

Activity Based Costing for Management Decision Making in Quality Assurance Laboratories

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Background

UNX Industries is a detergent manufacturer with a production facility and development laboratory located in Greenville, NC catering to healthcare, athletic and hospitality customers since 1958. UNX has constantly been at the frontier of cleaning technology introducing liquid detergents and enzymes to the market. Being a large-scale production facility it is important to keep track of activities along with the associated costs. Identifying cost drivers in production and the quality assurance laboratory is important for numerous reasons. Activity Based Costing (ABC) helps identify all indirect costs and allows a company to get closer to true net margin. Similarly in any company there are multiple sections of their pipeline, all carrying important roles in moving the company forward in a different aspect. Quality assurance (QA) is the operational activity used to fulfill requirements for incoming products. These operations are typically part of a larger quality program which also includes quality control (QC) and quality improvement (QI). Chemical / manufacturing companies are expected to partake in these procedures for either governmental regulations or to insure higher customer retention through insuring product quality. All these parts of the pipeline have different activities associated with them along which influence costing. It is important for companies to keep track of the costing of activities like QA to better grasp how much material, labor and overhead costs are used in the activities.

INTRODUCTION

Activity Based Costing (ABC) is a costing that allocates overhead costs based on the activities that create the cost, providing a much more accurate cost of the service or product. "ABC was pioneered by Copper, Kaplan and Johnson & Johnson. They developed a costing methodology used to allocate overhead costs directly to costs objects and help managers make the right decisions regarding product mix and competitive strategies" (Ray 2012). ABC helps allocate costs more effectively so products can be better evaluated and identify whether a product line is worth keeping or not. Organizations and companies can identify activities required to produce a product, of the given activities' costs can be assigned on various grounds such as labor, equipment and consumable costs. On the contrary traditional costing systems use all costs including overhead costs to determine a cost per unit. Traditional costing systems add average overhead rates to the cost driver such as labor. Traditional costing systems easier to implement, significantly cheaper, and easy to understand from a third party compared to ABC systems. This costing skews data because the overhead costs are split between all the products making it difficult to identify key cost drivers, this may result in different management decisions. This does not give an accurate representation of the performance if a company produces multiple products. ABC systems are expensive and take time to implement but they specifically demonstrate where money is being allocated. This results in upper management being able to make efficient portfolio management decisions, ultimately removing products which starve resources from more profitable items. ABC has helped companies in all industries from pharmaceuticals to auto manufacturers, allowing them to create competitive strategies to propel towards its visions and goals.

HYPOTHESIS

How does an ABC system allocate costs more effectively using activities as drivers instead of traditional costing drivers and how can this influence management decisions in modifying QA testing standards in lab environments?

METHOD

Data Collection Method

ABC Steps in Laboratory Setting

Identify products requiring QA Assigning costs to activities Identify cost drivers for activities Assign costs to products requiring QA

Collecting and Recording Data: To accurately record ABC data on quality assurance, data from previous records were analyzed in conjunction with recording and collecting firsthand information from the laboratory. Data was recorded on labor, equipment, and disposable costs.

RESULTS

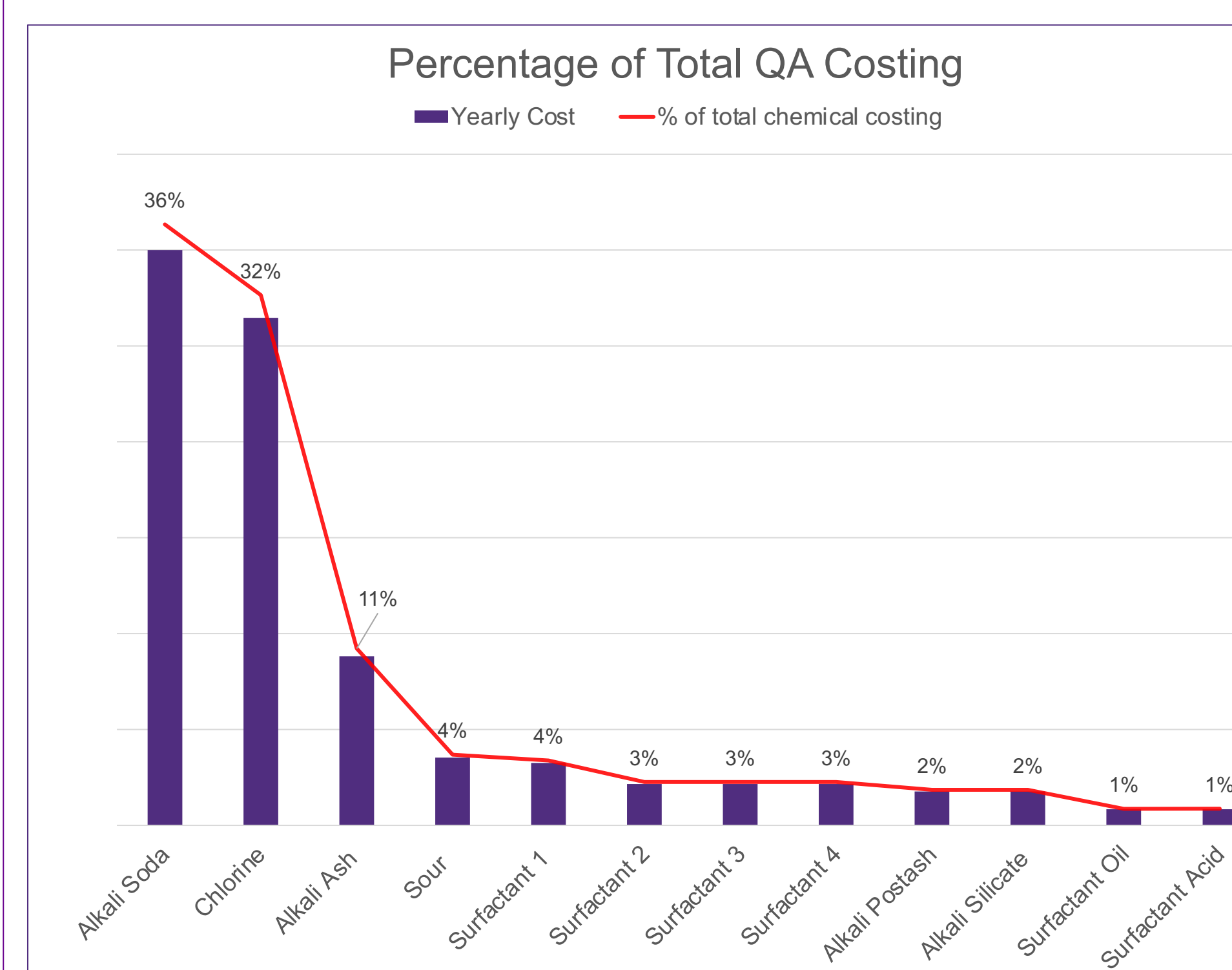
ABC Breakdown

Chemical	Testing Frequency	Cost per Test	Yearly Testing Cost
Surfactant 2	2	\$21.65	\$43.30
Alkali Potash	1	\$37.60	\$37.60
Alkali Soda	17	\$37.43	\$636.31
Alkali Silicate	1	\$35.29	\$35.29
Sour	2	\$38.82	\$77.64
Surfactant 3	2	\$21.65	\$43.30
Surfactant 4	2	\$21.64	\$43.28
Surfactant 1	3	\$16.65	\$49.95
Alkali Ash	5	\$35.89	\$179.45
Chlorine	15	\$35.29	\$529.35
Surfactant Acid	1	\$16.64	\$16.64
Surfactant Oil	1	\$21.64	\$21.64

The figure above shows frequency on a yearly basis of QA testing of the chemicals. Frequency is dependent purchase order (PO) frequency. The cost per test includes labor, chemical cost and disposable costs.

Analysis: After collecting and analyzing data, it was determined that QA testing costs is primarily costed based on labor and frequency of testing. Alkali soda gets tested 17 times per year compared to its counterparts which may get tested less than 5 times. Equipment costs will be gathered as more specific costing is conducted and were not calculated while gathering this data set. Applying this information allows UNX Industries to accurately determine costing on a per period basis while knowing exactly where costs are going. This is a helpful indicator in applying new procedures and policies that use this data to make better decisions. Management can now review applying a reduced methodology in testing while increasing confidence in supplier relationships.

Current Allocation Costing in QA Laboratory



Based on the costing per year there are two products that are consuming a large portion of testing costs; Alkali Soda and Chlorine. The main cost driver for these products is frequency of testing. In a given year these two products consumed 68% of spending. The remaining 10 products only use 32% of yearly costing in QA testing. Using Reduced Methodology in QA testing and relying more solely on supplier confidence will reduce costing. If there is a lack of consistency in supplier, then tightened methodology will be used until margin of error is reduced to a level acceptable to UNX. Auditing will be required to ensure suppliers are accurately testing product orders. This will allow a variance in pricing to be allocated to other activities not related to QA testing.

RESULTS (Continued)

Labor Costing in QA Testing

Use of Time	Labor Cost per Test						
	% Active	SG	pH	Color	Cloud point	Sampling	Total: per part
Setup Time	5	5	5	0	5	0	20
Sample prep	5	5	5	0	5	10	30
Test	5	5	5	5	4	0	24
Clean-up	5	5	5	0	1	0	16
Calculation	5	5	0	0	0	0	10
Data Entry	5	5	5	5	0	0	20
Total Time	30	30	25	10	15	10	120

Labor was calculated by identifying the amount of time used in each part of the product testing process. Some products have different QA testing policies; meaning they only have some tests conducted on each product. Different products require different testing to ensure quality. The figure above shows where time is being allocated in each part of the testing process with a cushion to account for extra time being used. Creating a unified costing system that works on various tests was a challenge overcome in the past by UNX. It was defined that there are 7 key parts of any test conducted by the QA laboratory as demonstrated in the figure above. This allowed an efficient system to be formed to identify allocated labor hours required in QA testing. QA labor hours is the main cost driver in laboratory testing. The most expensive tests conducted were % Active testing as well as Specific Gravity (SG). Alkali and chlorine-based chemicals must be tested for Active %, specific gravity along with the other testing associated with the QA process. Surfactant based chemicals have lower costing because they are only tested for pH, color and sampling. It is important to allocate ample time for each test to avoid overscheduling the QA laboratory and ensure all raw materials meet the quality standards of UNX. Therefore these processes cannot be altered without risking the reliability of testing which is a crucial role in the manufacturing side of the operation.

SUMMARY AND CONCLUSIONS

- **ABC systems help management decisions in a QA laboratory identify products that are expensive, this allows reduced costing while maintaining high level of quality using tightened and reduced methodology.**
- **ABC systems offer more benefits than traditional costing systems because all costs associated with a product are included in costing that are not included in traditional systems.**
- **UNX Industries can reduce costing by testing Alkali Soda and Chlorine less frequently under the circumstance that audits are taking place to ensure supplier has relevant data.**

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