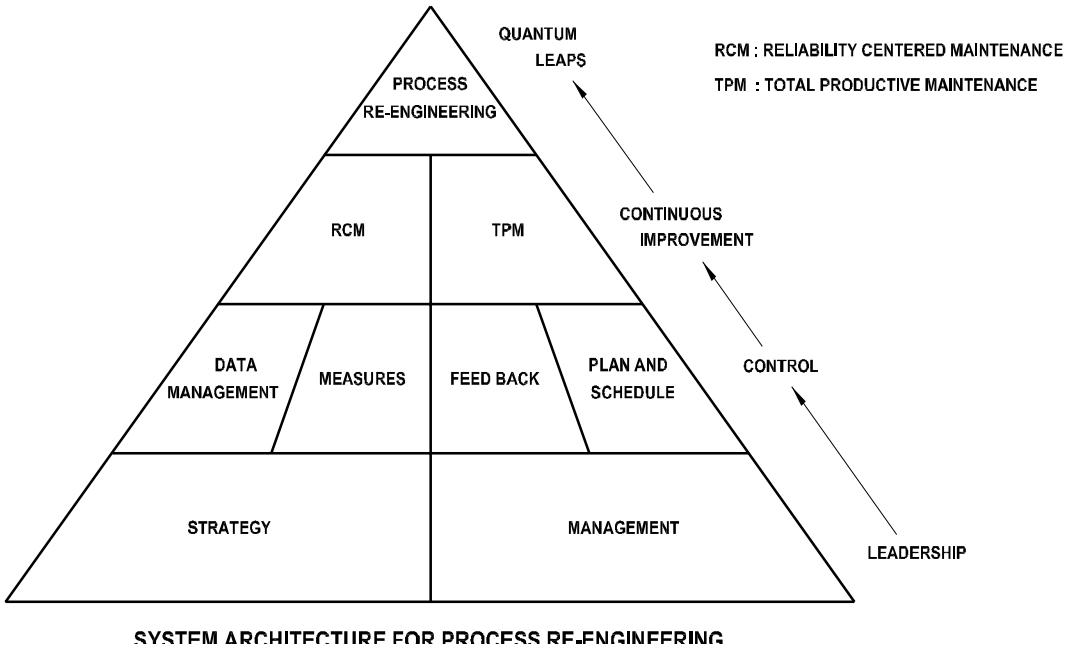

Fig. 1

2.2 Improvement in performance over time

Instead of fine-tuning the status quo with continuous incremental improvement, reengineering focuses on core business of processes, such as the new product development, order fulfillment, and maintenance management, which results in high jump in performance (Fig. 2)

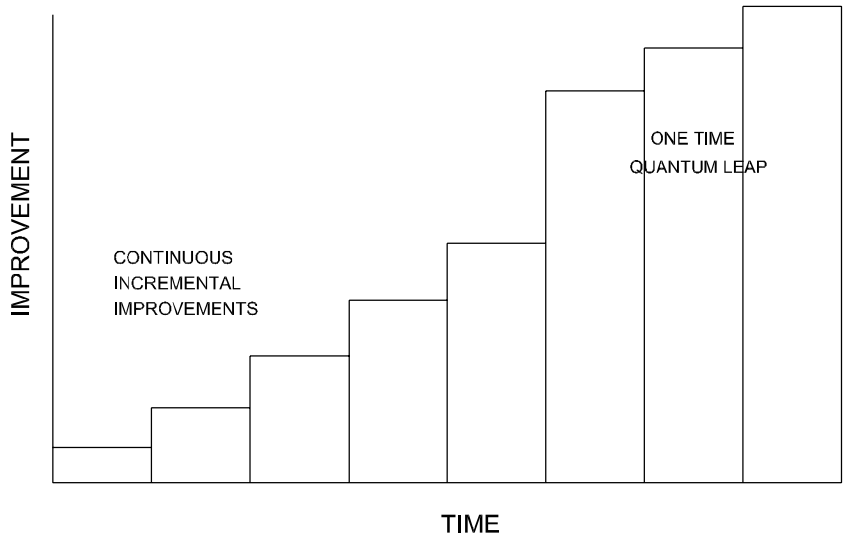

Fig. 2

2.3 Maintenance management process

It begins with a need, often expressed by a "customer," and ends with It being satisfied. As a process, it covers purchasing, stores, production scheduling, operations , engineering, and several other management and administrative functions. The process could also include automated tools to simulate how the reengineered process will work, and benchmarking to help set goals and provide insights. The team must clearly understand the overall vision of the business and what drives competitive advantage in your particular sector.

In maintenance, inputs involve identifying an equipment need and various materials, skills, and information. The linked activities include planning, scheduling, and the actual work. Outputs are available equipment, histories, and satisfied customers. To reengineer maintenance, one need to understand clearly how the current process is actually conducted. The objective is to simplify it to reduce cycle times, work–in–process, waste, and duplication.

2.4 Process Analysis

2.4.1 For each activity, one need to know what is being done, how it is done, why it is done, what the volume is, who is Involved, how long it takes, and what it costs.

2.4.2 One must be able to answer the question, "Does this activity add value?" In other words, would customer pay for it if they knew you were doing it?

2.4.3 List which activities don't add value: move, inspect, file, store, retrieve, count, travel, wait.

2.4.4 They all can't be eliminated, but they are good places to start streamlining.

2.4.5 Once the current process is understood in detail, one need an even more exact picture of what the engineered model than would look like.

2.4.6 The detailed plan, costs, the cycle times–these are the mechanics.

Fig. 3 shows the flow diagram of the maintenance process before and after re-engineering

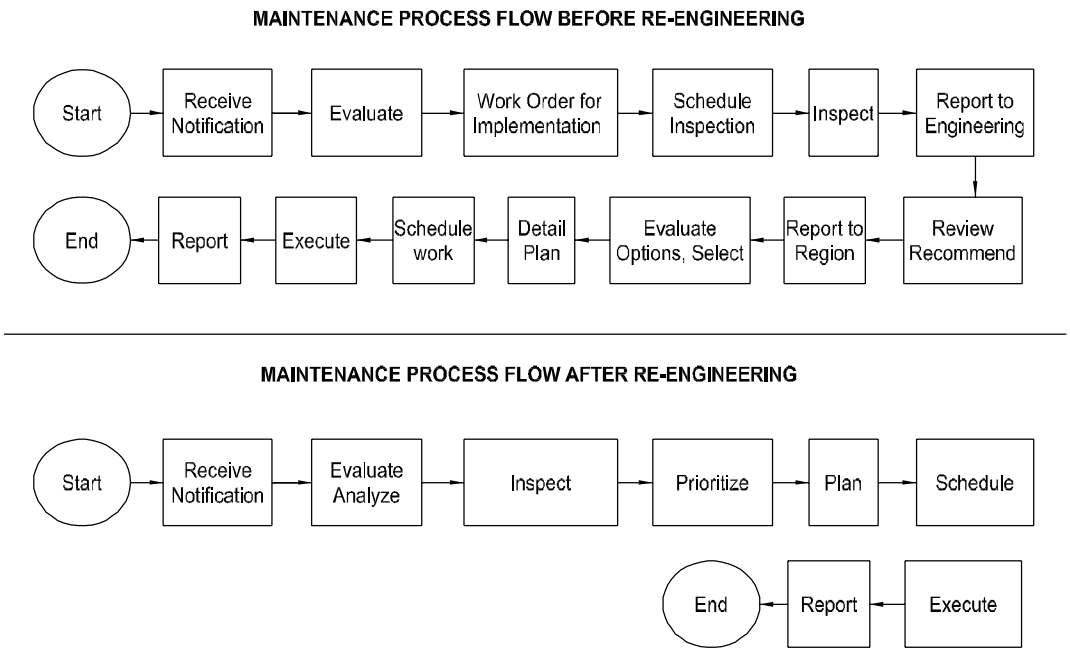

Fig. 3

3. Case Study

Re-engineering the maintenance process layout in an engine maintenance organization.

Typical market drivers that impact engine maintenance companies are, Reduced Costs, Improved Quality, Reduced Cycle-Times.

The objectives established by Any Maintenance Group in order to address market drivers are Restructure, Production Processes and Transition from Workshop Based Flow to Material Based Flow.

3.1 Plant layout

Normally Workshops are characterized by Numerous Individual Stations or Machineries on various locations.

Material Moves from One Station to the Next

Material Flow Difficult to Follow

Control Factors are High and Included the following

Personal–(Men)

Material–(Material)

Deadlines–(Time)

Tools–(Machines)

Difficult to Coordinate (Management)

Fig. 4 shows the plant layout wherein the primary control element is personal

Fig. 4

Fig. 5 shows the plant layout after re-engineering wherein the primary control elements are personal material schedules on tools. Here the engine will move sequentially from one end and the serviced engine will come out at the other end.

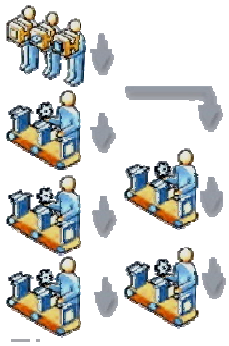

Fig. 5

3.2 Methodology

The maintenance team has studied the existing processes using methods study and time study and calculated the process time, idle time of persons in unnecessary movement, the utilization of space etc. Through the optimization of systems characteristics, maintenance team was able to study and characterize the existing processes and map out transition from Workshop- based flow to Material- based flow

3.3 Result

The organization was able to get the following benefits because of this re-engineering process

- Approximately 40% reduction in process times
- More efficient utilization of personnel
- Better on-time delivery of maintained engines
- Over all reduction in maintenance cost and improved customer satisfaction

4. Conclusion

The Aerospace industry is expected to grow fast owing to the growth in the commercial aviation sector however it faces a multitude of challenges including:

Rising fuel costs and price volatility which significantly impacts the cost of operation and margins.

Supply chain risk, if not managed well and efficiently, can lead to cost overruns, production delays, and program cancellations.

Globalization driven by emerging markets which will test both the operational and financial readiness of aerospace manufacturers and suppliers.

Increasing end-customer expectations for innovative products at a lower cost.

The above mentioned goals will become unrealistic without the following expectations:

There would be a major restructuring–in the way you are organized, the roles each person will play, the skills required, the way you are evaluated, the supporting technology, indeed, in the company culture, availability of spare parts on time.

The top executive will commit an enormous amount of time at the site is sponsoring and supporting the effort.

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