HASKELL

CASE STUDY

Reasonable Conclusions vs. Real Insight

The scientific method is often mischaracterized as a static, linear process. However, real insight and discovery in science is an ongoing cycle of constantly developing models and methods that provide greater accuracy and usefulness. Discovering better results requires being open to a different approach for answering questions and solving problems.

This case study examines how an engineering team went beyond basic feasibility and design practices and was rewarded with a massive return for their efforts.

Introduction

The scientific method is often mischaracterized by the following straightforward sequence of steps:

Define the question - Observe data - Form hypothesis - Perform experiment and collect data - Analyze data - Interpret data and draw conclusions that serve as a starting point for new hypothesis - Publish results – Retest.

Einstein demonstrated that science is not a recipe. All inquiry requires intelligence, imagination and creativity. Real insight and discovery is an ongoing cycle of constantly developing models and methods that provide greater accuracy and usefulness.

For example, Einstein's Theories of Relativity didn't negate the foundational truth of Sir Isaac Newton's *Principia*, they just expanded and refined them.

At times, manufacturing engineering can fall into stale patterns and methodologies. The basic feasibility and design practices of many of these processes are sound but they often fail to realize full potential for improvements.

This case study examines a case in which an engineering team used a small, incremental step to **realize savings of $500,000**.

Big Dollars & High Complexity

The Southeastern facility that is the stage for this case study is massive. Prior to this initiative, the facility included 4 miles of conveyor; 13 palletizing systems, 11 new tie-in points, 33 possible inputs and 13 destinations. Demand for the plant's consumer products continues to grow but equipment and operations need updating.

The company's engineering team brought in professionals from Haskell to conduct an initial engineering feasibility study that would help scope the project to determine initial funding needs.

This static capacity and linear analysis is, by definition, conservative, spreadsheet-type work. Once the feasibility study was completed, a more detailed engineered project definition plan provided refined appropriation requirements and was the beginning of verifying a new layout for variables such as product demand curves, operating schedules, maintenance and selection of equipment.

Targets of Opportunity

Targets of opportunity were identified to justify or deny the capital investment for the system's improvement. In this case there were eight major decision points established:

- Two High-Speed Sortation Points
- Two High-Speed Laners
- Four 2-to-1 Merges with Scan Points

The definition report indicated that – to meet production requirements – the addition of a new high speed sorter would likely be required. Then, the debate began.

Reasonable Conclusions vs. Real Insight

The company's engineering design team was satisfied with the static capacity reports and layout alternatives. The Haskell team had conducted a thorough analysis and corporate leadership was ready to make an investment choice against the overall business case.

However, the Haskell folks and some client members of the team had a nagging feeling. From their experience with other complex systems, the professionals knew there was more to be learned and to be revealed than the static reports could flesh out.

The local project team, comprised of facility and Haskell engineers, had previous successful experiences to draw from as they began to lobby corporate management to fund simulation of the design options. The simulation costs would be about the same as the service costs to create the static reports. But the Haskell engineers knew that simulations **mimic specific characteristics of real systems dynamically** and provide insights on system operations, performance, and verification of controls strategies for the entirety of Process, Packaging and Material Handling & Distribution systems.

By running a full simulation of various design options, the Haskell team contended they would be able to reveal new – and likely better – design for such a large and complex system.

Corporate management agreed with the project team's decision to utilize simulation. Their choice paid off.

The simulation revealed that the new system was currently "over designed."

Careful study of the simulation under multiple operating scenarios revealed some major changes could be made, including:

- **Shifting from using an expensive, high-speed sorter to a lower cost,** custom sortation method would provide more than ample throughput.
- **Large sections of conveyor – approximately 300 feet – could be removed** from the system at a significant savings – reducing system complexity and cost while maintaining required capacity.
- **Confirmation that the 13 palletizing systems** originally supporting the facility could be reconfigured to a 9-piece system by removing 5 palletizers, adding 1 high-speed palletizer and rebuilding 2 palletizers.

Conclusion and Summary

Ultimately, by using simulation to mimic the entire system, the project team invested a little more in the "up front" engineering effort and realized a return of more than 10-fold the investment, saving approximately $500,000 on equipment and systems they would not need.

While there was nothing wrong with the data the static analyses produced, real insight and discovery through the more sophisticated simulation models and methods ultimately provided greater accuracy and usefulness in the form of significant savings for the client.