

# The Use of Pharma Hose Options Will be Shaped by Innovation

*With the recent growth of the pharmaceutical sector, the medicinal industry require innovations from industrial hose manufacturers. The route to better products and higher profits will ultimately come from the Innovation-TCO-Profitability Causation Loop.*

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## A Growing Industry

The pharmaceutical industry has grown faster than other industry sectors; it currently spends approximately USD \$10 billion on flow and treat products, see Figure 2.<sup>1</sup> For many years the need for single use hoses and tubing, was limited. Now, the research and development of new medication has led to a need for an increased push from hose manufacturers.

The rapidly evolving industry has developed new drugs that can treat diseases, such as cancer, without harming patients. The common challenge with these medications is, however, that they utilize the cells from within each individual patient to create a drug, which can therefore only be used by that patient.

Manufacturing these single-patient drugs has been a real struggle for manufacturers because the quantities are small,

and it is very difficult to switch from the previous batch to a new one without contamination. This manufacturing difficulty has resulted in an increased use of single use technologies which are both very expensive and vulnerable to damage.

## Single Use Technologies

Hose suppliers are now developing products to meet these new needs, and are attempting to communicate their advantages. As product pricing is very sensitive to patent protection, there is a limited time frame for a developer to profit from a new product. It is therefore important for the new technologies to be as efficient and effective as possible.

For example, Watson-Marlow Fluid Technology Group (WMFTG) is now offering a way of matching Bredel hose material to the fluid being pumped, an activity that is prov-

en to reduce costs. Optimized pump life and efficiency depends on selecting the correct hose material in tough fluid-handling applications. Matching the peristaltic hose material to the pumped fluid can reduce downtime, cut production costs, and save energy in pumping operations that involve viscous and abrasive fluids.<sup>2</sup>

*Total Cost of Ownership (TCO) Cost Factors: Reduced downtime, reduced production costs, and energy savings.*

**General Risk Factors**

Another factor that manufacturers must consider when creating these single use hoses are the general risks associated with the hose applications. Pressure rated hose assemblies are typically installed around reactor vessels, bioreactors and other equipment placed on load cells. Specific applications are also found in chromatography, de-ionized and reverse osmosis water purification systems, as well as modular filtration systems. Generally, these hoses are used to make connections between two processes where rigid piping is not practical.

*Hose + Coupling World* published this three-part series, which describes important risk factors that system designers should take into account when specifying pressure rated hose assemblies in biopharmaceutical applications. The first installment specifically examines drainability and the related concepts of wetting angle and media affinity, interior smoothness and force to bend.<sup>3</sup>

*TCO Factors: Understanding the risk factors is a pre requisite for selecting the LTCO.*

The standards of construction are also an important consideration when selecting and developing high purity hoses. Although most specialty hoses are compliant with both ISO and USP standards, the standards vary considerably depending on its intended application.<sup>4</sup>

*TCO Factors: Non compliance has a number of potential associated costs.*

**TCO Evaluations**

In the past, manufacturers with many successful installations could use their large market share to validate their equipment. The argument has been if all these users are finding it the best so will a new purchaser. In the new environment purchasers want accurate cost of ownership evaluations for new and better options.

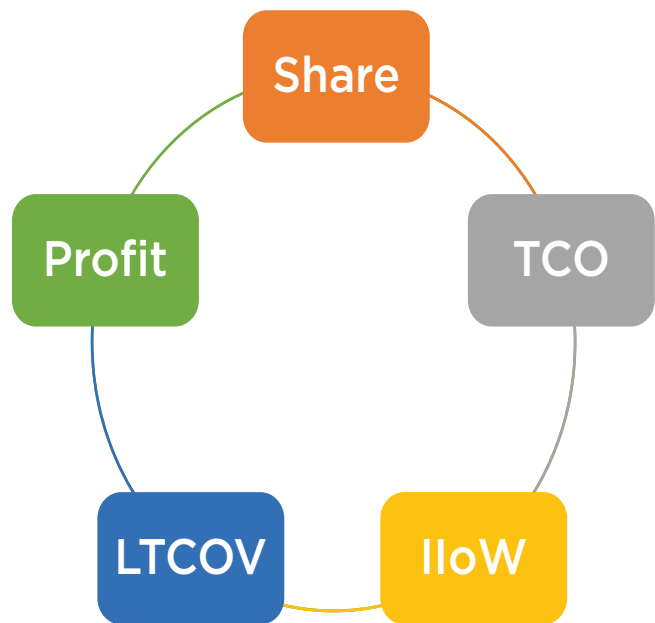


Figure 1: Innovation-TCO-Profitability Causation Loop.

The media, suppliers, and associations are providing instant access to the latest information. In effect this is an Industrial Internet of Wisdom (IloW) which allows the user to determine which product has the lowest total cost of ownership.

What is being created is an Innovation – TCO- Profitability Causation Loop consisting of:

- Market share,
- Total cost of ownership (TCO) for the innovation,
- Industrial Internet of Wisdom (IloW),
- Lowest Total Cost of Ownership Validation (LTCOV),
- Profit margin and total profits.

The TCO for the innovation can now be validated with IloW. LTCOV convinces the customer to pay a higher price for the product. In turn the higher price results in higher profits. Funds are then available for more R&D. This investment leads to new and better products and the cycle continues, as highlighted in steps 1 through 8 below.

1. Develop a better hose for a bag sampling system through an R&D investment.
2. Determine that this hose reduces the total cost of ownership for bag sampling systems and quantify the lower total cost of ownership (LTCO).
3. With IloW, validate this LTCO even with higher gross margins than achieved with less novel products.
4. Achieve a high market share due to the LTCOV.
5. The high market share plus the high margins will substantially increase profits.
6. A portion of this profit is directed toward additional R&D.
7. The R&D expenditures are made only with careful analysis of the potential to decrease TCO in market niches selected to maximize profits.
8. The successful development on the next new product results in the continuance of the causation loop.



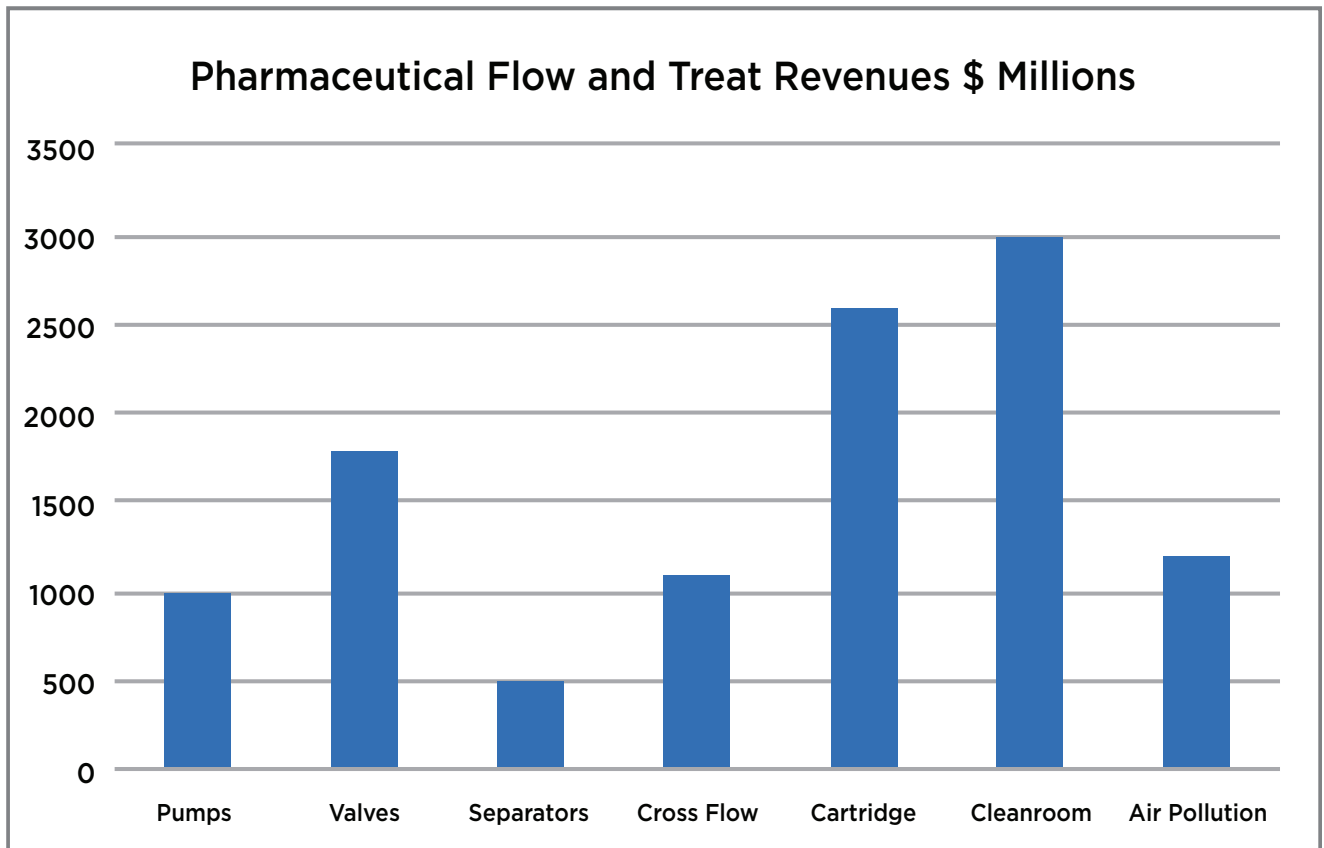


Figure 2.

**Summary**

The pharmaceutical industry is the leader with R&D expenditures averaging 19% of revenues. The hose industry averages 3%. The large investment in pharma has resulted in remarkable cell and gene therapy treatments and a vaccine for coronavirus.

There are many potential niches for hoses in flow and treat products in the pharmaceutical industry (see Figure 3). There are unique conditions, and therefore unique TCO factors, in each segment. The challenge is to quantify the market size and the LTCO in each niche.

Hose suppliers need to keep pace with their pharma customers. The Innovation-TCO- Profitability Causation Loop is the recommended route.

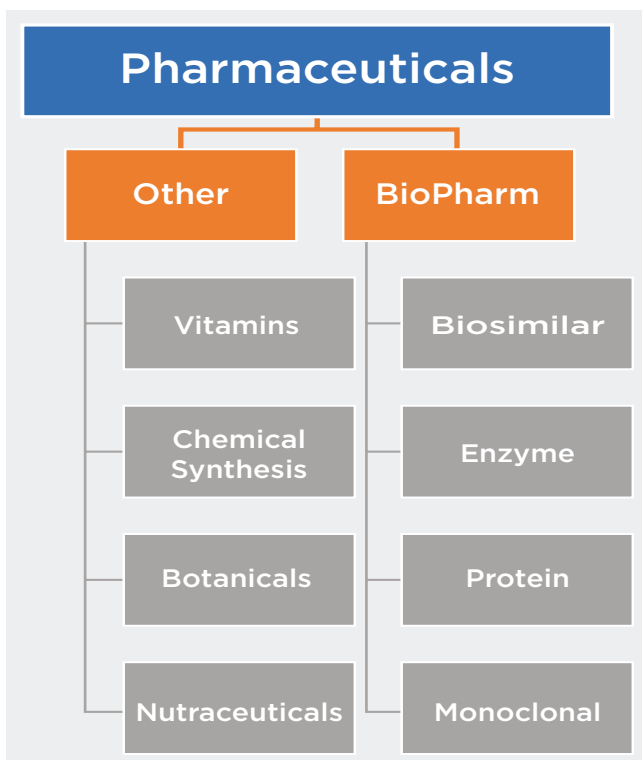


Figure 3.

References

- (1) Hose & Coupling Markets published by the McIlvaine Company
- (2) <https://hose-coupling-world.com/wmftg-matches-hose-material-to-pumped-fluids/>
- (3) <https://hose-coupling-world.com/archive-high-purity-hose-biopharmaceuticals-1-3/>
- (4) <https://hose-coupling-world.com/5-questions-to-ask-about-high-purity-hoses/>

**ABOUT THE AUTHOR**

Bob McIlvaine founded the McIlvaine Company in 1974 and oversees the work of 30 analysts and researchers. He has a BA degree from Princeton University.

