

## ***Headcount Reduction in a Microbiology Laboratory***

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**Abstract** — A headcount reduction of 20% in the Microbiology Laboratory of a manufacturing company is required. A time study was performed to determine the quantity of time each Microbiology Analyst requires to perform different tasks. The results obtained shows that 456.2 hours per month are required. This data was used to perform the capacity analysis which concludes that three analysts are required in the Laboratory. This result was compared with the present number of five analysts. A reduction of 40% was achieved during this project, which represents a positive accomplishment of the project goal.

**Key Terms** — Headcount, Headcount analysis, Reduction, Time Study

### **INTRODUCTION**

A Microbiology Laboratory of a manufacturing company, is currently composed of five analysts divided in one shift only. Laboratory Supervisor requires a reduction of twenty percent (20%) of the headcount.

Each analyst is responsible to perform all microbiology testing related to environmental and manufacturing samples of all manufacturing lines and controlled areas, such as Transfer Area, Incoming Area, etc.

The testing process of the laboratory are divided in the following categories:

- Bioburden
- Environmental
- LAL
- Product Audit
- Special Test
- Other Tasks

### **PROJECT OVERVIEW**

Headcount reduction or downsizing is a process which companies use to reduce the number of employees in the organization or in specific areas of the organization. This reduction can be associated to manufacturing process decrease, drop in sales, automatization process or re-organization process, etc.

If the headcount reduction is managed in a positive form, the company can achieve positive results, such as decreased expenses and improved productivity [1]. All actions have their consequences and based on that, it is important that companies take care of employees after headcount reduction.

It is important to perform the headcount reduction using the right steps to avoid [2]:

- Employee demotivation
- Reduction of Trust in the organization
- Loss of employees with expertise and knowledge
- Company reputation which can cause it to lose value in the market

### **Project Objectives**

The objective of this project is to reduce the Microbiology headcount by 20% and to re-distribute the microbiology analyst tasks to assure all analyst work is equitable.

### **HEADCOUNT REDUCTION ANALYSIS**

#### **Data Analysis**

The DMAIC problem-solving [Methodology methodology](#), which consists of five (5) [different stages](#): [\(Define, Measure, Analyze, Improve and Control\)](#), was used for this project [as the main tool](#)

~~to solve the project objectives and approach the organization with valuable data for their personnel process and for their procedure balancing and improvement.~~

In the Define stage the Microbiology laboratory tasks that each analyst perform was determined. It was found that 65 different tasks were performed in the Microbiology laboratory by the five analysts. These tests are divided into the following five categories:

- Bioburden
- Environmental
- LAL
- Other Task
- Special Task

For the Measure stage, a time study was performed in order to determine the quantity of time required to perform each task. Based on the analysis, a total of 456.2 hours per month are required to perform all microbiology tasks. Refer to Attachment #1: Microbiology Laboratory Tasks: Time Study

#### Headcount Analysis

Based on the quantity of time required to perform the different laboratory tasks a headcount analysis was perform as follows:

Quantity of Analyst = Quantity of hours required for testing \* Quantity of hours analyst work monthly.

Quantity of Analyst = 456.2 hrs/month \* (1 analyst / 160 hrs/month)

Quantity of Analyst = 2.85 analysts

In summary, three (3) analyst are required in the Microbiology Laboratory to perform all test and tasks. This represent a headcount reduction of 40% which is equal to two analysts.

In the Improve Stage a task distribution was performed between the three (3) analyst determined in the previous step. For the analyst #1, the tasks are distributed as shown in Table 1. This task distribution for analyst #1 represents that the working period consists of 138.7 hours per month.

This represent that an 86.7% of their time, analyst #1 will be working with the Bioburden, Environmental and other tasks assigned.

**Table 1**  
**Task Distribution for Analyst #1**

Task Distribution List		
Task	Time conversion per month (min)	Test Type
BB Monster SDA	120	Bioburden
GPT/Sterility	120	Bioburden
Media	120	Bioburden
Water Filtration	1200	Bioburden
BB Monster TSA	1920	Bioburden
Flexsafe BB	2880	Bioburden
Glove fingertip	240	Bioburden
FMTV Environmental TSA	120	Environmental
FTV Environmental	120	Environmental
FTNV Environmental	120	Environmental
FMTNV Environmental	360	Environmental
FMTV Environmental SDA	120	Environmental
FTV Environmental	120	Environmental
Excursions-Retest	120	Other Task
Graph Change	120	Other Task
Inventory	120	Other Task
Biowaste Management	160	Other Task
Material receiving	240	Other Task

Analyst #2 task distribution is presented in Table 2. A total of 140 hours per month are required by analyst #2 to perform LAL tasks. This quantity of time represents an 87.5% of their monthly time.

**Table 2**  
**Task Distribution for Analyst #2**

Task Distribution List		
Task	Time conversion per month (min)	Test Type
LAL pm	600	LAL
LAL/PC Monster	2400	LAL
Flexsafe PC, LAL	2880	LAL
LAL Product Audit	120	LAL
LAL am	600	LAL
Spores	360	LAL
Spore population determination	1440	LAL

Analyst #3 task distribution is presented in Table 3. A total of 138.5 hours per month are required by analyst #2 to perform LAL tasks. This

quantity of time represents an 86.5% of their monthly time.

**Table 3**  
**Task Distribution for Analyst #3**

Task Distribution List		
Task	Time conversion per month (min)	Test Type
Product Audit	90	Product Audit
Integrity-Out of Box	180	Product Audit
BCT Flat Filters	180	Product Audit
Thermal Stability	425	Product Audit
Bacterial Challenge	660	Product Audit
Bayer	480	Product Audit
Glycerin	1200	Product Audit
Leak/Dart Test	25	Product Audit
Stock Cultures	120	Product Audit
Dose audit	270	Product Audit
Cleaning log review	20	Other Task
Equipment Disinfection	30	Other Task
Alcohol preparation	40	Other Task
Log Temperature	100	Other Task
Backup main Building	120	Other Task
Discard Sample Bags	240	Other Task
Membrane Release	720	Special Test
Weekly Roll Inspect	100	Special Test
Perform of IM certificate	240	Special Test
Certificate to Biosart	180	Special Test
Certificate of ETO	30	Special Test
Solvent Results	80	Special Test
Flat filters Orders	80	Special Test
LAL Test:	2400	Special Test
Growth Promotion Test	120	Special Test
Sterility Test	180	Special Test

During this period, an evaluation of the data obtained was performed. The purpose of this division is to facilitate that each analyst focus in similar test or test that are related. Based on that, the task distribution is documented in Table 4. Data was distributed to each analyst in equitable time, to assure all analyst work approximately the same time. In addition, a comparison with the quantity of hours per month was performed and all values are less than 160 hours which is the monthly available time per analyst.

The Control Stage was performed using the new task distribution and a meeting with the analysts was performed to assure they feel comfortable with the changes. Based on that, the

results obtained a positive feedback from the analysts.

**Table 4:**  
**Test Type per Analyst**

Analyst #	Test Type	Quantity of hours / month
1	Bioburden	138.7
1	Environmental	
1	Other Task	
2	LAL	140.0
3	Product Audit	138.5
3	Special Test	
3	Other Task	

~~The Control Stage was performed using the new task distribution and a meeting with the analysts was performed to assure they feel comfortable with the changes. Based on that, the results obtained a positive feedback from the analysts.~~

### CONCLUSION

Based on the results obtained during this project, the objective was achieved and exceeded. The goal was to reduce the headcount in the Microbiology Laboratory by 20% and, based on the study and analysis, a 40% of the headcount was reduced. In order to assure that the laboratory have backup between their employees, the following recommendation was provided to management:

- Cross training between employees to assure they have the knowledge to perform all test.
- Rotate analyst every three (3) months to maintain employees active with all testing procedures.

In summary this project will provided the following benefits to the company:

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- Headcount reduction for the laboratory, which can also be represented as cost reduction due to two (2) analysts will not be required.
- Less idle time from the analyst which can be seen as higher efficiency or productivity.
- Cross functional training (backup)

### REFERENCES

- [1] Smith, B and Rutigliano, T, "Reducing Staff the Right Way", Gallup News Business Journal, October 8,2001
- [2] Wyman, O, "Managing the Organization Dynamics of Downsizing", Oliver Wyman Insights, January 2011

### Attachment #1: Microbiology Laboratory Tasks: Time Study

Task Distribution List		
Task	Time per month (min)	Test Type
Leak/Dart Test	25	Bioburden
Stock Cultures	120	Bioburden
BB Monster SDA	120	Bioburden
GPT/Sterility	120	Bioburden
Media	120	Bioburden
Lab Stock	240	Bioburden
RO Tank/RO04	400	Bioburden
Water Filtration	1200	Bioburden
BB Monster TSA	1920	Bioburden
Flexsafe BB	2880	Bioburden
Glove fingertip	240	Bioburden
FMTV Environmental TSA	120	Environmental
FTV Environmental	120	Environmental
FTNV Environmental	120	Environmental
FMTNV Environmental	360	Environmental
FMTV Environmental SDA	120	Environmental
FTV Environmental	120	Environmental
Backup main Building	120	LAL
FT LAL Tubing Prep.	240	LAL
Discard Sample Bags	240	LAL
Bayer	480	LAL
LAL pm	600	LAL
Glycerin	1200	LAL
LAL/PC Monster	2400	LAL
Flexsafe PC.LAL	2880	LAL
Spore population determination	720	LAL
Spores	360	LAL
Cleaning log review	20	Other Task
Equipment Disinfection	30	Other Task
Alcohol preparation	40	Other Task
Log Temperature	100	Other Task
Excursions-Retest	120	Other Task
Graph Change	120	Other Task

Inventory	120	Other Task
Biowaste Management	160	Other Task
Material receiving	240	Other Task
Testing for Protocol	240	Other Task
External/ Internal Investigation	480	Other Task
Trainings	120	Other Task
Meetings	120	Other Task
Retest	60	Other Task
Student in House	120	Other Task
Product Audit-E&O/TOC/PM	90	Product Audit
LAL Product Audit	120	Product Audit
Integrity-Out of Box	180	Product Audit
BCT Flat Filters	180	Product Audit
Thermal Stability	425	Product Audit
LAL am	600	Product Audit
Bacterial Challenge	660	Product Audit
Dose audit	270	Product Audit
Wetting Time	360	Special Test
Hydrophobicity Test	360	Special Test
Membrane Release	720	Special Test
Weekly Roll Inspect	100	Special Test
Perform of IM certificate	240	Special Test
Certificate to Biosart	180	Special Test
Certificate of ETO	30	Special Test
Solvents Results	80	Special Test
Flat filters Orders	80	Special Test
LAL Test	2400	Special Test
Growth Promotion Test	120	Special Test
Sterility Test	180	Special Test
Stock Culture	140	Special Test
Prepare Requisition for Micro (ECO and Main Building)	120	Special Test
Laboratory disinfection: Refrigerator 1, Oven 3 and Incubators 2	60	Special Test