

# Online Flight Hangar Status using Lean Six Sigma

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**Abstract** - There are some issues which are the manual process in flight hangar department of HAL. This process is time consuming also involves some non-standards procedures, errors in documentation, rewriting and overwriting, multiple verifications etc. To address these requirements, an automated system has been developed which is named Online Flight Hangar (OFH) details.

Online Flight Hangar is a web application that consists of different stages of helicopters send for induction and enables monitoring the progress of stages completion of inducted helicopters. The different users of this system are the customer, shop people, QA and CRI. Thus online flight hangar facilitates communication and coordination between these users starting from helicopter induction to stage clearance.

Apart from showing the online clearance status of helicopter servicing, the application also provides various reports. Few of them being Dform, memo, form 1090. This will help in centralizing flight hangar so that the flight hangar servicing can be done at the customer's place rather than in flight hangar at the MRO.

Thus the OFH will ensure good coordination with the flight hangar and smooth work flow at the different stages.

Thus, through new technology, a little creativity, and a lot of thinking, we have begun to produce Flight Hangar Status that makes HAL pilots to track the status of their helicopters under periodic servicing and also provide the servicing and overhauling of their helicopter at the customerbase.

The recent drive in the Information and Communication Technology (ICT) industry toward new wireless communication devices and systems and their utilization in addressing a wide variety of real-world problems have resulted in several new areas of active research and this online flight hangar become one of the most hot topic.

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## 1. INTRODUCTION

We viewed development as a process of change and a continuous learning. Technological and institutional change or capabilities are at the heart of this process. Technology is much more than an ingredient in development strategies; it is a conditioning element of their viability. As technology rapidly changes, it sets the condition that generates development opportunities.

Development becomes one of the learning that benefit from such changing opportunities. While learning is within a single technological revolution, a new technological revolution would constitute major discontinuities and shifts in the direction of change, providing new opportunities for learning and catching up.

Technology is at the heart of the innovative process, and it has become a tool for amplify brainpower. It further brings about changes within and among institutions and accelerates the rate of innovation. CEO of Microsoft Corporation stressed that the number one benefit of technology is that it empowers people to do what they want to do, letting people be creative and productive.

### 1.1 Problem Statement

*Statement1:* The present system will not support the monitoring and track the helicopters which are inducting at the HAL Flight Hangar.

*Statement2:* This process is consuming the weeks to complete servicing of helicopter after the physical overhauling of helicopters to ferry out which increases the Turnaround Time of helicopters which in turn reduce the customer satisfaction and productivity.

*Statement3:* To do the mobile servicing or servicing of the helicopters at the customer bases the present system will be the tedious process.

## 2. OBJECTIVE

The primary objective of servicing ALH helicopters to meet all servicing requirements including overhaul of helicopters. The primary objective of the facility is to ensure improved customer satisfaction through reduction in Turn Around Time (TAT) covering Major Servicing, TBO servicing. TAT is calculated as the time taken from the day the helicopter is inducted at HAL for servicing till ferry

back to the Squadron by customer pilots after servicing at HAL MRO.

This system is aimed at providing a very useful and convenient tool for a HAL Flight Hangar to manage its online information. Flexibility and convenience in managing information, user friendly interface and ease of use are the key features that make it a desirable online tool for a MRO department.

This system is mainly aimed at providing of servicing of helicopters at the customer bases which will reduce the queuing of the helicopters at the HAL flight Hangar. To do this at customerbase it will provide the complete information through online so that in centralized system. So that the all the users along with the customers can be able to communicate each other.

More over the Authorities like the CRI and QA inspection teams can able to clear the memo and snags through online without visiting the to customer base which can reduce the time of travelling.

The developed system can able to reduce the manpower involvement in generate the dform, memo, form1090 and also in corresponding with the customers. So that it can reduce the manual mistakes that they encountered and also it can able to remove the difficulties in generating the related documents at signal out the helicopter from servicing. This can helps to avoid the redundancy in data of helicopters so that duplication of any work will be removed.

Another main objective is CRI who are not the HAL authority they can view the memo in their own place and can generate the form 1090 using the OFHS. They can check and keep track all the required information through online here. Finally it can improve the complete process at flight hangar and it can improve the productivity at HAL.

An analysis of servicing carried over the years at HAL as well as at bases has revealed the following salient points for the increased TAT in servicing of hepters-

1. Servicing of helicopters may take over a year .
2. Problem of obsolescence
3. Bunching of helicopters for servicing at different bases covering shortage of availability of skilled manpower

4. Turn around time is more.

5.Productivity is reduced.

6.Customers were not aware of status of helicopters.

### 3. METHOD

To help curb the rising costs of flight hangar status and provide the quality of servicing demanded by its many constituents.Lean Six Sigma, of course, is a composite of two process improvement methodologies: (1) Lean and (2) Six Sigma. Following is an overview of how these two methodologies work together.The lean approach

Lean is both a strategy and a set of techniques. The strategy of Lean is simple yet compelling: minimize waste and maximize customer satisfaction.

Lean continuously seeks to drive out waste in flight hangar processes so that customers needs are more effectively and efficiently met. Lean focuses on waste elimination where waste is defined by Shoichiro Toyoda, founder of Toyota, as “anything other than the minimum amount of equipment, materials, parts, space, and worker’s time which are absolutely essential to add value to the product.”Adapted in flight hangar, waste is anything other than the minimum amount of supplies, equipment, personnel, space and time that is absolutely essential to delivering a quality level of checked helicopters.Lean emphasizes the continuous movement towards a best process, not the typical American concept of an innovative step change in performance.

At the tactical level, Lean is implemented through the use of a set of practical tools and techniques. Below is a brief description of the principal Lean techniques that have particular application to flight hangar processes.

*Work cells:* a streamlined, modular approach for carrying out a process. Pilots,Shop technicians,Quality teamand Cri team will operate as a team to get helicopters to flow through a sequence of activities at flight hangar.

*5s:* a systematic way of organizing and standardizing practices in the workplace (sort, straighten, shine, standardize, sustain). 5S eliminates much of the time staff might spend serching information to fill the Dform manually,write memo for to Cri ,to write 1090.

*Setup:* a systematic method of reducing setup or changeover time for. Quick setup techniques help reduce flight hangar waiting time and maximize resource utilization.

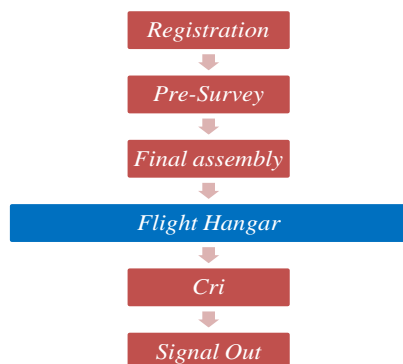


Figure1: Major servicing steps.

*Productive maintenance:* conscientious and systematic maintenance of equipment to keep it operational, thus minimizing equipment failures and avoiding long delays.

*Visual Controls:* utilization of visual signals and images to alert attention and ensure correct action and meaningful feedback occurs. Such controls reduce errors and wasted time. They also improve communication and prevent errors caused by handoffs across caregivers and departments.

*Mistakeproofing:* designing procedures so they can only be performed the right way. Mistake proofing focuses on error prevention rather than detection and correction. It often utilizes visual controls to eliminate error and provide verifying feedback. Mistake proofing directly attacks the roots of many of the causes contributing to the unprecedented mistake that occurs each year.

*Standardized methods:* ensures that procedures are documented and performed consistently. This is often achieved through printed instructions and staff training.

*Cross-training:* trains staff to function in multiple aspects of the process to provide greater interchangeability of workers. This reduces customers waiting time and improves worker utilization.

#### *The sixsigma methodology*

Where the strength of Lean lies in providing a set of proven techniques for eliminating waste, Six Sigma provides a structured methodology based on quantitative analysis for carrying out and sustaining Lean initiatives (or any other initiative for that matter). Lean and Six Sigma thus complement each other in driving process improvement. The standard Six Sigma methodology for process improvement is called the DMAIC pro process is intended to be repeated as a cycle of continuous improvement (see figure2).

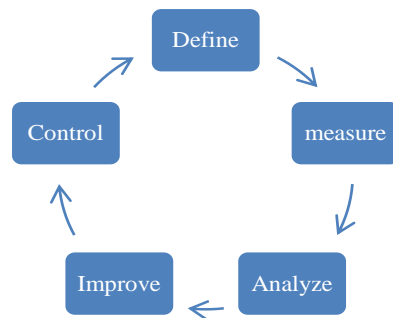


Figure 2: The DMAIC Process

## 4. CONCLUSION

The system's capability is to keep track of all the information and generate the reports as its main feature, which helps the management to know the current position of the organization activities by just glancing through system, generated details.

The system has been developed considering every single quality factor. Due to this reason the system is highly secure from the crash down problem. Moreover, the system is highly reliable and due to the security and integrity features, provides for the system, unauthorized users cannot access the system.

Online flight hangar is being implemented successfully in MRO division thus easy and efficient flow of work among all the users.

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